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VOC Emissions from Evaporative Sources in Residential Garages

Doyun Won

July 7, 2015



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Development of technical documents related to chemical emissions from building materials and consumer products

VOC Emissions from Evaporative Sources in Residential Garages

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Executive Summary

The goal of this study was to characterize volatile organic compounds (VOCs) emitted from consumer products that Canadians commonly store in attached garages. A total of 30 consumer products were tested for 121 volatile organic compounds (VOCs) in one large-scale (2 m^3) chamber and four small-scale (50 L) chambers for 4 days under standard conditions of 50% RH, $\sim 23\text{ }^\circ\text{C}$ and 1 air change per hour. Additionally, the air concentrations of selected VOCs¹ in the house and garage were predicted based on the emission factors measured in the tests.

Tests were conducted in different phases:

- First, static headspace analysis was conducted to screen the level of VOC emissions. This was done by taking one air sample from the headspace of 50-L chamber that contained a consumer product. The products were divided into high and low emitters based on the headspace concentrations. A high emitter was determined as the product with the headspace concentration greater than $1,500\text{ }\mu\text{g m}^{-3}$ for TVOC and greater than $1,000\text{ }\mu\text{g m}^{-3}$ for sum of 51 VOCs in the Japanese IAQ mixture².
- Second, high emitters were tested with cap/cover closed in 50-L chambers under a dynamic flow condition for 4 days. Low emitters were tested in the same manner without cap/cover since preliminary dynamic tests with three low emitters (transmission fluid, 4-stroke motor oil and power steering fluid) showed only trace level of VOCs with cap/cover closed.
- Third, for selected high emitters, the effects of temperature and cap tightness were tested.
- Fourth, gas-powered equipment (snow blowers, lawn mowers, chainsaws and trimmers) was tested in a 2 m^3 chamber due to their size. To simulate their actual usage and storage, each piece of equipment was subjected to a 30-min operation period before installation in the emissions chamber. The main variable found to influence emissions of gas-powered equipment was the age of the product (brand-new vs. used).

Based on the TVOC results of the static and dynamic tests, the consumer products could be divided into three categories:

- High emitters that include gasoline-based products such as gas-powered equipment and gasoline container. Particularly, they were main sources of petroleum-related compounds such as benzene, toluene, ethylbenzene and xylenes (BTEX).

¹ "Priority VOCs" identified by Health Canada's Indoor Air Contaminant Assessment Program as substances warranting further investigation, with respect to sources and risk assessment. The term "priority" does not imply that the VOC poses greater health risks than VOCs not identified as such.

² Japanese IAQ mixture is an analytical standard used for the VOC analysis and contains a total of 51 VOCs (see Table 5 for the VOCs included in the mixture).

- Medium emitters that include non-gasoline products such as paint products (oil-based paint/primer, paint remover, paint thinner, aerosol paint), automotive products (2-stroke motor oil, windshield washer fluid), an oil-based wax, a lubricant, an adhesive, a degreaser and a roof sealant product. Medium emitters could be high emitters for certain individual compounds. For example, paint remover was the main emitter of dichloromethane.
- Low emitters that include a garden/plant care product, a driveway maintenance product, and 6 automotive products (antifreeze, upholstery cleaner, transmission fluid, power steering fluid, motor oil for 4-stroke engines, and wax for automotive). The emissions from low emitters were lower than those from high and medium emitters even though they were tested with cap/cover open.

Three variables that may affect evaporative emissions were investigated: age of a stored product, storage temperature, and closure tightness. The following observations were made:

1. The emissions from used gasoline-powered equipment (> 10 years) were higher than that of a new product by a factor of 5 to 14. The small age difference in two trimmers (brand-new and 2 years old) did not affect emissions. More tests with different age groups of a product are recommended. This will help understand whether there is a critical product age that can adversely affect VOC emissions or whether the deterioration is a gradual phenomenon. Also, more systematic research is required to understand how various components of a fuel system of gas-powered equipment change with age.
2. The emission factors depended on test temperature, which was varied in four levels (4, 14, 23, and 30 °C) with three products (adhesive, gasoline container, and paint remover). The average ratios of emissions factors against that at 23 °C were 0.4, 0.6 and 1.4 at 4, 14 and 30 °C, respectively. The Clausius-Clapeyron relation described the temperature dependence of emission factors well. However, it was difficult to generalize the temperature dependence for one compound for various sources. This is likely due to the fact that the emissions were affected by material properties of containers as well as chemical properties of a compound. Since the Clausius-Clapeyron relation is for the temperature dependence of a chemical property, i.e., vapor pressure, the temperature dependence of material properties also need to be considered.
3. The cap/cover tightness test with three high emitters (paint/primer, paint thinner and motor oil for 2-stroke engines) showed that emission factors with an opening had higher emissions compared to those with a cap/cover closed tightly, although the difference in the opening size did not make much difference in the emissions at 72 h and 96 h. This emphasizes the importance of closing a product tightly when it is stored. However, for a high emitter such as 2-stroke motor oil, the additional emissions due to a loose cap were not significant at 72 h and 96 h. This may be due to poor quality of container materials or seals, which could facilitate permeation of VOCs through polymers. This may imply that closing a product tightly is not a good

enough measure for some high emitters. Better storage containers (e.g., materials and design) need to be developed for high emitters.

The findings from the chamber tests were re-emphasized in the two-zone modeling, which was performed to predict the air concentration in the house and garage based on a scenario developed for residential usage of building materials and consumer products. The main sources of BTEX were gasoline-based products, which agree with the observations from the chamber tests. The transport from the garage was the main contributor of BTEX in the house. On the other hand, the main emitters of aldehydes (formaldehyde, acetaldehyde, propanal) were wood-based building materials and paint in the house. The transport from the house was the main source of aldehydes in the garage.

The two-zone modeling based on two types of sources (building materials and consumer products) resulted in the IAQ predictions that are in good agreement with literature values for both BTEX and aldehydes in residences. This may imply that the unaccounted sources in this study (e.g., consumer products stored in a kitchen, bathroom and basement) are minor sources for BTEX and aldehydes in houses. On the other hand, the predicted garage concentrations were generally lower than measured values, most likely because the modelled garage sources did not include a parked car. This shows the importance of understanding different sources. Overall, the two-zone modeling was shown to be a good tool to understand the combined effects of different sources and identify main sources.

1 Introduction

Attached garages have been identified as an important source of residential indoor air pollutants (Batterman et al., 2006, Batterman et al., 2007, Dodson et al., 2008, Graham et al., 2004, Héroux et al., 2010). This is particularly relevant to petroleum-related pollutants such as benzene, toluene, ethylbenzene and xylenes (BTEX). Gordian et al. (2010) reported that elevated benzene levels in a home in Anchorage were strongly associated with small engines and gasoline stored in the garage. In spite of their importance as a source of air pollutants, there is generally a lack of information on the evaporative sources that Canadians tend to keep in attached garages.

The goal of this study was to identify major sources of volatile organic compounds (VOCs) commonly found in attached garages in Canada. This report summarizes the emission test results for a total of 10 gas-powered implements (lawn mowers, trimmers, chainsaws, and snow blowers) and 20 small products (e.g., gasoline container, automotive products, paint products, wax/polishes, lubricants, glues, cleaning products, driveway/roof products). The indoor air concentrations in Canadian homes and garages were estimated using empirical emission models based on emission factors measured for the 4 day test periods. While a total of 121 VOCs were examined in the emission tests, more in-depth analysis was given to “priority” chemicals. This study is expected to further advance the knowledge on VOC sources in Canadian residences as an expansion on the past studies on building materials as a source of VOCs (Won et al., 2014, Won et al., 2013).

2 Methods

2.1 List of test products and test overview

The test products were selected based on the result of a telephone survey administered nationwide to identify products and equipment Canadians typically store in attached garages. The survey involved a total of 772 home owners in in Edmonton, Halifax, Montreal, Ottawa, Quebec City, St. John's, Toronto, Vancouver and Winnipeg.

Table 1 lists the test products in the major product categories identified in the survey and the percentage of homes with a product in different categories. Two snow blowers and four lawn mowers were tested as they were the major gas-powered equipment identified (31% and 34%). Two lawn trimmers and two chainsaws were tested to represent the category of other gas-powered equipment (15%). Since gas-powered equipment did not fit a 50 L chamber, they were tested in 2 m³ as described below.

All other products were tested in 50 L chambers. Due to the high ownership frequency (80%), a total of 8 automotive products were tested, including 1) two automotive care products (one interior, one exterior), 2) two motor oils (2-stroke and 4-stroke), 3) power steering fluid, 4) transmission fluid, 5) windshield washer fluid, and 6) antifreeze. While the lawn and garden products showed a high frequency (64%), only one product was tested since the main ingredients were expected to be inorganics. Within the category of paint products (32 – 34%), four different products were tested, including 1) oil-based paint, 2) paint/stain remover, 3) paint thinner and 4) solvent-based spray paint. For the remaining categories, only one product was tested, including 1) gasoline container (5 L) filled with regular-grade gasoline purchased in September 2014, 2) driveway crack filler, 3) roof sealant, 4) degreaser, 5) adhesive, 6) lubricant, 7) oil based wax for furniture.

Table 1 lists the tests conducted under standard conditions (22 – 24 °C, 47 - 51% RH, and 1 air change per hour, cap open/closed). Selected products were tested with a cap open in 50 L chambers since they were low emitters (Table 1). To determine a low or high emitter, a headspace analysis using a 50 L chamber was conducted before a dynamic test. The test methods are described below. Additionally, selected high emitters (gasoline container, paint remover, and adhesive) were tested at different temperatures (4, 14, 23, and 30 °C) to determine the differences in the emissions as a function of temperature. This was to understand the extreme emissions. While low emitters can have elevated emissions at high temperatures, they are not expected to represent extreme cases. Also, several high emitters were tested with a cap with a varying degree of tightness (completely closed with 1.5 turn, ½ turn opening, 1 turn opening). More detailed information on the test methods are provided in the following sections.

Table 1: Summary of test products under standard conditions ¹

Category	% of Homes	#	Test ID	Description	New/Used	Year of purchase	Cap	Chamber
Gas powered snow blower	31%	1	SB2	Snow blower (205 cc, 4-cycle, 2-stage, 24" blade)	New	2014	Closed	2 m ³
		2	SB3	Snow blower (4-cycle, 2-stage, 26" blade)	Used	2002	Closed	
Gas powered lawn mower	34%	3	LM1	Lawn mower (149 cc, 4-cycle, 22" blade)	New	2014	Closed	
		4	LM2	Lawn mower (140 cc, 4-cycle, 21" blade)	New	2014	Closed	
		5	LM3	Lawn mower (160 cc, 4-cycle, 22" blade)	Used	2013	Closed	
		6	LM4	Lawn mower (161 cc, 4-cycle, 21" blade)	Used	2003	Closed	
Other gas powered equipment	15%	7	TR1	Lawn trimmer (26 cc, 2-cycle, 17" cutting path)	New	2014	Closed	
		8	TR2	Lawn trimmer (31 cc, 2-cycle, 18" cutting path)	Used	2002	Closed	
		9	CS1	Chainsaw (46 cc, 2-cycle, 18" cutting path)	New	2014	Closed	
		10	CS2	Chainsaw (45 cc, 2-cycle, 15" cutting path)	Used	2011	Closed	
Gas container	48%	11	GC	Gasoline container (plastic, filled with 5 L of regular gasoline purchased in September 2014)	New	2014	Closed	50 L
Automotive products	80%	12	AF_f ²	Antifreeze	New	2014	Open	
		13	UC_f ²	Automotive carpet/upholstery cleaner (spray)	New	2014	Open	
		14	TF_f ²	Transmission fluid	New	2014	Open	
		15	WW	Windshield washer fluid (all season, -40 °C)	New	2014	Closed	
		16	SF_f ²	Power steering fluid	New	2014	Open	
		17	MO2	Motor oil (2 stroke)	New	2014	Closed	
		18	MO4_f	Motor oil (4 stroke)	New	2014	Open	
		19	WXA_f	Exterior automotive care product (liquid wax)	New	2014	Open	
Lawn and plant care products	64%	20	WC_f ²	Weed control compound (spray, eco-friendly, iron-based)	New	2014	Open	
Wax or polishes	48%	21	WXF	Oil based wax for furniture	New	2014	Closed	
Lubricants	45%	22	LUB	Lubricant (multi-purpose, viscous oil, spray)	New	2014	Closed	
Glues and adhesives	42%	23	ADH12	Adhesive (contact cement)	New	2014	Closed	
Cleaning products	39%	24	DG	Degreaser	New	2014	Closed	
Paint products	32 - 34 %	25	PTO	Oil based primer/sealer	New	2014	Closed	
		26	PTR	Paint/stain remover	New	2014	Closed	
		27	PTH	Paint thinner	New	2014	Closed	
		28	PTS	Aerosol paint (indoor/outdoor, solvent based)	New	2014	Closed	
Driveway or roof products	16%	29	CF_f ²	Driveway crack filler (acrylic latex based)	New	2014	Open	
		30	RS	Roof sealant (fiber reinforced roof coating)	New	2014	Closed	

¹ Standard condition: 23 ± 1 °C for 2 m³, 23 ± 0.5 °C for 50 L, 50% RH, and 1 air change per hour;

² "f" means "fully open"; if "f" is not included in the test ID, it means the cover was closed.

2.2 Test procedures

2.2.1 2 m³ Chamber

A cylindrical stainless steel chamber (1.185 m diameter, 1.78 m height, and 1.96 m³ volume) was used for the test of gas-powered equipment (Figure 1). Clean air for the chamber was supplied using an Aadco Model 737 Pure Air Generator. The clean air entered at the bottom of the chamber (#1 in Figure 1) through a perforated diffuser (#2) and exhausted through the top of the chamber (#4). The flow rate to the chamber was 30 – 32.7 L min⁻¹, leading to an air exchange rate of 1.0 h⁻¹. The air change rate was confirmed by tracer decay testing by injecting SF₆ and monitoring its concentration for at least 4 hours with an Innova photoacoustic gas monitor. To facilitate the internal mixing, a fan (#3) attached to the ceiling was operated during a test.

The chamber relative humidity was controlled by directing a portion of the supply air flow through a humidifier (glass impinger) with a target of 50% RH. Temperature control of the chamber relied on the building temperature control, and ranged between 21.7 and 23.8 °C. The pressure inside the chamber was maintained positively (10 – 26 Pa above the ambient pressure). The surface temperature of the test equipment was monitored with K-type thermocouples attached to the muffler and engine body (Figure 2).

Regular-grade gasoline was purchased one week before each season (in February for winter and in June for summer) at the gas pump on the NRC campus. Before each test, the gasoline was poured into the test object equipment according to the manufacturer's instruction. If required, the gasoline was mixed with engine oil recommended by the manufacturer. The test equipment was operated under a typical operating condition for 30 minutes, including 10 min of idling and 20 min of operation. Figure 3 and Figure 4 show a snow blower and lawn mower in operation before a test, respectively. After the 30-min operation, the test equipment was wiped out to remove debris or snow from the operation and put into the chamber for the test. This was to prevent the relative humidity in the chamber from being excessively high. If the equipment is too big for the chamber, the handle was disassembled from the main body and put into the chamber. The starting point was when the chamber door was closed and secured. It took 20 – 30 min from the end of operation to the start of a test.

A test lasted for 4 days with air sampling done at 0 h, 1 h, 3 h, 6 h, 24 h, 48 h, 72 h, and 96 h with two exceptions. The test with SB3, which lasted for 240 h to check when steady state was achieved, showed a 4-day test was long enough to get the steady state. The same was observed for TR1, which lasted for 192 h. One background air sample collected for each test was to verify chamber cleanliness. The tests with snow blowers were done between February and March, 2014 and the remaining tests were conducted between June and August, 2014.

Table 2 summarizes the environmental conditions (air and surface temperature, relative humidity) monitored using a data acquisition system based on Agilent Vee Program. The chamber air temperatures for two snow blower tests were lower than other tests since the tests were done in winter and the building temperature was low. A similar observation can be

made for the surface temperature. While the surface temperatures for most products were $\sim 24^{\circ}\text{C}$ on average, it was $\sim 22^{\circ}\text{C}$ for two snow blowers. The relative humidity level for all tests was between 47% and 50% except for SB3. This is because the RH level went to below 40% for 2 hours during the SB3 test due to the low water level in the humidifier.

The surface temperatures of the test equipment showed bigger standard deviations than air temperatures. This reflects the fact that the surface temperature was elevated at the start of the test due to the 30-min operation and it was gradually reduced to the chamber air temperature. Figure 5 and Figure 6 show the muffler surface temperature profiles (30 min average) for the first 2 and 8 hours, respectively. The muffler surface temperature varied between 25 and 55°C at the beginning and decreased to $22 \sim 24^{\circ}\text{C}$. Similar observation can be made for the surface temperature profiles of engine body or motor in Figure 7 and Figure 8 for the first 2 and 8 hours, respectively.

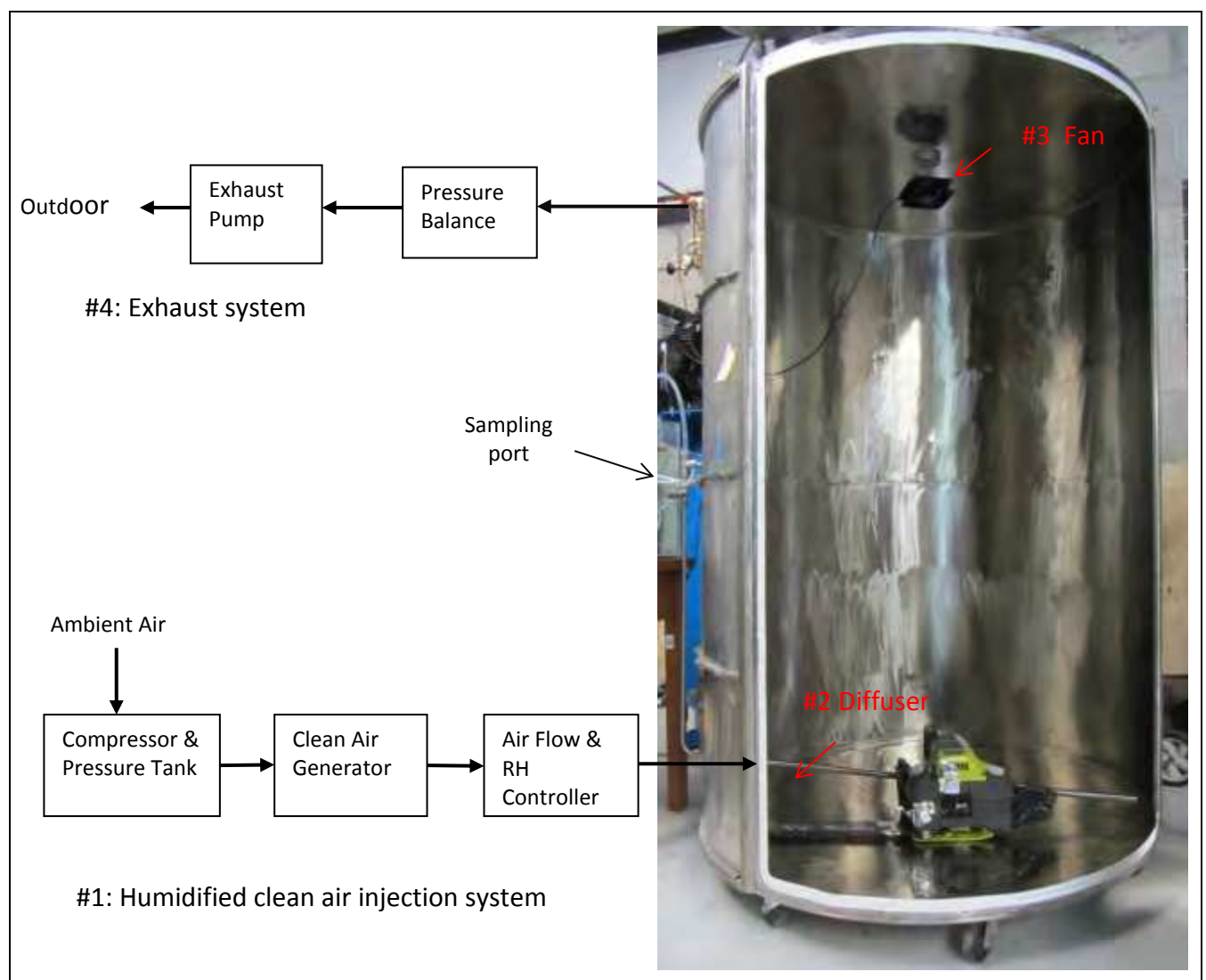


Figure 1: Photo of 2 m³ chamber with a chainsaw

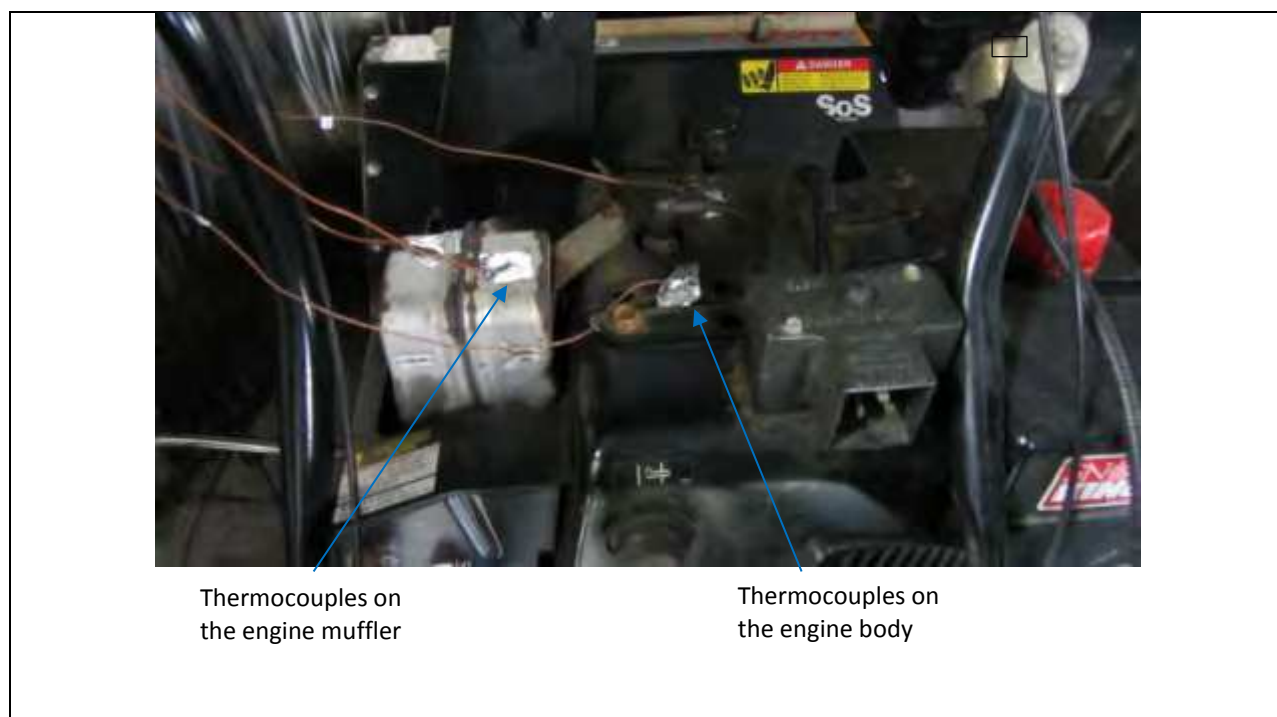


Figure 2: Close-up photo of a snow blower in the chamber



Figure 3: Snow blower in operation before a test



Figure 4: Lawn mower in operation before a test

Table 2: Environmental conditions of 2 m³ chamber (mean $\pm$ standard deviation)

Test ID	ACH (h ⁻¹)	Chamber air temperature (°C)	Chamber RH (%)	Surface temperature (°C)		
				Muffler	Engine body or motor	Metal part below engine or chain
SB2	1	21.9 $\pm$ 0.4	49.6 $\pm$ 17	22.2 $\pm$ 0.4	22.1 $\pm$ 0.4	-
SB3	1	21.7 $\pm$ 0.4	42.3 $\pm$ 9	22.2 $\pm$ 1.9	22.0 $\pm$ 0.8	-
LM1	1	23.3 $\pm$ 0.6	47.8 $\pm$ 6	23.8 $\pm$ 2.3	23.6 $\pm$ 2.3	23.7 $\pm$ 4.9
LM2	1	23.7 $\pm$ 0.4	48.1 $\pm$ 2	24.2 $\pm$ 1.5	24.1 $\pm$ 3.4	24.2 $\pm$ 6.2
LM3	1	23.8 $\pm$ 0.4	48.9 $\pm$ 5	24.2 $\pm$ 0.9	24.0 $\pm$ 0.7	24.1 $\pm$ 3.2
LM4	1	23.7 $\pm$ 0.4	50.4 $\pm$ 6	24.1 $\pm$ 0.8	24.0 $\pm$ 1.5	23.9 $\pm$ 1.3
TR1	1	23.6 $\pm$ 0.3	49.1 $\pm$ 5	24.1 $\pm$ 2.7	23.9 $\pm$ 2.3	23.9 $\pm$ 2.3
TR2	1	23.4 $\pm$ 0.5	48.2 $\pm$ 2	23.9 $\pm$ 1.3	23.6 $\pm$ 0.8	23.7 $\pm$ 2.2
CS1	1	23.6 $\pm$ 0.4	47.2 $\pm$ 1	23.7 $\pm$ 4.2	Motor: 23.9 $\pm$ 3.1	Chain: 23.6 $\pm$ 1.0
CS2	1	23.8 $\pm$ 0.3	48.5 $\pm$ 1	23.8 $\pm$ 4.7	Motor: 24.2 $\pm$ 1.9	Chain: 24.0 $\pm$ 2.3

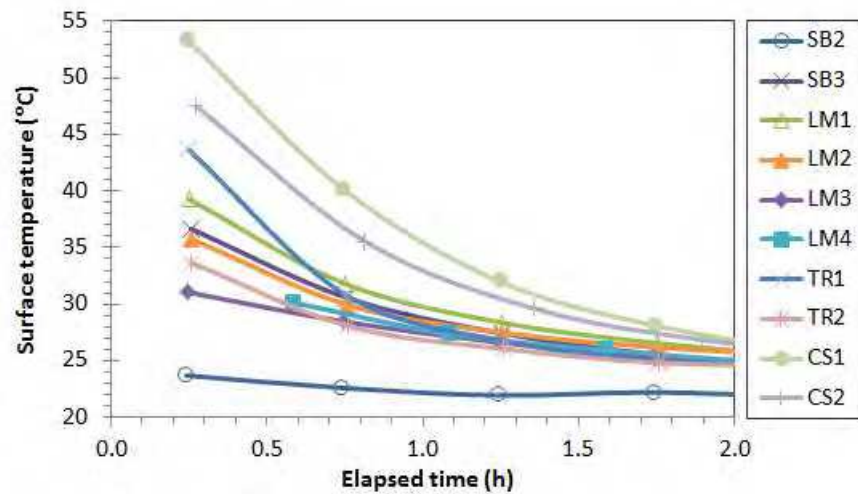


Figure 5: Surface temperature profiles (muffler): first 2 hours

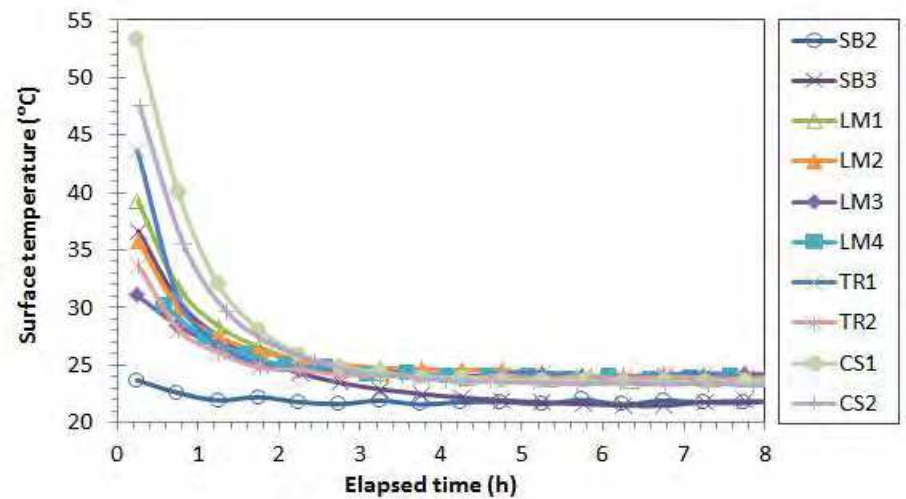


Figure 6: Surface temperature profiles (muffler): first 8 hours

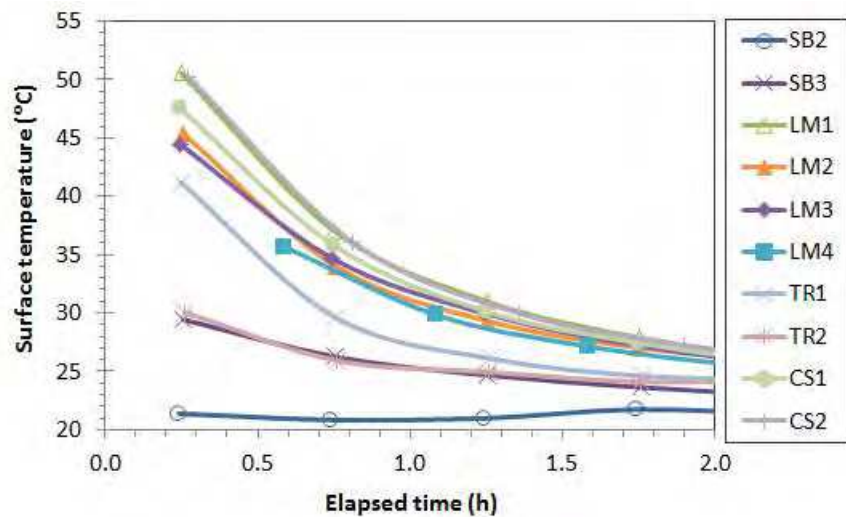


Figure 7: Surface temperature profiles (engine): first 2 hours

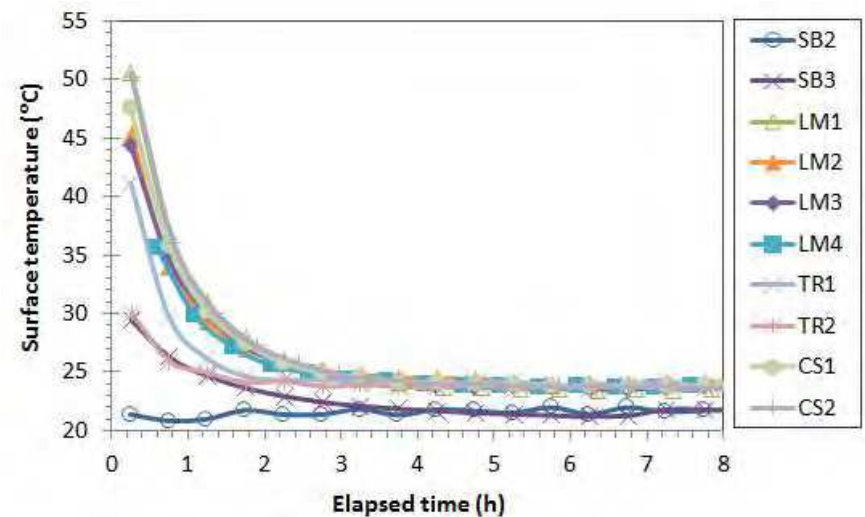


Figure 8: Surface temperature profiles (engine): first 8 hours

2.2.2 50 L chamber

Four electro-polished stainless steel 50 L chambers were operated simultaneously for all products other than gas-powered equipment.

2.2.2.1 Preliminary dynamic test

Three products that were suspected to be low emitters were tested in 50-L chambers under dynamic conditions (see test conditions in Section 2.2.2.3). They were power steering fluid (SF), transmission fluid (TF), 4-stroke motor oil (MO4). The chromatograms of the chamber concentration at 24 h were compared with those of chamber background levels. The results showed that the chamber concentrations were similar to the chamber background levels when caps were closed (see Section 2.3.3.2). While this type of information can be used to determine whether a product is a high or low emitter, it is an invalid test in the sense that the purpose of a dynamic test is to determine the emission behavior over time and to apply emissions modeling. It was decided to be more preferable to shorten a test to determine whether a product is a low or high emitter in advance. Therefore, each product was subject to a 24-hour headspace analysis before a dynamic 4-day test before a dynamic test.

2.2.2.2 Static headspace test in 50 L chambers

A static test consisted of a 3-h dynamic condition period and a 24-h static condition period. A test product was placed into a 50 L chamber and clean air (23 ± 0.5 °C, $50 \pm 0.5\%$ RH, and 1 air change rate) was supplied for 3 hours to remove VOCs that might be entered from lab air. At the end of 3 hours, the chamber was sealed for 24 h before a single chamber air sample was collected. When the sample was collected, clean air was supplied at a 20% higher rate than the sampling rate (100 mL min^{-1}) to prevent the chamber pressure from being negative compared to lab air. The excess air that could positively pressurize the chamber was released through ~ 30 cm tubing, of which one end was open to air and the other end was connected to a Tee of the chamber air inlet (Figure 9). The sampled tubes (2-layer, see Section 2.3.1) were subject to the same GC/MS analysis as the tubes from the dynamic tests. The identification and quantification were done for 51 VOCs in the Japanese IAQ mixture (identified in Table 5). TVOC was also calculated by summing up all peaks between hexane and hexadecane as described in Section 2.3.1.

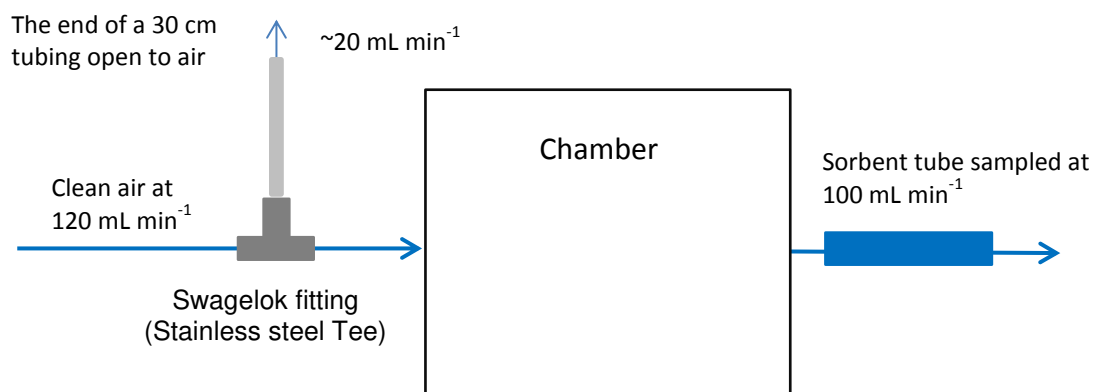


Figure 9: A diagram of a chamber during a sampling period for a static test

2.2.2.3 Dynamic test in 50 L chambers under standard conditions

In a dynamic test, the test conditions were set at 50% RH, 23 °C and 1 air change per hour. Three chambers were enclosed in an environmental chamber and the fourth chamber was placed in a room, both of which were maintained at a constant temperature of 23 ± 0.5 °C. Clean air for the chambers was supplied using an Aadco Model 737 Pure Air Generator. The humidity of the supply air was maintained at a constant level of $50 \pm 0.5\%$ RH through the use of mass flow controllers to blend separate streams of Aadco air (one dry and one saturated by bubbling air through HPLC-grade water).

To simulate the storage after one use, the cap or cover of the test product was opened completely and resealed tightly if it was a high emitter (Figure 10). If it was a low emitter, it was placed in the chamber with the cap/cover removed (Figure 11 and Figure 12). This was to prevent a test from being invalid due to low chamber concentrations that are close to a chamber background level. As mentioned in the previous section, tests with three low emitters (TF, MO4 and SF) produced the chamber concentrations similar to the background levels. Therefore, they were re-tested with caps open (TF_f, MO4_f and SF_f)

For a spray product, it was used for spraying outside of the lab and placed into a chamber with a cap on (Figure 13). To accommodate the height of a test product, the chamber was oriented vertically with an air supply at the bottom (Figure 14 with a cap on, Figure 11 with a cap off, and Figure 16 with a small opening). Twelve small products with high emission rates were tested with its cap closed, while 8 low emitters were tested with its cap open (Table 1). A test lasted for 4 days with air sampling at 0 h, 3 h, 6 h, 24 h, 48 h, 72 h and 96 h (4d). A background air sample was collected prior to each test to verify chamber cleanliness.



Figure 10: A test product with a cap closed



Figure 11: A test product with a cap off



Figure 12: A test product with a cover flipped off



Figure 13: A spray product with a cap closed



Figure 14: A test product with a cap on in a 50 L chamber vertically oriented



Figure 15: A test product with a cap off in a 50 L chamber vertically oriented



Figure 16: A test product with an opening in a 50 L chamber vertically oriented

2.2.2.4 Dynamic test in 50 L chambers under varied conditions

Selected high emitters (gasoline container with regular-grade gasoline, paint remover, and adhesive) were tested at three more temperatures (4, 14 and 30 °C), in addition to the standard temperature (23 °C). This was to understand the effects of the temperature on VOC emissions. The test conditions are summarized in Table 3. At each temperature, the humidity was changed to maintain the absolute humidity close to 10.3 g m^{-3} , which represents the level at 23 °C and 50% RH. When it was not feasible to change the humidity (e.g., 4 °C) to meet the target absolute humidity level, the relative humidity was kept at 50%.

Additionally, the gasoline container with regular-grade gasoline was subject to cyclic changes of temperature. To represent winter conditions, the chamber temperature was cycled between 4 and 14 °C for 24 hours at each temperature. For summer conditions, it was cycled between 23 and 30 °C. The purpose of the test was to determine whether the emission factor from the 2nd cycle had elevated emission factors compared to the 1st cycle.

Three high emitters (2-stroke motor oil, paint thinner and oil-based paint/primer) were tested with a cap with a varying degree of tightness (completely closed with 1.5 turn, ½ turn opening, and 1 turn opening). The cap tightness test was to understand the emissions of a product when it is stored without complete closing. The test conditions are summarized in Table 4.

Table 3: Summary of tests at different temperatures

#	Test ID	Description	Temperature (°C) & duration (h)	RH (%) & location of humidifier ¹	Absolute humidity (g m ⁻³) ²	Ach (h ⁻¹)	Cap tightness ³
31	GC_4oC	Gas container	4 °C for 96 h	50 %, inside	3.2	1	Closed
32	GC_14oC		14 °C for 96 h	82.4 %, outside	10.0	1	Closed
33	GC_30oC		30 °C for 96 h	33 %, outside	10.0	1	Closed
34	PTR_4oC	Paint remover	4 °C for 96 h	50 %, inside	3.2	1	Closed
35	PTR_14oC		14 °C for 96 h	82.4 %, outside	10.0	1	Closed
36	PTR_30oC		30 °C for 96 h	33 %, outside	10.0	1	Closed
37	ADH12_4oC	Adhesive	4 °C for 96 h	50 %, inside	3.2	1	Closed
38	ADH12_14oC		14 °C for 96 h	82.4 %, outside	10.0	1	Closed
39	ADH12_30oC		30 °C for 96 h	33 %, outside	10.0	1	Closed
40	GC_4_14oC	Gas container	2 cycles of 4 °C to 14 °C • 4 °C for 24 h • 14 °C for 24 h • 4 °C for 24 h • 14 °C for 24 h	50% at 4 °C, inside 50% at 14 °C, inside	3.2 6.1	1	Closed
41	GC_23_30oC	Gas container	2 cycles of 23 °C to 30 °C • 23 °C for 24 h • 30 °C for 24 h • 23 °C for 24 h • 30 °C for 24 h	50% at 23 °C, outside 33% at 30 °C, outside	10.3 10.0	1	Closed

¹ The humidifier was located insider or outside the environmental chamber; ² the absolute humidity was calculated from temperature and RH (%) using a Humidity Calculator (Vaisala, 2015); ³ the cap was closed completely.

Table 4: Summary of tests with a cap with different tightness

#	Test ID	Description	Temperature (°C)	RH (%)	Ach (h ⁻¹)	Cap/cover tightness
42	MO2_0.5t	Motor oil (2 stroke)	23 °C	50	1	Opened by 0.5 turn *
43	MO2_1t		23 °C	50	1	Opened by 1 turn *
44	PTH_0.5t	Paint thinner	23 °C	50	1	Opened by 0.5 turn *
45	PTH_1t		23 °C	50	1	Opened by 1 turn *
46	PTO_0.4mm	Oil-based primer/sealer	23 °C	50	1	Opened with a gap by inserting a metal piece (0.4 mm thickness x 1 cm width) between the can and cover
47	PTO_1mm		23 °C	50	1	Opened with a gap (a metal piece of 1 mm thickness x 1 cm width)

* 1.5 turn is needed for complete opening or closing.

2.3 Chemical analysis

The target VOC list is similar to that in the previous study (Won et al., 2013). Acrolein was excluded since the inadequacy of the sampling method was identified in the previous study (Won et al., 2014). Consequently, a total of 121 VOCs were analyzed using two analytical methods: air sampling on two-layer sorbent tubes (Tenax TA and Carbograph 5D) with subsequent TD/GC/MS analysis for 118 VOCs and 2,4-dinitrophenylhydrazine (DNPH)-coated cartridges extracted/analysed for formaldehyde, acetaldehyde and propanal by HPLC (Table 5). Additionally, ten biggest peaks were identified. If the peaks were not included in the target VOC list, they were quantified as a toluene equivalent and designated as abundant VOCs. As a result, a test can have 10 abundant VOCs at maximum. Total volatile organic compound (TVOC) was quantified by summing all peaks eluted between hexane and hexadecane in the gas chromatograms as a toluene equivalent.

The sampled tubes (Tenax/Carbograph) were thermally desorbed and analyzed with gas chromatography-mass spectrometry (TD/GC/MS). DNPH cartridges were extracted with acetonitrile and analyzed with high performance liquid chromatography with a UV detector (HPLC/UV). Detailed methodology is described in Sections 2.3.1 and 2.3.2. The chemical properties, structures and CAS reference numbers for the 121 compounds are listed in Table 5.

The 20 chemical compounds highlighted in Table 5 are "Priority VOCs" identified by Health Canada's Indoor Air Contaminant Assessment Program as substances warranting further investigation, with respect to sources and risk assessment. The term "priority" does not imply that the VOC poses greater health risks than VOCs not identified as such.

Table 5: Properties and method detection limits of 121 NRC ME target compounds

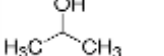
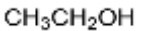
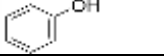
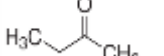
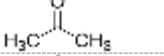
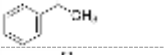
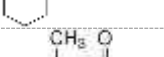
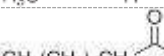
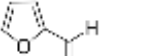
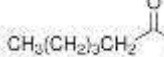
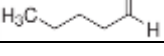
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1	Alcohols ^f	71-36-3	1-Butanol	74	114	56	0.7	JMix	
2		71-23-8	1-Propanol	60	90	59	0.9	JMix	
3		104-76-7	Hexanol, 2-ethyl-1-	130	189	57	1.0	B	
4		67-63-0 ⁱ	2-Propanol	60	67	45	1.2	JMix	
5		64-17-5	Ethanol	46	65	45	2.9	JMix	
6		108-95-2	Phenol	94	170	94	1.1	B	
7	Aldehydes & ketones ^f	78-93-3	Methylethyl ketone	72	70	43	1.6	JMix	
8		67-64-1	Acetone	58	45	43	2.2	JMix	
9		98-86-2	Acetophenone	120	190	105	1.5	A	
10		108-94-1	Cyclohexanone	98	155	55	2.3	A	
11		108-10-1	Methylisobutyl ketone	100	105	43	1.0	JMix	
12		100-52-7	Benzaldehyde	106	181	106	2.0	A	
13		123-72-8	Butanal	72	85	44	5.1	A	
14		112-31-2	Decanal	156	216	82	0.9	JMix	
15		3913-81-3	2-Decenal	154	222	55	2.0	A	
16		98-01-1	Furfural	96	144	96	1.4	A	
17		111-71-7	Heptanal	114	155	70	2.5	A	
18		66-25-1	Hexanal	100	132	56	6.0	A	
19		124-19-6	Nonanal	142	196	57	0.7	JMix	
20		18829-56-6	2-Nonenal	140	203	55	3.2	A	
21		2548-87-0	2-Octenal	126	182	55	2.0	A	
22		110-62-3	Pentanal	86	109	44	6.0	A	

Table 5 (continued)

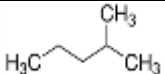
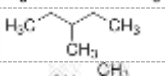
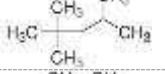
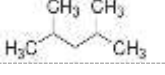
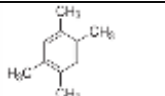
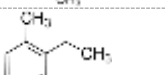
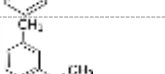
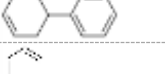
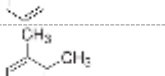
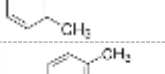
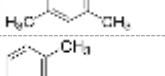
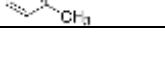
		CAS # ^a	Compound	MW ^b	BP ^c	Qion ^d	MDL (ng) ^e	Mixture ^j	Structure
23	Aliphatic Hydrocarbons ^f	107-83-5	Pentane, 2-methyl-	86	56	71	0.9	B	
24		96-14-0	Pentane, 3-methyl-	86	56	57	0.7	B	
25		540-84-1	2,2,4-Trimethylpentane	114	81	57	0.4	JMix	
26		108-08-7	2,4-Dimethylpentane	100	66	57	0.7	JMix	
27		124-18-5	Decane	142	165	57	0.5	JMix	$\text{CH}_3(\text{CH}_2)_8\text{CH}_3$
28		112-40-3	Dodecane	170	206	57	0.6	JMix	$\text{CH}_3(\text{CH}_2)_{10}\text{CH}_3$
29		142-82-5	Heptane	100	96	71	0.4	JMix	$\text{CH}_3(\text{CH}_2)_5\text{CH}_3$
30		544-76-3	Hexadecane	226	277	57	0.5	JMix	$\text{CH}_3(\text{CH}_2)_{14}\text{CH}_3$
31		110-54-3	Hexane	86	72	57	0.4	JMix	$\text{CH}_3(\text{CH}_2)_4\text{CH}_3$
32		111-84-2	Nonane	128	143	57	0.6	JMix	$\text{CH}_3(\text{CH}_2)_7\text{CH}_3$
33		111-65-9	Octane	114	120	43	0.5	JMix	$\text{CH}_3(\text{CH}_2)_6\text{CH}_3$
34		629-62-9	Pentadecane	212	261	57	0.6	JMix	$\text{CH}_3(\text{CH}_2)_{13}\text{CH}_3$
35		629-59-4	Tetradecane	198	243	57	0.6	JMix	$\text{CH}_3(\text{CH}_2)_{12}\text{CH}_3$
36		629-50-5	Tridecane	184	225	57	0.7	JMix	$\text{CH}_3(\text{CH}_2)_{11}\text{CH}_3$
37		1120-21-4	Undecane	156	186	57	0.7	JMix	$\text{CH}_3(\text{CH}_2)_9\text{CH}_3$
38	Aromatic hydrocarbons ^f	95-93-2	Benzene, 1,2,4,5-tetramethyl-	134	191	119	0.6	JMix	
39		611-14-3	Toluene, 2-ethyl-	120	170	105	0.5	JMix	
40		620-14-4	Toluene, 3-ethyl-	120	170	105	0.6	JMix	
41		622-96-8	Toluene, 4-ethyl-	120	170	105	0.5	JMix	
42		4994-16-5	Cyclohexene, 4-phenyl	158	240	104	0.9	B	
43		71-43-2 ^e	Benzene	78	102	78	1.1	JMix	
44		526-73-8	Benzene, 1,2,3-trimethyl-	120	170	105	0.6	JMix	
45		95-63-6	Benzene, 1,2,4-trimethyl-	120	170	120	0.6	JMix	
46		95-47-6 ^e	Benzene, 1,2-dimethyl-	106	148	91	0.5	JMix	

Table 5 (continued)

		CAS # ^a	Compound	MW ^b	BP ^c	Qion ^d	MDL (ng) ^e	Mixture ^j	Structure
47	Aromatic Hydrocarbons (continued) ^f	108-67-8	Benzene, 1,3,5-trimethyl-	120	170	105	0.5	JMix	
48		108-38-3 ^e	Benzene, 1,3&(4)-dimethyl-	106	148	91	0.9	JMix	
49		98-82-8	Benzene, isopropyl	120	157	105	0.4	B	
50		103-65-1	Benzene, propyl-	120	170	91	0.5	B	
51		100-41-4 ^e	Ethylbenzene	106	148	91	0.5	JMix	
52		91-20-3	Naphthalene	128	232	128	0.9	B	
53		99-87-6	p-Cymene	134	178	119	0.7	B	
54		100-42-5	Styrene	104	147	104	0.9	JMix	
55		108-88-3	Toluene	92	126	91	1.9	JMix	
56		98-83-9	2-Phenylpropene	118	163	118	0.6	B	
57		95-13-6	Indene	116	182	115	0.9	B	
58	Esters ^f	108-21-4	Acetic acid, 1-methylethyl ester	102	88	43	0.7	B	
59		111-15-9	Acetic acid, 2-ethoxyethyl ester	132	149	59	1.7	B	
60		123-86-4	Acetic acid, butyl ester	116	126	43	0.8	JMix	
61		141-78-6	Acetic acid, ethyl ester	88	78	43	1.4	JMix	
62		80-62-6	Methyl methacrylate	100	94	69	0.5	B	
63		103-09-3	2-Ethylhexyl acetate	172	199	70	1.1	B	
64		96-48-0	Butyrolactone	86	177	42	2.6	B	
65		25265-77-4	Texanol	216	258	71	3.5	B	
66		6846-50-0	TXIB *	286	272	71	4.1	B	

Table 5 (continued)

		CAS # ^a	Compound	MW ^b	BP ^c	Qion ^d	MDL (ng) ^e	Mixture ^j	Structure
67	Glycols, GlycoEthers ^f	57-55-6	1,2-Propanediol	76	155	45	16.1	A	
68		110-49-6	2-Methoxyethylacetate	118	127	43	3.6	A	
69		111-90-0	Diethylene glycol monoethyl ether	134	202	45	8.5	A	
70		107-98-2	Propanol, 1-methoxy-2-	90	117	45	2.6	A	
71		111-76-2	Ethanol, 2-butoxy-	118	181	87	3.3	A	<chem>CH3CH2CH2CH2OCH2CH2OH</chem>
72		112-34-5	Ethanol, 2-butoxyethoxy-	162	240	45	2.6	A	<chem>CH3CH2CH2CH2OCH2CH2OCH2CH2OH</chem>
73		110-80-5	Ethanol, 2-ethoxy-	90	138	59	6.4	A	<chem>CH3CH2OCH2CH2OH</chem>
74		109-86-4	Ethanol, 2-methoxy-	76	115	45	3.8	A	<chem>CH3OCH2CH2OH</chem>
75	Halo Carbons ^f	75-65-0	Propanol, 2-methyl-2-	74	70	59	3.7	A	
76		71-55-6	1,1,1-Trichloroethane	133	66	97	0.5	JMix	
77		95-50-1	1,2-Dichlorobenzene	147	182	146	0.6	B	
78		107-06-2 ⁱ	1,2-Dichloroethane	99	105	62	0.5	JMix	<chem>ClCH2CH2Cl</chem>
79		78-87-5	1,2-Dichloropropane	113	101	63	0.4	JMix	
80		106-46-7 ⁱ	1,4-Dichlorobenzene	147	175	146	0.6	JMix	
81		75-27-4	Bromodichloromethane	164	118	83	0.5	JMix	
82		56-23-5 ⁱ	Carbon tetrachloride	154	80	117	0.5	JMix	<chem>CCl4</chem>
83		67-66-3 ⁱ	Chloroform	119	91	83	0.4	JMix	<chem>CHCl3</chem>
84		124-48-1	Dibromochloromethane	208	143	129	0.5	JMix	<chem>ClCHBr2</chem>
85		75-09-2 ⁱ	Dichloromethane	85	80	84	1.3	JMix	<chem>CH2Cl2</chem>
86		127-18-4 ⁱ	Tetrachloroethylene	166	114	166	0.7	JMix	
87		79-01-6	Trichloroethylene	131	85	130	2.0	JMix	
88		79-34-5 ⁱ	1,1,2,2-Tetrachloroethane	168	150	83	0.7	B	<chem>Cl3CCHCl2</chem>

Table 5 (continued)

#		CAS # ^a	Compound	MW ^b	BP ^c	Qion ^d	MDL (ng) ^e	Mixture ^j	Structure
89	Cyclo Alkanes ^f	108-87-2	Methylcyclohexane	98	107	83	0.4	B	
90		110-82-7	Cyclohexane	84	90	84	0.4	B	
91		1678-93-9	Cyclohexane, butyl-	140	174	83	0.4	B	
92		1678-91-7	Cyclohexane, ethyl-	112	130	83	0.5	B	
93		1678-92-8	Cyclohexane, propyl-	126	153	83	0.5	B	
94		493-02-7 (trans) 91-17-8 (cis)	Decahydronaphthalene	138	180	138	0.3	B	
95	Terpenes ^f	80-56-8	alpha-Pinene	136	157	93	0.4	JMix	
96		99-86-5	alpha-Terpinene	136	169	121	2.3	B	
97		127-91-3	beta-Pinene	136	151	93	0.4	JMix	
98		99-85-4	gamma-Terpinene	136	169	93	0.7	B	
99		13466-78-9	3-Carene	136	157	93	0.6	B	
100		79-92-5	Camphene	136	151	93	0.8	B	
101		5989-27-5	Limonene	136	168	68	0.4	JMix	

Table 5 (continued)

		CAS # ^a	Compound	MW ^b	BP ^c	Qion ^d	MDL (ng) ^e	Mixture ^j	Structure
102	Acids ^f	64-19-7	Acetic acid	60	122	60	22.4	A	
103		79-31-2	Isobutyric acid	88	154	73	5.2	A	
104		107-92-6	Butyric acid	88	167	60	22.7	A	
105		111-14-8	Heptanoic acid	130	227	60	4.1	A	
106		149-57-5	2-Ethylhexanoic acid	144	234	88	3.0	A	
107		142-62-1	Hexanoic acid	116	208	60	2.8	A	
108		109-52-4	Pentanoic acid	102	188	60	21.7	A	
109	Other ^f	3777-69-3	Furan, 2-pentyl	138	176	81	4.2	B	
110		872-50-4	2-Pyrrolidinone, 1-methyl-	99	202	99	0.9	B	
111		123-91-1	1,4-Dioxane	88	103	88	0.4	B	
112		78-40-0	Triethyl phosphate	182	233	99	1.3	B	
113		142-96-1	n-Butyl ether	86	56	57	0.6	B	
114		96-29-7	2-Butanone oxime	87	157	42	2.4	A	
115		121-44-8	Triethylamine	101	95	86	5.9	A	
116		75-21-8 ⁱ	Ethylene oxide	44	12	44	1.4	Gas	
117		75-56-9 ⁱ	Propylene oxide	58	31	58	3.2	Gas	
118		106-99-0 ⁱ	1,3-Butadiene	54	16	54	3.1	Gas	
D1	DNPH ^g	75-07-0 ⁱ	Acetaldehyde	44	34		6.48	TO11	
D2		50-00-0 ⁱ	Formaldehyde	30	10		1.62	TO11	
D3		123-38-6 ⁱ	Propanal	58	60		6.16	TO11	

^a CAS #: Chemical Abstracts Service number, ^b MW: molecular weight, ^c BP: boiling point from EPI Suite (US EPA, 2011); ^d Qion: quantifying ions used for quantification; ^e MDL: method detection limit; ^f Tenax/Carbograph 5TD sampling; ^g DNPH sampling; ⁱ Health Canada targets; ^j Five separate calibration mixtures were used: custom-made mixture A (A), custom-made mixture B (B), commercial Japanese indoor air standards mixture (JMix), TO-11 aldehyde/ketone-DNPH mixture (TO11)

*TXIB: 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate

2.3.1 Two-layer sorbent tube sampling and analysis

The two-layer sorbent tubes (178 x 6 x 4 mm) packed with Carbograph 5TD (180 mg) and Tenax TA (106 mg) were purchased from CAMSCO. Sampling was conducted using a mass flow controlled pump at 50 - 100 mL min⁻¹ for 5 to 20 min, leading to a sampling volume of 0.25 to 2 L. The sampling volume of 0.25 L was mostly used for the gasoline-related products, while 2 L was used for low emitters that were tested with a cap/cover open.

Air samples collected on sorbent tubes were thermally desorbed and analyzed with a TD/GC/MS system comprised of a Gerstel thermal desorption unit (TDS) connected with an autosampler (TDS-A), an Agilent 6890 Gas Chromatograph equipped with a DB-624 capillary column (30 m × 0.25 mm I.D. × 1.4 µm thickness), and a 5973N Mass Selective Detector. The desorbed analytes were injected using a Gerstel programmable temperature vaporizer called a Cooled Injection System (CIS), which concentrated the sample prior to injection onto the Agilent 6890 column. The MS was operated in the full scan mode (m/z 28 to 300).

Temperature profiles for the thermal desorption and GC/MS analyses are as follows:

- Thermal desorption conditions: initial temperature of 30 °C to a final temperature 300 °C with a rate of 60 °C min⁻¹ with a holding time of 5 min at the end.
- CIS conditions: initial temperature of -120 °C to a final temperature of 350 °C with a rate of 12 °C s⁻¹ with a holding time of 3 min at the end.
- GC conditions: an initial temperature of -10 °C holding 4 min, then increasing to a temperature of 230 °C with a rate of 6 °C min⁻¹.

Calibration of the 118 compounds analyzed by GC/MS was performed using two sets of gas mixtures and three sets of liquid mixtures. Gas mixtures purchased from MEGS were used for the calibration of 1,3-butadiene, ethylene oxide and propylene oxide (1 ppm each). For the calibration of other VOCs, a commercial calibration mixture (Japanese Indoor Air Standards mixture; 100 µg mL⁻¹ each in methanol: water = 19: 1) and two custom-made standard mixtures (Custom A and Custom B, 500 µg mL⁻¹ for each chemical in methanol) were purchased from Supelco Inc.

The calibration gas or liquid mixture was injected onto the glass frit of the two-layer sorbent tube while room air was pumped into the tube at 50 - 100 mL min⁻¹ for 2 minute. The calibration was performed in two sets to accommodate the wide range of concentrations by using a CIS inlet split ratio of 20:1 (Splitless Desorption) for low concentration samples (Range 1), and a desorption split 50:1 and CIS split 20:1 (a total split ratio of 1000:1) for high concentration samples (Range 2). A 5-point calibration was achieved via introduction five different volumes of calibration mixture onto the tubes resulting in five concentration levels, whose range is indicated in Table 6. Linear calibration curves were obtained with an R² value between 0.91 and 0.99, with lower R² values for acids, esters and glycol ethers.

For some of the high emitters, the chamber air concentrations exceeded the higher calibration range (Range 2) for chemicals such as ethanol, 2-butanone, heptane, dichloromethane, cyclohexane, benzene, toluene and octane. To determine the validity of using Range 2 for these cases, two in-house calibration solutions with up to 5000 µg mL⁻¹ each of chemical were prepared. The variation of slopes obtained with the new higher concentration range was within

15% of that obtained with Range 2 with commercial calibration mixtures. Therefore, it was confirmed that Range 2 could be applicable to a higher range (the mass up to 50,000 ng) for ethanol, 2-butanone, heptane, dichloromethane, cyclohexane, benzene, toluene and octane.

Compounds were identified by comparing their mass spectrum with the NIST Mass Spectral Library (NIST98, version 1.7a) and retention time with those from the standard mixtures. They were identified by target ions and quantified by peak areas from the quantification ion. The quantifying ions are summarized in Table 5.

Ten biggest peaks were identified by the mass spectrum with the NIST Library. If they were not included in the target list, they were quantified as a toluene equivalent. In consequence, there were 10 abundant chemicals at maximum. TVOC was obtained by summing all peaks eluted between hexane and hexadecane as a toluene equivalent.

Table 6: Ranges and correlation coefficients (R^2) of calibration curves

Type of mixture	1,3-Butadiene Gas Mixture	Oxides Gas Mixture	Custom Mix A Liquid Mixture ¹	Custom Mix B Liquid Mixture ¹	Japanese IAQ Mix Liquid Mixture ¹
Range 1 & R^2 for split ratio of 20:1	7-45 ng (R^2 : 0.985)	5-50 ng (R^2 : 0.99)	100-1000 ng (R^2 : 0.91 – 0.99)	10-100 ng (R^2 : 0.92 – 0.99)	5-50 ng (R^2 : 0.96 -0.99)
Range 2 & R^2 for split ratio of 1000:1	-	-	500-5000 ng (R^2 : 0.94 – 0.99)	500-5000 ng (R^2 : 0.94 – 0.99)	100-1000 ng (R^2 : 0.96 – 0.99)

¹ See Table 5 for the list of different calibration mixtures

2.3.2 DNPH cartridge sampling and analysis

Waters Sep-Pak XPOsure Aldehyde samplers, which contained acidified DNPH-coated silica, were used for sampling of low molecular carbonyl compounds. Sampling was conducted at 400 mL min⁻¹ for 25 to 40 min to give sampling volumes of 10 to 16 L.

Analysis of carbonyl compounds was performed in accordance with ASTM D5197 and EPA TO-11. Exposed cartridges were washed with acetonitrile. An eluate of 20 µL was then analyzed by reverse phase HPLC with UV detection at 360 nm. The HPLC system includes Agilent Technologies 1260 Quaternary Solvent Delivery System / 1260 Variable Wavelength Detector VL / 1260 Infinity Standard Autosampler with two Supelcosil LC-18 columns (25 cm x 4.6 mm, 5 µm) in series maintained at 30 °C. A gradient of acetonitrile in water from 60% to 100% was used for separation of the carbonyl compounds. System calibration was performed using a six-point calibration from a commercial DNPH derivative mixture (TO-11/IP-6A Aldehyde/Ketone reference standard from Supelco, Inc.). Linear calibration curves were produced with R^2 between 0.9997 and 0.9999.

2.3.3 Quality assurance and control analysis (QA/QC)

2.3.3.1 Method detection limit

The method detection limit (MDL) was determined in accordance with the Code of Federal Regulations established by US EPA (40CFR136 Appendix B) (US EPA, 1986). The MDL was determined by analyzing seven replicates of a calibration tube spiked with the lowest level of the calibration range. The MDL was calculated by multiplying the standard deviation of the seven measurements with Student's t value of 3.14. The resulting method detection limits are summarized in Table 5.

2.3.3.2 Background and blank samples

The quality control procedure involved the analysis of blank and background samples. Blank samples were analyzed for each run of GC/MS and HPLC/UV. The DNPH blank levels were generally higher than MDL. To be consistent with the previous tests, the blank correction was done for DNPH. Tenax-Carbograph tubes did not show high levels of blank values above MDL except for benzene. The benzene blank level was 3.5 ng on average, which was higher than MDL of 1.1 ng and the blank level of 1.8 ng in the previous year (Won et al., 2014). Therefore, the blank correction was made for benzene only.

Background samples were collected in empty chambers prior to each test at the highest sampling volume employed for three sampling methods. In general, the background levels were higher than MDL for both sorbent and DNPH sampling. Background levels were subtracted from the chamber concentrations when the emission factor was estimated as shown in Section 2.4.1.

2.3.3.3 Duplicate samples

Duplicate air samples were taken in selected tests for all samples taken between 24 h and 96 h. The median value for the difference between duplicate samples was less than 20% for a snow blower test (SB3) and a lawn mower test (LM1). In particular, the difference was less than 10% for samples taken at 72 h and 96 h.

2.4 Estimation of indoor air concentrations

2.4.1 Emission factors

This section describes the method of calculating emission factors based on chamber air concentration data. Emission factors (E) are normally expressed per unit exposed area of the test material. In this case, since the emissions sources are discrete consumer products and equipment, the values of E are expressed simply as $\mu\text{g h}^{-1}$ (with unit^{-1} implied).

The mass balance of a chemical compound for the chamber can be expressed by Eq. (3):

$$V \frac{dC}{dt} = QC_{in} - QC + E \quad (3)$$

where:

V is the chamber volume (m^3)

E is the emission factor ($\mu\text{g h}^{-1}$)

C is the chamber air concentration ($\mu\text{g m}^{-3}$)

C_{in} is the concentration of the supplied air ($\mu\text{g m}^{-3}$), which is assumed to be the background chamber concentration

Q is the chamber flow rate ($\text{m}^3 \text{h}^{-1}$)

The time-varying emission factor was assumed to follow the power-law decay model, which was typically used to express the emissions from dry building materials.

$$E = at^{-b} \quad (4)$$

where:

a and b are empirical coefficients

t is the time (h).

The emission factors calculated from the chamber concentrations were used to estimate best-fit coefficients of Eq. (4) through curve fitting. Since it takes about 3 hours for a small-scale chamber concentration to reach 95% of the equilibrium concentration at an air change rate of 1 h^{-1} , the data after 3 hours were used for curve-fitting. This means the curve-fitting was done for the data between 3 hours and 4 days. While Eq. (4) assumes a decaying trend of emission factors and concentrations, an increasing trend can also be expected with evaporative sources since their emission sources are not depleted in 4 days. Therefore, the curve-fitting results for the increasing trends were also reported in this study.

2.4.2 Indoor air concentrations

The VOC concentration in the house and garage can be expressed as Eq. (5) and (6), respectively.

$$V_h \frac{dC_h}{dt} = Q_{oh}C_o + Q_{gh}C_g - Q_{ho}C_h - Q_{hg}C_h + \sum_{i=1}^n A_{hi} E_{hi} \quad (5)$$

$$V_g \frac{dC_g}{dt} = Q_{og}C_o + Q_{hg}C_h - Q_{go}C_g - Q_{gh}C_g + \sum_{j=1}^m A_{gj} E_{gj} \quad (6)$$

where:

V_h and V_g are the house and garage volume (m^3)

Q_{oh} is the air flow from outside to the house ($\text{m}^3 \text{h}^{-1}$)

Q_{gh} is the air flow from the garage to house ($\text{m}^3 \text{h}^{-1}$)

Q_{ho} is the air flow from the house to outdoor ($\text{m}^3 \text{h}^{-1}$)

Q_{hg} is the air flow from the house to garage ($\text{m}^3 \text{h}^{-1}$)

Q_{og} is the air flow from outdoor to the garage ($\text{m}^3 \text{h}^{-1}$)

Q_{hg} is the air flow from the house to garage ($\text{m}^3 \text{h}^{-1}$)

Q_{og} is the air flow from the garage to outdoor ($\text{m}^3 \text{h}^{-1}$)

C_o is the concentration of a pollutant in outdoor air ($\mu\text{g m}^{-3}$), which was assumed as zero

C_g is the concentration of a pollutant in the garage ($\mu\text{g m}^{-3}$)

C_h is the concentration of a pollutant in the house ($\mu\text{g m}^{-3}$)

A_{hi} is the area of the i th source in the house (m^2)

A_{gj} is the number of the j th source in the garage (unit), which was assumed as one

E_{hi} is the emission factor of the i th source in the house ($\mu\text{g m}^{-2} \text{h}^{-1}$)

E_{gj} is the emission factor of the j th source in the garage ($\mu\text{g h}^{-1} \text{unit}^{-1}$)

n is the number of sources in the house

m is the number of sources in the garage.

The contribution of each source was approximated by:

$$C_{hi} = C_h \frac{A_{hi} E_{hi}}{Q_{gh}C_g + \sum_{i=1}^n A_{hi} E_{hi}} \quad (7)$$

$$C_{gj} = C_g \frac{E_{gj}}{Q_{hg}C_h + \sum_{j=1}^m E_{gj}} \quad (8)$$

where:

C_{hi} is the portion of the house concentration contributed by the i th source ($\mu\text{g m}^{-3}$)

C_{gj} is the portion of the garage concentration contributed by the j th source in the garage ($\mu\text{g m}^{-3}$).

Eq. (5) and (6) were solved using the explicit Euler method using the data measured after 3 hours. If no data was available in curve-fitting of Eq. (4) in the early stage of emissions (e.g., before 3 h), the emission factor between 0 and the time with the 1st measured data point (t_1) was considered to be constant as shown:

$$E = at_1^{-b} \quad \text{when } t < t_1 \quad (9a)$$

$$E = at^{-b} \quad \text{when } t > t_1 \quad (9b)$$

where t is the time (h) and t_1 is the time when the 1st measurement was made, which was 3 hours. This is a measure to prevent the indoor air concentration from being predicted unrealistically high during the early period, which can typically stem from the limitation associated with empirical modeling of fast-decaying sources with limited data points. However, introducing the constant emission for the early emission period won't affect the indoor air concentration predictions for the longer-term emission periods as mentioned in the previous report (Won et al., 2013).

The indoor air concentration was estimated based on product usage scenarios. The information on volume and air change rate (Table 7) is from the Residential Attached Garage Intervention (RAGI) study, involving 33 houses in the Ottawa region. For the scenario analysis, the median values in Table 7 were used. It should be noted that the measurements were conducted in winter. Due to unavailability of summer data on air change rates between homes and garages in Canada, the winter data was also used for the summer simulation.

The main sources in the house were assumed to be building materials (Table 8). With a few exceptions, most of the information in Table 8 was based on the measured values in the Reference House owned by the Canadian Centre for Housing Technology (CCHT), located at the NRC campus (CCHT, 2013). Since the CCHT house has a volume of 794.3 m³ (Won et al., 2006), the surface area was re-calculated for a small house (664 m³, median value of 33 houses) for the identical material loading ratios. For furniture, doors, kitchen countertop, and kitchen cabinet, there was no adjustment since it is expected that the identical units were used in a small house. More detailed information on the rationale of surface areas can be found in the previous report (Won et al., 2014).

For more representative simulation, the area designated for one material group was assumed to be equally divided and applied with multiple materials within the same material group. For example, nine different paints were assumed to be applied onto the wall and ceiling area (566.37 m²) with an equal area of 62.93 m² for each paint. This is a way to reduce the frequency of simulations when the mean value is of interest from multiple simulations. That is, this will give the same results as those obtained from conducting multiple simulations and averaging multiple results. The emission factors for building materials can be found in the previous reports (Won et al., 2014, Won et al., 2013).

Table 9 summarizes the evaporative sources in the garage for different scenarios. The garage volume was 99 m³. The products with low emission rates were excluded from the scenario analysis for two reasons. First, they were tested with cap/cover open, which is unlikely to represent the actual emission conditions. Even if they were tested with cap/cover closed, the results won't be useful for modeling since the concentrations were close to chamber

background levels according to three preliminary tests with TF, MO4 and SF. Second, even with cap/cover open, the emission factors were generally low. This indicates that their contributions would be small. The sources in the house were assumed to be identical for all scenarios. Only one unit of each product was assumed to be in the garage since no information on the number of products was available.

The scenario can be roughly divided into summer and winter. It was assumed that a lawn mower, trimmer and chainsaw were used in summer. The usage frequency was once a week for lawn mower and trimmer and once a month for chainsaw over 12 weeks. In winter, a snow blower was used every week for 12 weeks. The simulation was conducted for 3 months of summer and 3 months of winter. The base case (Case 1) is to show the residential indoor air levels without the contribution of the garage emissions. Case 2 and 3 show the impact of new and used gas-powered equipment, respectively, such as lawn mower, trimmer, and chainsaw stored in the garage in summer. Case 4 and 5 are for winter garage storage of a new or used snow blower.

To simulate temperature effects, it was assumed that the temperature of the garage was elevated from 23 °C to 30 °C between 2 pm and 8 pm for 3 months in summer (Case 6 and 7). For winter, it was assumed the garage temperature was at 14 °C between 2 pm and 8 pm and 4 °C otherwise (Case 8 and 9). The emission factors at 4, 14, and 30 °C were estimated based on those at 23 °C. For simplicity, a ratio of 1.4, 0.6 and 0.4 was used to convert the emission factor at 23 °C to that at 30, 14 and 4 °C, respectively. This is the mean values of the ratios based on the temperature tests on GC and ADH12. More detailed information on the conversion can be found in the result section.

Table 7: House/garage volume and air flow rates between home and garage in the RAGI study

	n	Min	Mean	Max	STDEV	p5	p25	p50	p75
Indoor temperature (°C)	33	16.79	20.00	23.36	1.49	17.71	18.97	20.15	20.61
Garage temperature (°C)	33	-8.16	-1.80	17.09	5.29	-7.23	-5.68	-2.85	-0.09
Garage volume (m ³)	33	35.00	97.00	189.00	35.09	36.00	76.00	99.00	120.00
Home volume (m ³)	33	356.00	684.06	1369.00	199.69	437.00	557.00	664.00	790.00
Total volume (m ³)	33	390.00	781.70	1495.00	217.78	496.00	643.00	768.00	923.00
Air flow from garage to home (m ³ h ⁻¹)	33	8.46	68.37	1256.98	214.35	9.60	19.12	27.11	39.40
Air flow from home to garage (m ³ h ⁻¹)	33	0.43	32.51	791.84	138.75	0.74	1.14	2.17	3.86
Air flow from home to outdoors (m ³ h ⁻¹)	33	-162.70	171.88	880.64	146.24	91.35	123.66	149.78	186.78
Air flow from garage to outdoors (m ³ h ⁻¹)	33	-41.13	48.03	627.52	109.45	-2.47	8.18	20.36	55.96
Air flow from outdoors to home (m ³ h ⁻¹)	33	-627.84	136.01	808.70	187.07	68.55	106.99	131.46	171.32
Air flow from outdoors to garage (m ³ h ⁻¹)	33	-39.86	83.89	1092.66	185.67	7.91	23.93	36.40	83.58
Inflow to house (h ⁻¹)			0.30	1.51	2.01	0.18	0.23	0.24	0.27
Outflow from house (h ⁻¹)			0.30	1.22	1.43	0.21	0.22	0.23	0.24
Inflow to garage (h ⁻¹)			1.20	9.97	9.25	0.24	0.33	0.39	0.73
Outflow from garage (h ⁻¹)			1.20	9.97	9.23	0.20	0.36	0.48	0.79

Note: p5: the 5th percentile, p25: 25th percentile, p50: 50th percentile (median), p75: 75th percentile
Since the percentiles were calculated, some of the air flow values are negative (see Min and p5).

Table 8: House volume and materials used in a single family resident for a scenario analysis

	Test ID ^d	Amount	Unit	Reference
House volume		664	m ³	RAGI
Materials	Painted drywall	PT9, PT10, PT11, PT12, PT13p, PT15, PT16, PT17, PT18	566.37 ^a (62.93) ^b	m ² Won eta l. (2006)
	Carpet	CRP11	127.0	m ² “
	Subfloor	OSB8, OSB10, SPR1	69.6 ^a (23.2) ^b	m ² “
	Particleboard	PB7	1.50	m ² “
	Varnish (oil)	WF1	5.00	m ² “
	I-beam joist	IB1 - 6	57.4 ^a (9.57) ^b	m ² “
	Sealant around windows ^c	CAK32 - 35, SPF4	0.1 ^a (0.02) ^b	m ² “
	Plywood	PLY4	5.56	m ² “
	Wood stain (oil)	WS8	5.00	m ² “
	Shelving	SHV1 - 3	5 ^a (1.67) ^b	m ² “
	Thermal insulation (30% of wall & ceiling area)	INS2 - 10, SPF2 - 3	61.8 ^a (5.62) ^b	m ² Infiltration ratio of 30% from Hayashi and Osawa (2008)
	Wood stain for furniture (water-based)	WF2	8.30	m ² BIFMA (2006)
	Doors (interior & closet)	DI1	81.8	m ² CDHS (2010)
	Kitchen countertop	CT3	5.00 ^e (both sides)	m ² Empire Countertops (2013)
	Kitchen cabinet	KC1	8.25	m ² measured

^a Total area (m²) ; ^b Area for each material (m²); ^c Spray foam sealants were assumed to be used instead of regular caulking; ^d Test ID from the tests done in 2012/13 and 2013/14; ^e It was assumed that both the top and bottom were exposed to air.

Table 9: Evaporative sources in the garage for different scenarios

Case #	1	2	3	4	5	6	7	8	9
Case ID	Base	Summer & New	Summer & Used	Winter & New	Winter & Used	Summer, New & 30 °C ^a	Summer, Used & 30 °C ^a	Winter, New & 4 °C ^b	Winter, Used & 4 °C ^b
Gasoline container	-	GC	GC	GC	GC	GC	GC	GC	GC
Windshield washer fluid	-	WW	WW	WW	WW	WW	WW	WW	WW
Motor oil (2-stroke)	-	MO2	MO2	MO2	MO2	MO2	MO2	MO2	MO2
Wax for furniture	-	W XF	W XF	W XF	W XF	W XF	W XF	W XF	W XF
Lubricant	-	LUB	LUB	LUB	LUB	LUB	LUB	LUB	LUB
Adhesive	-	ADH12	ADH12	ADH12	ADH12	ADH12	ADH12	ADH12	ADH12
Degreaser	-	DG	DG	DG	DG	DG	DG	DG	DG
Oil-based paint	-	PTO	PTO	PTO	PTO	PTO	PTO	PTO	PTO
Paint remover	-	PTR	PTR	PTR	PTR	PTR	PTR	PTR	PTR
Paint thinner	-	PTH	PTH	PTH	PTH	PTH	PTH	PTH	PTH
Spray paint	-	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS
Roof sealant	-	RS	RS	RS	RS	RS	RS	RS	RS
Lawn mower	-	LM1	LM4	-	-	LM1	LM4	-	-
Trimmer	-	TR1	TR2	-	-	TR1	TR2	-	-
Chainsaw	-	CS1	CS2	-	-	CS1	CS2	-	-
Snow blower	-	-	-	SB2	SB3	-	-	SB2	SB3

^a The emission factor was elevated to 30 °C from 23 °C between 2 pm and 8 pm using a ratio of 1.4.

^b The emission factor was reduced to 14 °C from 23 °C between 2 pm and 8 pm using a ratio of 0.6 and to 4 °C from 23 °C using a ratio of 0.4 otherwise.

3 Results and discussion

3.1 Preliminary tests with 50-L chambers for three products

The gas chromatogram of the chamber air sample taken at 24 hour in a dynamic test is compared with the chamber background level in Figure 17 (power steering fluid – SF), Figure 18 (transmission fluid – TF), and Figure 19 (4-stroke motor oil – MO4). The figures show that the chamber air concentrations were similar to the chamber background levels with a cap closed for SF, TF and MO4. Considering that the chamber concentration tends to decrease with time after 24 hour, this means that the test is most likely to be considered invalid in terms of emissions modeling. Consequently, it was decided that it would provide more valuable information if low emitters were tested with cap/cover open. The results with cap/cover open can provide emission data for one of worst cases, i.e., when a product is stored without capping. Whether a product is a low emitter or not was decided based on a static headspace test instead of a dynamic test, as discussed in the following section.

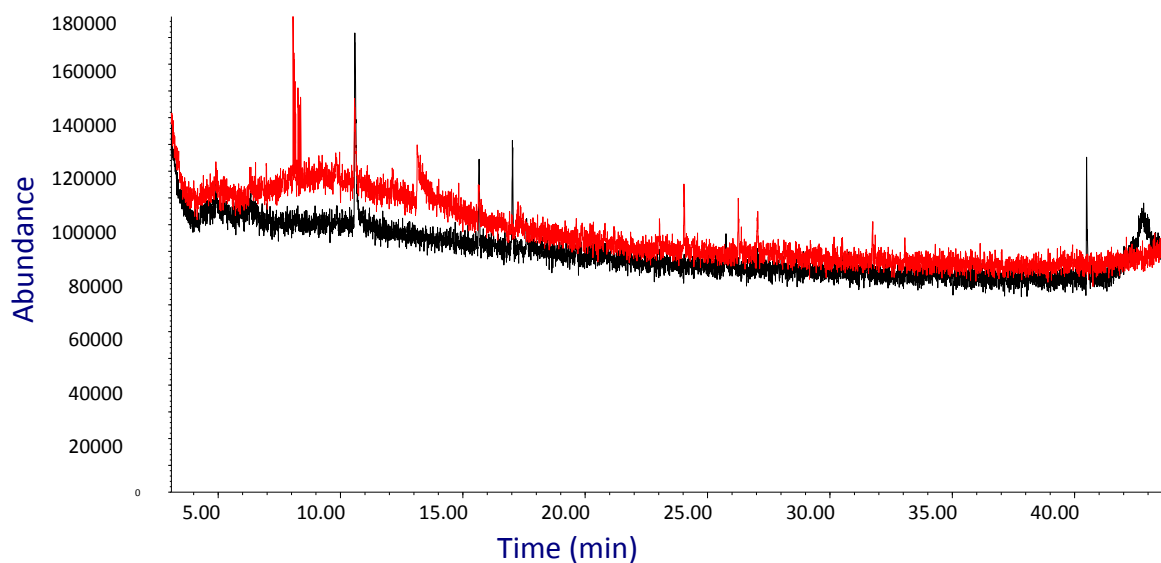


Figure 17: Gas chromatogram of a chamber background and a chamber air sample at 24 h with power steering fluid (SF)

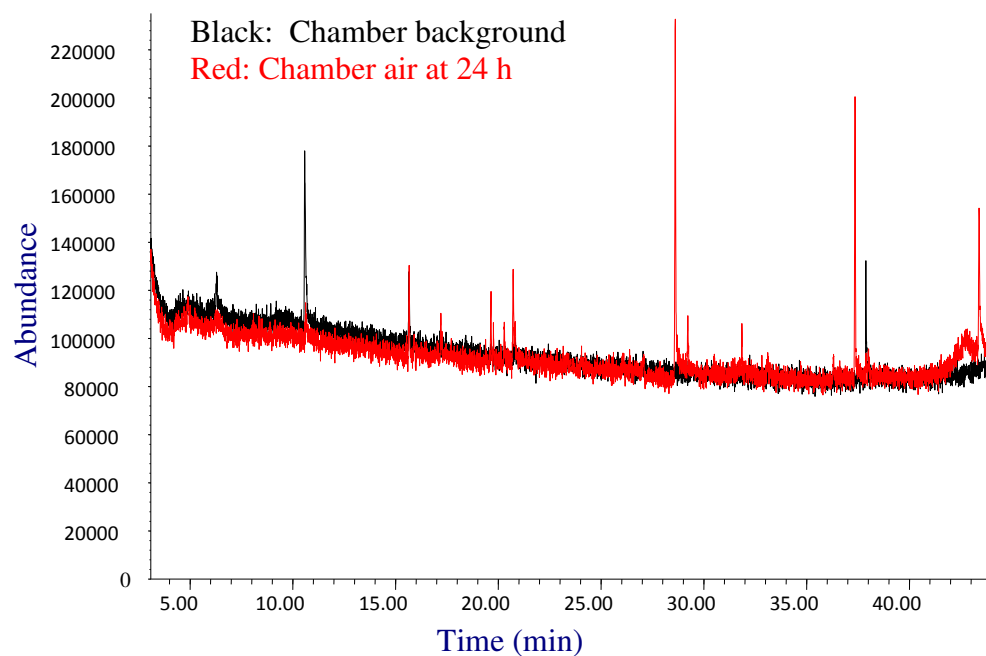


Figure 18: Gas chromatogram of a chamber background and a chamber air sample at 24 h with transmission fluid with cap closed (TF)

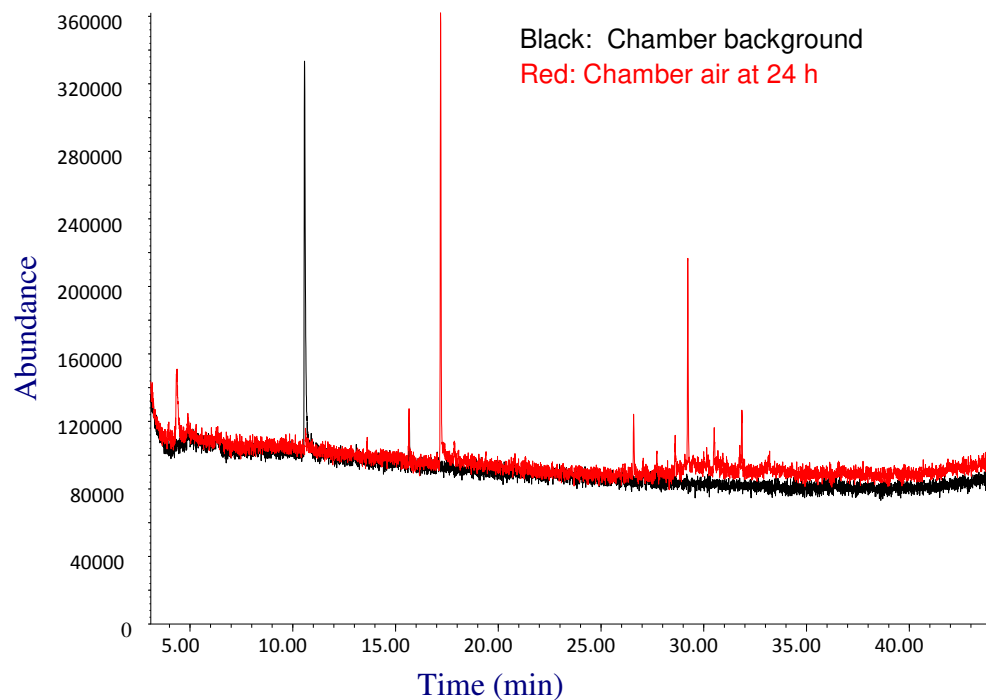


Figure 19: Gas chromatogram of a chamber background and a chamber air sample at 24 h with 4-stroke motor oil with cap closed (MO4)

3.2 50-L chamber headspace concentrations

The headspace concentrations of 51 VOCs from the 50 L chamber headspace tests are summarized in Table 10 for high emitters and Table 11 for low emitters. To determine the criteria for the high and low emitters, the preliminary dynamic tests were compared with the static tests for TF, MO4 and SF. As a result, a high emitter was determined as the product with the headspace concentration greater than $1,500 \mu\text{g m}^{-3}$ for TVOC and greater than $1,000 \mu\text{g m}^{-3}$ for sum of 51 VOCs (Figure 20).

A gasoline container with regular grade gasoline had the highest headspace concentrations, followed by oil-based paint products. According to the material safety datasheets (MSDS) by manufacturers (Table 12), high emitters are mostly the products based on petroleum distillates. Low emitters include most of automotive products, lawn/plant care product and driveway crack filler. Automotive products tested in this study appear to contain high molecular hydrocarbons that are not easy to evaporate (e.g., C15 – C50 in the transmission fluid). Exceptions are motor oil for 2-stroke engine (MO2) and windshield washer fluid (WW), the main ingredients of which are naphtha (15 – 20%) and methanol (30 – 40%) according to the manufacturers, respectively.

The headspace concentrations in Table 10 and Table 11 showed some of products have distinctive VOC profiles with the major VOCs that generally match with the main ingredients identified in MSDS (Table 12). A gasoline container (GC) and an oil-based paint (PTO) emitted various aliphatic and aromatic hydrocarbons at high concentrations. The difference can be found in the fact that more low-molecular weight aliphatic hydrocarbons (e.g., hexane and heptane) were emitted from GC and more high-molecular weight aliphatic hydrocarbons (e.g., undecane and dodecane) were emitted from PTO. The major ingredients identified by the manufactures were emitted at high concentrations. Examples include dichloromethane (PTR), acetone (PTS), and methyl ethyl ketone (ADH12). Some of main ingredients were not identified in the headspace analysis since the compounds were not included in the target list, including methanol in windshield washer fluid (WW) and glycols in antifreeze (AF). Methanol and ethylene glycol (CAS# 107-21-1) were later identified as an abundant chemical and quantified as a toluene equivalent in the dynamic test.

Table 10: 50-L chamber headspace concentrations ($\mu\text{g m}^{-3}$) for high emitters

					Gasoline container	Paint products				Glues/ adhesives	Automotive products		Cleaning products	Lubri- cant	Roof sealant	Wax or polishes
#	#	Class	CAS #	Compound	GC	PTO	PTR	PTH	PTS	ADH12	MO2	WW	DG	LUB	RS	WXF
1	1	Alcohols	71-36-3	1-Butanol		16.8	8.0	28.1	16.7		10.1	19.2	23.3	10.6	24.4	12.9
2	2		71-23-8	1-Propanol						864.9						
3	4		67-63-0	2-Propanol								61.7				
4	5		64-17-5	Ethanol				20.3				260.4	3.0			
5	7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		692.7	16.5	1.7	24.3	49021.9	3.6	56.7	1.5	14.5	1.8	2.1
6	8		67-64-1	Acetone		99.7	83.6	8.4	7304.0	838.6	7.9	132.0	6.5	560.6	15.4	5.5
7	11		108-10-1	Methylisobutyl ketone												1.1
8	14		112-31-2	Decanal												6.1
9	19		124-19-6	Nonanal				4.6	2.9							
10	26	Aliphatic Hydrocarbons	540-84-1	2,2,4-Trimethylpentane	256238.3											
11	27		108-08-7	2,4-Dimethylpentane	252606.4											
12	28		124-18-5	Decane	9759.4	54658.6	1353.0	4771.1	4.7	10.9	736.4	127.4	2635.6	1168.2	1151.8	856.9
13	29		112-40-3	Dodecane	210.1	10314.2	100.4	331.8	8.3		1053.3	26.1	148.1	131.6	72.0	17.6
14	30		142-82-5	Heptane	537577.1	12.1	14.5	543.9	3.4	31717.6	3.6	5.4	59.1		10.6	0.7
15	31		544-76-3	Hexadecane	37.2		2.6									0.8
16	32		110-54-3	Hexane	3499396.6	3.4		358.7	51.3	5216.7	7.0	4.4	91.8	3.2	4.1	
17	33		111-84-2	Nonane	48025.3	24246.7	453.3	4305.7	176.2	1.6	2.8	39.8	874.5	424.9	793.8	783.0
18	34		111-65-9	Octane	152171.5	1200.6	105.7	1638.2	144.2	1726.3	2.0	6.3	333.2	57.3	77.5	2.0
19	35		629-62-9	Pentadecane	62.5		0.9									1.2
20	36		629-59-4	Tetradecane	62.2	1.8	3.8	1.5	0.5		2.4		3.7			1.3
21	37		629-50-5	Tridecane	62.2	236.4	1.5	1.4			19.3		3.5	1.9	1.0	1.2
22	38		1120-21-4	Undecane	1102.7	25395.0	759.6	2313.3	25.5	0.8	3755.1	139.1	1684.9	623.6	706.3	149.3
23	39	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	2876.9	16.9	8.5	134.1	0.6		248.1	7.0	94.7	0.2	11.2	0.4
24	40		611-14-3	Toluene, 2-ethyl-	37191.1	146.7	30.6	809.8	11.7	0.4	1.1	13.3	181.8	1.1	37.5	1.2
25	41		620-14-4	Toluene, 3-ethyl-	68706.5	438.3	62.9	1622.7	36.3	1.4	17.0	28.7	383.0	2.3	96.6	3.2
26	42		622-96-8	Toluene, 4-ethyl-	56314.8	196.8	31.0	838.2	20.7	0.6	11.1	16.4	217.6	1.2	41.3	1.5
27	44		71-43-2	Benzene	177013.0	13.3	41.2	20.0	2.9		3.7	6.2	24.1	3.2	3.0	3.4
28	45		526-73-8	Benzene, 1,2,3-trimethyl-	27872.5	157.0	58.5	1269.8	12.5	0.3	74.8	30.8	527.5	1.6	71.5	1.2
29	46		95-63-6	Benzene, 1,2,4-trimethyl-	134438.6	509.1	144.6	2890.6	28.4	1.8	24.7	67.5	1044.3	4.0	226.2	3.3
30	47		95-47-6	Benzene, 1,2-dimethyl-	115050.0	4300.1	26.5	759.6	105.0	82.1	9.5	35.4	168.2	10.7	39.5	4.0
31	48		108-67-8	Benzene, 1,3,5-trimethyl-	49980.9	203.5	33.9	845.7	14.9	0.6	1.1	13.4	198.9	1.3	89.3	2.1
32	49		108-38-3	Benzene, 1,3-dimethyl-	177429.5	9175.8	73.6	1774.5	335.6	391.9	41.9	85.8	438.5	20.4	92.3	11.6
33	52		100-41-4	Ethylbenzene	89868.2	2675.9	27.4	634.0	78.7	110.6	8.6	27.3	156.3	4.4	17.7	2.9
34	55		100-42-5	Styrene			11.9				1.3	1.0				
35	56		108-88-3	Toluene	283691.7	270.6	9793.2	817.0	6280.0	26.3	24.5	601.4	4282.2	7.0	16.1	51.3
36	61	Esters	123-86-4	Acetic acid, butyl ester												
37	62		141-78-6	Acetic acid, ethyl ester			8.9		4.1							
38	78	Halo Carbons	71-55-6	1,1,1-Trichloroethane												
39	80		107-06-2	1,2-Dichloroethane												
40	81		78-87-5	1,2-Dichloropropane												
41	82		106-46-7	1,4-Dichlorobenzene								2.7	0.6			
42	83		75-27-4	Bromodichloromethane												
43	84		56-23-5	Carbon tetrachloride												
44	85		67-66-3	Chloroform			10.3									
45	86		124-48-1	Dibromochloromethane												
46	87		75-09-2	Dichloromethane		30.3	216151.8	10.4	4.6	3.9	8.8	337.6	12.8	14.3	1.1	11.3
47	88		127-18-4	Tetrachloroethylene			0.9							198.8	10.6	
48	89	Terpenes	79-01-6	Trichloroethylene		2.7	2.5	5.3	3.3		3.6	3.9	1.8	6.2	6.5	3.6
49	97		80-56-8	alpha-Pinene								1.4				
50	99		127-91-3	beta-Pinene												
51	103		5989-27-5	Limonene								14.5				
			0-00-0	TVOC	3.7E+08	7.2E+05	1.3E+05	1.1E+05	1.7E+04	1.2E+05	3.5E+04	4.6E+03	4.2E+04	1.7E+04	1.5E+04	1.2E+04
				Sum of 51 VOCs	6.0E+06	1.4E+05	2.3E+05	2.7E+04	1.5E+04	9.0E+04	6.1E+03	2.2E+03	1.4E+04	3.3E+03	3.6E+03	1.9E+03

Note: The concentration > 10,000 $\mu\text{g m}^{-3}$ are highlighted in pink; the concentrations between 1,000 and 10,000 $\mu\text{g m}^{-3}$ are highlighted in yellow.

Table 11: 50-L chamber headspace concentrations ($\mu\text{g m}^{-3}$) for low emitters

#	Class	CAS #	Compound	Automotive products						Lawn/plant care products	Driveway crack filler
				AF	UC	TF	SF	MO4	WXA	WC	CF
1	Alcohols	71-36-3	1-Butanol		27.0	74.0	9.4	18.0	10.0	22.3	27.8
2		71-23-8	1-Propanol								
4		67-63-0	2-Propanol		0.8						
5		64-17-5	Ethanol								15.9
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		0.8	1.0	0.7	2.5	0.9	1.0	1.5
8		67-64-1	Acetone		14.8	5.6	5.6	6.5	6.0	17.5	10.3
11		108-10-1	Methylisobutyl ketone					3.2			
14		112-31-2	Decanal			6.1					1.8
19		124-19-6	Nonanal		3.2		3.8	4.1	1.8	8.3	13.1
26	Aliphatic Hydrocarbons	540-84-1	2,2,4-Trimethylpentane								
27		108-08-7	2,4-Dimethylpentane								
28		124-18-5	Decane	72.7	4.7	5.7	10.6	4.4	3.8	10.8	8.6
29		112-40-3	Dodecane	10.3	7.7	9.0	3.7	2.5	1.4	5.7	2.5
30		142-82-5	Heptane	3.0				0.8			3.1
31		544-76-3	Hexadecane		8.0				0.7		
32		110-54-3	Hexane		12.4				6.2	77.8	15.1
33		111-84-2	Nonane	8.4	0.6	1.2	1.6	1.5	2.5	1.7	2.7
34		111-65-9	Octane	1.7		0.6		0.9		0.6	2.0
35		629-62-9	Pentadecane		11.1	0.4			1.1		
36		629-59-4	Tetradecane		12.1	0.9		0.6	2.0	0.6	
37		629-50-5	Tridecane		7.5	0.6			0.7		
38		1120-21-4	Undecane	71.0	9.1	43.7	9.8	4.5	2.7	10.9	7.4
39	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	3.0	0.2	1.0	0.4	0.2		0.4	0.2
40		611-14-3	Toluene, 2-ethyl-	5.1	0.2	0.2	0.1	0.3	0.1	1.0	0.4
41		620-14-4	Toluene, 3-ethyl-	8.8	0.4	0.3	3.0	0.6	0.1	2.4	1.0
42		622-96-8	Toluene, 4-ethyl-	4.7	0.3	0.2	2.8	0.4	0.1	1.3	0.7
44		71-43-2	Benzene	0.5	6.4	4.9	5.9	3.6	4.2	3.7	3.7
45		526-73-8	Benzene, 1,2,3-trimethyl-	14.2	0.3	0.5	0.4	0.4	0.1	2.2	0.7
46		95-63-6	Benzene, 1,2,4-trimethyl-	27.1	1.0	0.9	2.4	1.3	0.3	6.2	2.3
47		95-47-6	Benzene, 1,2-dimethyl-	2.0	0.2	0.7	1.0	0.8		1.0	1.1
48		108-67-8	Benzene, 1,3,5-trimethyl-	5.4	0.2	0.2	0.2	0.4	0.1	1.4	0.6
49		108-38-3	Benzene, 1,3-dimethyl-	4.1	0.8	2.6	4.8	2.3	0.2	2.2	3.7
52		100-41-4	Ethylbenzene	1.2	0.3	0.7	1.1	0.5	0.1	0.5	0.9
55		100-42-5	Styrene	1.0	0.4	0.4	0.3	0.5	0.3	0.9	10.5
56		108-88-3	Toluene	10.4	5.4	1.6	21.1	9.7	1.3	8.9	7.6
61	Esters	123-86-4	Acetic acid, butyl ester								0.6
62		141-78-6	Acetic acid, ethyl ester			0.5				0.4	
78	Halo Carbons	71-55-6	1,1,1-Trichloroethane								
80		107-06-2	1,2-Dichloroethane								
81		78-87-5	1,2-Dichloropropane								
82		106-46-7	1,4-Dichlorobenzene				0.3			0.2	
83		75-27-4	Bromodichloromethane								
84		56-23-5	Carbon tetrachloride								
85		67-66-3	Chloroform								
86		124-48-1	Dibromochloromethane								
87		75-09-2	Dichloromethane		2.4	2.4	7.9	1.1	7.8	2.0	40.5
88		127-18-4	Tetrachloroethylene	1.3							
89		79-01-6	Trichloroethylene	3.2	3.5	6.1	4.4	2.8	3.8	5.8	4.5
97	Terpenes	80-56-8	alpha-Pinene			0.5				6.7	2.2
99		127-91-3	beta-Pinene			0.3				2.2	0.5
103		5989-27-5	Limonene	2.9	1.4	17.1	1.1	1.2		18.9	2.6
		0-00-0	TVOC	1.5E+03	8.4E+02	5.4E+02	2.6E+02	2.0E+02	1.4E+02	7.0E+02	3.4E+02
			Sum of 51 VOCs	2.6E+02	1.4E+02	1.9E+02	1.0E+02	7.5E+01	5.8E+01	2.3E+02	2.0E+02

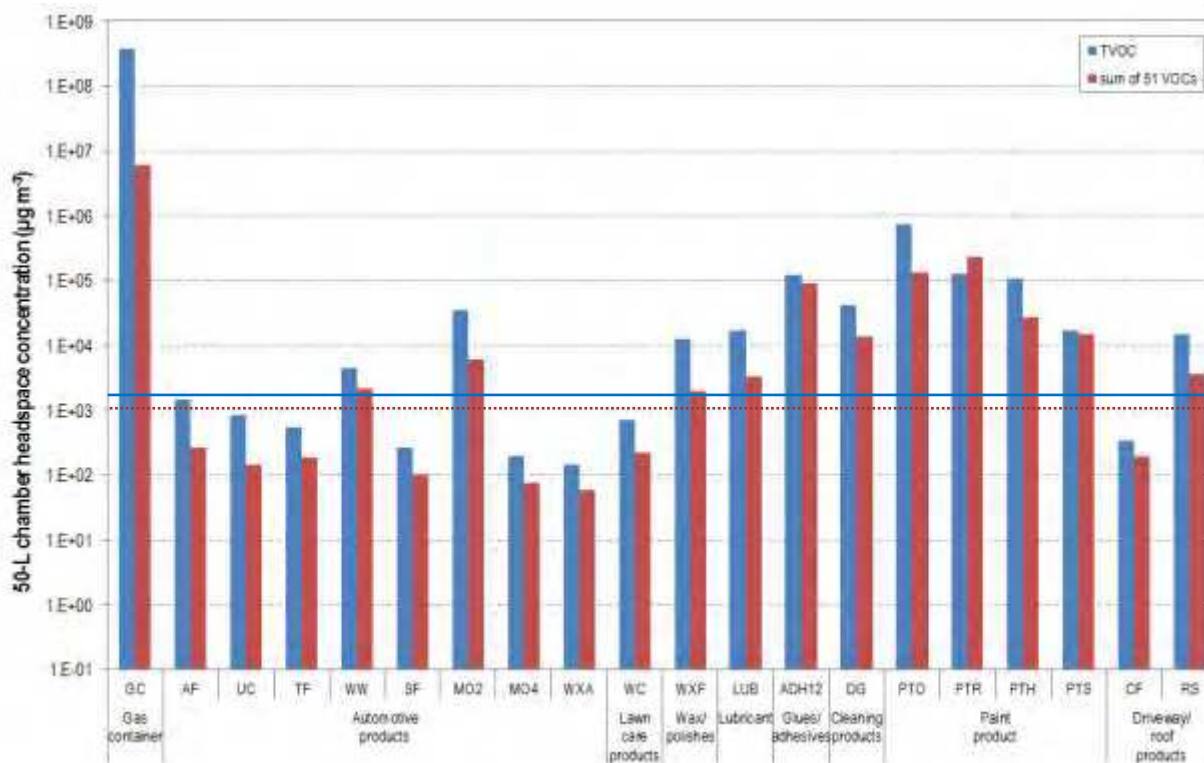


Figure 20: 50 L chamber headspace concentrations (TVOC and sum of 51 VOCs)

Note: The solid and dotted line correspond to 1,500 and 1,000 $\mu\text{g m}^{-3}$, respectively.

Table 12: VOC contents of the test products based on manufacturers' information

Group	#	ID	Contents
Gasoline container	11	GC	Naphtha (C ₄ – C ₁₂)
Automotive products	12	AF_f	Ethylene glycol (>90%), diethylene glycol (<5%)
	13	UC_f	2-Propanol (CAS# 67-63-0), 2-butoxy ethanol (CAS# 111-76-2)
	14	TF_f	Mineral oil (C ₁₅ - C ₅₀ , 70-99%)
	15	WW	Methanol (35 - 40%)
	16	SF_f	-
	17	MO2	Base oil (75-80%), naphtha (15-20%)
	18	MO4_f	-
	19	WXA_f	Petroleum distillates (CAS# 8052-41-3, 7-10%)
Lawn/plant care products	20	WC_f	Sodium nitrate (19-21%), nitrilotriacetic acid (0.5-0.8%), iron HEDTA (25-28%)
Was or polishes	21	WXF	Aliphatic hydrocarbons (68%)
Lubricants	22	LUB	Aliphatic petroleum distillates (50 -70%)
Glues & adhesives	23	ADH12	Naphtha (CAS# 64742-89-8, 30-60%), methyl ethyl ketone (CAS# 78-93-3, 10 -30%), 1,3-butadiene, 2-chloro-, homo-polymer (CAS# 9010-98-4, 10 - 30%), heptane (CAS# 142-82-5, 10-30%), propyl acetate (CAS# 109-60-4, 5 -10%)
Cleaning products	24	DG	Naphtha (90 -100%)
Paint products	25	PTO	Petroleum distillates (CAS# 64742-47-8, 10-30%)
	26	PTR	Dichloromethane (60-100%), methanol (5-10%), naphtha (C ₉ -C ₁₂ , CAS# 64742-88-7, 1-5%), toluene (1-5%)
	27	PTH	C ₉ -C ₁₁ paraffin (85%), aromatics (15%)
	28	PTS	Acetone (38%), propane (14%), xylene (9%), methyl ethyl ketone (8%), 1-methoxy-2-propanol acetate (7%), butane (6%), ethylbenzene (2%), methyl isobutyl ketone (2%)
Driveway & roof products	29	CF_f	Asphalt (0.1-1%)
	30	RS	Coal tar pitch (CAS# 65996-93-2: 60 -100%)

3.3 Dynamic chamber tests

Chamber concentrations and calculated emission factors between 1 h and 96 h are provided in the appendix (**Table A. 1** to **Table A. 47**). The curve-fitting results for a power-law decay model, which can be used to predict emission rates as a function of time, are also included in the tables.

3.3.1 Chamber concentration profiles

3.3.1.1 Emission profiles of gasoline-powered equipment

Figure 21 and Figure 22 present the emission factors as a function of time for selected aromatic and aliphatic hydrocarbons, respectively, for a used snow blower (SB3). The emission factor decreases over time. The decreasing emission trend is likely due to the reduced temperature of the test equipment, which is represented as the engine surface temperature in Figure 21 and Figure 22. While the surface temperature reached steady state at ~5 hours, the emissions continued to decrease beyond that point. It may imply that evaporative emissions are affected by various factors other than surface temperature.

Test SB3 lasted for 10 days compared to 4 days for other tests. This is to determine whether the 4-day test can approximate the 10-day test. The difference between the concentration at 96 h and at 240 h was about 30% on average. Although a different product is likely to behave differently in terms of long-term emissions, this shows the possibility that the 4-day test could approximate a longer term emission, e.g., 10 day.

The emission factor profiles for lawn mowers (LM2, LM4), a trimmer (TR1) and a chainsaw (CS1) are also presented in Figure 23 to Figure 26 for aromatic hydrocarbons. While the emissions from SB3, TRI1, and CS1 showed a continuously decreasing trend, those of LM2 and LM4 stayed relatively constant between 24 h and 96 h. The reason for the difference in the decaying pattern is not clear. Considering that the temperature profiles have similar patterns for all tests, it may be due to the design, capacity and tightness of the fuel reservoir.

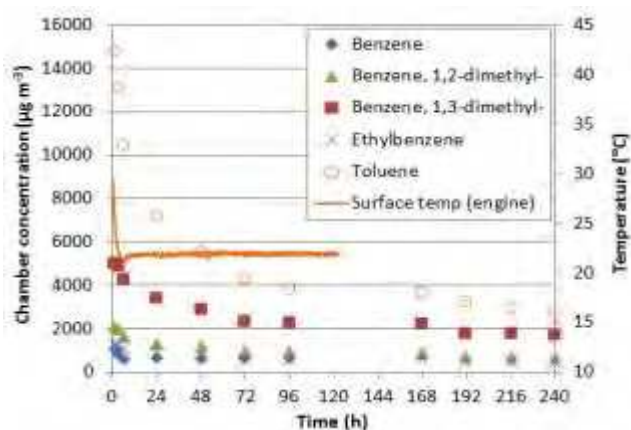


Figure 21: Chamber concentrations for aromatic hydrocarbons (SB3)

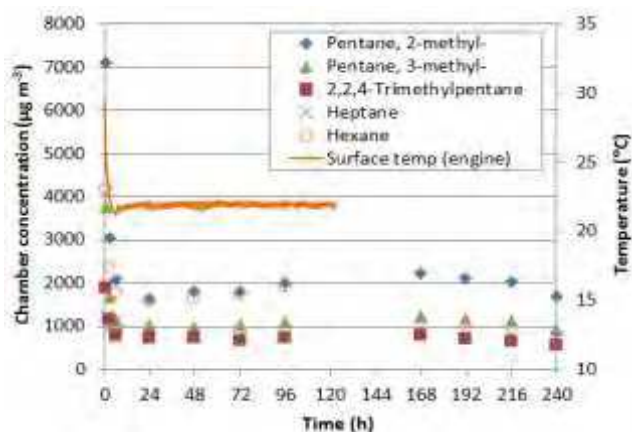


Figure 22: Chamber concentrations for aliphatic hydrocarbons (SB3)

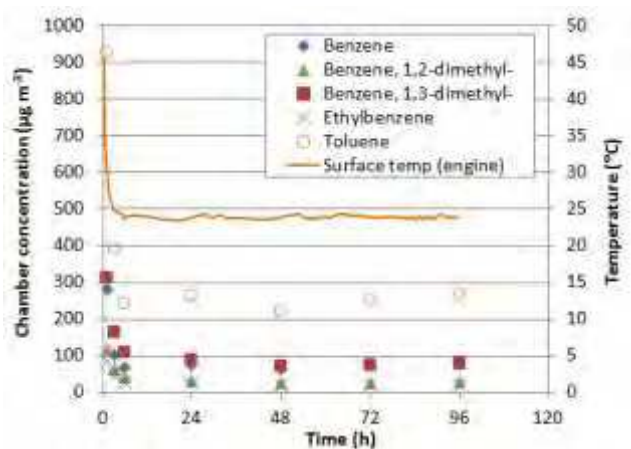


Figure 23: Chamber concentrations for aromatic hydrocarbons (LM2)

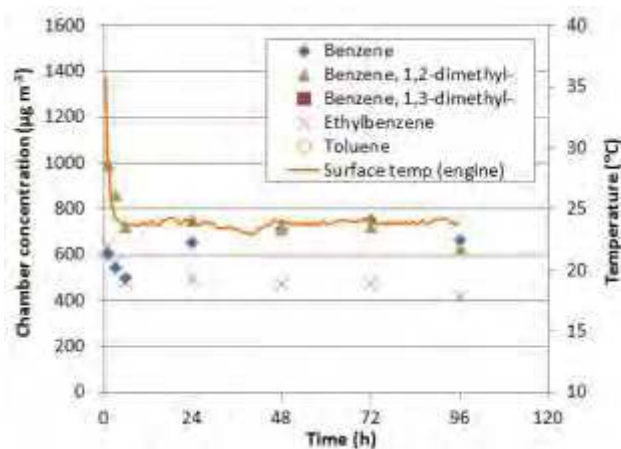


Figure 24: Chamber concentrations for aromatic hydrocarbons (LM4)

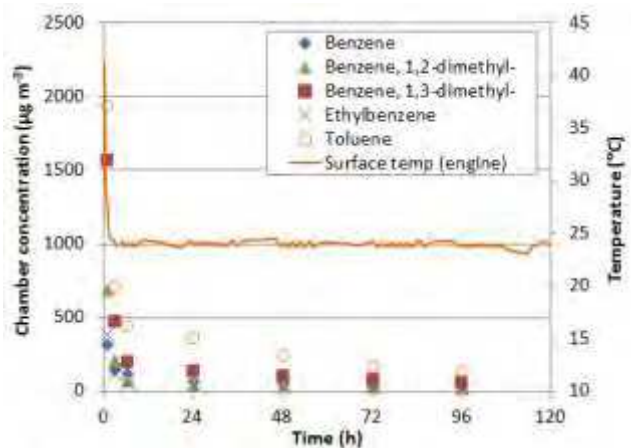


Figure 25: Chamber concentrations for aromatic hydrocarbons (TR1)

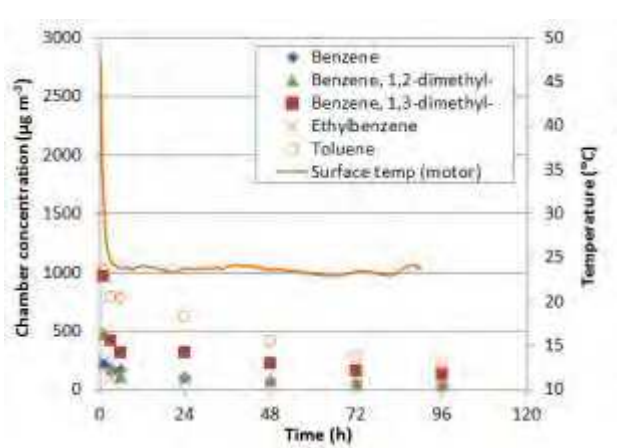


Figure 26: Chamber concentrations for aromatic hydrocarbons (CS2)

3.3.1.2 Emission profiles of small products tested in 50 L chambers

Figure 27 to Figure 30 show the chamber concentrations with a rapidly decreasing trend that is similar to those of gasoline-powered equipment. They were either oil-based primer/paint (PTO) or spray products (PTS = spray paint, LUB = spray lubricant and UC_f = Automotive carpet/upholstery cleaner). This trend is likely to reflect the rapid depletion of sources. As sprays were tested after one usage, it is likely that the high emissions at the beginning were mostly from the content left outside of the container and the low emissions at the end were from the content inside the container. The rapid decrease of VOCs from PTO may be explained in the same context. As the paint was opened once and closed before the test, it is likely that paint residuals were left outside of the paint can, creating high emissions at the beginning. Most VOCs behaved in a similar way for PTO and PTS. However, this does not apply to LUB and UC_f. Except for the main VOCs (acetone for LUB and hexane for UC_f), other VOCs tend to decrease slowly.

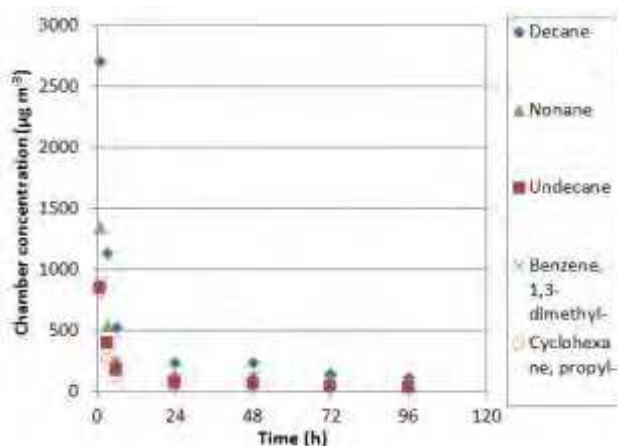


Figure 27: Chamber concentrations (PTO)

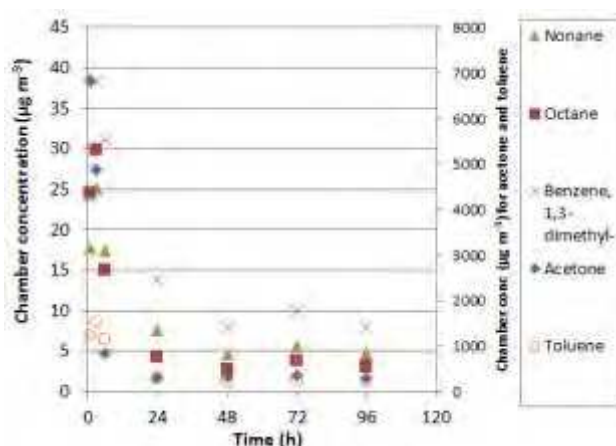


Figure 28: Chamber concentrations (PTS)

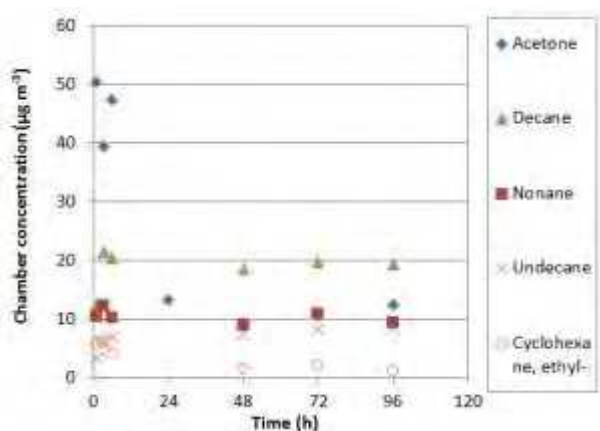


Figure 29: Chamber concentrations (LUB)

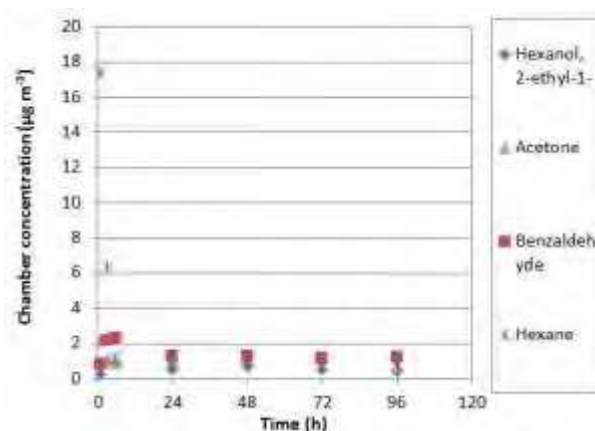


Figure 30: Chamber concentrations (UC_f)

Figure 31 to Figure 36 show the chamber concentration profiles for the products tested with cap/cover open. The VOC concentrations tend to decay slowly and reach semi-steady state at the end of the test.

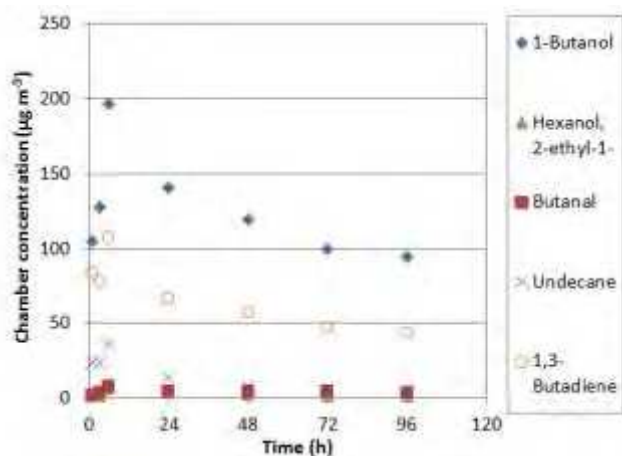


Figure 31: Chamber concentrations (TF_f)

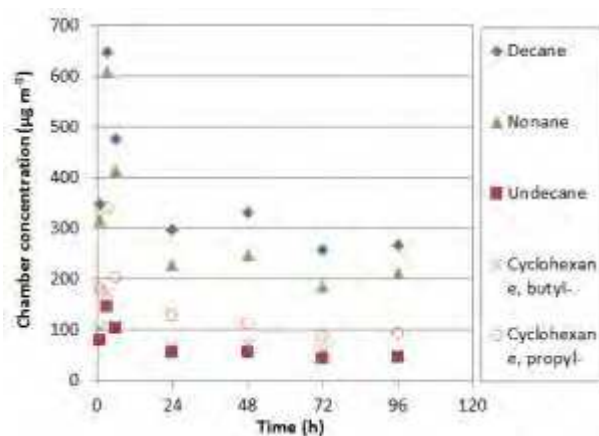


Figure 32: Chamber concentrations (WXA_f)

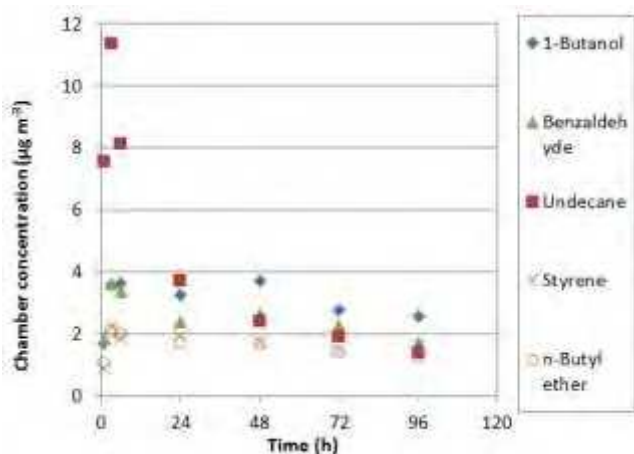


Figure 33: Chamber concentrations (CF_f)

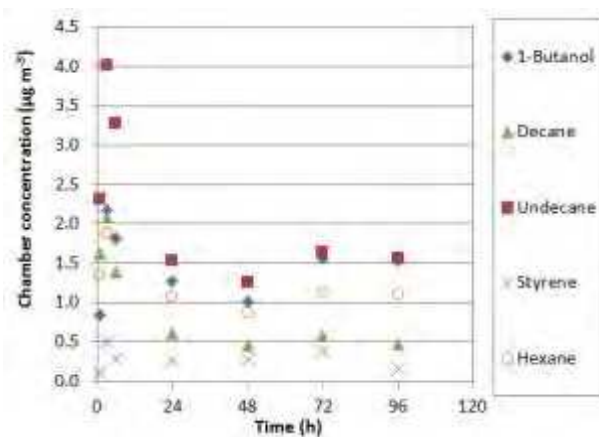


Figure 34: Chamber concentrations (WC_f)

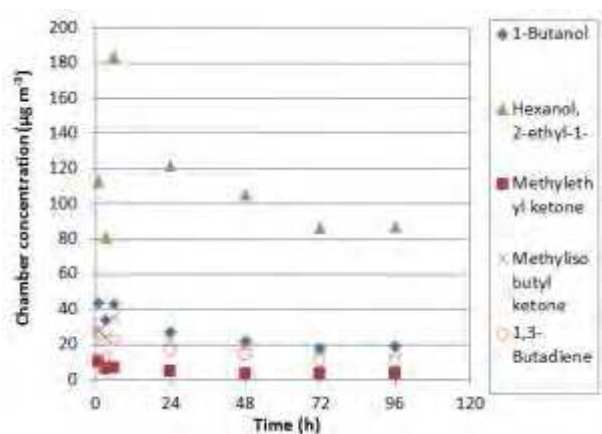


Figure 35: Chamber concentrations (MO4_f)

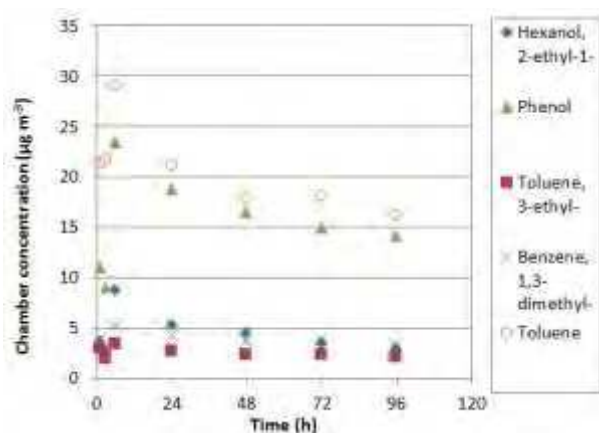


Figure 36: Chamber concentrations (SF_f)

Figure 37 to Figure 39 present the concentration profiles with a slowly decaying trend, while Figure 40 to Figure 42 show the concentration profiles with an increasing or constant trend. It appears the VOC emission rates of DG, PTH, and MO2 were almost constant and those of WXF, ADH12 and GC had a small decaying constant.

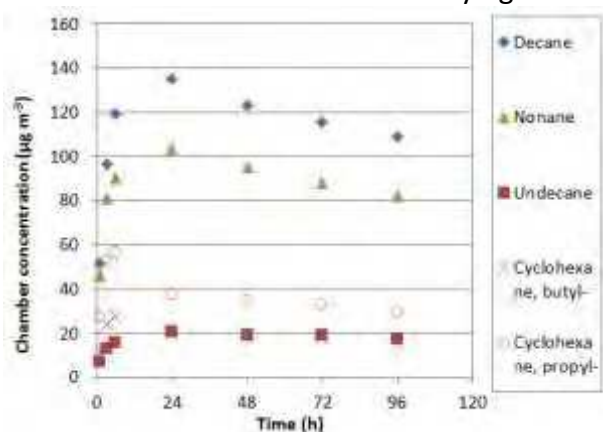


Figure 37: Chamber concentrations (WXF)

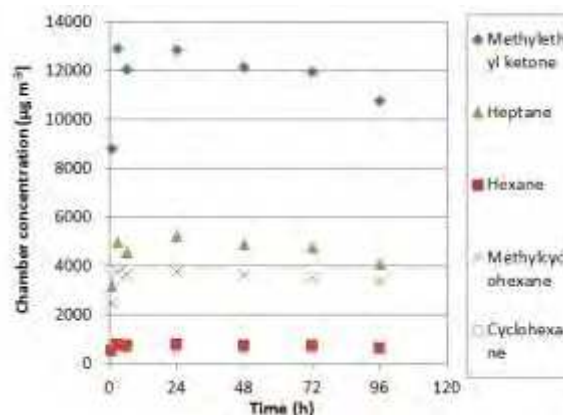


Figure 38: Chamber concentrations (ADH12)

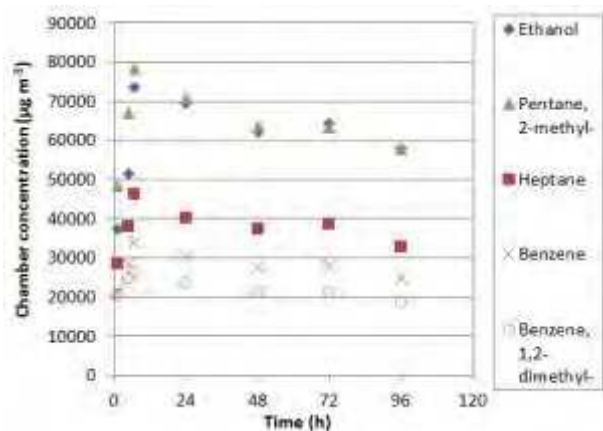


Figure 39: Chamber concentrations (GC)

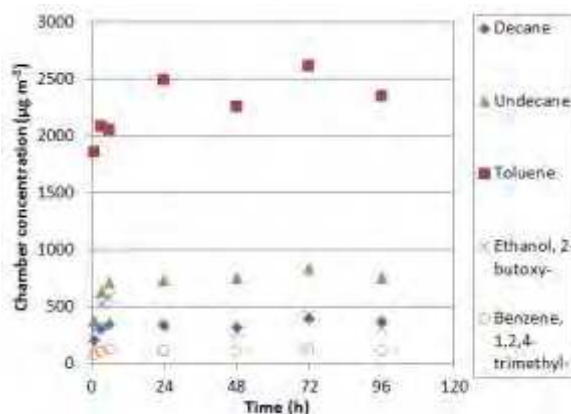


Figure 40: Chamber concentrations (DG)

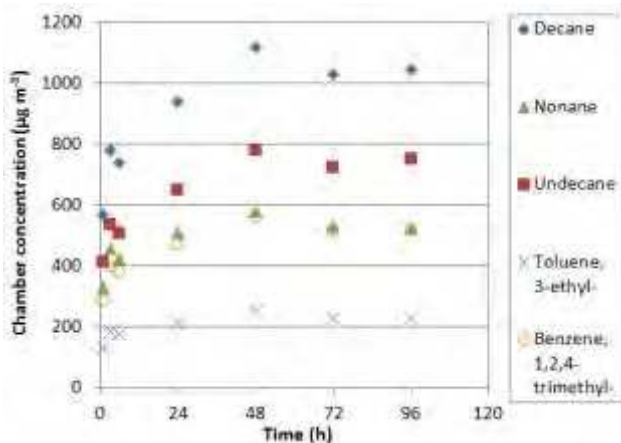


Figure 41: Chamber concentrations (PTH)

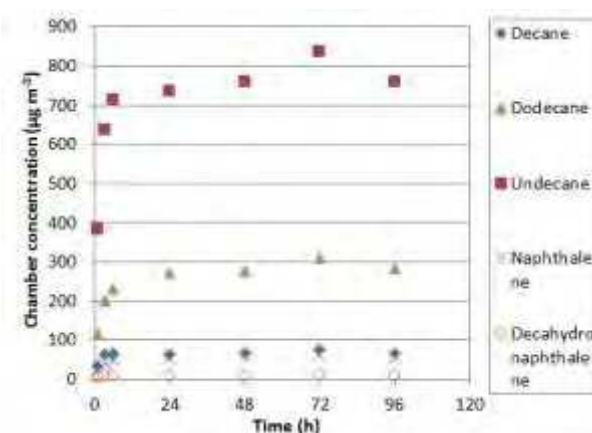


Figure 42: Chamber concentrations (MO2)

3.3.2 Emission factors for different groups of products

To facilitate the grouping based on the magnitude of emission strength, the emission factors at 24 h and 96 h were summarized in the appendix. The emission factors (EF) are summarized in the following tables:

- **Table A. 48** (EF_{24h} for large products tested in 2 m³)
- **Table A. 49** (EF_{24h} for small products tested in 50 L with cap/cover closed)
- **Table A. 50** (EF_{24h} for small products tested in 50 L with cap/cover open)
- **Table A. 51** (EF_{96h} for large products tested in 2 m³)
- **Table A. 52** (EF_{96h} for small products tested in 50 L with cap/cover closed)
- **Table A. 53** (EF_{96h} for small products tested in 50 L with cap/cover open)

Based on the magnitude of emission factors, evaporative sources tested in this study can roughly be grouped into three categories. This is more refined grouping compared to two groups (low and high) defined based on the headspace analysis results.

- High emitters that contained gasoline, including gas-powered equipment (snow blowers, lawn mowers, chainsaws and trimmers) tested in a 2 m³ chamber and gasoline container (GC) with regular grade gasoline tested in a 50 L chamber (Table A. 51)
- Medium emitters that did not contain gasoline and were tested in 50 L chambers with cover/cap closed (Table A. 52)
- Low emitters that were tested with cover/cap open, including antifreeze (AF_f), upholstery cleaner (UC_f), transmission fluid (TF_f), power steering fluid (SF_f), motor oil for 4-stroke engines (MO4_f), wax for automotive (WXA_f), weed control fluid (WC_f) and driveway crack filler (CF_f) (Table A. 53).

The three groups were used to determine the descriptive statistics on emission factors and the chemical detection frequency. This is to provide an overview on the evaporative sources. The information on individual products and chemicals are provided in the following sections.

3.3.2.1 Detection frequency

The detection frequency was calculated in two ways, by counting when the concentration was above zero or above the method detection limit (MDL). Table 13 and Table 14 summarize the detection frequency of each VOC based on the measurements at 24 h and 96 h, respectively, for all tested products (All). The same information is available for three groups of products mentioned previously, including 1) high emitters that are either gas-powered equipment or gasoline container, 2) medium emitters that were tested with a cap/cover closed completely, and 3) low emitters that were tested with a cap/cover open.

Overall, the detection frequencies were more than 50% for aliphatic hydrocarbons, aromatic hydrocarbons and cyclic alkanes based on all tests. The detection frequencies were close to

zero for other groups of compounds, including esters/glycols/glycol ethers, halogenated compounds, terpenes, and acids.

For gasoline-related high emitters, the detection frequencies of hydrocarbons were close to 100%. While the frequencies of oxygenated compounds were low, there were a few exceptions. Ethanol, which is contained in gasoline, was detected in all eleven gasoline-related products. It appears that gasolines purchased in February, June and September contained ethanol regardless of whether it represents summer or winter gasoline. Acetaldehyde and formaldehyde were detected > 50%, but their emission factors were low as shown in the following section.

For non-gasoline-related medium emitters, the same three categories of hydrocarbons also had the highest detection frequencies. However, the detection frequencies of these compounds for non-gasoline-related medium emitters were lower than those for gasoline-related high emitters. Acetone was detected > 50% in this category of products.

For low emitters, the detection frequencies of hydrocarbons (aliphatic and aromatic) were relatively high. However, the detection frequencies based on the concentration above the method detection limit became lower, indicating they were low emitters even when they were tested with cap/cover open. Five oxygenated compounds, i.e., 1-butanol, 2-ethyl-1-hexanol, benzaldehyde, acetaldehyde and formaldehyde, showed relatively high detection frequencies.

3.3.2.2 Emission factors for different classes of compounds

The emission factors can be shown for different groups of VOCs and products. The emission factors within each group of VOCs were added for an individual product and, then, statistical values were calculated for three groups of products (high, medium and low emitters). Figure 43 and Figure 44 show the values of percentiles (25%, 50% and 75%) and ranges of the emission factors measured at 24 h and 96 h, respectively, for 8 groups of VOCs and 3 groups of products. Some of data are missing since there were not enough data sets to calculate the percentiles.

For each group of compounds, the gasoline-related products showed the highest emission factors. This is particularly pertinent to hydrocarbons (aliphatics, aromatics, and cyclic alkanes) and alcohols that were identified as most frequently detected compound groups in the previous section. For the aldehyde group, the gasoline-related products were also high emitters. The compounds that belong to halogenated compounds, esters/glycols/glycol ethers, and terpenes were rarely emitted from gasoline-related products.

In the product category of medium level emitters, aliphatic and aromatic hydrocarbons were also the dominant VOCs. The halogenated compound group shows the widest range of emission factors in this group. This is because the high level of dichloromethane emitted from a paint remover (PTR) skewed the data. Terpenes were not detected in the tested evaporative sources.

In the product category of low emitters, the alcohol group had the biggest emission factors, followed by the aldehydes/ketones, aliphatic hydrocarbons and aromatic hydrocarbons. While the emission factors were low in this group of products, more diverse VOCs were emitted.

More detailed information can be found in Table 15 and Table 16, which summarize the descriptive statistics of the 24 h and 96 h emission factors for individual compounds. “All” presents descriptive statistics of all products without distinction for cap opening or closing. Additionally, descriptive statistics are separately shown under the title of “high”, “medium” and “low” emitters. The dominance of aliphatic and aromatic hydrocarbons from gasoline-related products can also be observed. Exceptions were methyl ethyl ketone and dichloromethane that showed high emission factors in the group of non-gasoline medium emitters or low emitters. The large differences between the median and mean values for these compounds indicate that these two compounds were emitted from one particular product. Overall, the emission factors of formaldehyde and acetaldehyde were low in all evaporative sources.

Table 13: Detection frequency based on emission factor at 24 h

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²	
				#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
1	Alcohols	71-36-3	1-Butanol	9	30	8	27	0	0	0	0	1	9	0	0	8	100	8	100
2		71-23-8	1-Propanol	1	3	1	3	0	0	0	0	1	9	1	9	0	0	0	0
3		104-76-7	Hexanol, 2-ethyl-1-	8	27	6	20	0	0	0	0	1	9	0	0	7	88	6	75
4		67-63-0	2-Propanol	2	7	2	7	0	0	0	0	0	0	0	0	2	25	2	25
5		64-17-5	Ethanol	14	47	12	40	11	100	11	100	0	0	0	0	3	38	1	13
6		108-95-2	Phenol	9	30	7	23	3	27	3	27	0	0	0	0	6	75	4	50
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	18	60	7	23	7	64	3	27	4	36	2	18	7	88	2	25
8		67-64-1	Acetone	25	83	18	60	8	73	7	64	9	82	5	45	8	100	6	75
9		98-86-2	Acetophenone	17	57	5	17	6	55	5	45	3	27	0	0	8	100	0	0
10		108-94-1	Cyclohexanone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11		108-10-1	Methylisobutyl ketone	2	7	2	7	0	0	0	0	1	9	1	9	1	13	1	13
12		100-52-7	Benzaldehyde	11	37	11	37	0	0	0	0	4	36	4	36	7	88	7	88
13		123-72-8	Butanal	3	10	1	3	0	0	0	0	0	0	0	0	3	38	1	13
14		112-31-2	Decanal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15		3913-81-3	2-Decenal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16		98-01-1	Furfural	2	7	2	7	0	0	0	0	0	0	0	0	2	25	2	25
17		111-71-7	Heptanal	1	3	0	0	0	0	0	0	0	0	0	0	1	13	0	0
18		66-25-1	Hexanal	3	10	1	3	0	0	0	0	1	9	1	9	2	25	0	0
19		124-19-6	Nonanal	2	7	2	7	1	9	1	9	0	0	0	0	1	13	1	13
20		18829-56-6	2-Nonenal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21		2548-87-0	2-Octenal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22		110-62-3	Pentanal	4	13	0	0	0	0	0	0	1	9	0	0	3	38	0	0
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	16	53	16	53	11	100	11	100	3	27	3	27	2	25	2	25
24		96-14-0	Pentane, 3-methyl-	15	50	15	50	11	100	11	100	3	27	3	27	1	13	1	13
25		540-84-1	2,2,4-Trimethylpentane	11	37	11	37	11	100	11	100	0	0	0	0	0	0	0	0
26		108-08-7	2,4-Dimethylpentane	1	3	1	3	1	9	1	9	0	0	0	0	0	0	0	0
27		124-18-5	Decane	28	93	26	87	11	100	11	100	9	82	8	73	8	100	7	88
28		112-40-3	Dodecane	26	87	25	83	11	100	11	100	8	73	7	64	7	88	7	88
29		142-82-5	Heptane	17	57	17	57	11	100	11	100	3	27	3	27	3	38	3	38
30		544-76-3	Hexadecane	4	13	4	13	3	27	3	27	0	0	0	0	1	13	1	13
31		110-54-3	Hexane	20	67	20	67	10	91	10	91	3	27	3	27	7	88	7	88
32		111-84-2	Nonane	25	83	23	77	11	100	11	100	8	73	8	73	6	75	4	50
33		111-65-9	Octane	20	67	20	67	11	100	11	100	6	55	6	55	3	38	3	38
34		629-62-9	Pentadecane	6	20	6	20	5	45	5	45	0	0	0	0	1	13	1	13
35		629-59-4	Tetradecane	11	37	10	33	7	64	7	64	2	18	1	9	2	25	2	25
36		629-50-5	Tridecane	14	47	13	43	9	82	9	82	3	27	2	18	2	25	2	25
37		1120-21-4	Undecane	27	90	26	87	11	100	11	100	8	73	8	73	8	100	7	88
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetrameth	24	80	16	53	11	100	11	100	6	55	4	36	7	88	1	13
39		611-14-3	Toluene, 2-ethyl-	25	83	16	53	11	100	11	100	7	64	5	45	7	88	0	0
40		620-14-4	Toluene, 3-ethyl-	26	87	21	70	11	100	11	100	9	82	7	64	6	75	3	38
41		622-96-8	Toluene, 4-ethyl-	26	87	18	60	11	100	11	100	9	82	6	55	6	75	1	13
42		4994-16-5	Cyclohexene, 4-phenyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43		71-43-2	Benzene	24	80	20	67	11	100	11	100	6	55	3	27	7	88	6	75
44		526-73-8	Benzene, 1,2,3-trimethyl-	26	87	18	60	11	100	11	100	8	73	7	64	7	88	0	0
45		95-63-6	Benzene, 1,2,4-trimethyl-	25	83	23	77	11	100	11	100	7	64	6	55	7	88	6	75
46		95-47-6	Benzene, 1,2-dimethyl-	26	87	21	70	11	100	11	100	9	82	8	73	6	75	2	25
47		108-67-8	Benzene, 1,3,5-trimethyl-	26	87	18	60	11	100	11	100	8	73	6	55	7	88	1	13
48		108-38-3	Benzene, 1,3-dimethyl-	27	90	23	77	11	100	11	100	10	91	9	82	6	75	3	38
49		98-82-8	Benzene, isopropyl	15	50	12	40	7	64	7	64	5	45	4	36	3	38	1	13
50		103-65-1	Benzene, propyl-	20	67	15	50	7	64	7	64	7	64	6	55	6	75	2	25
51		100-41-4	Ethylbenzene	26	87	21	70	11	100	11	100	9	82	8	73	6	75	2	25
52		91-20-3	Naphthalene	24	80	16	53	7	64	7	64	9	82	4	36	8	100	5	63
53		99-87-6	p-Cymene	17	57	11	37	7	64	7	64	5	45	4	36	5	63	0	0
54		100-42-5	Styrene	15	50	4	13	1	9	1	9	6	55	1	9	8	100	2	25
55		108-88-3	Toluene	29	97	21	70	11	100	11	100	10	91	7	64	8	100	3	38
56	Esters	98-83-9	2-Phenylpropene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57		95-13-6	Indene	6	20	4	13	6	55	4	36	0	0	0	0	0	0	0	0
58		108-21-4	Acetic acid, 1-methylethyl e	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59		111-15-9	Acetic acid, 2-ethoxyethyl e	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60		123-86-4	Acetic acid, butyl ester	1	3	1	3	0	0	0	0	0	0	0	0	1	13	1	13
61		141-78-6	Acetic acid, ethyl ester	2	7	2	7	1	9	1	9	0	0	0	0	1	13	1	13
62		80-62-6	Methyl methacrylate	3	10	2	7	0	0	0	0	0	0	0	0	3	38	2	25
63		103-09-3	2-Ethylhexyl acetate	1	3	1	3	0	0	0	0	0	0	0	0	1	13	1	13
64		96-48-0	Butyrolactone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65		25265-77-4	Texanol	1	3	0	0	0	0	0	0	1	9	0	0	0	0	0	0
66		6846-50-0	TXIB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 13 (continued)

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²	
				#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol	1	3	0	0	0	0	0	0	1	9	0	0	0	0	0	0
68		110-49-6	2-Methoxyethylacetate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69		111-90-0	Diethylene glycol monoeth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70		107-98-2	Propanol, 1-methoxy-2-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71		111-76-2	Ethanol, 2-butoxy-	1	3	1	3	0	0	0	0	1	9	1	9	0	0	0	0
72		112-34-5	Ethanol, 2-butoxyethoxy-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		110-80-5	Ethanol, 2-ethoxy-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		109-86-4	Ethanol, 2-methoxy-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		75-65-0	Propanol, 2-methyl-2-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		71-55-6	1,1,1-Trichloroethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78		107-06-2	1,2-Dichloroethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79		78-87-5	1,2-Dichloropropane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80		106-46-7	1,4-Dichlorobenzene	1	3	0	0	0	0	0	0	1	9	0	0	0	0	0	0
81		75-27-4	Bromodichloromethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82		56-23-5	Carbon tetrachloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83		67-66-3	Chloroform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84		124-48-1	Dibromochloromethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85		75-09-2	Dichloromethane	8	27	7	23	1	9	1	9	3	27	3	27	4	50	3	38
86		127-18-4	Tetrachloroethylene	1	3	1	3	0	0	0	0	1	9	1	9	0	0	0	0
87	Cyclo Alkanes	79-01-6	Trichloroethylene	11	37	5	17	3	27	3	27	4	36	0	0	4	50	2	25
88		79-34-5	1,1,2,2-Tetrachloroethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89		108-87-2	Methylcyclohexane	19	63	19	63	11	100	11	100	5	45	5	45	3	38	3	38
90		110-82-7	Cyclohexane	10	33	10	33	7	64	7	64	3	27	3	27	0	0	0	0
91		1678-93-9	Cyclohexane, butyl-	13	43	11	37	1	9	1	9	8	73	7	64	4	50	3	38
92		1678-91-7	Cyclohexane, ethyl-	15	50	15	50	7	64	7	64	6	55	6	55	2	25	2	25
93		1678-92-8	Cyclohexane, propyl-	16	53	16	53	7	64	7	64	6	55	6	55	3	38	3	38
94		91-17-8	Decahydronaphthalene	8	27	8	27	1	9	1	9	6	55	6	55	1	13	1	13
95	Terpenes	80-56-8	alpha-Pinene	5	17	4	13	5	45	4	36	0	0	0	0	0	0	0	0
96		99-86-5	alpha-Terpinene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97		127-91-3	beta-Pinene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98		99-85-4	gamma-Terpinene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99		13466-78-5	3-Carene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100		79-92-5	Camphene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101		5989-27-5	Limonene	4	13	4	13	1	9	1	9	0	0	0	0	3	38	3	38
102	Acids	64-19-7	Acetic acid	3	10	0	0	0	0	0	0	0	0	0	0	3	38	0	0
103		79-31-2	Isobutyric acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104		107-92-6	Butyric acid	1	3	0	0	1	9	0	0	0	0	0	0	0	0	0	0
105		111-14-8	Heptanoic acid	1	3	1	3	1	9	1	9	0	0	0	0	0	0	0	0
106		149-57-5	2-Ethylhexanoic acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107		142-62-1	Hexanoic acid	1	3	1	3	1	9	1	9	0	0	0	0	0	0	0	0
108		109-52-4	Pentanoic Acid	1	3	0	0	1	9	0	0	0	0	0	0	0	0	0	0
109	Other	3777-69-3	Furan, 2-pentyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110		872-50-4	2-Pyrrolidinone, 1-methyl-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111		123-91-1	1,4-Dioxane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112		78-40-0	Triethyl phosphate	1	3	0	0	0	0	0	0	0	0	0	0	1	13	0	0
113		142-96-1	n-Butyl ether	2	7	2	7	0	0	0	0	0	0	0	0	2	25	2	25
114		96-29-7	2-Butanone oxime	1	3	1	3	0	0	0	0	1	9	1	9	0	0	0	0
115		121-44-8	Triethylamine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116		75-21-8	Ethylene oxide	1	3	1	3	0	0	0	0	0	0	0	0	1	13	1	13
117		75-56-9	Propylene oxide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118		106-99-0	1,3-Butadiene	2	7	2	7	0	0	0	0	0	0	0	0	2	25	2	25
D1	DHPH	75-07-0	Acetaldehyde	22	73	16	53	10	91	9	82	7	64	2	18	5	63	5	63
D2		50-00-0	Formaldehyde	9	30	9	30	7	64	7	64	0	0	0	0	2	25	2	25
D3		123-38-6	Propanal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0-00-0	TVOC	29	97 ³	29	97	11	100	11	100	10	91	10	91	8	100	8	100

¹ Detection frequency above zero; ² Detection frequency above the method detection limit (MDL), ³ The detection frequency less than 100% for TVOC was due to a missing 24-h sample for a lubricant.

Table 14: Detection frequency based on emission factor at 96 h

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²	
				#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
1	Alcohols	71-36-3	1-Butanol	7	23	7	23	0	0	0	0	0	0	0	0	7	88	7	88
2		71-23-8	1-Propanol	1	3	1	3	0	0	0	0	1	9	1	9	0	0	0	0
3		104-76-7	Hexanol, 2-ethyl-1-	9	30	5	17	0	0	0	0	2	18	0	0	7	88	5	63
4		67-63-0	2-Propanol	2	7	1	3	0	0	0	0	0	0	0	0	2	25	1	13
5		64-17-5	Ethanol	15	50	13	43	11	100	11	100	3	27	2	18	1	13	0	0
6		108-95-2	Phenol	8	27	5	17	3	27	2	18	0	0	0	0	5	63	3	38
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	15	50	7	23	3	27	2	18	5	45	3	27	7	88	2	25
8		67-64-1	Acetone	24	80	14	47	9	82	5	45	7	64	6	55	8	100	3	38
9		98-86-2	Acetophenone	16	53	4	13	6	55	4	36	2	18	0	0	8	100	0	0
10		108-94-1	Cyclohexanone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11		108-10-1	Methylisobutyl ketone	3	10	2	7	0	0	0	0	1	9	1	9	2	25	1	13
12		100-52-7	Benzaldehyde	11	37	10	33	0	0	0	0	4	36	4	36	7	88	6	75
13		123-72-8	Butanal	2	7	1	3	0	0	0	0	0	0	0	0	2	25	1	13
14		112-31-2	Decanal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15		3913-81-3	2-Decenal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16		98-01-1	Furfural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17		111-71-7	Heptanal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18		66-25-1	Hexanal	2	7	1	3	0	0	0	0	1	9	1	9	1	13	0	0
19		124-19-6	Nonanal	1	3	1	3	1	9	1	9	0	0	0	0	0	0	0	0
20		18829-56-6	2-Nonenal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21		2548-87-0	2-Octenal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22		110-62-3	Pentanal	4	13	0	0	0	0	0	0	1	9	0	0	3	38	0	0
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	14	47	14	47	11	100	11	100	2	18	2	18	1	13	1	13
24		96-14-0	Pentane, 3-methyl-	16	53	13	43	11	100	11	100	3	27	2	18	2	25	0	0
25		540-84-1	2,2,4-Trimethylpentane	10	33	10	33	10	91	10	91	0	0	0	0	0	0	0	0
26		108-08-7	2,4-Dimethylpentane	1	3	1	3	1	9	1	9	0	0	0	0	0	0	0	0
27		124-18-5	Decane	28	93	25	83	11	100	11	100	9	82	9	82	8	100	5	63
28		112-40-3	Dodecane	27	90	25	83	11	100	11	100	9	82	7	64	7	88	7	88
29		142-82-5	Heptane	17	57	17	57	11	100	11	100	3	27	3	27	3	38	3	38
30		544-76-3	Hexadecane	5	17	5	17	4	36	4	36	0	0	0	0	1	13	1	13
31		110-54-3	Hexane	20	67	20	67	10	91	10	91	4	36	4	36	6	75	6	75
32		111-84-2	Nonane	24	80	21	70	11	100	11	100	9	82	8	73	4	50	2	25
33		111-65-9	Octane	20	67	19	63	11	100	11	100	7	64	7	64	2	25	1	13
34		629-62-9	Pentadecane	7	23	7	23	6	55	6	55	0	0	0	0	1	13	1	13
35		629-59-4	Tetradecane	11	37	10	33	8	73	8	73	1	9	1	9	2	25	1	13
36		629-50-5	Tridecane	13	43	12	40	9	82	9	82	2	18	2	18	2	25	1	13
37		1120-21-4	Undecane	28	93	27	90	11	100	11	100	10	91	9	82	7	88	7	88
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	23	77	15	50	11	100	11	100	6	55	4	36	6	75	0	0
39		611-14-3	Toluene, 2-ethyl-	23	77	15	50	11	100	11	100	7	64	4	36	5	63	0	0
40		620-14-4	Toluene, 3-ethyl-	24	80	18	60	11	100	11	100	8	73	6	55	5	63	1	13
41		622-96-8	Toluene, 4-ethyl-	25	83	17	57	11	100	11	100	9	82	5	45	5	63	1	13
42		4994-16-5	Cyclohexene, 4-phenyl	1	3	1	3	1	9	1	9	0	0	0	0	0	0	0	0
43		71-43-2	Benzene	23	77	20	67	11	100	11	100	7	64	5	45	5	63	4	50
44		526-73-8	Benzene, 1,2,3-trimethyl-	26	87	17	57	11	100	11	100	9	82	6	55	6	75	0	0
45		95-63-6	Benzene, 1,2,4-trimethyl-	25	83	22	73	11	100	11	100	9	82	7	64	5	63	4	50
46		95-47-6	Benzene, 1,2-dimethyl-	28	93	21	70	11	100	11	100	11	100	9	82	6	75	1	13
47		108-67-8	Benzene, 1,3,5-trimethyl-	24	80	16	53	11	100	11	100	8	73	4	36	5	63	1	13
48		108-38-3	Benzene, 1,3-dimethyl-	29	97	24	80	11	100	11	100	11	100	11	100	7	88	2	25
49		98-82-8	Benzene, isopropyl	14	47	10	33	7	64	7	64	4	36	3	27	3	38	0	0
50		103-65-1	Benzene, propyl-	17	57	12	40	7	64	7	64	5	45	4	36	5	63	1	13
51		100-41-4	Ethylbenzene	28	93	22	73	11	100	11	100	11	100	9	82	6	75	2	25
52		91-20-3	Naphthalene	22	73	13	43	7	64	7	64	7	64	4	36	8	100	2	25
53		99-87-6	p-Cymene	16	53	8	27	7	64	5	45	5	45	3	27	4	50	0	0
54		100-42-5	Styrene	12	40	3	10	0	0	0	0	4	36	1	9	8	100	2	25
55	Esters	108-88-3	Toluene	30	100	22	73	11	100	11	100	11	100	9	82	8	100	2	25
56		98-83-9	2-Phenylpropene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57		95-13-6	Indene	7	23	4	13	7	64	4	36	0	0	0	0	0	0	0	0
58		108-21-4	Acetic acid, 1-methylethyl ester	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59		111-15-9	Acetic acid, 2-ethoxyethyl ester	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60		123-86-4	Acetic acid, butyl ester	1	3	1	3	0	0	0	0	0	0	0	0	1	13	1	13
61	Esters	141-78-6	Acetic acid, ethyl ester	1	3	1	3	0	0	0	0	0	0	0	0	1	13	1	13
62		80-62-6	Methyl methacrylate	3	10	2	7	0	0	0	0	0	0	0	0	3	38	2	25
63		103-09-3	2-Ethylhexyl acetate	1	3	1	3	0	0	0	0	0	0	0	0	1	13	1	13
64		96-48-0	Butyrolactone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65		25265-77-4	Texanol	1	3	0	0	0	0	0	0	1	9	0	0	0	0	0	0
66		6846-50-0	TXIB	1	3	1	3	1	9	1	9	0	0	0	0	0	0	0	0

Table 14 (continued)

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²		Detection frequency ¹		Detection frequency ²	
#	Class	CAS#	Compound	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
67	Glycols, GlycolEthers	57-55-6	1,2-Propanediol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68		110-49-6	2-Methoxyethylacetate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69		111-90-0	Diethylene glycol monoethyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70		107-98-2	Propanol, 1-methoxy-2-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71		111-76-2	Ethanol, 2-butoxy-	1	3	1	3	0	0	0	0	1	9	1	9	0	0	0	0
72		112-34-5	Ethanol, 2-butoxyethoxy-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		110-80-5	Ethanol, 2-ethoxy-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		109-86-4	Ethanol, 2-methoxy-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		71-55-6	1,1,1-Trichloroethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		95-50-1	1,2-Dichlorobenzene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78		107-06-2	1,2-Dichloroethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79		78-87-5	1,2-Dichloropropane	1	3	0	0	0	0	0	0	1	9	0	0	0	0	0	0
80		106-46-7	1,4-Dichlorobenzene	1	3	0	0	0	0	0	0	1	9	0	0	0	0	0	0
81		75-27-4	Bromodichloromethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82		56-23-5	Carbon tetrachloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	Cyclo Alkanes	67-66-3	Chloroform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84		124-48-1	Dibromochloromethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85		75-09-2	Dichloromethane	7	23	6	20	0	0	0	0	5	45	5	45	2	25	1	13
86		127-18-4	Tetrachloroethylene	3	10	2	7	1	9	1	9	2	18	1	9	0	0	0	0
87		79-01-6	Trichloroethylene	9	30	3	10	2	18	2	18	3	27	1	9	4	50	0	0
88		79-34-5	1,1,2,2-Tetrachloroethane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89		108-87-2	Methylcyclohexane	17	57	17	57	11	100	11	100	4	36	4	36	2	25	2	25
90		110-82-7	Cyclohexane	10	33	10	33	7	64	7	64	3	27	3	27	0	0	0	0
91	Terpenes	1678-93-9	Cyclohexane, butyl-	12	40	10	33	1	9	1	9	7	64	7	64	4	50	2	25
92		1678-91-7	Cyclohexane, ethyl-	16	53	16	53	7	64	7	64	7	64	7	64	2	25	2	25
93		1678-92-8	Cyclohexane, propyl-	18	60	17	57	7	64	7	64	8	73	7	64	3	38	3	38
94		91-17-8	Decahydronaphthalene	9	30	9	30	1	9	1	9	7	64	7	64	1	13	1	13
95		80-56-8	alpha-Pinene	3	10	1	3	3	27	1	9	0	0	0	0	0	0	0	0
96		99-86-5	alpha-Terpinene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97		127-91-3	beta-Pinene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98		99-85-4	gamma-Terpinene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	Acids	13466-78-9	3-Carene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100		79-92-5	Camphene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101		5989-27-5	Limonene	2	7	2	7	0	0	0	0	0	0	0	0	2	25	2	25
102		64-19-7	Acetic acid	3	10	0	0	0	0	0	0	0	0	0	0	3	38	0	0
103		79-31-2	Isobutyric acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104		107-92-6	Butyric acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105		111-14-8	Heptanoic acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106		149-57-5	2-Ethylhexanoic acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	Other	142-62-1	Hexanoic acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108		109-52-4	Pentanoic Acid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109		3777-69-3	Furan, 2-pentyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110		872-50-4	2-Pyrrolidinone, 1-methyl-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111		123-91-1	1,4-Dioxane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112		78-40-0	Triethyl phosphate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113		142-96-1	n-Butyl ether	2	7	2	7	0	0	0	0	0	0	0	0	2	25	2	25
114		96-29-7	2-Butanone oxime	1	3	0	0	0	0	0	0	1	9	0	0	0	0	0	0
115	DHPH	121-44-8	Triethylamine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116		75-21-8	Ethylene oxide	1	3	1	3	0	0	0	0	0	0	0	0	1	13	1	13
117		75-56-9	Propylene oxide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118		106-99-0	1,3-Butadiene	2	7	2	7	0	0	0	0	0	0	0	0	2	25	2	25
D1		75-07-0	Acetaldehyde	24	80	21	70	9	82	9	82	7	64	5	45	8	100	7	88
D2		50-00-0	Formaldehyde	12	40	11	37	7	64	6	55	1	9	1	9	4	50	4	50
D3		123-38-6	Propanal	3	10	1	3	0	0	0	0	0	0	0	0	3	38	1	13
		0-00-0	TVOC	30	100	30	100	11	100	11	100	11	100	11	100	8	100	8	100

¹ Detection frequency above zero; ² Detection frequency above the method detection limit (MDL)

Note: Frequencies > 70% are highlighted in green; frequencies between 50% and 70% are highlighted in yellow.

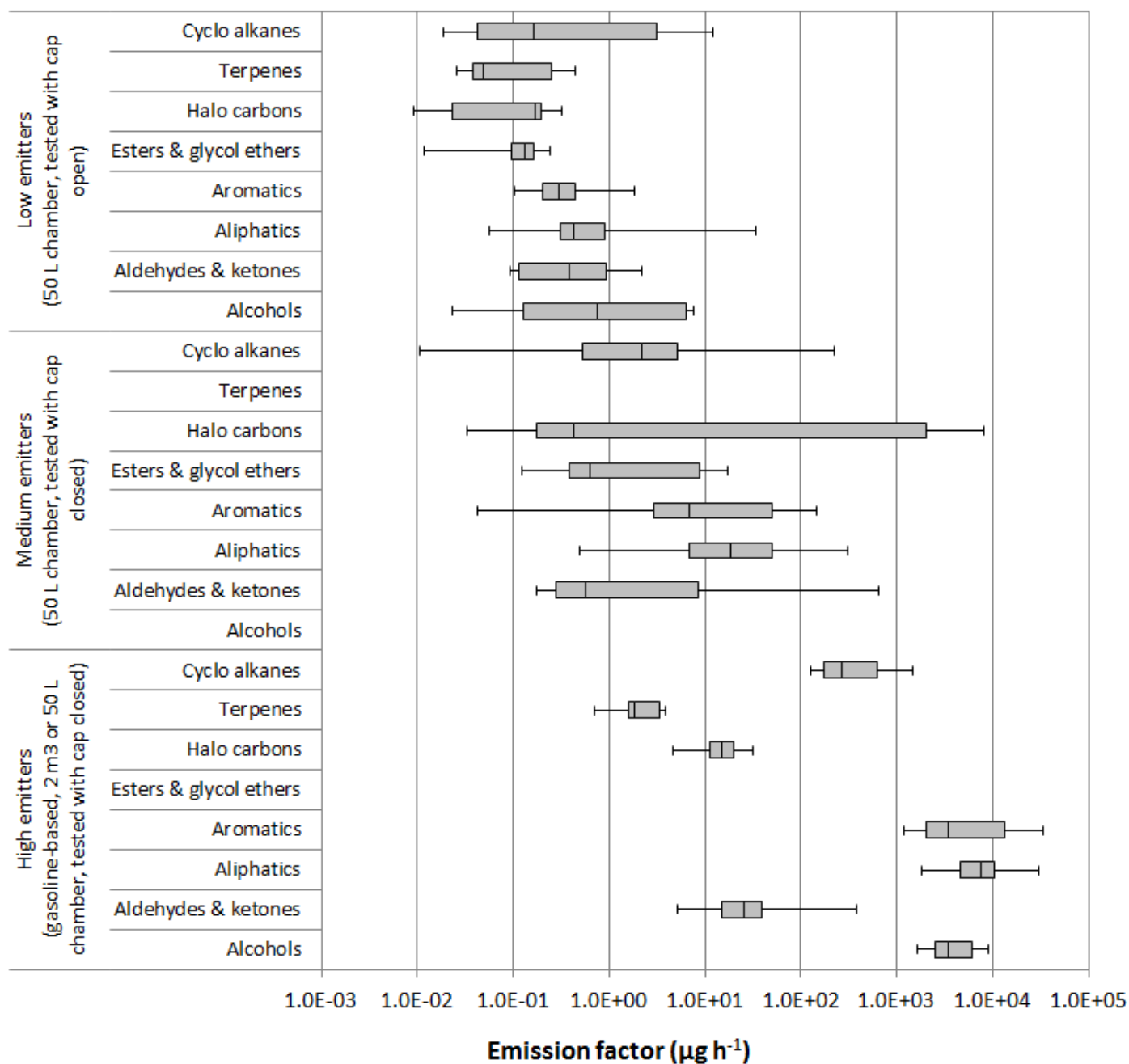


Figure 43: Range of emission factors @ 24 h for high, medium and low emitters

Note: 1) Low emitters were tested with cap/cover open while medium and high emitters were tested with cap/cover closed. 2) Aldehydes & ketones include formaldehyde, acetaldehyde and propanal analyzed with DNPH & HPLC analysis.

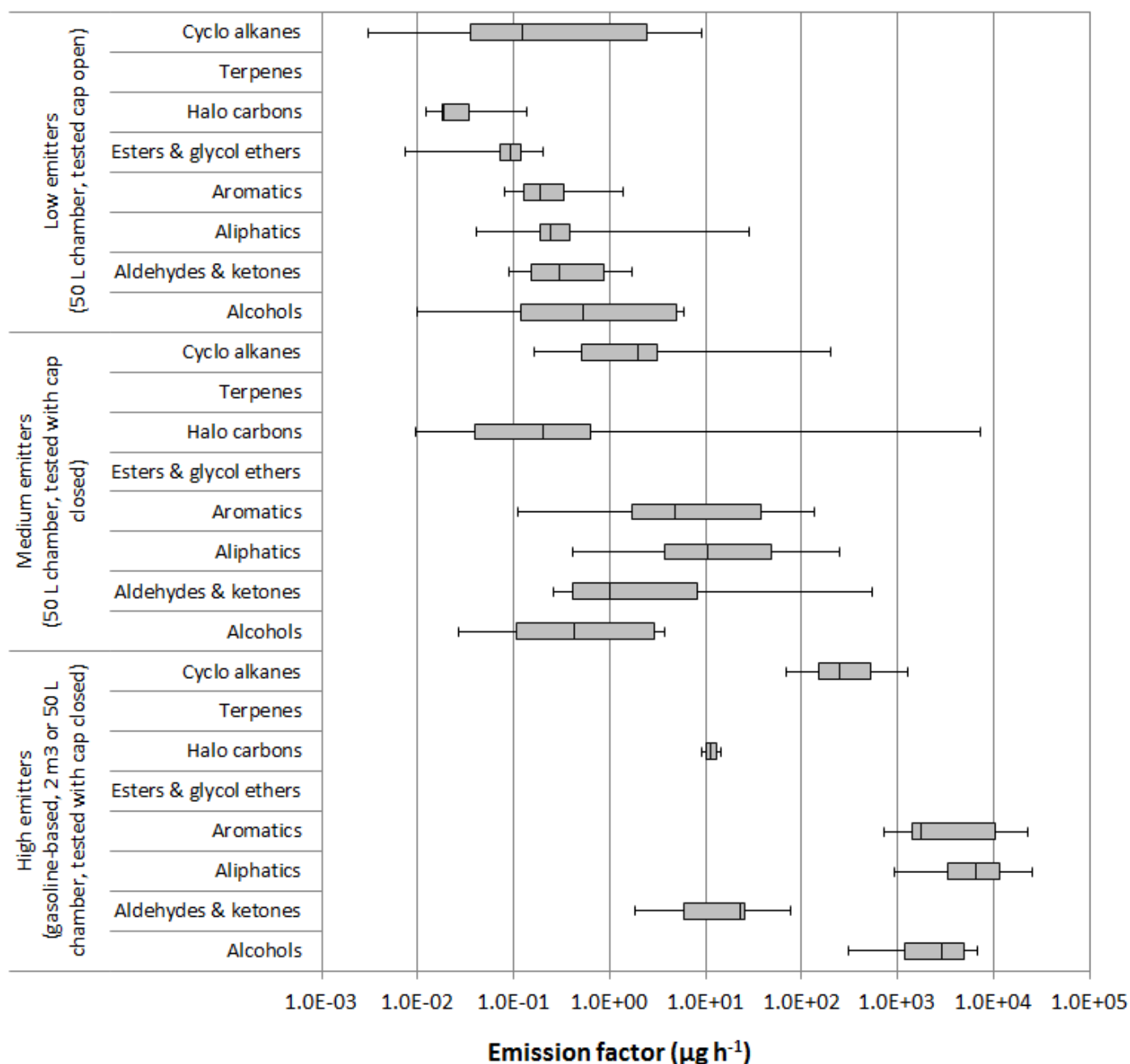


Figure 44: Range of emission factors @ 96 h for high, medium and low emitters

Note: 1) Low emitters were tested with cap/cover open while medium and high emitters were tested with cap/cover closed. 2) Aldehydes & ketones include formaldehyde, acetaldehyde and propanal analyzed with DNPH & HPLC analysis.

Table 15: Emission factors ($\mu\text{g h}^{-1}$) at 24 h grouped for three categories (high, medium and low)

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean
1	Alcohols	71-36-3	1-Butanol	0.0	7.0	0.0	1.0					0.0	0.0	0.0	0.0	0.0	7.0	0.1	1.1
2		71-23-8	1-Propanol	5.2	5.2	5.2	5.2					5.2	5.2	5.2	5.2				
3		104-76-7	Hexanol, 2-ethyl-1-	0.0	6.1	0.1	0.9					0.0	0.0	0.0	0.0	0.0	6.1	0.1	1.0
4		67-63-0	2-Propanol	0.0	5.8	2.9	2.9									0.0	5.8	2.9	2.9
5		64-17-5	Ethanol	0.0	9019.2	2916.8	3539.5	1642.2	9019.2	3479.5	4504.8					0.0	0.1	0.0	0.1
6		108-95-2	Phenol	0.0	5.4	0.1	1.3	2.5	5.4	2.6	3.5					0.0	0.9	0.0	0.2
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.0	644.6	0.2	46.6	0.1	180.1	2.1	27.7	0.0	644.6	0.2	161.3	0.0	0.2	0.0	0.1
8		67-64-1	Acetone	0.0	68.0	1.8	6.4	2.7	68.0	5.7	13.7	0.1	15.1	0.6	4.3	0.0	1.8	0.2	0.3
9		98-86-2	Acetophenone	0.0	15.0	0.0	2.9	2.2	15.0	7.9	8.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
10		108-94-1	Cyclohexanone																
11		108-10-1	Methylisobutyl ketone	0.2	1.1	0.7	0.7					0.2	0.2	0.2	0.2	1.1	1.1	1.1	1.1
12		100-52-7	Benzaldehyde	0.0	0.3	0.1	0.1					0.0	0.3	0.1	0.2	0.0	0.1	0.0	0.1
13		123-72-8	Butanal	0.0	0.2	0.1	0.1									0.0	0.2	0.1	0.1
14		112-31-2	Decanal																
15		3913-81-3	2-Decenal																
16		98-01-1	Furfural	0.0	0.1	0.0	0.0									0.0	0.1	0.0	0.0
17		111-71-7	Heptanal	0.0	0.0	0.0	0.0									0.0	0.0	0.0	0.0
18		66-25-1	Hexanal	0.0	0.6	0.1	0.2					0.6	0.6	0.6	0.6	0.0	0.1	0.0	0.0
19		124-19-6	Nonanal	0.1	5.2	2.6	2.6	5.2	5.2	5.2	5.2					0.1	0.1	0.1	0.1
20		18829-56-6	2-Nonenal																
21		2548-87-0	2-Octenal																
22		110-62-3	Pentanal	0.0	0.1	0.1	0.1					0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	0.0	5260.1	691.9	1200.9	314.2	5260.1	935.7	1746.8	0.1	0.5	0.2	0.2	0.0	0.1	0.0	0.0
24		96-14-0	Pentane, 3-methyl-	0.0	2121.3	481.5	701.9	175.6	2121.3	575.3	957.0	0.1	0.7	0.2	0.3	0.0	0.0	0.0	0.0
25		540-84-1	2,2,4-Trimethylpentane	113.7	1539.6	453.8	663.1	113.7	1539.6	453.8	663.1								
26		108-08-7	2,4-Dimethylpentane	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5								
27		124-18-5	Decane	0.0	122.1	9.0	21.1	7.7	122.1	26.0	43.7	0.0	46.9	4.8	10.4	0.0	15.0	0.0	1.9
28		112-40-3	Dodecane	0.0	85.2	2.5	9.7	3.7	85.2	13.4	20.8	0.0	13.6	0.7	2.8	0.0	0.4	0.1	0.2
29		142-82-5	Heptane	0.0	2003.5	243.3	456.7	126.1	2003.5	393.4	681.7	0.4	262.6	1.6	88.2	0.0	0.1	0.0	0.0
30		544-76-3	Hexadecane	0.1	5.9	1.8	2.4	1.3	5.9	2.3	3.2					0.1	0.1	0.1	0.1
31		110-54-3	Hexane	0.0	20701	493.7	2862.0	949.8	20701	3571.8	5719.9	1.0	37.6	1.1	13.3	0.0	0.3	0.1	0.1
32		111-84-2	Nonane	0.0	272.9	11.5	46.9	20.6	272.9	57.4	101.4	0.0	25.6	3.7	5.8	0.0	11.5	0.0	1.9
33		111-65-9	Octane	0.0	647.2	49.6	127.4	43.9	647.2	127.7	229.9	0.1	9.9	1.3	3.2	0.0	0.0	0.0	0.0
34		629-62-9	Pentadecane	1.1	8.6	2.4	3.1	1.6	8.6	2.5	3.5					1.1	1.1	1.1	1.1
35		629-59-4	Tetradecane	0.0	28.0	2.0	4.6	1.4	28.0	3.6	6.9	0.0	0.1	0.0	0.0	0.0	2.8	1.4	1.4
36		629-50-5	Tridecane	0.0	118.0	2.9	11.2	2.1	118.0	3.3	17.4	0.0	0.3	0.1	0.1	0.0	0.3	0.2	0.2
37		1120-21-4	Undecane	0.0	56.1	6.0	11.8	6.0	56.1	16.4	20.3	0.3	36.8	3.6	11.4	0.0	2.7	0.2	0.5
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetrameth	0.0	103.2	1.4	17.0	7.1	103.2	28.5	36.9	0.0	1.4	0.3	0.6	0.0	0.0	0.0	0.0
39		611-14-3	Toluene, 2-ethyl-	0.0	462.9	0.9	70.2	18.3	462.9	80.6	159.0	0.0	4.9	0.1	0.9	0.0	0.0	0.0	0.0
40		620-14-4	Toluene, 3-ethyl-	0.0	1596.0	1.2	213.2	56.6	1596.0	237.3	502.7	0.0	10.7	0.1	1.5	0.0	0.1	0.0	0.0
41		622-96-8	Toluene, 4-ethyl-	0.0	784.5	0.8	125.9	33.7	784.5	156.9	296.9	0.0	6.0	0.1	0.9	0.0	0.1	0.0	0.0
42		4994-16-5	Cyclohexene, 4-phenyl																
43		71-43-2	Benzene	0.0	1522.6	10.7	262.0	21.3	1522.6	239.5	523.9	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.0	519.6	1.6	72.9	22.1	519.6	92.3	171.0	0.0	9.2	0.3	1.6	0.0	0.0	0.0	0.0
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.0	2468.0	5.6	389.3	98.7	2468.0	439.0	881.9	0.0	23.5	0.9	4.6	0.0	0.1	0.0	0.0
46		95-47-6	Benzene, 1,2-dimethyl-	0.0	2585.0	1.4	268.2	65.3	2585.0	215.3	633.2	0.0	3.7	0.4	0.9	0.0	0.1	0.0	0.0
47		108-67-8	Benzene, 1,3,5-trimethyl-	0.0	611.2	0.7	92.2	26.5	611.2	106.7	217.2	0.0	5.4	0.2	0.9	0.0	0.0	0.0	0.0
48		108-38-3	Benzene, 1,3-dimethyl-	0.0	6692.2	4.0	691.7	171.6	6692.2	510.6	1632.9	0.0	9.0	1.1	2.3	0.0	0.2	0.0	0.1
49		98-82-8	Benzene, isopropyl	0.0	91.8	1.5	16.0	7.5	91.8	19.9	34.1	0.0	1.5	0.0	0.3	0.0	0.0	0.0	0.0
50		103-65-1	Benzene, propyl-	0.0	381.2	0.1	56.7	38.6	381.2	100.2	160.9	0.0	7.0	0.1	1.1	0.0	0.0	0.0	0.0
51		100-41-4	Ethylbenzene	0.0	1703.0	1.1	177.7	46.7	1703.0	135.6	419.5	0.0	2.9	0.2	0.7	0.0	0.1	0.0	0.0
52		91-20-3	Naphthalene	0.0	134.6	0.1	24.7	20.9	134.6	90.8	80.0	0.0	4.7	0.1	1.0	0.0	0.2	0.0	0.0
53		99-87-6	p-Cymene	0.0	7.6	0.2	1.9	1.3	7.6	3.7	4.4	0.0	1.9	0.1	0.5	0.0	0.0	0.0	0.0
54	Esters	100-42-5	Styrene	0.0	9.3	0.0	0.7	9.3	9.3	9.3	9.3	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0
55		108-88-3	Toluene	0.0	14061	15.4	1223.3	292.1	14061	1100.0	2984.5	0.0	124.7	2.0	24.9	0.0	1.1	0.0	0.2
56		98-83-9	2-Phenylpropene																
57		95-13-6	Indene	0.9	7.9	2.8	3.7	0.9	7.9	2.8	3.7								
58		108-21-4	Acetic acid, 1-methylethyl e																
59		111-15-9	Acetic acid, 2-ethoxyethyl e																
60	Esters	123-86-4	Acetic acid, butyl ester	0.1	0.1	0.1	0.1									0.1	0.1	0.1	0.1
61		141-78-6	Acetic acid, ethyl ester	0.1	5.7	2.9	2.9	5.7	5.7	5.7	5.7					0.1	0.1	0.1	0.1
62		80-62-6	Methyl methacrylate	0.0	0.2	0.1	0.1									0.0	0.2	0.1	0.1
63		103-09-3	2-Ethylhexyl acetate	0.0	0.0	0.0	0.0									0.0	0.0	0.0	0.0
64		96-48-0	Butyrolactone																
65		25265-77-4	Texanol	0.1	0.1	0.1	0.1					0.1	0.1	0.1	0.1				
66		6846-50-0	TXIB																

Table 15 (continued)

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol	0.6	0.6	0.6	0.6					0.6	0.6	0.6	0.6				
68		110-49-6	2-Methoxyethylacetate																
69		111-90-0	Diethylene glycol monoethyl ether																
70		107-98-2	Propanol, 1-methoxy-2-																
71		111-76-2	Ethanol, 2-butoxy-	17.0	17.0	17.0	17.0					17.0	17.0	17.0	17.0				
72		112-34-5	Ethanol, 2-butoxyethoxy-																
73		110-80-5	Ethanol, 2-ethoxy-																
74		109-86-4	Ethanol, 2-methoxy-																
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																
76		71-55-6	1,1,1-Trichloroethane																
77		95-50-1	1,2-Dichlorobenzene																
78		107-06-2	1,2-Dichloroethane																
79		78-87-5	1,2-Dichloropropane																
80		106-46-7	1,4-Dichlorobenzene	0.0	0.0	0.0	0.0					0.0	0.0	0.0	0.0				
81		75-27-4	Bromodichloromethane																
82		56-23-5	Carbon tetrachloride																
83	Cyclo Alkanes	67-66-3	Chloroform																
84		124-48-1	Dibromochloromethane																
85		75-09-2	Dichloromethane	0.0	8067	0.3	1010.6	16.6	16.6	16.6	16.6	0.2	8067	0.6	2689.4	0.0	0.3	0.1	0.1
86		127-18-4	Tetrachloroethylene	0.0	0.0	0.0	0.0					0.0	0.0	0.0	0.0				
87		79-01-6	Trichloroethylene	0.0	31.4	2.4	8.3	4.7	31.4	13.6	16.6					0.0	0.1	0.1	0.1
88		79-34-5	1,1,2,2-Tetrachloroethane																
89		108-87-2	Methylcyclohexane	0.0	749.0	127.5	184.1	75.7	749.0	199.2	300.6	0.0	187.2	0.5	38.2	0.0	0.2	0.0	0.1
90	Terpenes	110-82-7	Cyclohexane	0.1	602.3	106.9	179.6	55.9	602.3	181.3	251.7	0.1	33.5	0.5	11.4				
91		1678-93-9	Cyclohexane, butyl-	0.0	7.0	0.7	1.6	5.9	5.9	5.9	5.9	0.0	7.0	0.9	1.5	0.0	3.2	0.0	0.8
92		1678-91-7	Cyclohexane, ethyl-	0.0	111.2	3.3	22.3	11.9	111.2	35.0	47.0	0.1	3.3	0.4	1.0	0.0	0.1	0.1	0.1
93		1678-92-8	Cyclohexane, propyl-	0.0	26.7	4.7	6.4	3.4	26.7	9.2	12.0	0.0	7.5	1.2	2.1	0.0	6.3	0.0	2.1
94		91-17-8	Decahydronaphthalene	0.2	5.1	0.8	1.7	5.1	5.1	5.1	5.1	0.2	3.4	0.5	1.0	2.4	2.4	2.4	2.4
95		80-56-8	alpha-Pinene	0.3	3.9	1.6	1.7	0.3	3.9	1.6	1.7								
96		99-86-5	alpha-Terpinene																
97		127-91-3	beta-Pinene																
98	Acids	99-85-4	gamma-Terpinene																
99		13466-78-3	3-Carene																
100		79-92-5	Camphene																
101		5989-27-5	Limonene	0.0	3.1	0.2	0.9	3.1	3.1	3.1	3.1					0.0	0.4	0.0	0.2
102		64-19-7	Acetic acid	0.1	0.4	0.2	0.2									0.1	0.4	0.2	0.2
103		79-31-2	Isobutyric acid																
104		107-92-6	Butyric acid	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9								
105		111-14-8	Heptanoic acid	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4								
106	Other	149-57-5	2-Ethylhexanoic acid																
107		142-62-1	Hexanoic acid	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5								
108		109-52-4	Pentanoic Acid	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3								
109		3777-69-3	Furan, 2-pentyl																
110		872-50-4	2-Pyrrolidinone, 1-methyl-																
111		123-91-1	1,4-Dioxane																
112		78-40-0	Triethyl phosphate	0.0	0.0	0.0	0.0									0.0	0.0	0.0	0.0
113		142-96-1	n-Butyl ether	0.1	0.1	0.1	0.1									0.1	0.1	0.1	0.1
114	DHPH	96-29-7	2-Butanone oxime	0.1	0.1	0.1	0.1					0.1	0.1	0.1	0.1				
115		121-44-8	Triethylamine																
116		75-21-8	Ethylene oxide	0.6	0.6	0.6	0.6									0.6	0.6	0.6	0.6
117		75-56-9	Propylene oxide																
118		106-99-0	1,3-Butadiene	0.8	3.3	2.1	2.1									0.8	3.3	2.1	2.1
D1		75-07-0	Acetaldehyde	0.0	112.8	6.3	18.7	5.4	112.8	14.2	27.0	0.2	0.2	0.2	0.2	0.0	0.2	0.1	0.1
D2		50-00-0	Formaldehyde	0.1	9.5	2.2	3.7	1.2	9.5	2.4	4.3					0.1	0.1	0.1	0.1
D3		123-38-6	Propanal																
		0-00-0	TVOC	1.E+00	7.E+04	3.E+02	1.E+04	5.E+03	7.E+04	1.E+04	3.E+04	6.E+00	3.E+03	2.E+02	5.E+02	1.E+00	3.E+02	8.E+00	4.E+01

Note: Pink (EF > 1,000 µg h⁻¹); Yellow (100 < EF < 1,000 µg h⁻¹)

“All” presents the descriptive statistics of all tested products without distinction for cap closing/opening.

Table 16: Emission factors ($\mu\text{g h}^{-1}$) at 96 h grouped for three categories (high, medium and low)

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean
1	Alcohols	71-36-3	1-Butanol	0.0	4.7	0.1	0.8									0.0	4.7	0.1	0.8
2		71-23-8	1-Propanol	3.8	3.8	3.8	3.8					3.8	3.8	3.8	3.8				
3		104-76-7	Hexanol, 2-ethyl-1-	0.0	4.3	0.1	0.5					0.0	0.0	0.0	0.0	0.0	4.3	0.1	0.7
4		67-63-0	2-Propanol	0.0	5.8	2.9	2.9					0.0	5.8	2.9	2.9	0.0	5.8	2.9	2.9
5		64-17-5	Ethanol	0.0	6910.3	1612.8	2386.6	306.2	6910.3	2902.1	3254.1	0.1	2.9	0.4	1.1	0.0	0.0	0.0	0.0
6		108-95-2	Phenol	0.0	29.8	0.4	4.2	1.4	29.8	1.6	10.9					0.0	0.7	0.0	0.2
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.0	537.7	0.1	37.1	0.8	13.0	4.1	6.0	0.0	537.7	0.3	107.7	0.0	0.2	0.0	0.0
8		67-64-1	Acetone	0.0	16.5	0.5	3.3	1.5	16.5	5.4	6.8	0.1	14.8	0.3	3.4	0.0	1.5	0.0	0.2
9		98-86-2	Acetophenone	0.0	13.0	0.0	2.2	0.7	13.0	6.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10		108-94-1	Cyclohexanone																
11		108-10-1	Methylisobutyl ketone	0.0	0.8	0.1	0.3					0.1	0.1	0.1	0.1	0.0	0.8	0.4	0.4
12		100-52-7	Benzaldehyde	0.0	0.2	0.1	0.1					0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1
13		123-72-8	Butanal	0.1	0.2	0.1	0.1									0.1	0.2	0.1	0.1
14		112-31-2	Decanal																
15		3913-81-3	2-Decenal																
16		98-01-1	Furfural																
17		111-71-7	Heptanal																
18		66-25-1	Hexanal	0.0	0.4	0.2	0.2					0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0
19		124-19-6	Nonanal	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0								
20		18829-56-2	2-Nonenal																
21		2548-87-0	2-Octenal																
22	Aliphatic Hydrocarbons	110-62-3	Pentanal	0.0	0.1	0.0	0.0					0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0
23		107-83-5	Pentane, 2-methyl-	0.1	4299.0	620.0	1222.1	182.3	4299.0	988.6	1555.3	0.2	0.4	0.3	0.3	0.1	0.1	0.1	0.1
24		96-14-0	Pentane, 3-methyl-	0.0	2180.5	305.8	579.5	98.6	2180.5	627.8	842.8	0.1	0.6	0.1	0.3	0.0	0.0	0.0	0.0
25		540-84-1	2,2,4-Trimethylpentane	62.4	1433.0	487.7	626.6	62.4	1433.0	487.7	626.6								
26		108-08-7	2,4-Dimethylpentane	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2								
27		124-18-5	Decane	0.0	96.0	4.8	15.8	2.9	96.0	15.4	30.7	0.1	52.2	3.7	10.3	0.0	13.3	0.0	1.7
28		112-40-3	Dodecane	0.0	24.6	1.1	4.9	3.0	24.6	7.1	9.7	0.0	14.3	0.4	2.6	0.0	0.2	0.1	0.1
29		142-82-5	Heptane	0.0	1644.2	167.5	419.4	60.5	1644.2	403.9	629.3	0.4	205.9	1.4	69.2	0.0	0.0	0.0	0.0
30		544-76-3	Hexadecane	0.1	58.8	4.5	14.0	1.7	58.8	4.7	17.5					0.1	0.1	0.1	0.1
31		110-54-3	Hexane	0.0	17108	492.2	2710.2	492.2	17108	3797.3	5146.0	0.8	30.9	0.9	10.9	0.0	0.2	0.1	0.1
32		111-84-2	Nonane	0.0	290.6	8.9	42.1	7.3	290.6	44.8	87.0	0.0	26.2	1.8	4.7	0.0	10.6	0.0	2.7
33		111-65-9	Octane	0.0	687.4	30.5	117.9	19.2	687.4	111.6	212.9	0.0	7.1	0.2	2.3	0.0	0.0	0.0	0.0
34		629-62-9	Pentadecane	0.5	21.7	2.6	6.5	1.4	21.7	3.7	7.5					0.5	0.5	0.5	0.5
35		629-59-4	Tetradecane	0.0	11.3	1.9	3.5	1.6	11.3	3.9	4.6	0.0	0.0	0.0	0.0	0.0	1.1	0.6	0.6
36		629-50-5	Tridecane	0.0	40.1	2.1	4.9	1.1	40.1	3.2	7.0	0.0	0.3	0.2	0.2	0.0	0.1	0.1	0.1
37		1120-21-4	Undecane	0.0	50.7	2.6	8.9	2.5	50.7	9.4	13.6	0.0	38.0	1.5	9.7	0.0	2.2	0.1	0.4
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetrameth	0.0	81.8	1.6	12.4	2.4	81.8	13.8	25.7	0.0	1.6	0.3	0.6	0.0	0.0	0.0	0.0
39		611-14-3	Toluene, 2-ethyl-	0.0	401.3	5.2	57.7	13.7	401.3	44.5	120.0	0.0	5.2	0.1	0.9	0.0	0.0	0.0	0.0
40		620-14-4	Toluene, 3-ethyl-	0.0	1341.3	6.7	177.7	43.8	1341.3	121.8	386.3	0.0	11.4	0.1	1.8	0.0	0.1	0.0	0.0
41		622-96-8	Toluene, 4-ethyl-	0.0	771.1	1.1	100.6	28.1	771.1	79.9	227.8	0.0	6.5	0.0	0.9	0.0	0.1	0.0	0.0
42		4994-16-5	Cyclohexene, 4-phenyl	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2								
43		71-43-2	Benzene	0.0	1304.0	43.7	259.4	43.0	1304.0	236.5	471.5	0.1	0.6	0.1	0.2	0.0	0.1	0.0	0.1
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.0	452.3	1.6	54.6	13.5	452.3	49.2	127.8	0.0	10.2	0.2	1.6	0.0	0.0	0.0	0.0
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.0	2272.5	5.8	303.6	74.9	2272.5	246.1	686.9	0.0	25.9	0.1	3.8	0.0	0.1	0.0	0.0
46		95-47-6	Benzene, 1,2-dimethyl-	0.0	1860.7	0.6	184.1	45.4	1860.7	115.1	468.1	0.0	3.7	0.1	0.6	0.0	0.0	0.0	0.0
47		108-67-8	Benzene, 1,3,5-trimethyl-	0.0	553.0	3.4	77.3	19.3	553.0	60.7	167.9	0.0	5.8	0.1	0.9	0.0	0.0	0.0	0.0
48		108-38-3	Benzene, 1,3-dimethyl-	0.0	4451.3	1.9	471.2	117.9	4451.3	278.0	1197.9	0.0	9.0	0.6	1.8	0.0	0.2	0.0	0.0
49		98-82-8	Benzene, isopropyl	0.0	69.4	2.2	12.0	2.9	69.4	10.6	23.7	0.0	1.5	0.1	0.4	0.0	0.0	0.0	0.0
50		103-65-1	Benzene, propyl-	0.0	316.0	0.6	47.2	16.5	316.0	50.8	113.4	0.0	7.5	0.1	1.6	0.0	0.0	0.0	0.0
51		100-41-4	Ethylbenzene	0.0	1148.5	0.8	123.4	30.0	1148.5	71.9	302.4	0.0	2.8	0.1	0.5	0.0	0.0	0.0	0.0
52		91-20-3	Naphthalene	0.0	113.7	0.2	19.9	10.9	113.7	53.8	55.7	0.0	5.5	0.4	1.8	0.0	0.0	0.0	0.0
53	Esters	99-87-6	p-Cymene	0.0	8.9	0.4	1.6	0.5	8.9	1.9	3.3	0.0	2.1	0.1	0.5	0.0	0.0	0.0	0.0
54		100-42-5	Styrene	0.0	0.1	0.0	0.0					0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
55		108-88-3	Toluene	0.0	7513	6.9	819.1	254.5	7513	524.8	2067.4	0.0	117.7	0.9	21.4	0.0	0.8	0.0	0.2
56		98-83-9	2-Phenylpropene																
57		95-13-6	Indene	0.4	5.8	1.8	2.5	0.4	5.8	1.8	2.5								
58		108-21-4	Acetic acid, 1-methylethyl e																
59	Esters	111-15-9	Acetic acid, 2-ethoxyethyl e																
60		123-86-4	Acetic acid, butyl ester	0.1	0.1	0.1	0.1									0.1	0.1	0.1	0.1
61		141-78-6	Acetic acid, ethyl ester	0.1	0.1	0.1	0.1									0.1	0.1	0.1	0.1
62		80-62-6	Methyl methacrylate	0.0	0.2	0.0	0.1									0.0	0.2	0.0	0.1
63		103-09-3	2-Ethylhexyl acetate	0.0	0.0	0.0	0.0									0.0	0.0	0.0	0.0
64		96-48-0	Butyrolactone																
65		25265-77-4	Texanol	0.1	0.1	0.1	0.1					0.1	0.1	0.1	0.1				
66		6846-50-0	TXIB	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0								

Table 16 (continued)

#	Class	CAS#	Compound	All				High emitters (gas-powered or contained)				Medium emitters (no gasoline, tested with a cap)				Low emitters (tested without a cap)			
				Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean	Min	Max	Median	Mean
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																
68		110-49-6	2-Methoxyethylacetate																
69		111-90-0	Diethylene glycol monoethyl																
70		107-98-2	Propanol, 1-methoxy-2-																
71		111-76-2	Ethanol, 2-butoxy-	15.8	15.8	15.8	15.8					15.8	15.8	15.8	15.8				
72		112-34-5	Ethanol, 2-butoxyethoxy-																
73		110-80-5	Ethanol, 2-ethoxy-																
74	Halo Carbons	109-86-4	Ethanol, 2-methoxy-																
75		75-65-0	Propanol, 2-methyl-2-																
76		71-55-6	1,1,1-Trichloroethane																
77		95-50-1	1,2-Dichlorobenzene																
78		107-06-2	1,2-Dichloroethane																
79		78-87-5	1,2-Dichloropropane	0.0	0.0	0.0	0.0					0.0	0.0	0.0	0.0				
80		106-46-7	1,4-Dichlorobenzene	0.0	0.0	0.0	0.0					0.0	0.0	0.0	0.0				
81	Halo Carbons	75-27-4	Bromodichloromethane																
82		56-23-5	Carbon tetrachloride																
83		67-66-3	Chloroform																
84		124-48-1	Dibromochloromethane																
85		75-09-2	Dichloromethane	0.0	7293	0.1	1042.1					0.0	7293	0.1	1458.9	0.0	0.1	0.1	0.1
86		127-18-4	Tetrachloroethylene	0.0	9.2	0.2	3.1	9.2	9.2	9.2	9.2	0.0	0.2	0.1	0.1				
87		79-01-6	Trichloroethylene	0.0	14.3	0.0	5.2	11.5	14.3	12.9	12.9					0.0	0.0	0.0	0.0
88	Cyclo Alkanes	79-34-5	1,1,2,2-Tetrachloroethane																
89		108-87-2	Methylcyclohexane	0.0	679.6	123.2	186.0	35.0	679.6	139.3	271.8	0.0	169.2	1.5	43.1	0.0	0.1	0.1	0.1
90		110-82-7	Cyclohexane	0.1	485.2	75.1	148.6	28.4	485.2	108.3	207.9	0.1	30.2	0.4	10.2				
91		1678-93-9	Cyclohexane, butyl-	0.0	7.2	0.8	1.6	4.9	4.9	4.9	4.9	0.1	7.2	0.8	1.6	0.0	2.6	0.0	0.6
92		1678-91-7	Cyclohexane, ethyl-	0.0	107.3	2.1	18.3	4.3	107.3	23.1	41.0	0.0	3.1	0.2	0.7	0.0	0.1	0.0	0.0
93		1678-92-8	Cyclohexane, propyl-	0.0	22.2	1.4	4.6	1.0	22.2	5.4	9.5	0.0	7.6	0.5	1.5	0.0	4.7	0.0	1.6
94		91-17-8	Decahydronaphthalene	0.1	3.7	0.5	1.3	3.7	3.7	3.7	3.7	0.1	3.7	0.4	0.8	1.9	1.9	1.9	1.9
95	Terpenes	80-56-8	alpha-Pinene	0.7	1.2	1.0	1.0	0.7	1.2	1.0	1.0								
96		99-86-5	alpha-Terpinene																
97		127-91-3	beta-Pinene																
98		99-85-4	gamma-Terpinene																
99		13466-78-9	3-Carene																
100		79-92-5	Camphene																
101		5989-27-5	Limonene	0.0	0.3	0.2	0.2									0.0	0.3	0.2	0.2
102	Acids	64-19-7	Acetic acid	0.0	0.1	0.1	0.1									0.0	0.1	0.1	0.1
103		79-31-2	Isobutyric acid																
104		107-92-6	Butyric acid																
105		111-14-8	Heptanoic acid																
106		149-57-5	2-Ethylhexanoic acid																
107		142-62-1	Hexanoic acid																
108		109-52-4	Pentanoic Acid																
109	Other	3777-69-3	Furan, 2-pentyl																
110		872-50-4	2-Pyrrolidinone, 1-methyl-																
111		123-91-1	1,4-Dioxane																
112		78-40-0	Triethyl phosphate																
113		142-96-1	n-Butyl ether	0.1	0.1	0.1	0.1									0.1	0.1	0.1	0.1
114		96-29-7	2-Butanone oxime	0.1	0.1	0.1	0.1					0.1	0.1	0.1	0.1				
115		121-44-8	Triethylamine																
116	DHPH	75-21-8	Ethylene oxide	0.4	0.4	0.4	0.4									0.4	0.4	0.4	0.4
117		75-56-9	Propylene oxide																
118		106-99-0	1,3-Butadiene	0.5	2.2	1.3	1.3									0.5	2.2	1.3	1.3
D1		75-07-0	Acetaldehyde	0.0	48.0	0.3	6.0	0.6	48.0	9.0	14.1	0.2	0.3	0.2	0.2	0.0	0.6	0.0	0.1
D2	DHPH	50-00-0	Formaldehyde	0.0	7.9	0.1	1.6	0.0	7.9	1.3	2.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
D3		123-38-6	Propanal	0.0	0.1	0.0	0.0									0.0	0.1	0.0	0.0
		0-00-0	TVOC	9.E-01	7.E+04	3.E+02	8.E+03	2.E+03	7.E+04	1.E+04	2.E+04	1.E+01	4.E+03	6.E+01	6.E+02	9.E-01	2.E+02	4.E+00	3.E+01

Note: Pink (EF > 1,000 µg h⁻¹); Yellow (100 < EF < 1,000 µg h⁻¹)

“All” presents the descriptive statistics of all tested products without distinction for cap closing/opening.

3.3.3 Emission factors for “priority” chemicals

Sixteen compounds identified by Health Canada in 2011/12 as “priority” compounds for development of indoor air quality guidelines for VOCs were analyzed in more detail in this section. “Xylenes” were separately reported as the ortho isomer (1,2-dimethyl benzene) and the combination of the meta and para isomers (1,3- and 1,4- dimethyl benzene) which are poorly separated with the GC methodology used in this study. Additionally, four compounds (benzene, toluene, formaldehyde and naphthalene) that were previously identified as priorities were included in the analysis. The resulting list of 21 compounds identified as “priorities” are summarized in Table 17 based on the emission factor at 96 h³.

Table 17: List of “priority” compounds by Health Canada

#	Class	Compound	Detection frequency (above zero)	Detection frequency (above MDL)
1	Alcohol (1)	2-propanol	7%	3%
2	Aromatics (5)	benzene	77%	67%
3		<i>o</i> -xylene	93%	70%
4		<i>m&p</i> -xylene	97%	80%
5		ethylbenzene	93%	73%
6		naphthalene	73%	43%
7		toluene	100%	73%
8	Chlorinated Compounds (7)	1,2-dichloroethane	Not detected	Not detected
9		1,4-dichlorobenzene	3%	0%
10		carbon tetrachloride	Not detected	Not detected
11		chloroform	Not detected	Not detected
12		dichloromethane	23%	20%
13		tetrachloroethylene	10%	7%
14		1,1,2,2-tetrachloroethane	Not detected	Not detected
15	Aldehydes (4)	acetaldehyde	80%	70%
16		formaldehyde	40%	37%
17		propanal	10%	3%
18		acrolein	Excluded	Excluded
19	Oxides (2)	ethylene oxide	3%	3%
20		propylene oxide	Not detected	Not detected
21	Diene (1)	1,3-butadiene	7%	7%

³ Since most of VOCs above MDL at 24 h were also above MDL at 96 h, the emission factors at 96 h were used with the emphasis on longer-term emissions.

Due to a low detection frequency, eight compounds were not discussed in this section. They are:

- 1,2-dichloroethane, carbon tetrachloride, chloroform, 1,1,2,2-tetrachloroethane, which were detected in none of the products,
- 2-propanol ($3.8 \mu\text{g h}^{-1}$ in ADH12)
- 1,4-dichlorobenzene ($0.007 \mu\text{g h}^{-1}$ in WW)
- Ethyl oxide ($0.42 \mu\text{g h}^{-1}$ in AF_f)
- 1,3-Butadiene (2.15 and $0.52 \mu\text{g h}^{-1}$ in TF_f and MO4_f, respectively)

3.3.3.1 BTEX

The emission factors for benzene, toluene, ethylbenzene, *o*-xylene (1,2-dimethylbenzene) and *m&p*-xylene (1,3(4)-dimethylbenzene) are shown in Figure 45 to Figure 49. While the magnitude of the emission factors is different for each compound, several common observations can be made for BTEX. First, the emission factors tend to be high with gas-powered products and gasoline container. Second, the emission factors were particularly high with used ones among gas-powered products. For example, a snow blower purchased in 2002 (SB3) and a lawn mower purchased in 2003 (LM4) had higher emission factors than brand-new ones by a factor of 10 (benzene) to 20 (toluene, *o*-xylene, *m&p*-xylene, and ethylbenzene). The used trimmer (TR2, purchased in 2002) also had a higher emission factor than the brand-new trimmer (TR1) by a factor of 10. The age effect was not observed in chainsaws. This may be due to the fact that the used chainsaw was relatively new as it was purchased in 2011. While the gasoline container (GC) containing 5 L of regular-grade gasoline was brand-new, the emission factor was also high.

3.3.3.2 Naphthalene

The emission factors for naphthalene are presented in Figure 50. Again, two used gas-powered products (SB3 and TR2, snow blower and trimmer) and gasoline container (GC) had the highest emission factors. The emission factors of the used snow blower and trimmer were greater than brand-new ones by a factor of 10. The used chainsaw (CS2) also had a higher emission factor than the brand-new one (CS1) by a factor of 2. Interestingly, no lawn mowers emitted naphthalene.

Among small-size products tested in 50 L chambers, a paint thinner (PTH) showed the highest emission factor. However, the emission factor of PTH was lower than those of a brand-new snow blower (SB2) and a brand-new trimmer (TR1) by a factor of 2. Motor oil for 2-stroke engines (MO2) emitted naphthalene with an emission factor slightly lower than that of PTH.

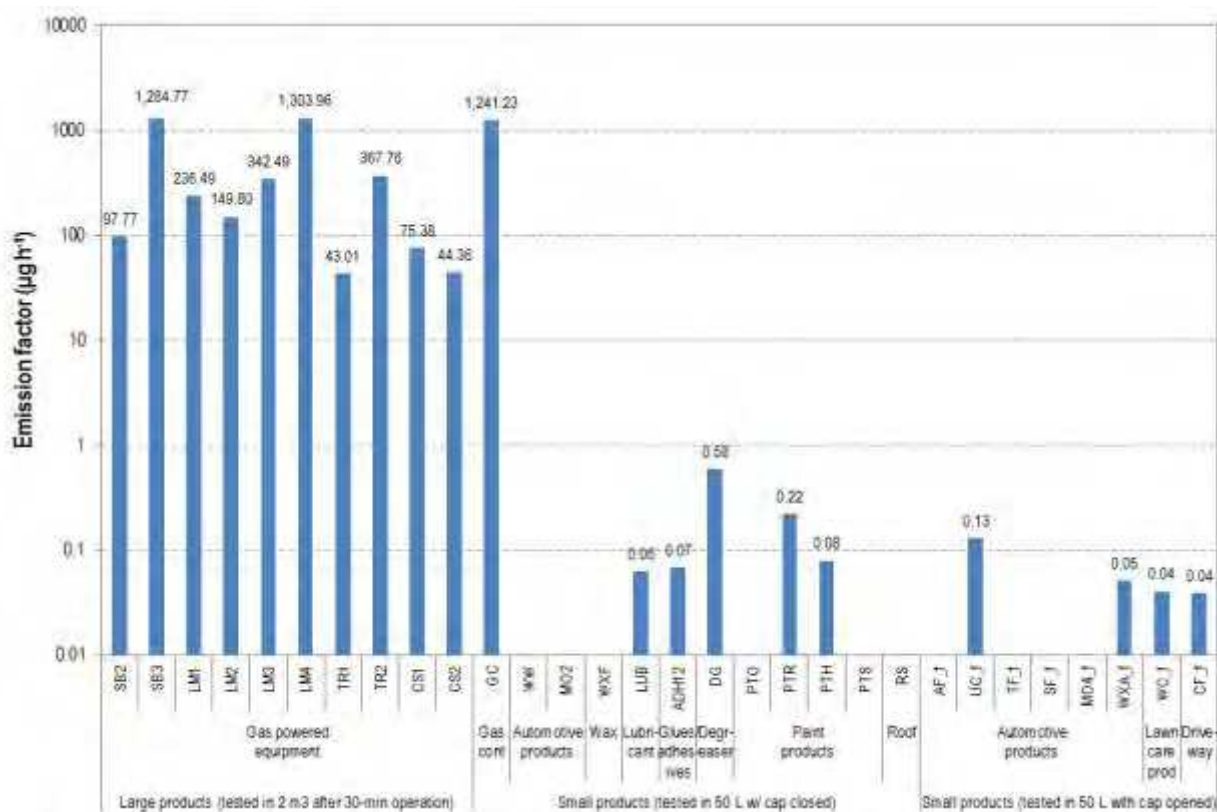


Figure 45: Emission factors at 96 h for evaporative sources (benzene)

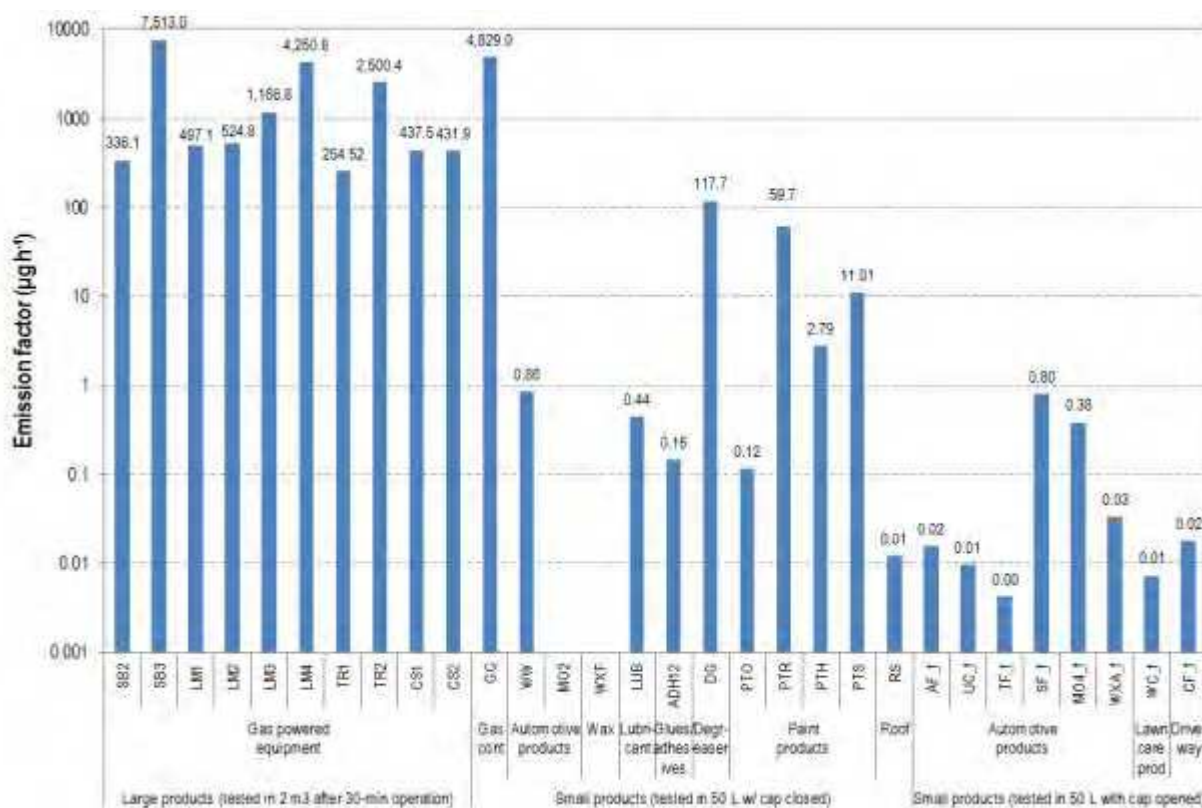


Figure 46: Emission factors at 96 h for evaporative sources (toluene)

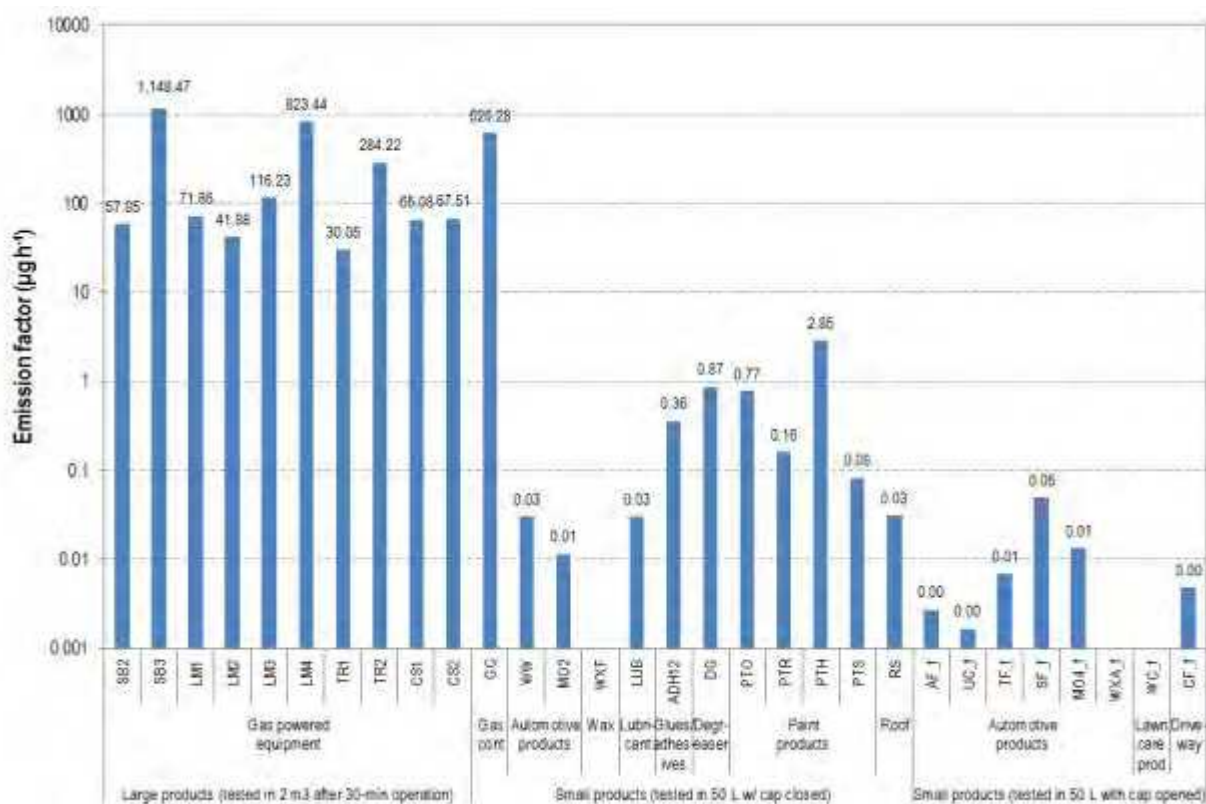


Figure 47: Emission factors at 96 h for evaporative sources (ethylbenzene)

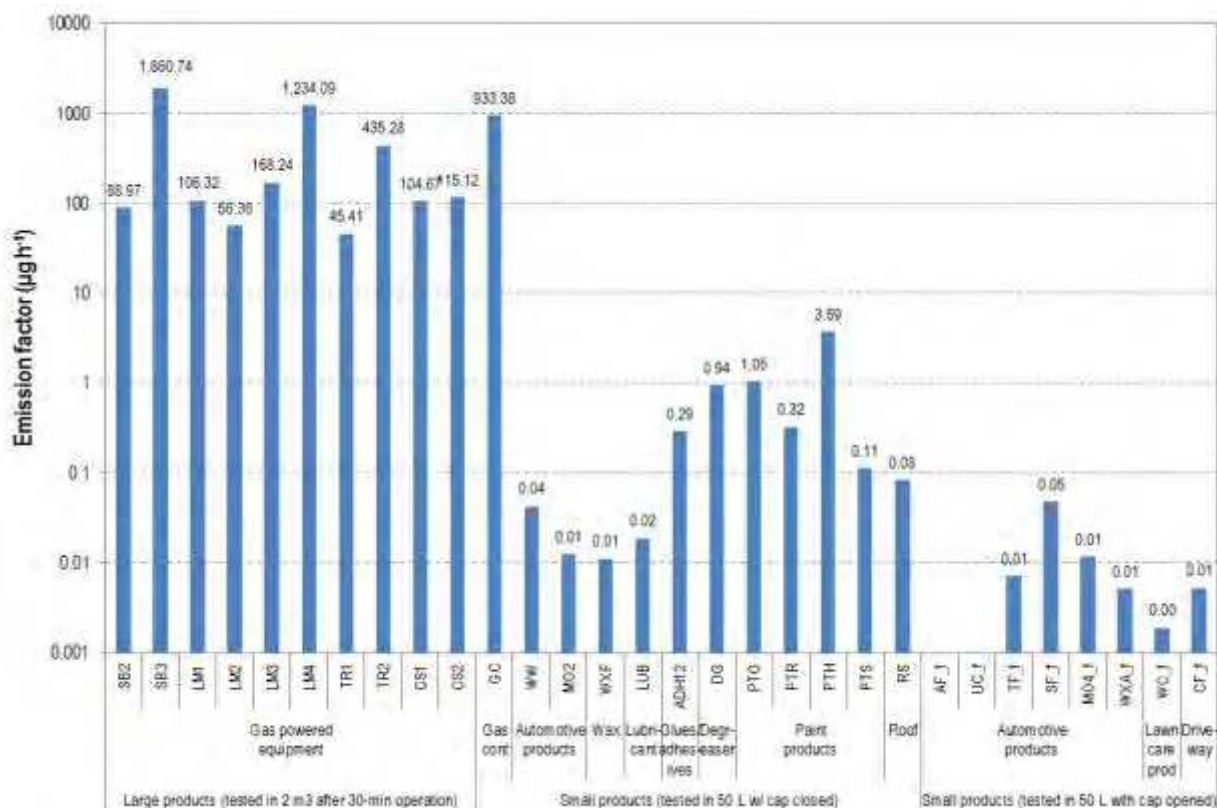


Figure 48: Emission factors at 96 h for evaporative sources (o-xylene)

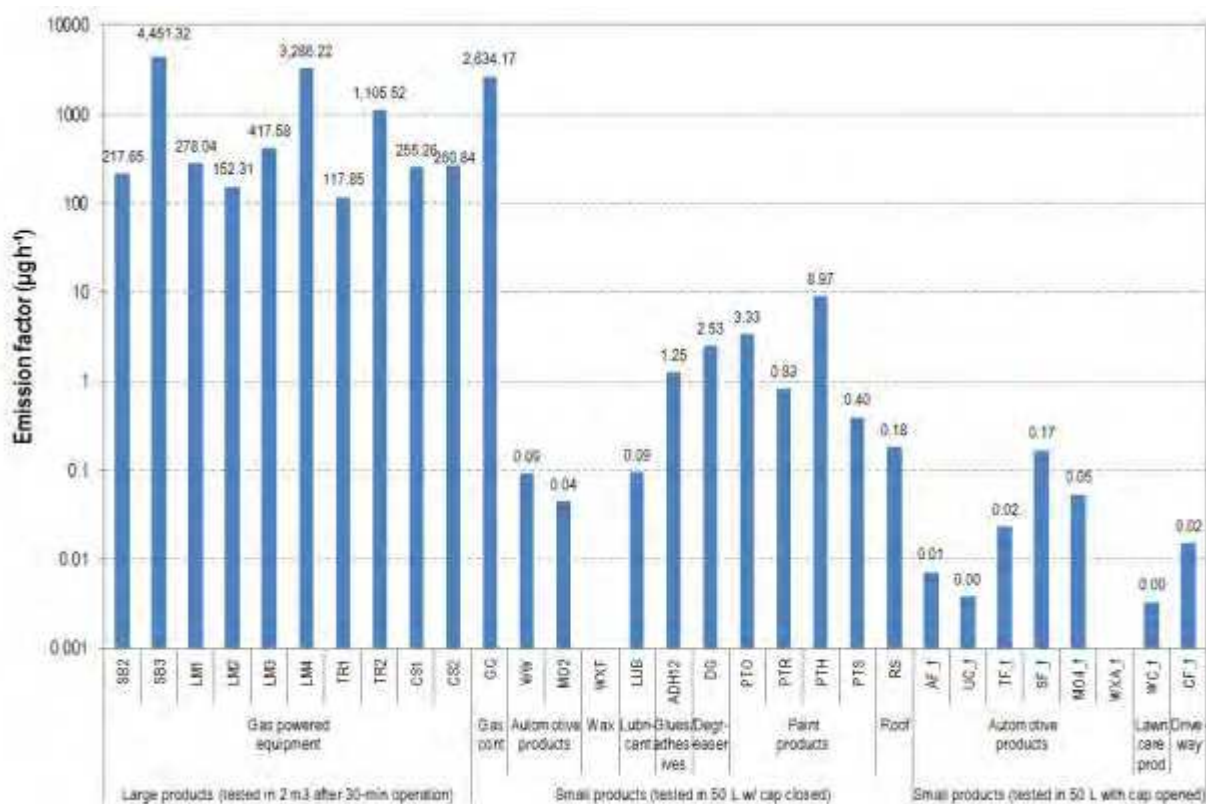


Figure 49: Emission factors at 96 h for evaporative sources (*m&p*-xylene)

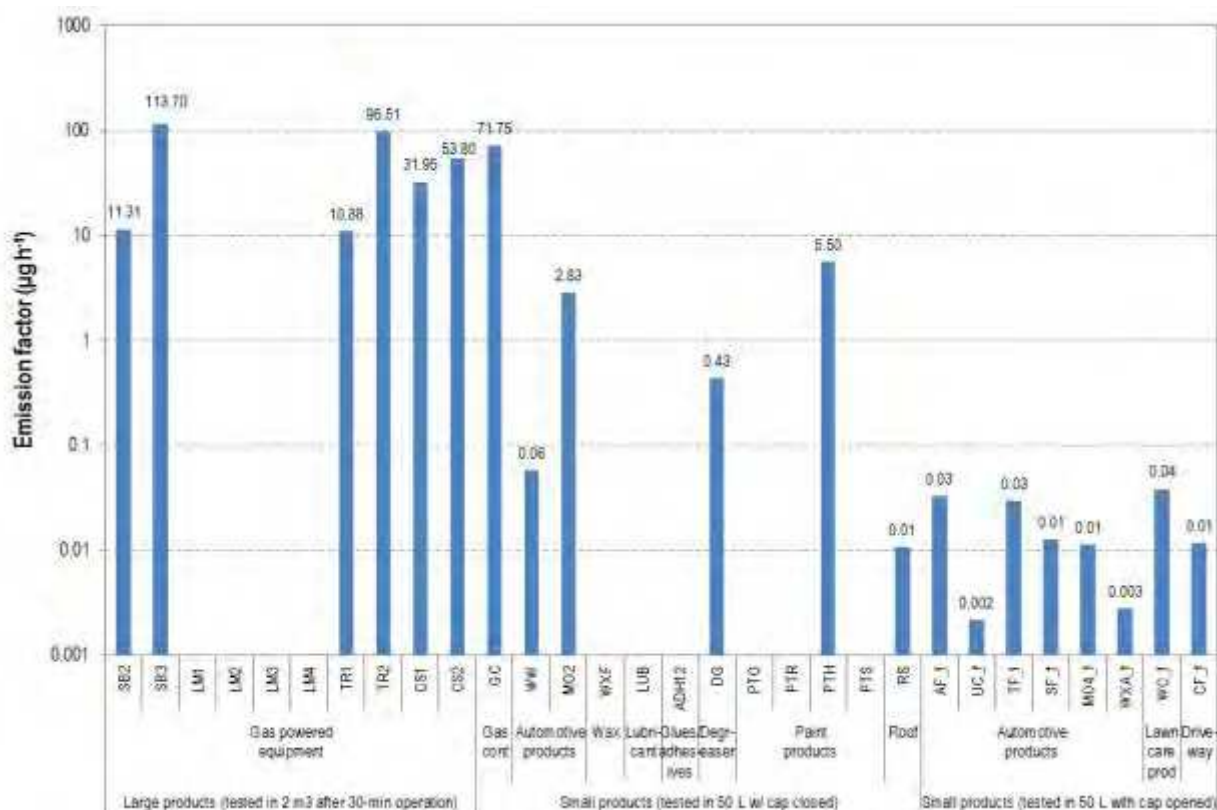


Figure 50: Emission factors at 96 h for evaporative sources (naphthalene)

3.3.3.3 Dichloromethane

The emission factors of dichloromethane (DCM) are presented in Figure 51. The biggest emitter of dichloromethane was a paint remover (PTR). The emission factor was higher than others by at least four orders of magnitude. DCM is known to be widely used in paint stripping products. According to the material safety data sheet (MSDS) by the manufacturer, PTR has 60-100% DCM (Table 12).

3.3.3.4 Tetrachloroethylene

Figure 52 shows tetrachloroethylene (PCE) was emitted from three products, including a used snow blower (SB3), a spray lubricant (LUB), and a roof sealant (RS). According to the Household Products Database by U.S. Department of Health & Human Services (2015), PCE is contained in various automotive products (liquid and aerosol) and household maintenance products (lubricant, adhesive and sealant).

3.3.3.5 Acetaldehyde and formaldehyde

The emission factors of acetaldehyde and formaldehyde are summarized in Figure 53 and Figure 54, respectively. Among evaporative sources, the main emitters of acetaldehyde and formaldehyde were gas-powered products. Aldehydes and ketones are known to be emitted from gasoline engines (Magnusson et al., 2002). The emission factors of acetaldehyde ($<50 \mu\text{g h}^{-1}$) were higher than those of formaldehyde ($<10 \mu\text{g h}^{-1}$). This agrees with the report that acetaldehyde was emitted more than formaldehyde from the ethanol-blended gasoline engines (Manzetti and Andersen, 2015). Overall, the emission factors of both aldehydes are much lower than those of aromatic hydrocarbons such as BTEX. This is likely due to the fact that aldehydes are the combustion products while aromatic hydrocarbons are the ingredient of gasoline. Since the emission test was done with engine stopped after 30-min operation, it is conceivable that the impacts of combustion products are less significant than those of fuel ingredients in this study.

3.3.3.6 Propanal

Figure 55 shows the emission factors of propanal. It was emitted from several automotive products (antifreeze, power steering fluid and motor oil). However, the emission factor was in a low range of $<0.1 \mu\text{g h}^{-1}$.

3.3.3.7 TVOC

Figure 56 presents the emission factors of TVOC. As individual VOCs, gasoline-related products had higher emissions of TVOC. Among small products, paint-related products (paint thinner and remover), adhesive and motor oil had high emissions to a less extent.

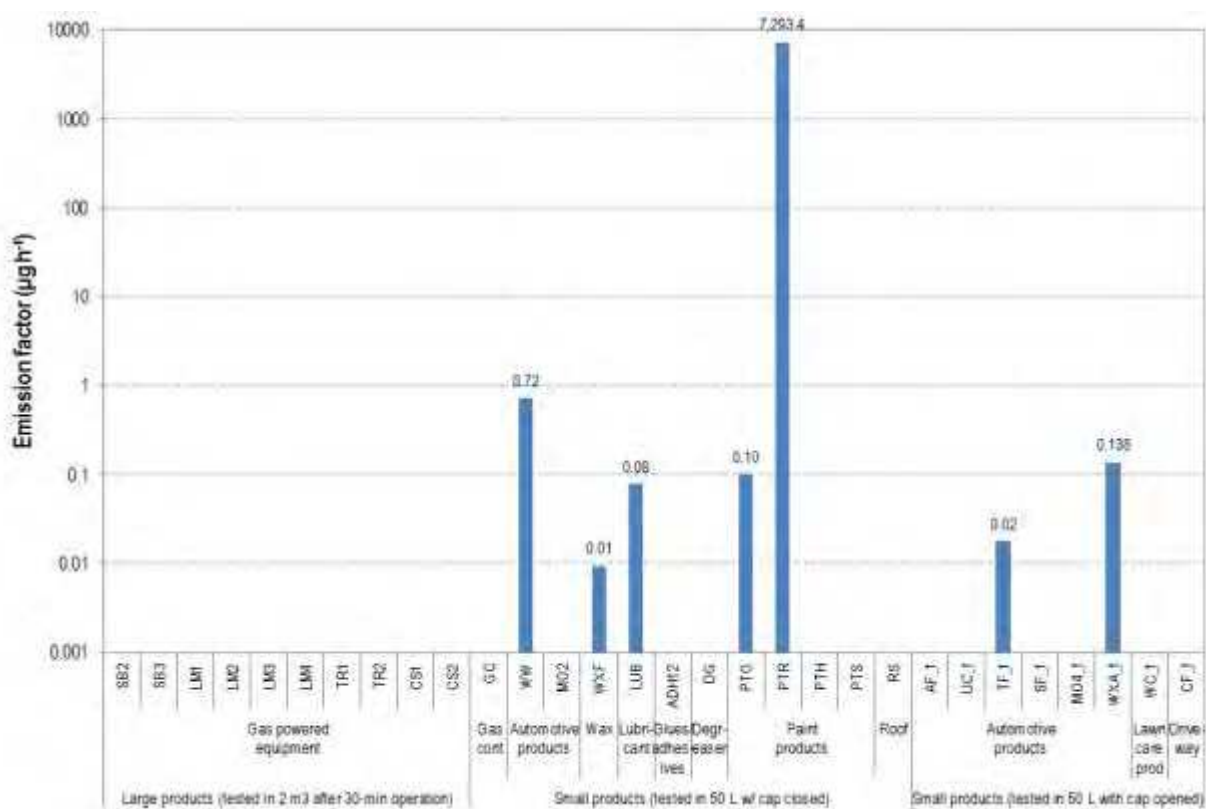


Figure 51: Emission factors at 96 h for evaporative sources (dichloromethane)

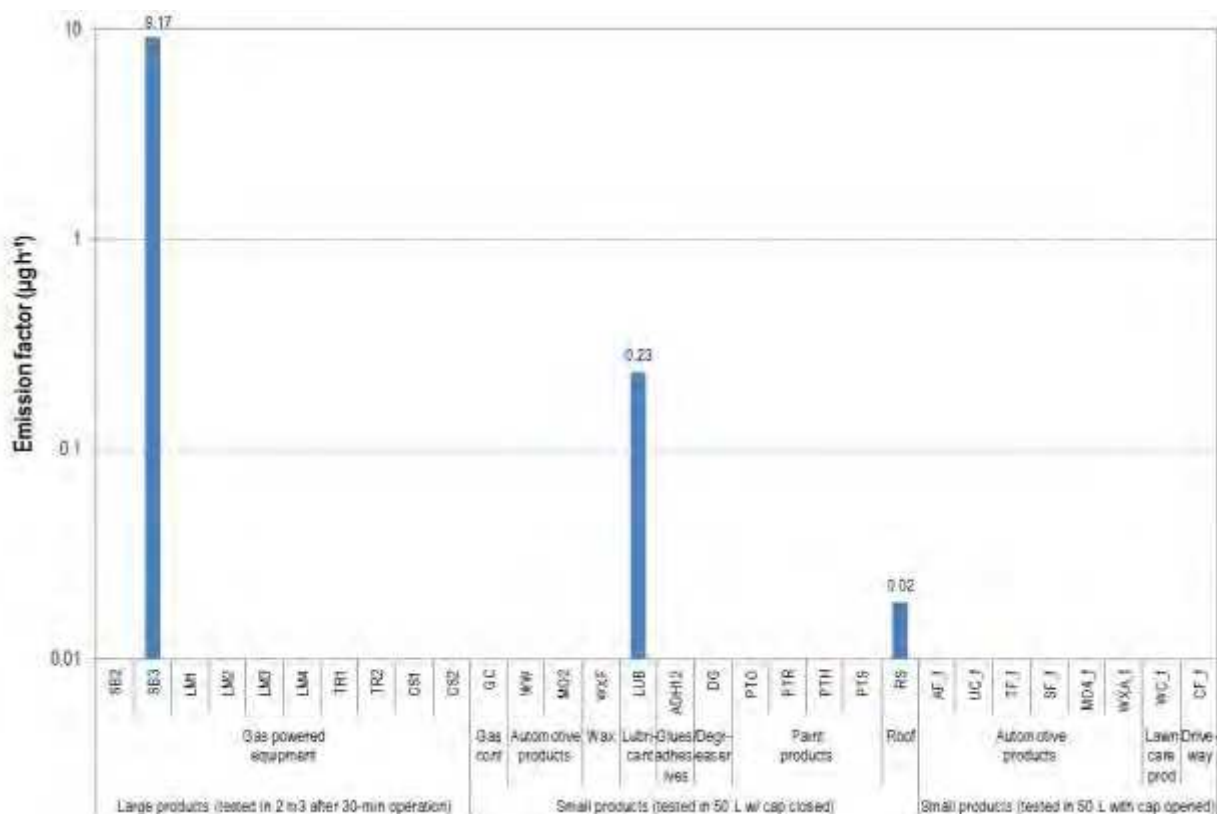


Figure 52: Emission factors at 96 h for evaporative sources (tetrachloroethylene)

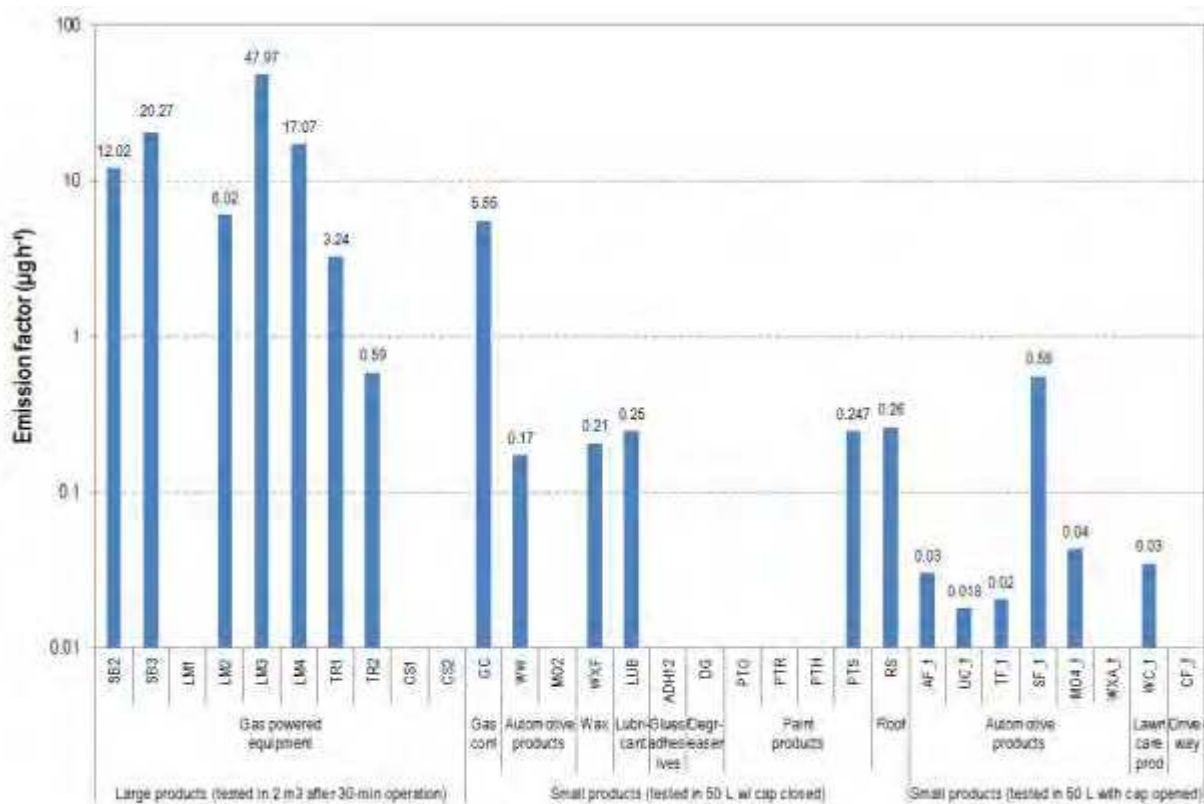


Figure 53: Emission factors at 96 h for evaporative sources (acetaldehyde)

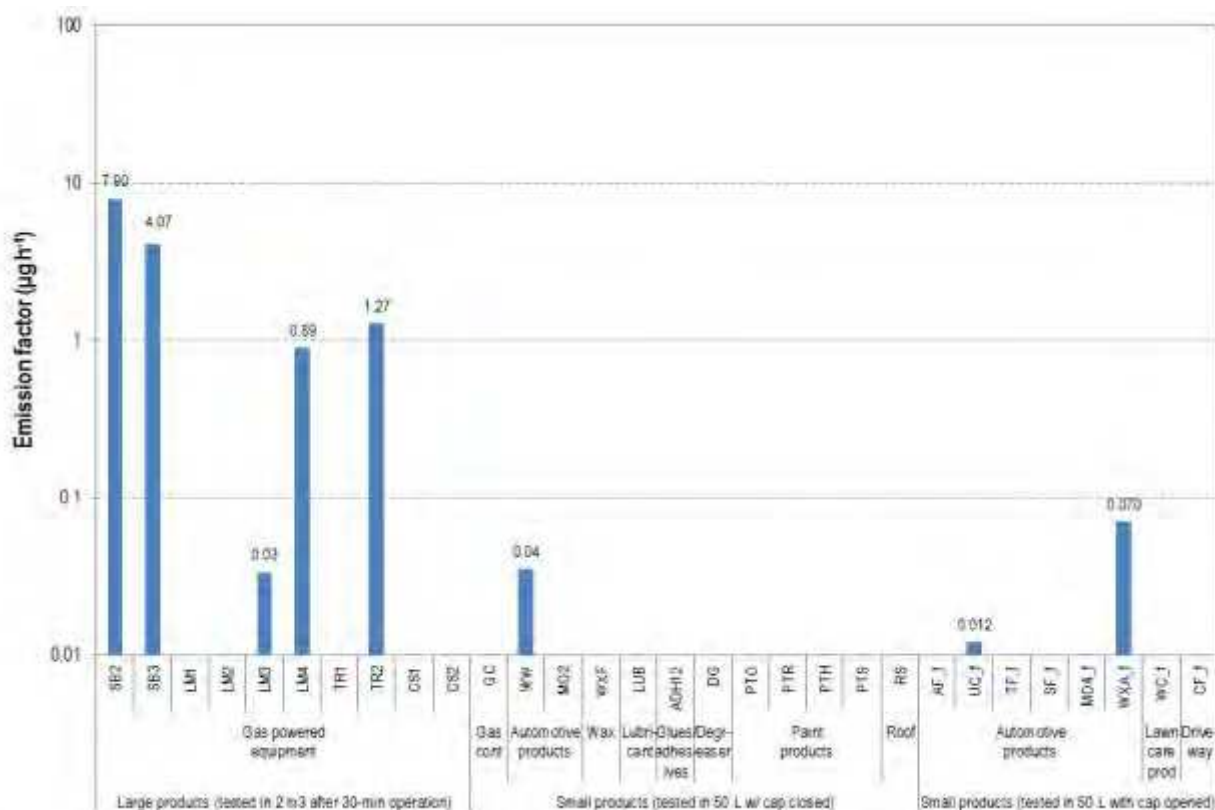


Figure 54: Emission factors at 96 h for evaporative sources (formaldehyde)

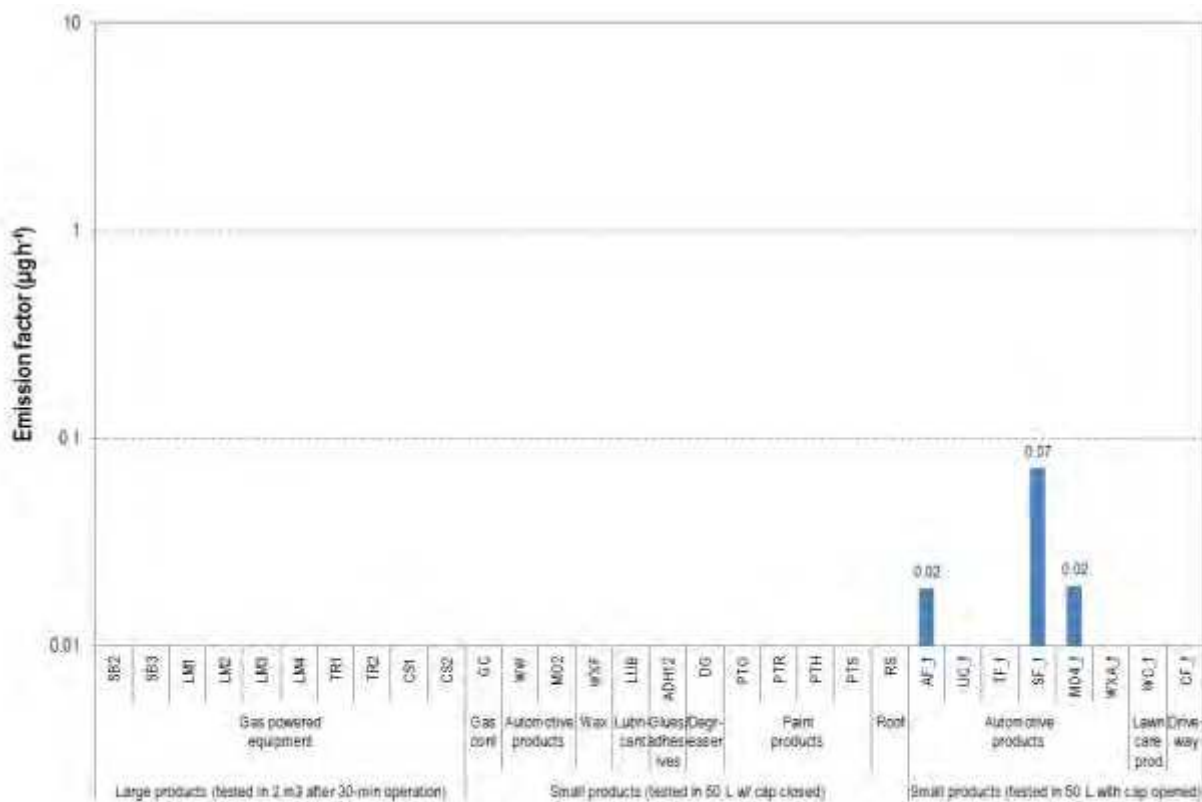


Figure 55: Emission factors at 96 h for evaporative sources (propanal)

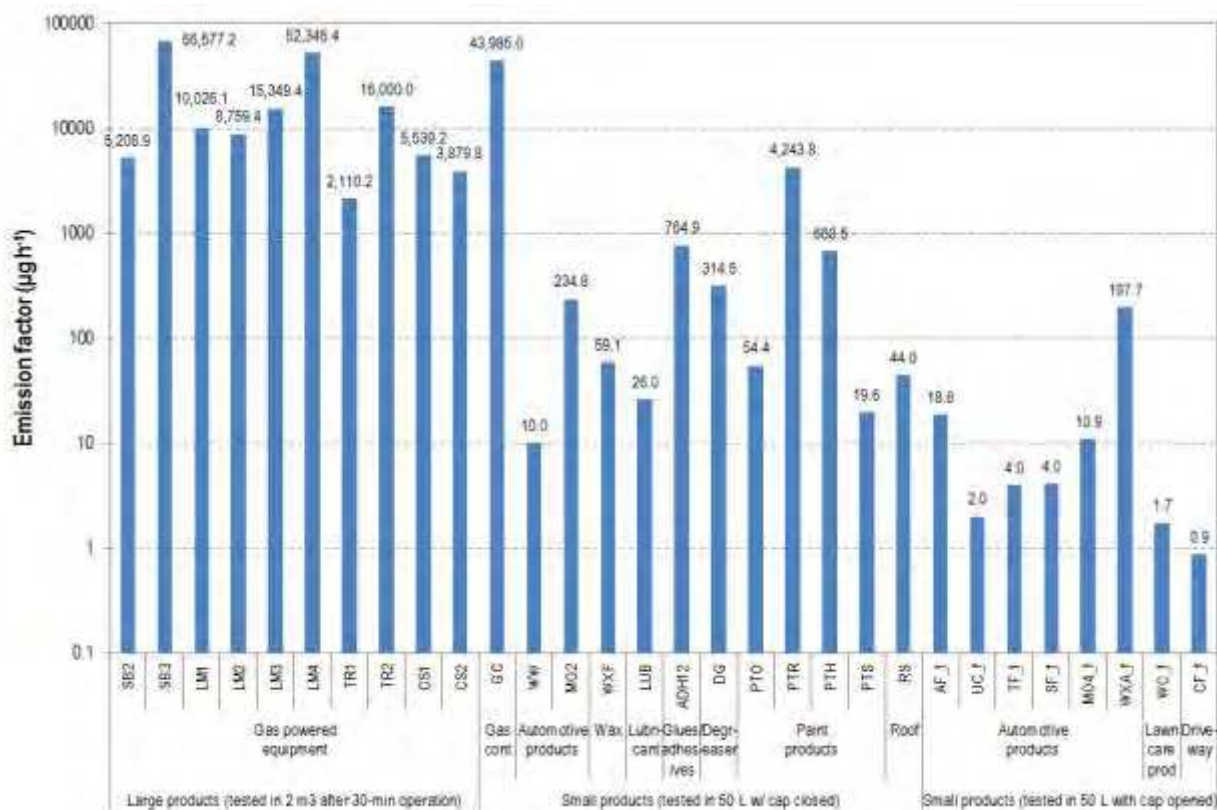


Figure 56: Emission factors at 96 h for evaporative sources (TVOC)

3.3.4 Emission factors for “abundant” chemicals

A total of 10 highest peaks were identified. If they were not included in the target list, they were quantified as a toluene equivalent and classified as “abundant” VOCs. Therefore, “abundant” VOCs include the chemical species in abundance outside of the target list. Table 18, Table 19 and Table 20 list the emission factors of the abundant VOCs measured at 96 h. Since they were determined as “abundant” relative to other VOCs within a gas chromatogram, the emission factors vary in a wide range. For example, even if a VOC has an identical concentration, it can be considered as “abundant” for low emitters, but not for high emitters.

Gas-powered equipment and gasoline container (GC) emitted aliphatic hydrocarbons such as butane and pentane, which are considered to be the component of gasoline. Liquid wax for automobiles (WXA_f) also emitted several aliphatic hydrocarbons.

Various alcohols were emitted from motor oil for 4-stroke engines (MO4). Methanol was emitted from windshield washer fluid (WW) and antifreeze (AF_f). Methanol was reported as a main ingredient of WW by the manufacturer in MSDS (Table 12). 1,2-Ethanedilol, which was identified as a main ingredient of antifreeze, was also detected in AF_f. 2,6-Di-tert-butylphenol (CAS# 128-39-2) from power steering fluid (SF_f) is used as UV stabilizers and antioxidants for petrochemical products (Wikipedia, 2015a). Dimethyl carbonate (CAS# 616-38-6) from aerosol paint (PTS) is a solvent that is gaining popularity since it is exempt from classification as a VOC that can contribute to the smog formation process (Wikipedia, 2015b). Propyl acetate (CAS# 109-60-4) from adhesive (ADH12) is a chemical compound used as a solvent for coatings and inks (BASF, 2015).

Table 18: Emission factors ($\mu\text{g h}^{-1}$) at 96 h for abundant compounds outside of the target VOC list from gas-powered equipment

				Large products tested in 2 m ³ after 30 min operation									
				Gas powered equipment									
#	Class	CAS#	Compound	SB2	SB3	LM1	LM2	LM3	LM4	TR1	TR2	CS1	CS2
A1	Alcohols & ketones	67-56-1	Methanol										
A2		78-83-1	1-Propanol, 2-methyl-										
A3		137-32-6	1-Butanol, 2-methyl-										
A4		626-93-7	2-Hexanol										
A5		71-41-0	1-Pentanol										
A6		128-39-2	Phenol, 2,6-bis(1,1-dimethylethyl)										
A7		107-87-9	2-Pentanone										
A8	Esters/ glycols	107-21-1	1,2-Ethanedilol										
A9		616-38-6	Carbonic acid, dimethyl ester										
A10		109-60-4	Propyl acetate										
A11	Aliphatic/cyclo hydrocarbons	78-78-4	Butane, 2-methyl-		4581.6	66.8	612.4	110.8	925.5				
A12		109-66-0	Pentane		3123.9	53.6	355.3	161.0	1242.1				
A13		106-97-8	Butane		3217.0								
A14		6236-88-0	1-Ethyl-4-methylcyclohexane										
A15		17301-94-9	Nonane, 4-methyl-										
A16		4316-65-8	1-Hexene, 3,3,5-trimethyl-										
A17		62338-08-3	3-Hexene, 3-ethyl-2,5-dimethyl-										
A18		17302-28-2	Nonane, 2,6-dimethyl-										
A19		513-35-9	2-Butene, 2-methyl-										
A20		589-34-4	Hexane, 3-methyl-										
A21		1192-18-3	Cyclopentane, 1,2-dimethyl-, cis-										

Table 19: Emission factors ($\mu\text{g h}^{-1}$) at 96 h for abundant compounds outside of the target VOC list from small products tested in 50 L chambers with a cap/cover closed

				Small products testd in 50 L with cap/cover closed											
				Gasoline container	Automotive products		Wax	Lubri cant	Adhesiv es	Degr easer	Paint products				Roof
#	Class	CAS#	Compound	GC	WW	MO2	WXF	LUB	ADH12	DG	PTO	PTR	PTH	PTS	RS
A1	Alcohols & ketones	67-56-1	Methanol		2.9										
A2		78-83-1	1-Propanol, 2-methyl-												
A3		137-32-6	1-Butanol, 2-methyl-												
A4		626-93-7	2-Hexanol												
A5		71-41-0	1-Pentanol												
A6		128-39-2	Phenol, 2,6-bis(1,1-dimethylethyl)												
A7		107-87-9	2-Pentanone												0.4
A8	Esters/ glycols	107-21-1	1,2-Ethanediol												
A9		616-38-6	Carbonic acid, dimethyl ester											0.6	
A10		109-60-4	Propyl acetate						60.8						
A11	Aliphatic/cyclo hydrocarbons	78-78-4	Butane, 2-methyl-	2407.6											
A12		109-66-0	Pentane	2492.8											
A13		106-97-8	Butane												3.1
A14		6236-88-0	1-Ethyl-4-methylcyclohexane												
A15		17301-94-9	Nonane, 4-methyl-												
A16		4316-65-8	1-Hexene, 3,3,5-trimethyl-												
A17		62338-08-3	3-Hexene, 3-ethyl-2,5-dimethyl-												
A18		17302-28-2	Nonane, 2,6-dimethyl-												
A19		513-35-9	2-Butene, 2-methyl-	1527.7											
A20		589-34-4	Hexane, 3-methyl-						41.7						
A21		1192-18-3	Cyclopentane, 1,2-dimethyl-, cis-						34.5						

Table 20: Emission factors ($\mu\text{g h}^{-1}$) at 96 h for abundant compounds outside the target VOC list from small products tested in 50 L chambers with a cap/cover open

				Small products tested in 50 L with cap/cover opened									
				Automotive products						Lawn	Drive-way crack filler		
#	Class	CAS#	Compound	AF_f	UC_f	TF_f	SF_f	MO4_f	WXA_f	WC_f	CF_f		
A1	Alcohols & ketones	67-56-1	Methanol	1.0									
A2		78-83-1	1-Propanol, 2-methyl-					0.6					
A3		137-32-6	1-Butanol, 2-methyl-					0.9					
A4		626-93-7	2-Hexanol					1.1					
A5		71-41-0	1-Pentanol					1.5					
A6		128-39-2	Phenol, 2,6-bis(1,1-dimethylethyl)				0.2						
A7		107-87-9	2-Pentanone										
A8	Esters/ glycols	107-21-1	1,2-Ethanediol	12.6									
A9		616-38-6	Carbonic acid, dimethyl ester										
A10		109-60-4	Propyl acetate										
A11	Aliphatic/cyclo hydrocarbons	78-78-4	Butane, 2-methyl-										
A12		109-66-0	Pentane										
A13		106-97-8	Butane		1.3								
A14		6236-88-0	1-Ethyl-4-methylcyclohexane						5.6				
A15		17301-94-9	Nonane, 4-methyl-						5.4				
A16		4316-65-8	1-Hexene, 3,3,5-trimethyl-						5.5				
A17		62338-08-3	3-Hexene, 3-ethyl-2,5-dimethyl-						5.8				
A18		17302-28-2	Nonane, 2,6-dimethyl-						5.4				
A19		513-35-9	2-Butene, 2-methyl-										
A20		589-34-4	Hexane, 3-methyl-										
A21		1192-18-3	Cyclopentane, 1,2-dimethyl-, cis-										

3.3.5 Factors affecting evaporative emissions

3.3.5.1 Age of equipment

For gas-powered products, both used and brand-new products were tested to determine whether the age of a product can affect emissions. The age difference was more than 10 years for snow blowers, lawn mowers and trimmers and 3 years for chainsaws. In the previous section, it was shown that the used products (> 10 years old) had emission factors greater than those of brand-new products by a factor of 10 to 20 for BTEX. In this section, the analysis was expanded to other categories of compounds, including alcohols, aliphatic hydrocarbons, aromatic hydrocarbons and cyclic alkanes.

Table 21 summarizes the ratio of emission factors between used and new gas-powered products. On average, the emission factors of used old products (> 10 years) were greater than those of new products by a factor of 5 to 14. This shows that the evaporative emissions can get worse as the equipment ages. It is likely due to fuel leaks caused by deterioration of equipment over time.

Table 21: Ratio of emission factors at 96 h between “new” and “used” gas powered equipment

#	Class	CAS#	Compound	Emission factors at 96 h ($\mu\text{g m}^{-3}$)								Ratio of emission factors at 96 h			
				Snow blower		Lawn mower				Trimmer		Snow b	Lawn mower		Trimmer
				New	Used	New	New	Used	Used	New	Used				
				SB2	SB3	LM1	LM2	LM3	LM4	TR1	TR2	SB3/SB2	LM4/LM1	LM4/LM2	TR2/TR1
5	Aliphatic Hydrocarbons	64-17-5	Ethanol	1613	6594	3866	2324	5882	6910	306	4052	4	2	3	13
23		107-83-5	Pentane, 2-methyl-	4299	3941	724	470	989	1489	182	1291	1	2	3	7
24		96-14-0	Pentane, 3-methyl-	1840	2181	438	298	628	943	99	715	1	2	3	7
25		540-84-1	2,2,4-Trimethylpentane	116	1433	472	373	835	1257	62	503	12	3	3	8
27		124-18-5	Decane	11	96	15	4	19	86	3	22	9	6	21	8
28		112-40-3	Dodecane	6	23	9	25	5	9	3	6	4	1		2
29		142-82-5	Heptane	134	1550	404	232	529	1592	61	503	12	4	7	8
31		110-54-3	Hexane		3769	3825	2552	5872	12038	492	3860		3	5	8
32		111-84-2	Nonane	23	291	45	17	47	233	7	55	13	5	14	8
33		111-65-9	Octane	59	687	112	51	129	541	19	149	12	5	11	8
37		1120-21-4	Undecane	6	51	9	3	9	28	2	10	9	3	10	4
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	7	82	18	4	10	71	2	28	11	4	17	12
39		611-14-3	Toluene, 2-ethyl-	30	401	44	14	51	329	14	117	13	7	24	9
40		620-14-4	Toluene, 3-ethyl-	65	1341	88	46	165	1121	44	346	21	13	25	8
41		622-96-8	Toluene, 4-ethyl-	43	566	55	28	97	771	30	220	13	14	27	7
43		71-43-2	Benzene	98	1285	236	150	342	1304	43	368	13	6	9	9
44		526-73-8	Benzene, 1,2,3-trimethyl-	30	452	54	14	46	344	13	131	15	6	25	10
45		95-63-6	Benzene, 1,2,4-trimethyl-	135	2272	246	75	262	1986	80	646	17	8	27	8
46		95-47-6	Benzene, 1,2-dimethyl-	89	1861	106	56	168	1234	45	435	21	12	22	10
47		108-67-8	Benzene, 1,3,5-trimethyl-	45	553	61	20	72	460	19	153	12	8	23	8
48		108-38-3	Benzene, 1,3-dimethyl-	218	4451	278	152	418	3286	118	1106	20	12	22	9
49		98-82-8	Benzene, isopropyl	9	69					3	30	8			10
50		103-65-1	Benzene, propyl-	38	316					16	140	8			9
51		100-41-4	Ethylbenzene	58	1148	72	42	116	823	30	284	20	11	20	9
52		91-20-3	Naphthalene	11	114					11	97	10			9
53	Cyclo Alkanes	99-87-6	p-Cymene	1	9					0	4	8			9
55		108-88-3	Toluene	336	7513	497	525	1167	4251	255	2500	22	9	8	10
57		95-13-6	Indene	1	6					0	4	11			11
89		108-87-2	Methylcyclohexane	120	680	139	123	252	589	35	236	6	4	5	7
90	Cyclo Alkanes	110-82-7	Cyclohexane	108	478					28	205	4			7
91		1678-93-9	Cyclohexane, butyl-												
92		1678-91-7	Cyclohexane, ethyl-	23	107					4	29	5			7
93		1678-92-8	Cyclohexane, propyl-	5	22					1	7	5			7
94		91-17-8	Decahydronaphthalene												
			Min	1	6	9	3	5	9	0	4	1	1	3	2
			Max	4299	7513	3866	2552	5882	12038	492	4052	22	14	27	13
			Mean	45	559	109	53	167	883	24	179	11	5	14	8

3.3.5.2 Temperature effects

A subset of small-size products were tested at four different temperatures (4, 14, 23 and 30 °C) as indicated in Table 3. Figure 57 (a) to (c) show the chamber concentrations of selected VOCs from a can of adhesive (ADH12) for four levels of temperature. Figure 57 (d) is for dichloromethane concentrations emitted from PTR at four levels of temperature. Figure 57 (e) and (f) present the same information for a portable gasoline container (GC). Overall, a higher temperature is associated with a higher concentration.

Table 22 summarizes the ratio of emission factors (at 96 h) at different temperatures in reference to the emission factor at 23 °C. On average, the emission factors at 30 °C were 40 – 50% higher than those at 23 °C. The emission factors at 4 and 14 °C were 40 – 50% lower than those at 23 °C. The exceptions were VOCs from PTR at 30 °C. The increase from 23 °C to 30 °C was a factor of 5 to 7.

Evaporation is typically affected by vapor pressure of a chemical substance, which increases non-linearly with temperature according to the Clausius-Clapeyron relation. Therefore, the temperature dependence of emission factor was described using Eq. (10).

$$E = A_c \exp\left(-\frac{\Delta H}{RT}\right) \quad (10)$$

where

E is the emission factors ($\mu\text{g h}^{-1}$)

A_c is a constant

ΔH is the enthalpy associated with the emission process (kJ mol^{-1})

R is the universal gas constant ($8.314\text{E-}3 \text{ kJ K}^{-1} \text{ mol}^{-1}$)

T is the absolute temperature (K)

Taking the logarithm of Eq. (10) gives:

$$-\ln E = -\ln A_c + \frac{\Delta H}{R} \frac{1}{T} \quad (11)$$

There is a linear relationship between $-\ln E$ and $1/T$. The emission factor at 96 h was used to back-calculate the slope and intercept. Examples of the plot of $-\ln E$ and $1/T$ are provided in Figure 58 (a) and (b) for ADH12 and GC, respectively.

Table 23 summarizes the coefficients (A_c and ΔH) and R^2 values as a result of curve-fitting of emission data for different temperature levels for ADH12, GC and PTR. The R^2 values were 0.93 (ADH12), 0.98 (GC) and 0.96 (PTR) on average. The high R^2 values show that Eq. (10) is adequate to describe the temperature dependence of emission factor. For a particular compound, the enthalpy for the emission process was different for different products. This can be explained with the fact that various mechanisms (e.g., evaporation, diffusion in air, and permeation through the container material) are involved in the emission process and they are affected by chemical properties as well as material properties.

The emission factor measured at 23 °C can be converted into that at a different temperature using Eq. (12).

$$\frac{E_T}{E_{23\text{ }^{\circ}\text{C}}} = \exp \left[\frac{\Delta H}{R} \left(\frac{1}{T+273} - \frac{1}{296} \right) \right] \quad (12)$$

where $E_{23\text{ }^{\circ}\text{C}}$ and E_T are the emission factor ($\mu\text{g h}^{-1}$) at 23 °C and T °C, respectively. The left term of Eq. (12) has the same concept as the ratio of emission factors summarized in Table 22.

Table 22: Ratio of emission factors (96 h) at different temperatures against the emission factor at 23 °C

#	Class	CAS#	Compound	ADH12				GC				PTR			
				4 °C	14 °C	23 °C	30 °C	4 °C	14 °C	23 °C	30 °C	4 °C	14 °C	23 °C	30 °C
2	Alcohols	71-23-8	1-Propanol	0.6	0.9	1.0	1.4								
5		64-17-5	Ethanol					0.2	0.3	1.0	1.3				
7	Aldehydes	78-93-3	Methylethyl ketone	0.4	0.5	1.0	1.4								
8		67-64-1	Acetone	0.7	1.1	1.0	1.1								
24	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	0.7	1.2	1.0		0.2	0.4	1.0	1.2				
25		96-14-0	Pentane, 3-methyl-	0.6	1.1	1.0	1.3	0.2	0.4	1.0	1.2				
26		540-84-1	2,2,4-Trimethylpentane					0.1	0.3	1.0	1.1				
28		124-18-5	Decane					0.3	0.5	1.0	1.7	0.3		1.0	2.6
30		142-82-5	Heptane	0.5	0.6	1.0	1.5	0.3	0.5	1.0	1.3				
32		110-54-3	Hexane	0.5	0.8	1.0	1.5	0.3	0.5	1.0	1.2				
33		111-84-2	Nonane					0.3	0.5	1.0	1.4	0.3		1.0	2.8
34		111-65-9	Octane	0.5	0.6	1.0	1.7	0.3	0.5	1.0	1.4				
38		1120-21-4	Undecane					0.3	0.4	1.0	1.9	0.3		1.0	
39		95-93-2	Benzene, 1,2,4,5-tetramethyl-					0.3	0.5	1.0	1.6				
40		611-14-3	Toluene, 2-ethyl-					0.3	0.5	1.0	1.4	0.1		1.0	5.5
41	Aromatic Hydrocarbons	620-14-4	Toluene, 3-ethyl-					0.4	0.6	1.0	1.5	0.1		1.0	6.4
42		622-96-8	Toluene, 4-ethyl-					0.4	0.5	1.0	1.5	0.1		1.0	5.1
44		71-43-2	Benzene	0.9		1.0		0.3	0.5	1.0	1.2	0.2	0.1	1.0	40.5
45		526-73-8	Benzene, 1,2,3-trimethyl-					0.3	0.5	1.0	1.5	0.1		1.0	4.7
46		95-63-6	Benzene, 1,2,4-trimethyl-					0.4	0.6	1.0	1.5	0.1		1.0	5.8
47		95-47-6	Benzene, 1,2-dimethyl-	0.4	0.5	1.0	1.8	0.4	0.5	1.0	1.4	0.1		1.0	7.8
48		108-67-8	Benzene, 1,3,5-trimethyl-					0.3	0.5	1.0	1.4	0.1		1.0	5.3
49		108-38-3	Benzene, 1,3-dimethyl-	0.4	0.6	1.0	1.8	0.4	0.5	1.0	1.3	0.1		1.0	7.6
50		98-82-8	Benzene, isopropyl					0.3	0.5	1.0	1.4				
51		103-65-1	Benzene, propyl-					0.4	0.5	1.0	1.5				
52		100-41-4	Ethylbenzene	0.4	0.5	1.0	1.8	0.4	0.5	1.0	1.4	0.2		1.0	7.4
53		91-20-3	Naphthalene					0.3	0.5	1.0	1.7				
54	Cyclo Alkanes	99-87-6	p-Cymene					0.3	0.5	1.0	1.5				
56		108-88-3	Toluene	0.3	0.2	1.0	0.3	0.5	0.6	1.0	1.0	0.2	0.3	1.0	1.8
57		98-83-9	2-Phenylpropene												
58		95-13-6	Indene							1.0	1.5				
87		75-09-2	Dichloromethane									0.1	0.3	1.0	1.4
91	Cyclo Alkanes	108-87-2	Methylcyclohexane	0.5	0.6	1.0	1.5	0.2	0.4	1.0	1.2				
92		110-82-7	Cyclohexane	0.6	0.8	1.0	1.4	0.2	0.4	1.0	1.2				
93		1678-93-9	Cyclohexane, butyl-					0.2	0.5	1.0	1.4				
94		1678-91-7	Cyclohexane, ethyl-	0.5	0.6	1.0	1.6	0.2	0.4	1.0	1.3				
95		1678-92-8	Cyclohexane, propyl-					0.2	0.4	1.0	1.3	0.2		1.0	
		0-00-0	TVOC	0.5	0.6	1.0	1.6	0.3	0.5	1.0	1.3	0.1	0.3	1.0	1.2

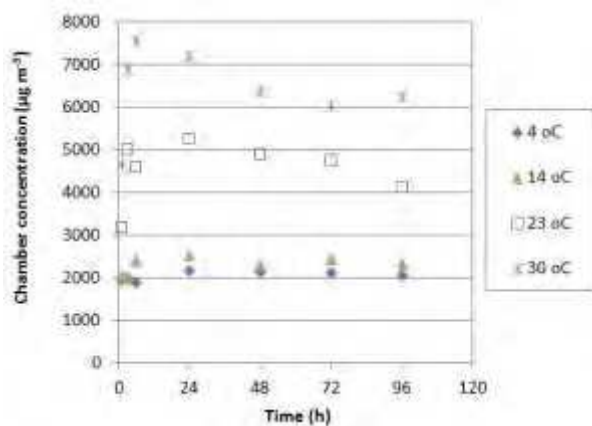


Figure 57 (a): Chamber concentrations (heptane from ADH12)

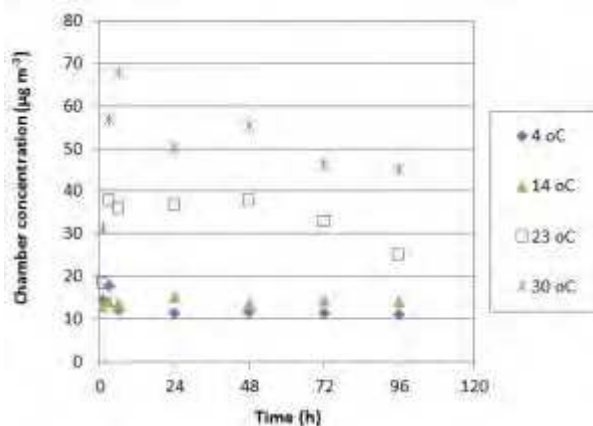


Figure 57 (b): Chamber concentrations (*m*&*p*-xylene from ADH12)

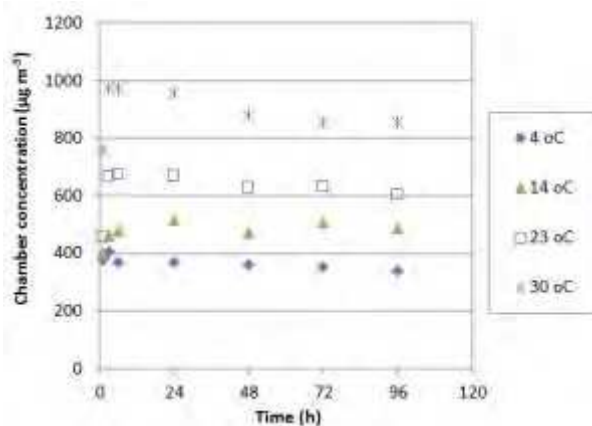


Figure 57 (c): Chamber concentrations (cyclohexane from ADH12)

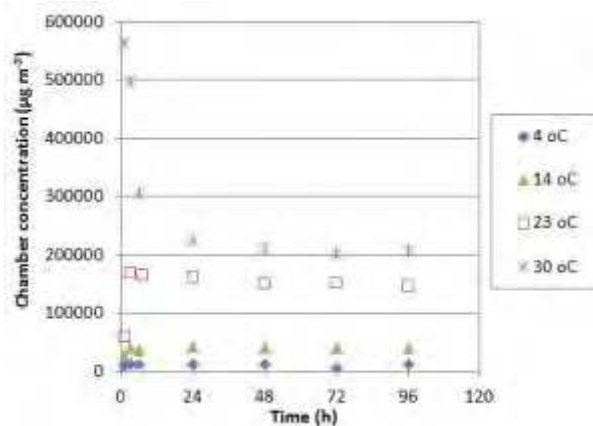


Figure 57 (d): Chamber concentrations (dichloromethane from PTR)

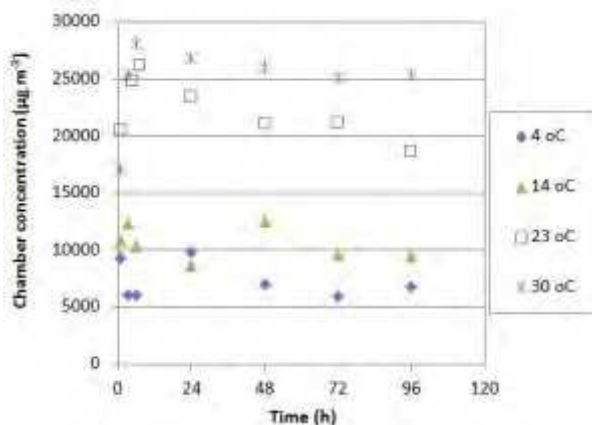


Figure 57 (e): Chamber concentrations (*o*-xylene from GC)

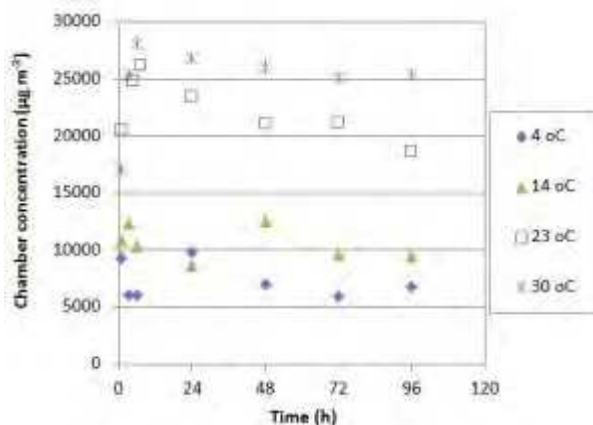
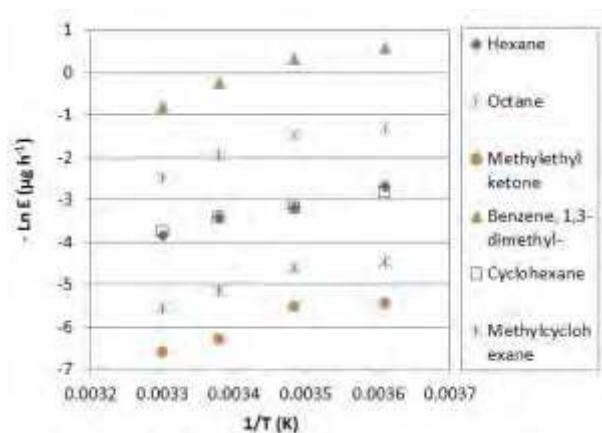
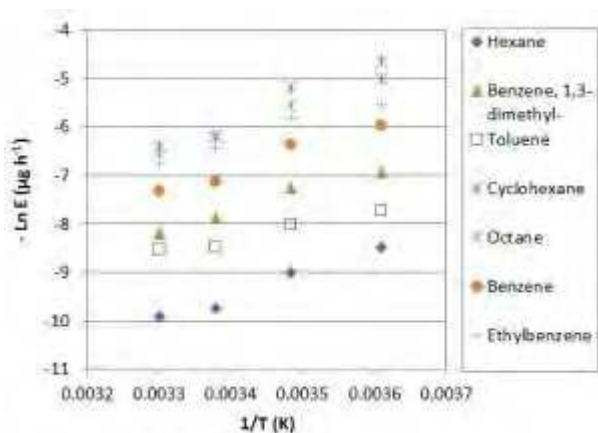


Figure 57 (f): Chamber concentrations (naphthalene from GC)

Figure 57: Chamber concentrations for different temperatures



(a) Plot of $-\ln E$ and $1/T$ for ADH12



(b) Plot of $-\ln E$ and $1/T$ for GC

Figure 58: Plot of $-\ln E$ and $1/T$ for ADH12 and GC

Table 23: Coefficients of an equation for the temperature dependence of emission factor

#	Class	CAS#	Compound	ADH12			GC			PTR		
				Ac	ΔH (kJ mol ⁻¹)	R ²	Ac	ΔH (kJ mol ⁻¹)	R ²	Ac	ΔH (kJ mol ⁻¹)	R ²
2	Alcohols	71-23-8	1-Propanol	5.6E+04	23	0.97						
5		64-17-5	Ethanol				4.0E+13	58	0.95			
7	Aldehydes	78-93-3	Methylethyl ketone	3.2E+08	33	0.89						
8		67-64-1	Acetone	1.0E+03	13	0.73						
24	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	3.2E+02	16	0.47	5.1E+11	47	0.98			
25		96-14-0	Pentane, 3-methyl-	2.1E+03	20	0.81	3.5E+11	48	0.97			
26		540-84-1	2,2,4-Trimethylpentane				1.5E+13	58	0.96			
28		124-18-5	Decane				7.6E+10	52	0.99	3.1E+10	56	0.96
30		142-82-5	Heptane	4.7E+07	30	0.91	3.0E+10	41	0.98			
32		110-54-3	Hexane	5.4E+06	29	0.98	2.3E+11	41	0.98			
33		111-84-2	Nonane				1.3E+10	45	0.99	3.2E+10	59	0.95
34		111-65-9	Octane	2.6E+06	31	0.91	1.1E+10	42	0.99			
38		1120-21-4	Undecane				5.1E+09	49	0.92			
39		95-93-2	Benzene, 1,2,4,5-tetrameth				1.7E+10	49	1.00			
40	Aromatic Hydrocarbons	611-14-3	Toluene, 2-ethyl-				2.4E+09	40	0.98	1.4E+17	100	0.96
41		620-14-4	Toluene, 3-ethyl-				1.7E+09	36	0.98	1.5E+18	104	0.95
42		622-96-8	Toluene, 4-ethyl-				1.9E+09	37	0.96	3.9E+18	107	0.98
44		71-43-2	Benzene				7.6E+09	39	0.97	8.0E+23	137	0.70
45		526-73-8	Benzene, 1,2,3-trimethyl-				4.3E+09	41	0.99	3.9E+16	95	0.97
46		95-63-6	Benzene, 1,2,4-trimethyl-				5.7E+09	37	0.99	2.6E+20	113	0.97
47		95-47-6	Benzene, 1,2-dimethyl-	1.3E+07	43	0.95	2.9E+09	37	0.97	1.7E+21	122	0.96
48		108-67-8	Benzene, 1,3,5-trimethyl-				5.7E+09	41	0.98	1.9E+19	111	0.98
49		108-38-3	Benzene, 1,3-dimethyl-	5.3E+06	37	0.93	3.2E+09	35	0.97	3.9E+20	116	0.96
50		98-82-8	Benzene, isopropyl				5.3E+08	41	0.97			
51	Cyclo Alkanes	103-65-1	Benzene, propyl-				1.3E+09	39	0.97			
52		100-41-4	Ethylbenzene	2.0E+06	38	0.93	7.1E+08	34	0.97	8.8E+15	93	0.91
53		91-20-3	Naphthalene				2.1E+10	48	0.98			
54		99-87-6	p-Cymene				8.8E+08	47	0.99			
56		108-88-3	Toluene	1.7E+01	14	0.12	6.6E+07	24	0.96	4.4E+11	56	0.91
91		108-87-2	Methylcyclohexane	3.4E+07	30	0.92	2.3E+11	49	0.97			
92		110-82-7	Cyclohexane	4.8E+05	24	0.98	3.0E+11	50	0.96			
93		1678-93-9	Cyclohexane, butyl-				1.1E+10	53	1.00			
94		1678-91-7	Cyclohexane, ethyl-	6.7E+05	33	0.93	4.4E+10	50	0.98			
95		1678-92-8	Cyclohexane, propyl-				1.9E+10	51	0.99			
		0-00-0	TVOC	2.8E+08	31	0.93	3.4E+11	39	0.98	2.4E+17	79	0.96

Figure 59 and Figure 60 show the emission factors obtained from the cyclic temperature tests with a gasoline container, where the chamber temperature was cycled between 4 and 14 °C (profile 1) or between 23 and 30 °C (profile 2) for 24 hours at each temperature. The purpose of the test was to determine whether the emission factor from the 2nd cycle had elevated emission factors compared to the 1st cycle.

Table 24 shows the emission factors measured at 24 h at each temperature. The emission factors were slightly elevated at the end of the 2nd cycle of 4 and 14 °C. However, the increase was 10 – 20%, which is considered insignificant and within error bounds of the test. Except for ethanol, no increase was observed with emission factors from the cyclic test of 23 and 30 °C. The increase for hexane and toluene was also within the error bounds.

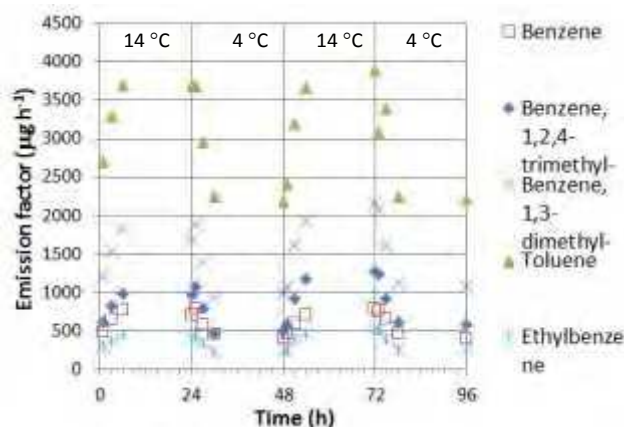


Figure 59 (a): Aromatic hydrocarbons

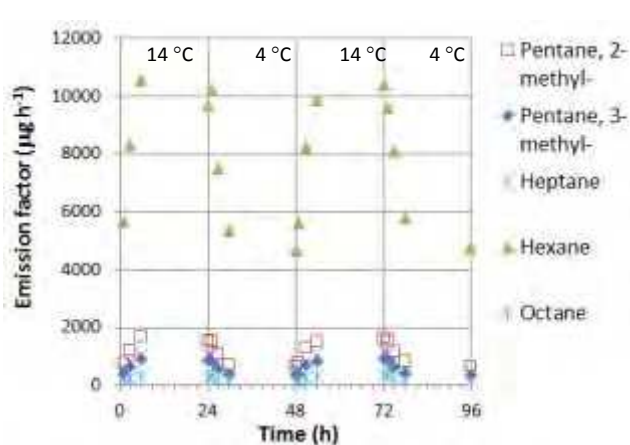


Figure 59 (b): Aliphatic hydrocarbons

Figure 59: Chamber concentrations with a cyclic temperature profile 1 (14 and 4 °C with GC)

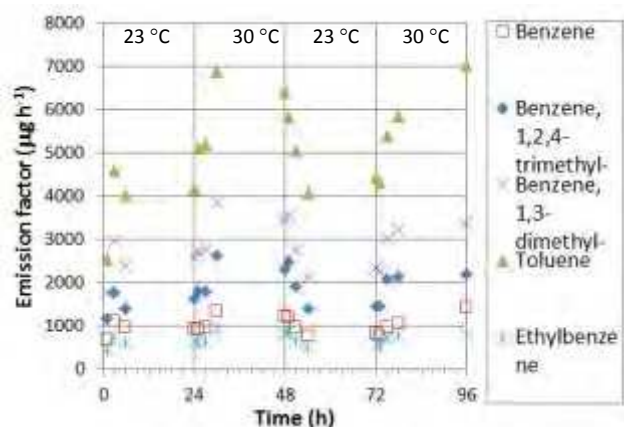


Figure 60 (a): Aromatic hydrocarbons

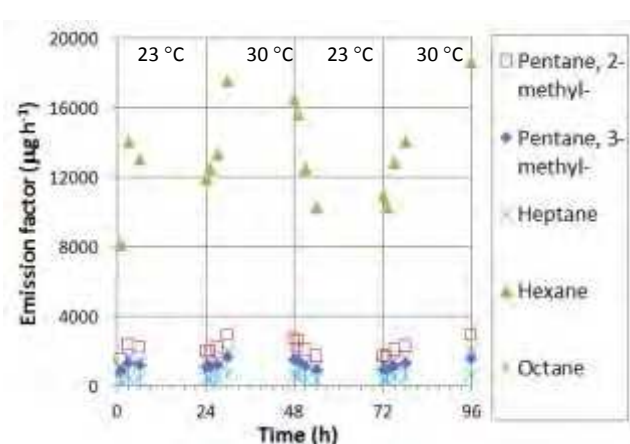


Figure 60 (b): Aliphatic hydrocarbons

Figure 60: Chamber concentrations with a cyclic temperature profile 2 (23 and 30 °C with GC)

Table 24: Emission factors at 24 h from the cyclic temperature tests

#	Class	CAS#	Compound	Emission factors at 24 h ($\mu\text{g h}^{-1}$)							
				4 °C		14 °C		23 °C		30 °C	
				1st	2nd	1st	2nd	1st	2nd	1st	2nd
5		64-17-5	Ethanol	517.3	518.2	1135.8	1206.5	1712.2	1784.8	2900.4	3920.5
24	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	635.1	637.8	1568.1	1627.0	1978.1	1706.7	2713.4	2932.8
25		96-14-0	Pentane, 3-methyl-	338.8	339.8	852.3	898.5	1108.8	933.8	1504.6	1587.4
26		540-84-1	2,2,4-Trimethylpentane	140.0	147.6	457.6	488.9	730.3	568.4	1033.7	1062.0
28		124-18-5	Decane	20.5	18.1	38.1	54.5	69.6	58.9	106.0	97.2
30		142-82-5	Heptane	459.0	478.1	1035.4	1147.6	1409.2	1210.6	1843.2	2118.1
32		110-54-3	Hexane	4677.3	4757.8	9686.3	10411.5	11967.2	10913.2	16540.2	18699.3
33		111-84-2	Nonane	52.3	58.2	116.7	150.6	193.4	166.6	275.6	266.5
34		111-65-9	Octane	138.0	150.0	308.3	365.0	455.7	395.1	623.2	630.0
38		1120-21-4	Undecane	4.6	4.5	8.6	13.1	19.4	17.8	34.0	26.4
39	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetrameth	11.0	14.5	22.6	34.5	49.6	44.5	76.1	66.2
40		611-14-3	Toluene, 2-ethyl-	77.4	88.1	154.1	194.3	252.8	220.9	346.8	334.0
41		620-14-4	Toluene, 3-ethyl-	309.5	359.7	551.1	743.2	930.2	847.7	1288.5	1228.9
42		622-96-8	Toluene, 4-ethyl-	211.8	246.7	339.8	484.3	604.2	554.6	819.1	788.5
44		71-43-2	Benzene	400.5	404.2	713.3	792.0	941.1	840.3	1241.6	1425.5
45		526-73-8	Benzene, 1,2,3-trimethyl-	74.6	87.0	160.2	201.3	270.5	236.1	384.3	364.8
46		95-63-6	Benzene, 1,2,4-trimethyl-	505.7	587.3	960.8	1266.8	1628.9	1474.9	2315.7	2214.2
47		95-47-6	Benzene, 1,2-dimethyl-	319.3	347.5	591.7	733.1	927.6	808.7	1236.1	1204.4
48		108-67-8	Benzene, 1,3,5-trimethyl-	108.5	125.6	230.7	291.2	384.1	334.0	531.6	507.5
49		108-38-3	Benzene, 1,3-dimethyl-	997.5	1081.5	1693.1	2151.4	2592.0	2339.2	3449.4	3380.4
50		98-82-8	Benzene, isopropyl	10.6	12.2	21.7	26.8	35.0	30.3	46.2	44.3
51		103-65-1	Benzene, propyl-	67.9	78.9	114.8	159.3	197.7	179.6	267.7	255.4
52		100-41-4	Ethylbenzene	241.9	262.4	411.8	521.5	637.1	569.1	826.5	809.9
53		91-20-3	Naphthalene	25.2	34.8	38.3	62.3	74.3	89.8	148.1	122.1
54		99-87-6	p-Cymene	1.6	1.9	3.4	4.4	5.9	5.1	8.1	6.8
56		108-88-3	Toluene	2193.5	2222.4	3708.9	3895.9	4172.3	4438.9	6431.3	7030.8
91	Cyclo Alkanes	108-87-2	Methylcyclohexane	122.8	124.7	341.2	359.4	481.7	387.8	662.4	674.5
92		110-82-7	Cyclohexane	93.6	94.7	236.9	264.8	349.0	280.1	469.3	466.3
93		1678-93-9	Cyclohexane, butyl-	1.4	1.1	3.3	3.6	4.9	4.5	7.1	6.5
94		1678-91-7	Cyclohexane, ethyl-	18.3	18.9	49.7	55.3	75.2	60.8	105.6	101.5
95		1678-92-8	Cyclohexane, propyl-	4.3	4.8	11.8	12.6	17.6	16.1	24.7	24.2
96		91-17-8	Decahydronaphthalene			1.7	2.2	3.6	2.9	5.4	4.1
		0-00-0	TVOC	13321.8	13742.4	27839.7	29574.2	36109.4	32398.4	50384.6	53889.3

3.3.5.3 Cap tightness

The cap/cover tightness was varied from full-closure (1.5 turn) to opening in two levels by half or one turn of a cap. The cap tightness tests were performed with MO2 and PTH. Additionally, a paint (PTO) can was opened with different crack sizes (0.4 mm and 1 mm).

The chamber concentrations for MO2 are presented in Figure 61. At the beginning (≤ 24 h), the chamber concentrations were generally higher for the test with a cap open. The emission factors were in an order of MO2_1t > MO2_0.5t > MO2. However, the difference diminished over time and the concentrations become similar at the end of the test (72 h and 96 h) for three cases. The compounds with this pattern (pattern 1) include aliphatic hydrocarbons (decane, undecane and dodecane), aliphatic hydrocarbons (1,2,4-trimethyl benzene and 1,2,4,5-tetramethyl benzene), and TVOC. It appears that the motor oil for 2 stroke engines (MO2) is a high emitter for these compounds even with a cap closed completely. This may be due to improper container material or seal. Therefore, additional leakage from an incompletely closed cap did not increase long-term emissions. This is partly supported by the strong petroleum smell associated with a closed container of MO2, unlike other similar products such as four-stroke motor oil (MO4).

On the other hand, a slightly different pattern (pattern 2) was observed in half of compounds emitted from MO2 (Figure 62). The observation that the difference between half-turn and one-turn opening was not significant at the end of the test is still valid for xylenes, p-cymene, naphthalene, butyl cyclohexane and decahydronaphthalene. The main difference is that the concentrations from the test with a cap closed tightly (MO2) remained lower than those with a cap open (MO1_1t = MO2_0.5t > MO2) for these compounds. The reason for two different patterns is not clear.

The chamber concentrations for PTH are presented in Figure 63. The chamber concentrations with a cap open by half- and one-turn were higher than those with a cap closed completely with 1.5 turn. However, the concentrations from the test with a cap opened by half turn (PTH_0.5t) were highest at the beginning. The difference in the chamber concentrations became smaller over time and those from the test with a cap opened by one turn (PTH_1t) were highest at the end. However, the differences among different cap tightness at the end of the test were small compared to those at the beginning. The emission factor that is greater with PTH_0.5t than PTH_1t may be due to the difference in the product handling before the test, although effort was made to be consistent. For example, a drop of liquid may be left outside of the product in the process of cap opening for PTH_0.5t.

The chamber concentrations for PTO are presented in Figure 64. At the beginning, the can with a wider opening (PTO_1mm) had the highest concentration. However, the concentration decreased to the same level as the can with 0.4 mm opening at the end. Both tests with an opening (PTO_0.4mm and PTO_1mm) led to higher concentrations than the test with a tightly closed cover (PTO).

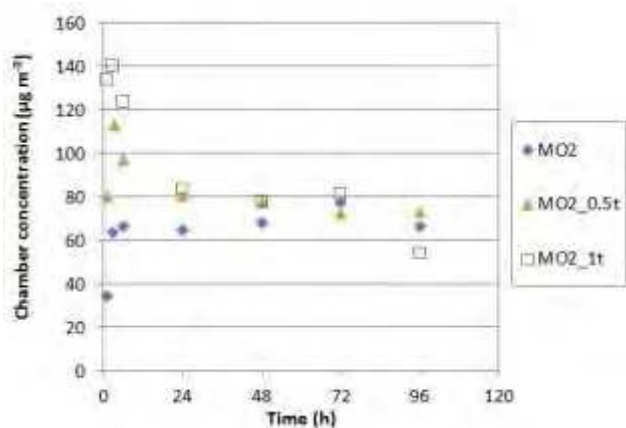


Figure 61 (a): Chamber concentrations (Decane from MO2)

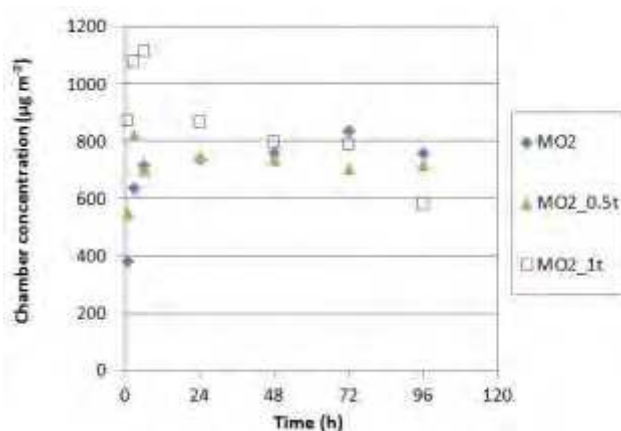


Figure 61 (b): Chamber concentrations (Undecane from MO2)

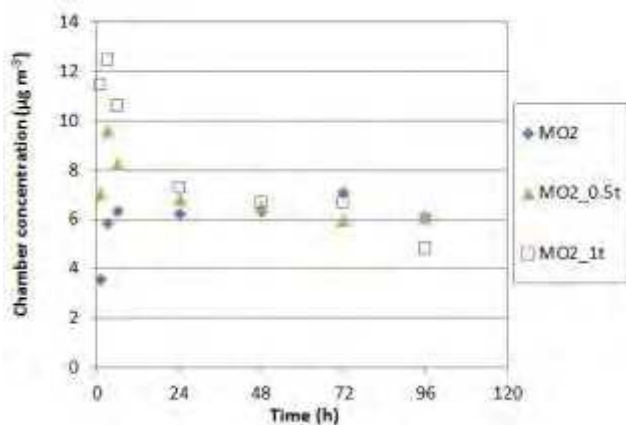


Figure 61 (c): Chamber concentrations (1,2,4-trimethyl benzene from MO2)

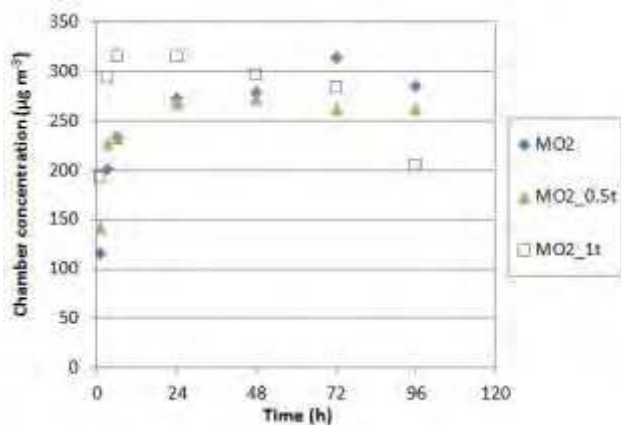


Figure 61 (d): Chamber concentrations (Dodecane from MO2)

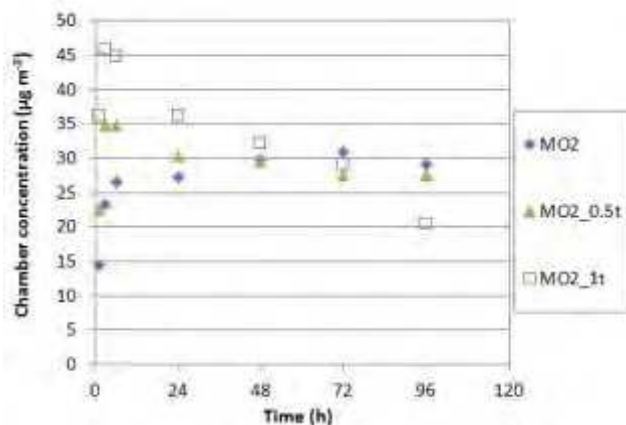


Figure 61 (e): Chamber concentrations (1,2,4,5-tetramethyl benzene from MO2)

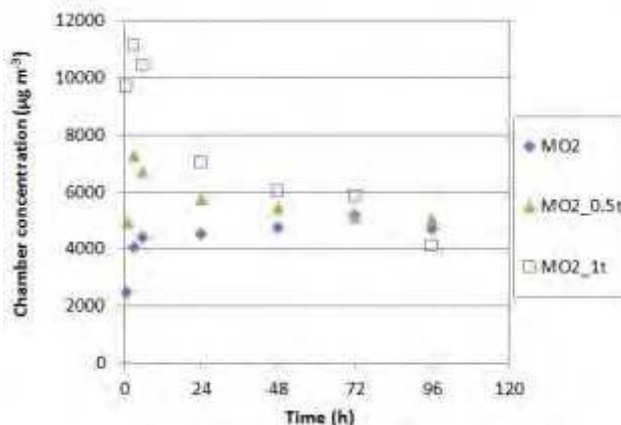


Figure 61 (f): Chamber concentrations (TVOC from MO2)

Figure 61: Chamber concentrations for different cap tightness (MO2): pattern 1

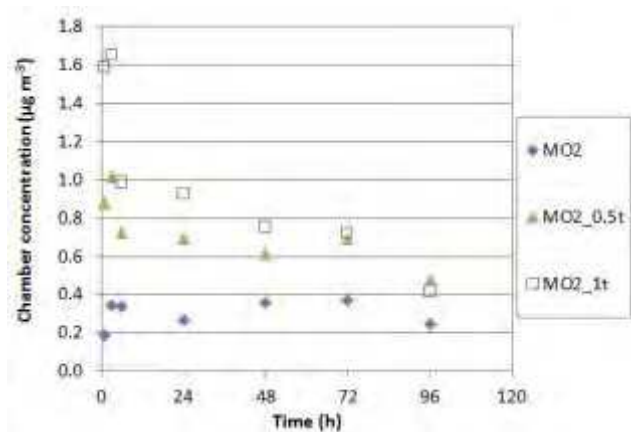


Figure 62 (a): Chamber concentrations (*o*-xylene from MO2)

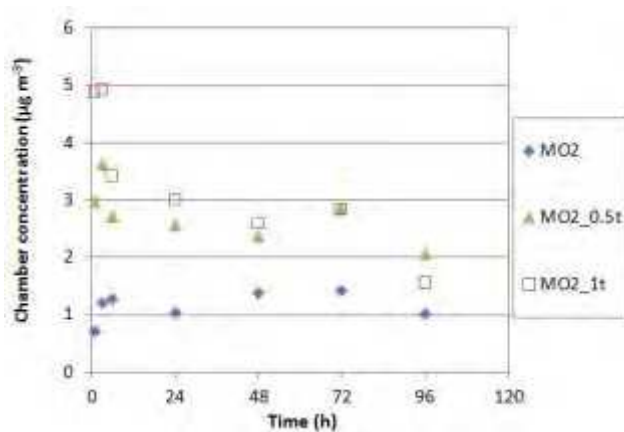


Figure 62 (b): Chamber concentrations (*m*&*p*-xylene from MOD2)

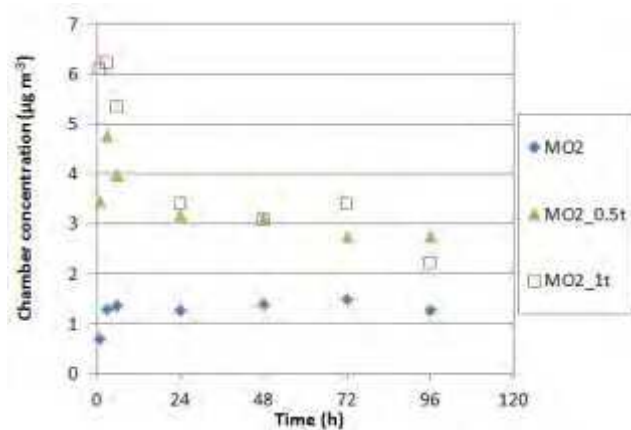


Figure 62 (c): Chamber concentrations (*p*-cymene from MO2)

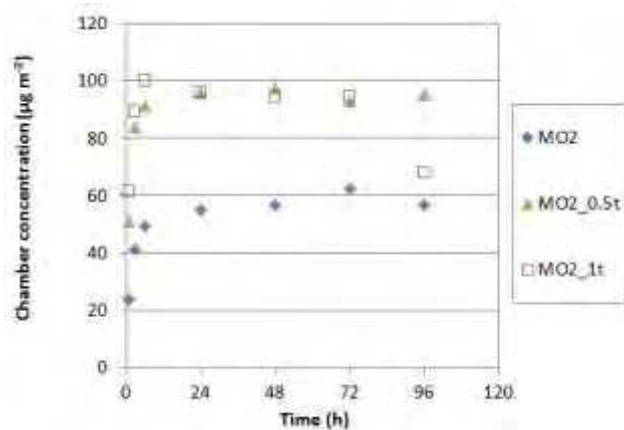


Figure 62 (d): Chamber concentrations (naphthalene from MO2)

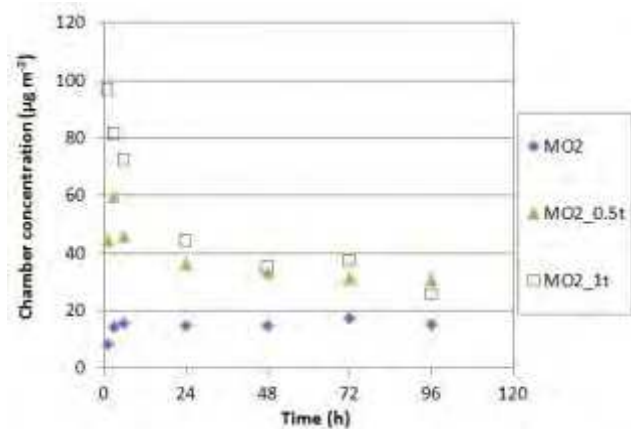


Figure 62 (e): Chamber concentrations (butyl cyclohexane from MO2)

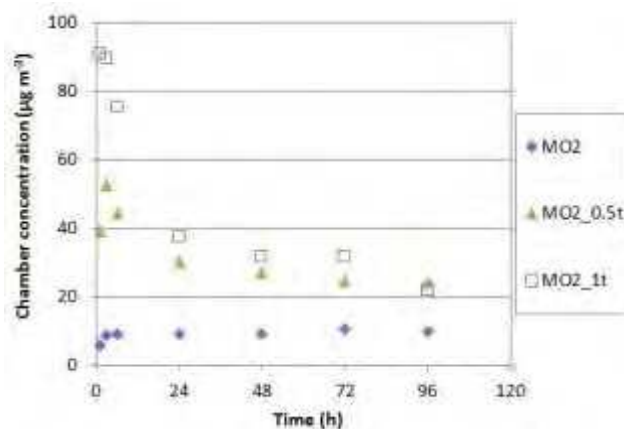


Figure 62 (f): Chamber concentrations (decahydronaphthalene from MO2)

Figure 62: Chamber concentrations for different cap tightness (MO2): pattern 2

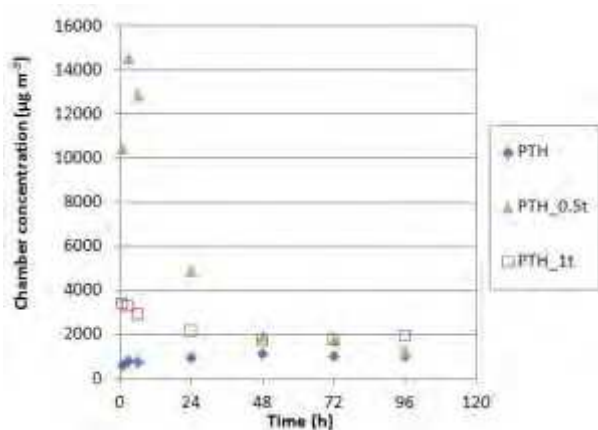


Figure 63 (a): Chamber concentrations (decane from PTH)

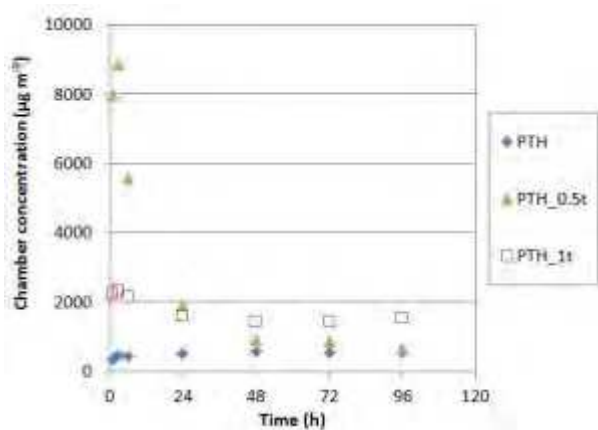


Figure 63 (b): Chamber concentrations (nonane from PTH)

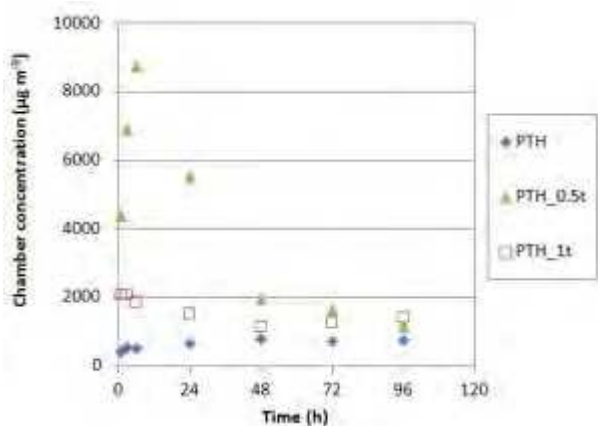


Figure 63 (c): Chamber concentrations (undecane from PTH)

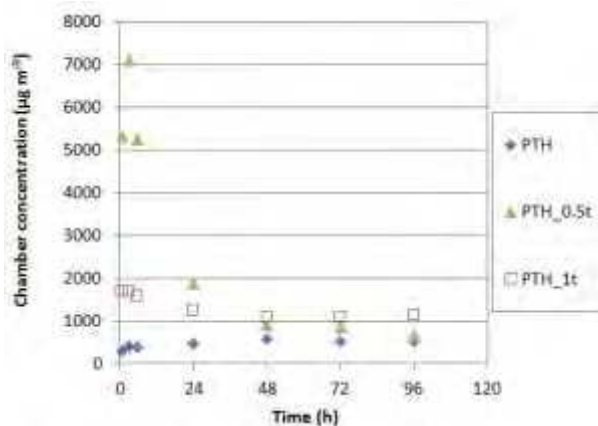


Figure 63 (d): Chamber concentrations (1,2,4-trimethyl benzene from PTH)

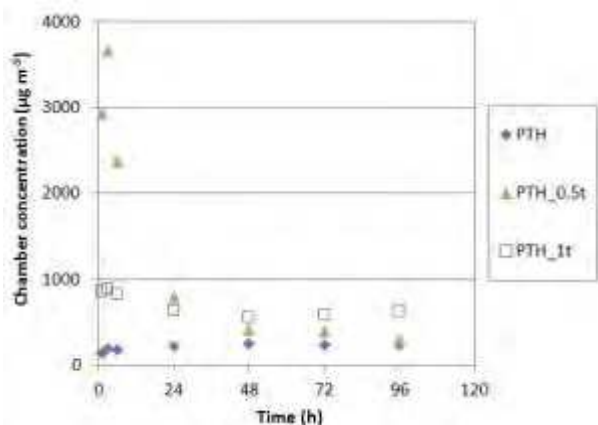


Figure 63 (e): Chamber concentrations (triethyl toluene from PTH)

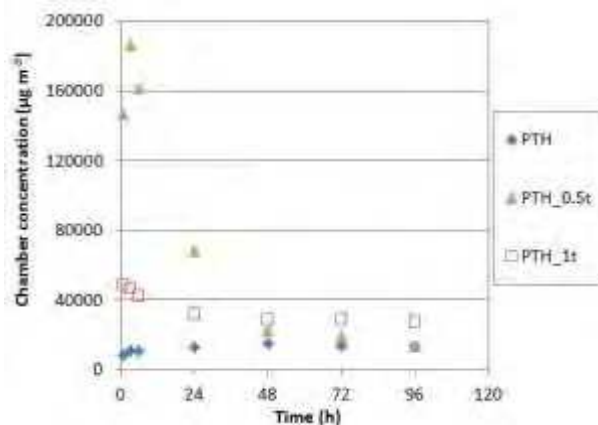


Figure 63 (f): Chamber concentrations (TVOC from PTH)

Figure 63: Chamber concentrations for different cap tightness (PTH)

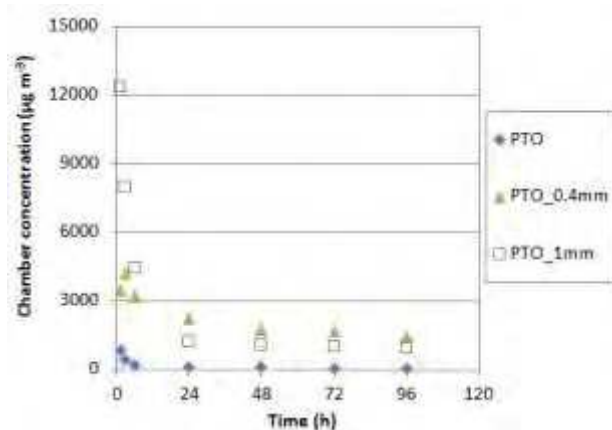


Figure 64 (a): Chamber concentrations (undecane from PTO)

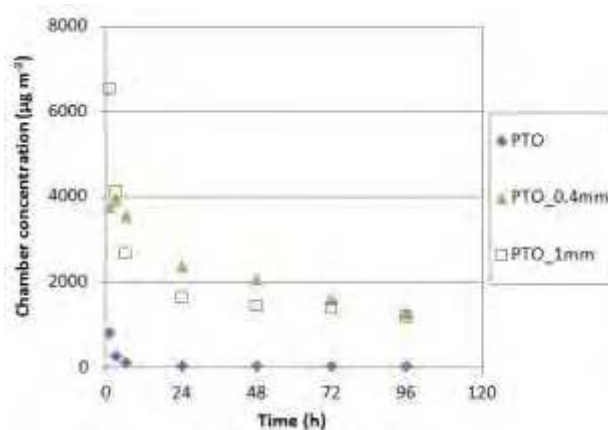


Figure 64 (b): Chamber concentrations (propyl cyclohexane from PTO)

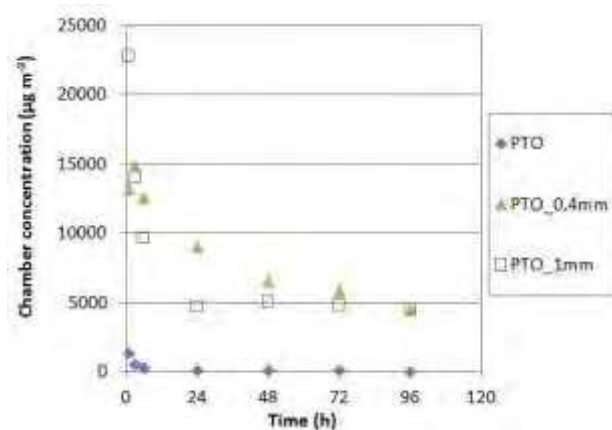


Figure 64 (c): Chamber concentrations (nonane from PTO)

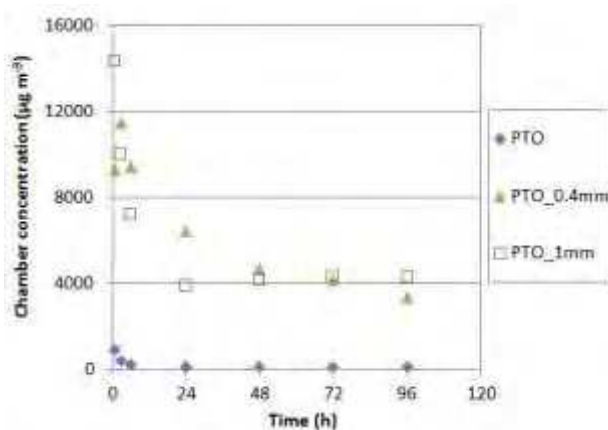


Figure 64 (d): Chamber concentrations (*m*&*p*-xylene from PTO)

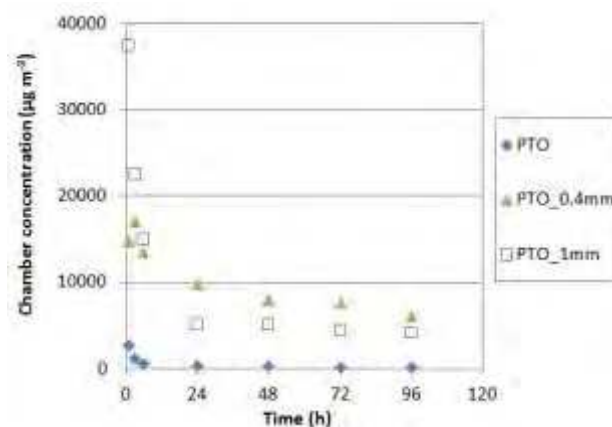


Figure 64 (e): Chamber concentrations (decane from PTO)

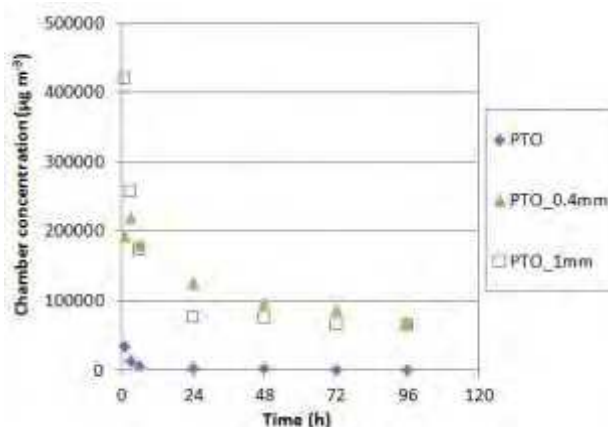


Figure 64 (f): Chamber concentrations (TVOC from PTO)

Figure 64: Chamber concentrations for different cap tightness (PTO)

Table 25 summarizes the emission factor averaged for 72 h and 96 h for different cap/cover tightness. Overall, the emission factor with an opening showed higher emissions compared to those with a cap/cover closed tightly. However, the difference in the opening size did not make much difference in the emissions at 72 h and 96 h. This was more pronounced with a paint/primer can. For a high emitter such as MO2, the additional emissions due to a loose cap were not significant at 72 h and 96 h.

Table 25: Emission factors for different cap tightness (average of EF at 72 h and 96 h)

#	Class	CAS#	Compound	MO2			PTH			PTO		
				Closed (1.5 turn)	Opened (0.5 turn)	Opened (1 turn)	Closed (1.5 turn)	Opened (0.5 turn)	Opened (1 turn)	Closed	Opened (0.4 mm)	Opened (1 mm)
7	Aldehyde s &	78-93-3	Methylethyl ketone							0.32	302.82	477.40
8		67-64-1	Acetone		0.56	0.02				0.12	0.69	0.87
9		98-86-2	Acetophenone							0.05		
24	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-				0.17	1.01	4.81			
25		96-14-0	Pentane, 3-methyl-				0.13	0.82	3.73			
28		124-18-5	Decane	3.59	3.63	3.37	51.87	76.88	93.28	6.41	342.90	212.51
29		112-40-3	Dodecane	14.97	13.12	12.17	6.98	15.61	12.17	0.49	20.95	8.61
30		142-82-5	Heptane				1.43	4.07	15.85	0.15	1.31	
32		110-54-3	Hexane				0.84	6.74	27.33	0.82		
33		111-84-2	Nonane				26.36	38.80	73.87	3.75	259.03	233.14
34		111-65-9	Octane				6.18	10.21	30.00	0.24	28.51	35.52
37		629-50-5	Tridecane	0.36	0.32	0.26						
38		1120-21-4	Undecane	39.89	35.57	34.09	36.87	71.22	67.49	1.70	78.55	48.22
39	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetrameth	1.50	1.38	1.23	1.56	2.66	2.55			
40		611-14-3	Toluene, 2-ethyl-				5.21	7.32	12.61	0.02	0.84	0.80
41		620-14-4	Toluene, 3-ethyl-	0.02	0.05	0.04	11.42	17.61	29.94	0.06	2.64	1.92
42		622-96-8	Toluene, 4-ethyl-	0.02	0.03	0.03	6.49	7.97	11.76	0.04	1.07	0.86
44		71-43-2	Benzene		0.25	0.02	0.08	0.05	0.72	0.17	1.68	2.66
45		526-73-8	Benzene, 1,2,3-trimethyl-	0.33	0.30	0.29	10.15	14.60	21.16	0.02	0.75	0.58
46		95-63-6	Benzene, 1,2,4-trimethyl-		0.08	0.06	25.89	37.59	55.24	0.07	2.43	1.64
47		95-47-6	Benzene, 1,2-dimethyl-	0.02	0.02	0.03	3.72	5.97	13.38	1.16	64.83	68.39
48		108-67-8	Benzene, 1,3,5-trimethyl-				5.79	7.98	13.68	0.03	1.24	0.93
49		108-38-3	Benzene, 1,3-dimethyl-	0.05	0.08	0.10	9.07	13.79	30.74	3.66	187.98	214.22
50		98-82-8	Benzene, isopropyl				1.54	1.46	3.26	0.03	0.85	0.77
51		103-65-1	Benzene, propyl-	0.00	0.01	0.01	7.50	5.72	10.28	0.04	0.74	0.58
52		100-41-4	Ethylbenzene	0.01	0.01	0.03	2.87	4.61	11.18	0.87	52.74	61.88
53		91-20-3	Naphthalene	2.98	4.71	4.04	5.43	3.87	3.61			
54		99-87-6	p-Cymene	0.07	0.14	0.14	2.12	1.76	2.39			
56		108-88-3	Toluene				2.86	6.57	20.55	0.33	15.01	20.80
91	Cyclo Alkanes	108-87-2	Methylcyclohexane				2.75	7.16	31.04	0.08	6.89	8.82
92		110-82-7	Cyclohexane				0.43	1.10	4.12			
93		1678-93-9	Cyclohexane, butyl-	0.82	1.55	1.57	7.24	6.70	9.07	1.00	37.44	23.39
94		1678-91-7	Cyclohexane, ethyl-				3.15	3.92	13.58	0.18	16.64	18.79
95		1678-92-8	Cyclohexane, propyl-				7.86	7.76	16.84	1.44	72.16	64.30
96		91-17-8	Decahydronaphthalene	0.52	1.24	1.34	3.72	4.08	5.58	0.43	22.39	13.19
116		96-29-7	2-Butanone oxime							0.07	5.77	3.30
		0-00-0	TVOC	246.68	252.02	247.51	665.42	805.84	1382.56	61.53	3955.97	3284.41

3.4 Indoor air concentrations

The indoor air concentrations were simulated for the scenario identified in Section 2.4. The predicted concentrations of selected “priority” chemicals are presented over 3 months in Figure 65 to Figure 82. The graphs from Case 6 to 9 are not presented since they have similar patterns to those of Case 2 to 5 with slightly higher (summer) or lower (winter) concentration levels. The dark brown line is the overall air concentration and other lines are to show the contributions from individual sources. If there is a dominant source, the line for the individual source overlaps with the line for the overall concentration. Since the individual contributions were approximated based on the overall concentration (Eq. 7 and 8), they mirror the fluctuations of the overall concentration even when the emission factor has a monotonic increasing or decreasing trend. For example, the contributions of all sources fluctuate in the garage for benzene since gas-powered equipment has a cyclic usage pattern (Figure 65 b).

The concentrations at 1 week and 3 months are compared in Table 26 for summer and Table 27 for winter. The contribution of each source is also presented in the tables. For petroleum-related chemical compounds such as BTEX, the main source in the house is the transport from the garage. This is particularly relevant to the concentrations predicted at 3 months. Dichloromethane in the house is also transported from the garage where the main source exists. For aldehydes in the house, the main sources are wood-based building materials (I-beam joist, door and subfloor) and paint. The main sources of naphthalene also exist in the house, including carpet and oil-based varnish.

Overall, gasoline container and gas-powered equipment are the main sources in the garage for BTEX. Generally, gas-powered equipment has a bigger contribution than gasoline container when it is ≥ 10 years old. For aldehydes in the garage, the main source is the contribution from the house since evaporative sources in the garage are not the main emitters of aldehydes. For dichloromethane, the main contributor is paint remover in the garage. The main source of naphthalene in the garage is the transport from the house when gas-powered equipment is new. However, when gas powered equipment is old, the contribution of a used trimmer (summer) or a used snow blower (winter) is bigger than the transport from the house.

More detailed information on the main sources of individual compounds is provided below.

3.4.1 Main sources

3.4.1.1 Benzene

Figure 65 presents the benzene concentrations predicted in the house and garage with new and used gas-powered equipment in summer. The dominant source of benzene in the house is the transport from the attached garage. Other important sources are paint, thermal insulation and I-beam joist. In the garage, the dominant source is gasoline container when the gas powered equipment is new. If the gas-powered equipment is ≥ 10 years, both gasoline container and lawn mower are the major sources in the garage, followed by trimmer and chainsaw. The garage concentration is higher with used equipment by a factor of 2 than that with new equipment. The contribution of evaporative sources other than gasoline container and gas-

powered is minimal, which is even lower than the transport from the house. Overall, gasoline-related sources are the main source of benzene.

The cyclic usage of the gas-powered equipment is reflected in the cyclic patterns of concentrations. The benzene concentration has a weekly cycle for lawn mower and trimmer (Figure 65 b) and a monthly cycle for chainsaw (Figure 65 d). Sources such as degreaser, paint remover, and adhesive are shown to have emission factors with increasing trend for benzene.

Similar observations can be made in winter (Figure 66). The transport of benzene from the garage is the dominant source of benzene in the house. Gasoline container and used snow blower (~10 years old) are the main sources of benzene in the garage. The seasonal difference between the predicted house and garage concentrations is small. This is partly due to the fact that the only variable between two seasons was the presence of different gas-powered equipment.

3.4.1.2 Xylenes

Figure 67 shows the predicted concentrations of 1,2-dimethylbenzene in the house and garage in summer. The dominant sources of 1,2-dimethylbenzene are building materials such as wood stain, varnish and paint at the beginning (< 10 days). Afterwards the transport of 1,2-dimethylbenzene from the garage becomes dominant. The major sources of 1,2-dimethylbenzene in the garage are gasoline container and gas-powered equipment. The contribution of gasoline container is bigger than that of new lawn mower, but it is smaller than that of used lawn mower (> 10 years old). Also, the transport from the house has a bigger contribution than non-gasoline-based evaporative sources in the garage.

Figure 68 presents the predicted concentrations of 1,2-dimethylbenzene in the house and garage in winter. Similar observations to those in summer can be made. When snow blower is > 10 years old, the contribution is bigger than gasoline container in the garage. After ~10 days, the contribution from the garage becomes dominant for 1,2-dimethylbenzene in the house in winter.

The findings of 1,2-dimethylbenzene also apply to 1,3(4)-dimethylbenzene (no graphs provided).

3.4.1.3 Ethylbenzene

Figure 69 presents the predicted concentration of ethylbenzene in the house and garage in summer. Building materials such as subfloor, thermal insulation and varnish (oil) are the main contributor of ethylbenzene in the house at the beginning (< 5 days). The transport from the garage becomes more important afterwards. In the garage, the main sources are gasoline container and gas-powered equipment. The contribution of gasoline container is bigger than new lawn mower and smaller than used lawn mower in the garage.

The same observation can be made in winter (Figure 70). While the contribution of gas container is biggest when snow blower is new, it becomes less significant when there is used

snow blower. The main sources of ethylbenzene in the house in winter are identical to those of summer.

3.4.1.4 Toluene

The predicted concentrations of toluene in the house and garage are presented in Figure 71 for summer and Figure 72 for winter. The main contributor of toluene in the house is the transport from the garage. Building materials such as I-beam joist, paint and subfloor are also important to a less extent. In the garage, the main contributor is gasoline container (summer and winter, new equipment), used lawn mower (summer, used equipment), and used snow blower (winter, used equipment). When equipment is new, lawn mower, trimmer and chainsaw have similar contributions. This observation is different from other BTEX compounds, for which lawn mower is the dominant garage source in summer.

3.4.1.5 Naphthalene

The predicted concentrations of naphthalene in the house and garage are presented in Figure 73 for summer and Figure 74 for winter. Building materials (oil-based varnish and carpet) are the main contributors of naphthalene in the house, followed by the transport from the garage. In the garage, the main contributor is gasoline container (summer and winter, new equipment), used trimmer (summer, used equipment), and used snow blower (winter, used equipment). The contribution of lawn mower is not significant compared to that of trimmer.

3.4.1.6 Acetaldehyde

The predicted concentrations of acetaldehyde in the house and garage are presented in Figure 75 for summer and Figure 76 for winter. Wood-based building materials (I-beam joist, doors, and subfloor) are the main contributors of acetaldehyde in the house. In the garage, the main contributor is the transport from the house. Additionally, gas-powered equipment in the garage contributes to a less extent. For BTEX compounds, the emissions from used equipment were always higher than those from new equipment. However, it is not always the case with acetaldehyde. When gas-powered equipment is at its peak emission, i.e., right after operation, the contributions of new lawn mower or chainsaw are comparable to the portion transported from the house (Figure 75 b). On the other hand, the contribution from used equipment is much less than that from the house. This is because the acetaldehyde emissions from new lawn mower and new chainsaw were higher than those from used equipment. The impact of used and new equipment is not significant with snow blower (Figure 75 d).

3.4.1.7 Formaldehyde

Figure 77 and Figure 78 show the predicted concentrations of formaldehyde in the house and garage for summer and winter, respectively. The main contributors of formaldehyde are similar

to those of acetaldehyde. Wood-based building materials (I-beam joist, doors, and subfloor) and paint are the main contributors. In the garage, the main contributor is the transport from the house since it was assumed there were no sources other than evaporative sources in the garage. The contribution from gas-powered equipment is smaller than that from the house by several orders of magnitude.

3.4.1.8 Propanal

Figure 79 and Figure 80 are the predicted concentrations of propanal in the house and garage for summer and winter, respectively. The main sources in the house are similar to those of acetaldehyde and formaldehyde. That is, wood-based building materials (I-beam joist, doors, and subfloor) and paint are the main contributors of propanal in the house. Since propanal is not emitted from evaporative sources, the main contributor for the propanal in the garage is the transport from the house.

3.4.1.9 Dichloromethane

The predicted concentrations of dichloromethane in the house and garage are presented in Figure 81 and Figure 82 for summer and winter, respectively. The transport from the garage to the house is the main source of dichloromethane in the house. In the garage, the main source is paint remover. Although the contribution is relatively low, dichloromethane re-transported from the house also affects the level in the garage.

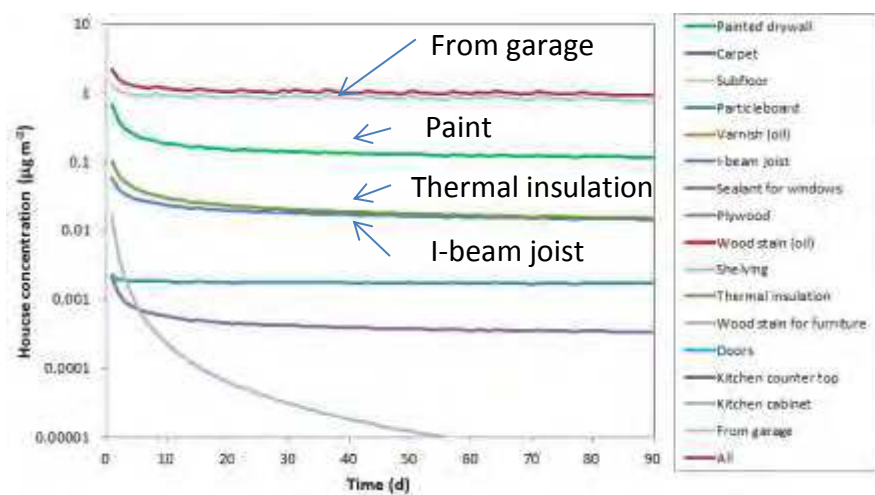


Figure 65 (a): Benzene (house, new equipment, summer)

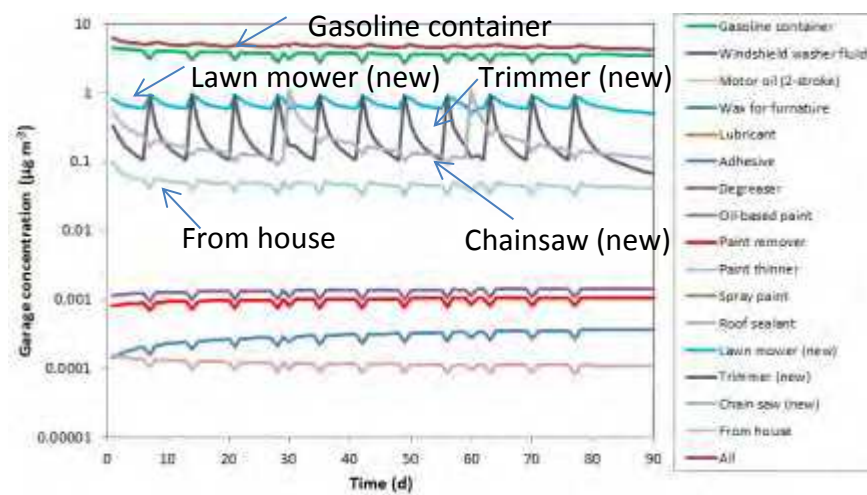


Figure 65 (b): Benzene (garage, new equipment, summer)

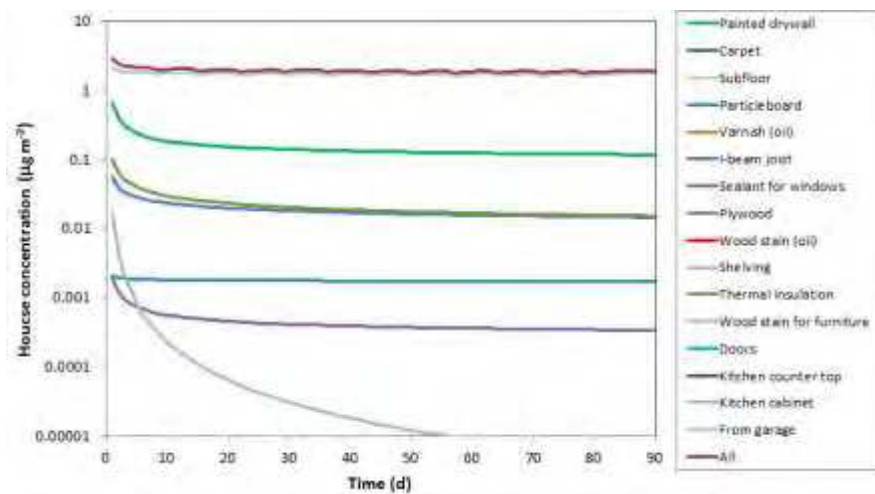


Figure 65 (c): Benzene (house, used equipment, summer)

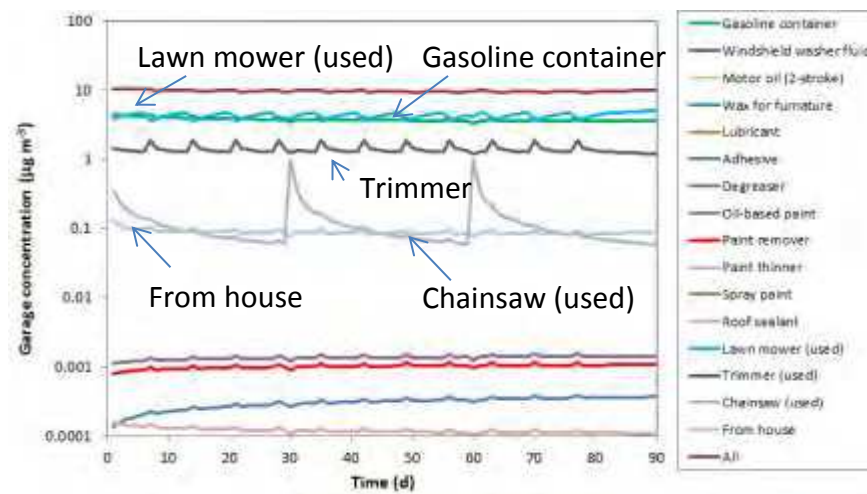


Figure 65 (d): Benzene (garage, used equipment, summer)

Figure 65: Predicted concentration of benzene in the house and garage (summer)

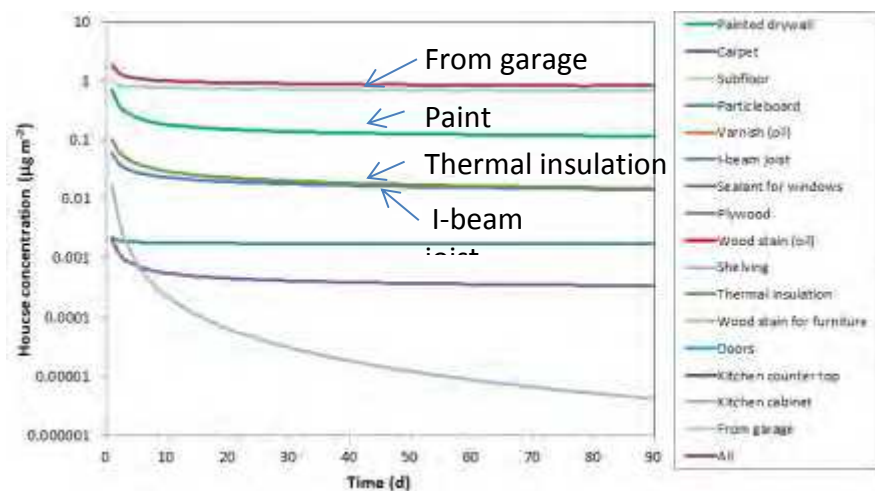


Figure 66 (a): Benzene (house, new equipment, winter)

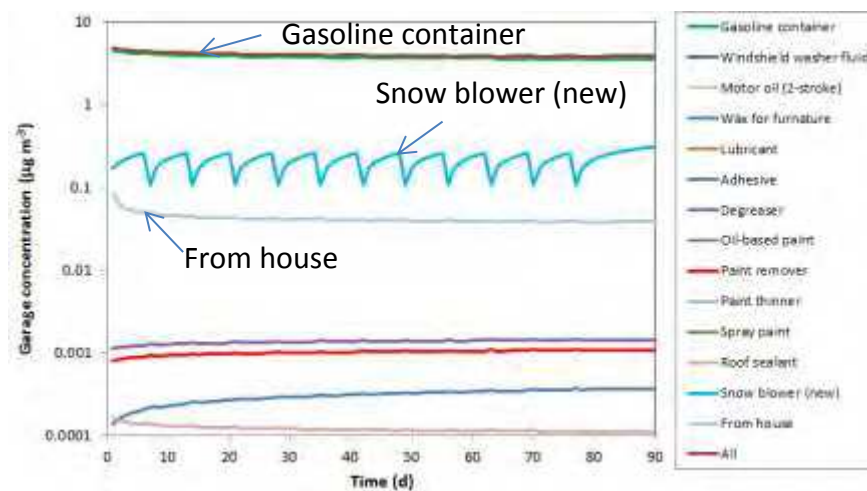


Figure 66 (b): Benzene (garage, new equipment, winter)

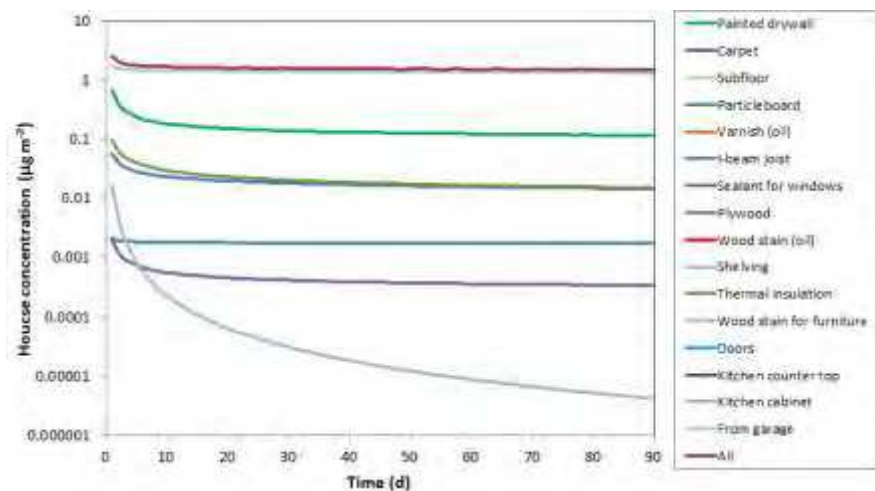


Figure 66 (c): Benzene (house, used equipment, winter)

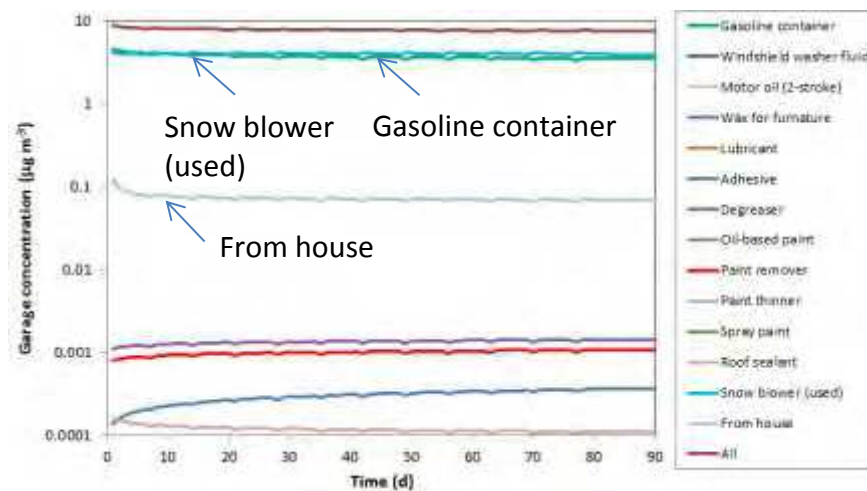


Figure 66 (d): Benzene (garage, used equipment, winter)

Figure 66: Predicted concentration of benzene in the house and garage (winter)

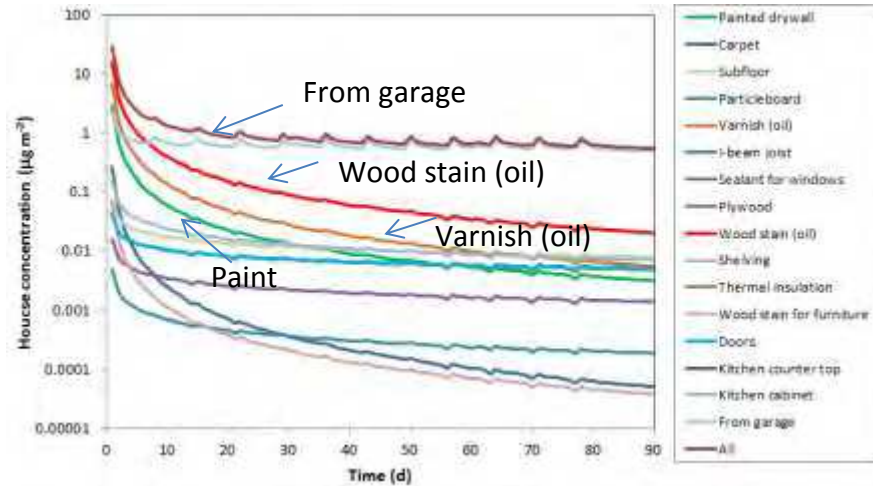


Figure 67 (a): 1,2-dimethylbenzene (house, new equipment, summer)

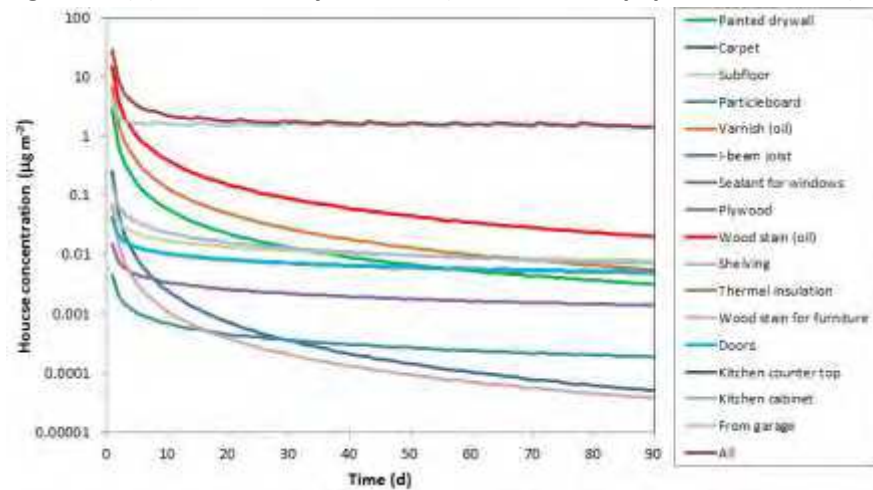


Figure 67 (c): 1,2-dimethylbenzene (house, used equipment, summer)

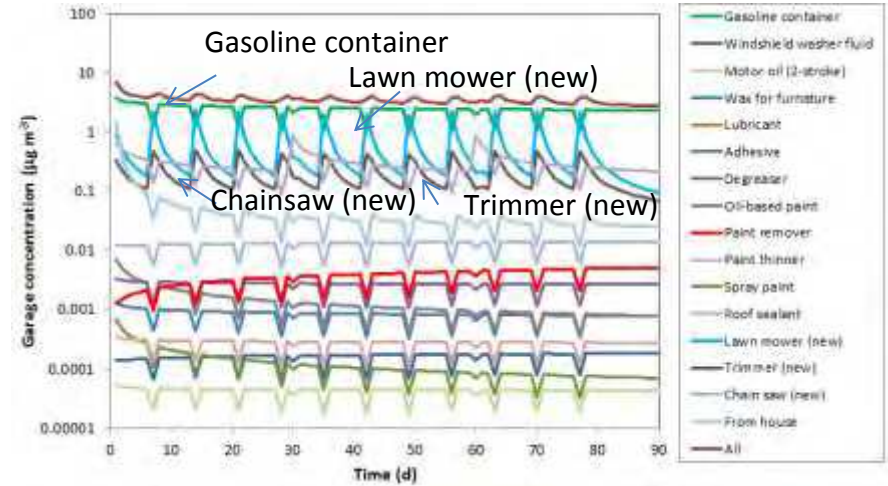


Figure 67 (b): 1,2-dimethylbenzene (garage, new equipment, summer)

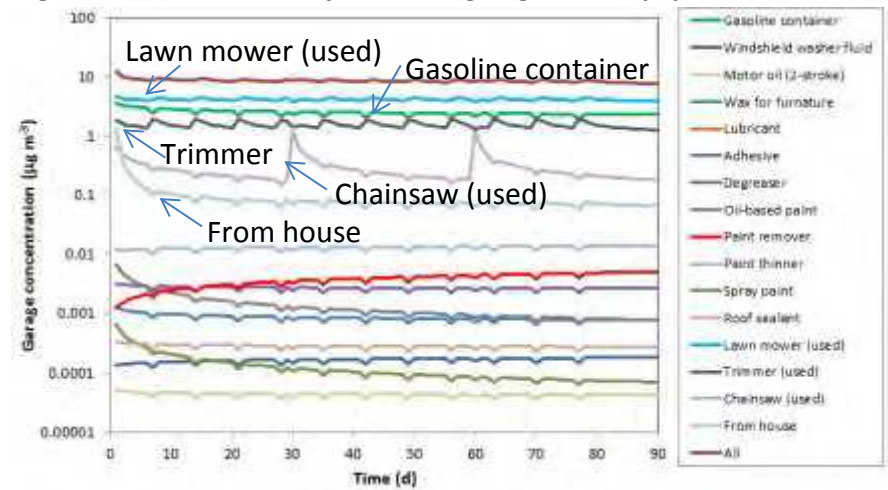


Figure 67 (d): 1,2-dimethylbenzene (garage, used equipment, summer)

Figure 67: Predicted concentration of 1,2-dimethylbenzene in the house and garage (summer)

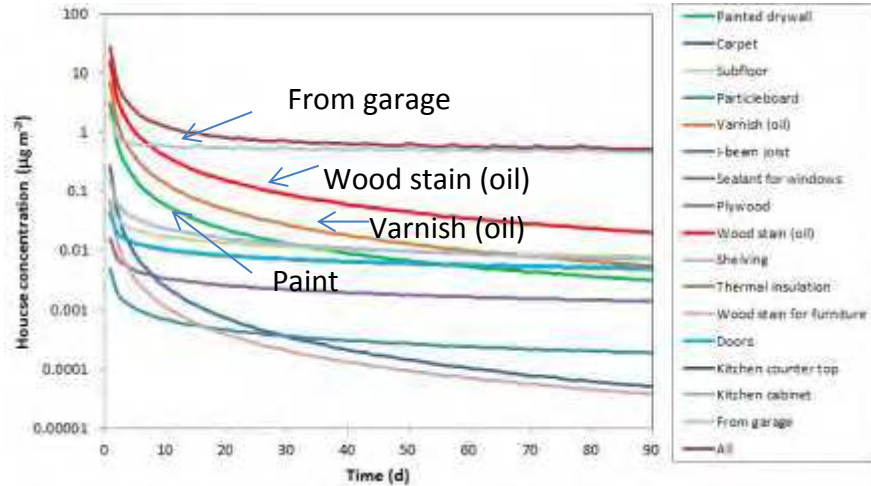


Figure 68 (a): 1,2-dimethylbenzene (house, new equipment, winter)

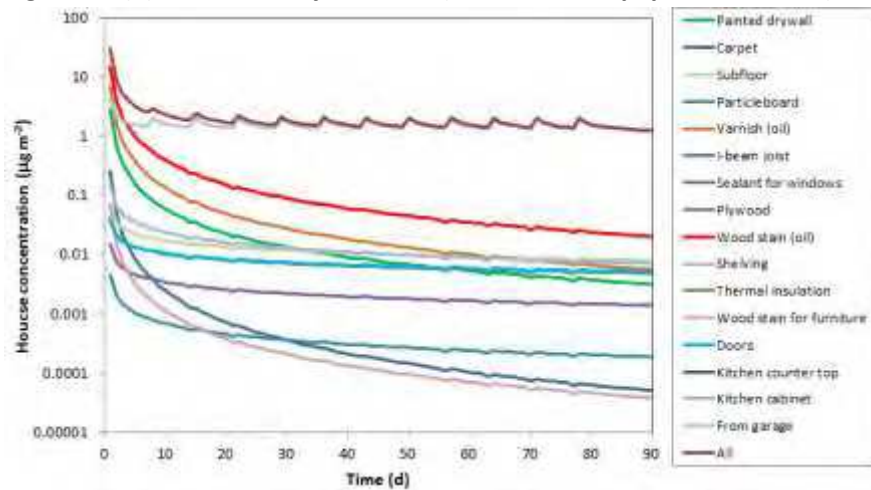


Figure 68 (c): 1,2-dimethylbenzene (house, used equipment, winter)

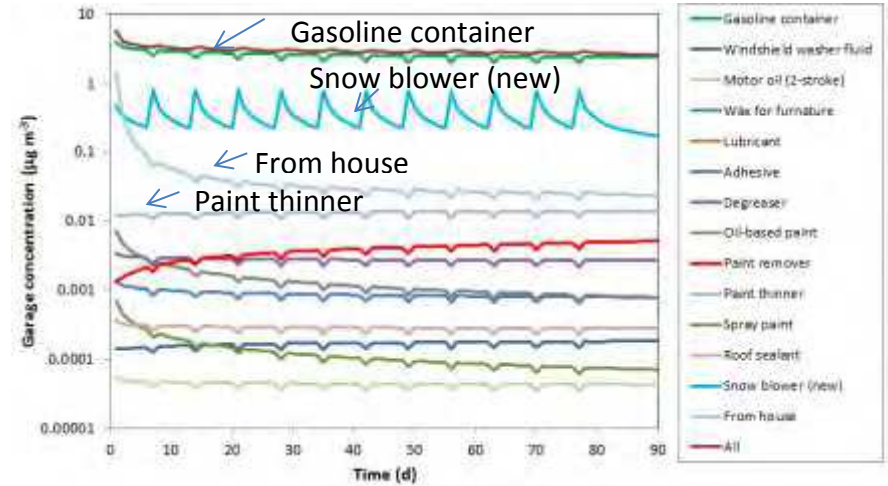


Figure 68 (b): 1,2-dimethylbenzene (garage, new equipment, winter)

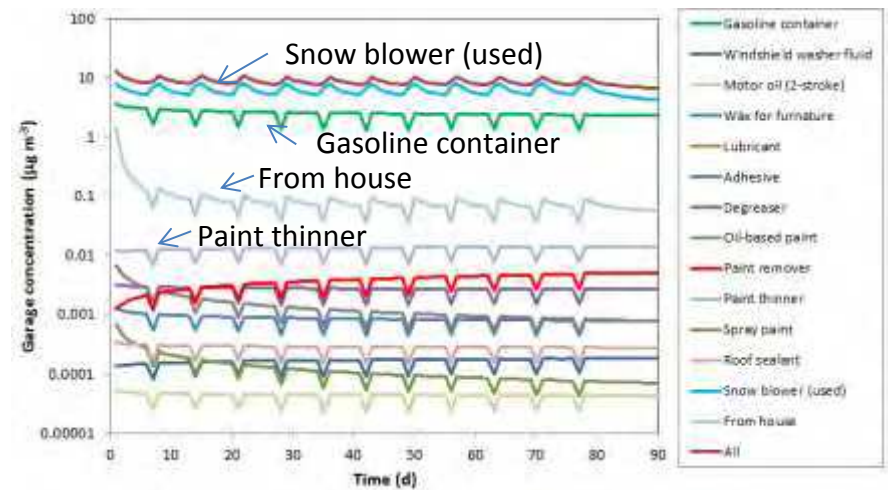


Figure 68 (d): 1,2-dimethylbenzene (garage, used equipment, winter)

Figure 68: Predicted concentration of 1,2-dimethylbenzene in the house and garage (winter)

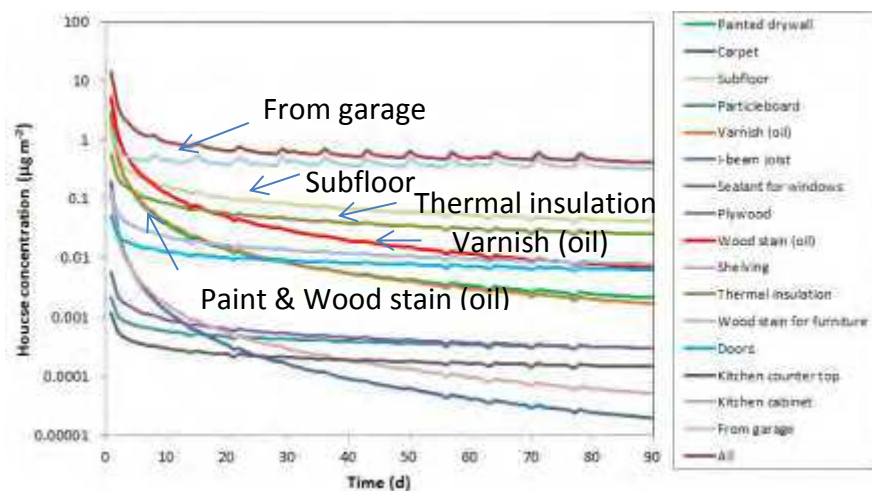


Figure 69 (a): Ethylbenzene (house, new equipment, summer)

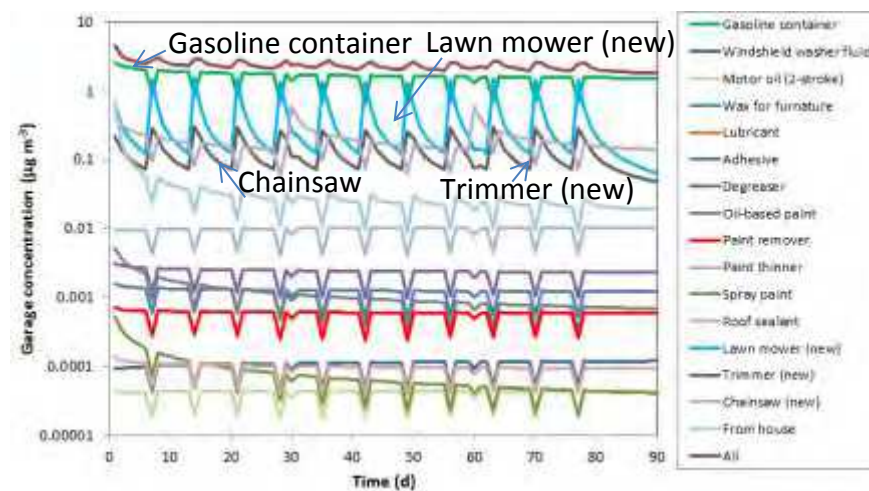


Figure 69 (b): Ethylbenzene (garage, new equipment, summer)

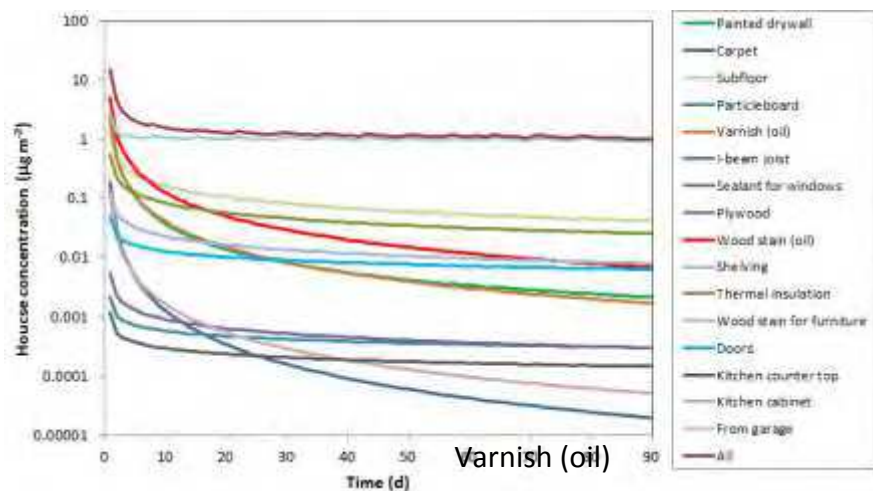


Figure 69 (c): Ethylbenzene (house, used equipment, summer)

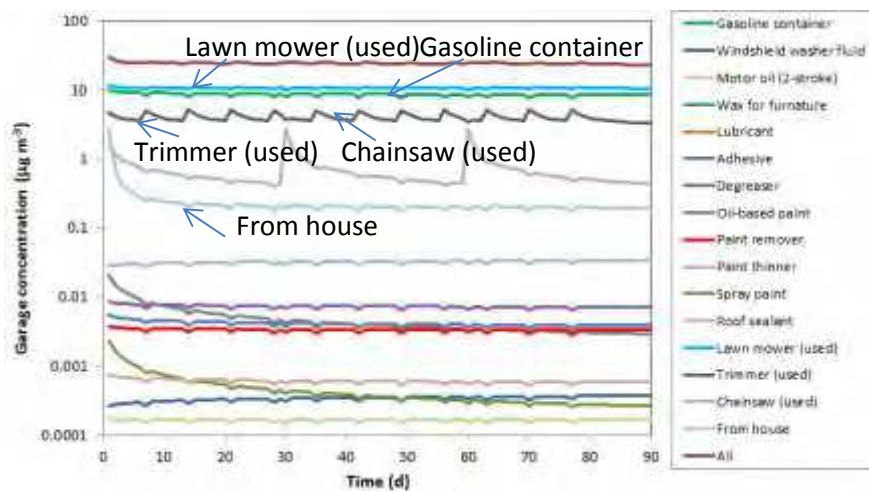


Figure 69 (d): Ethylbenzene (garage, used equipment, summer)

Figure 69: Predicted concentration of ethylbenzene in the house and garage (summer)

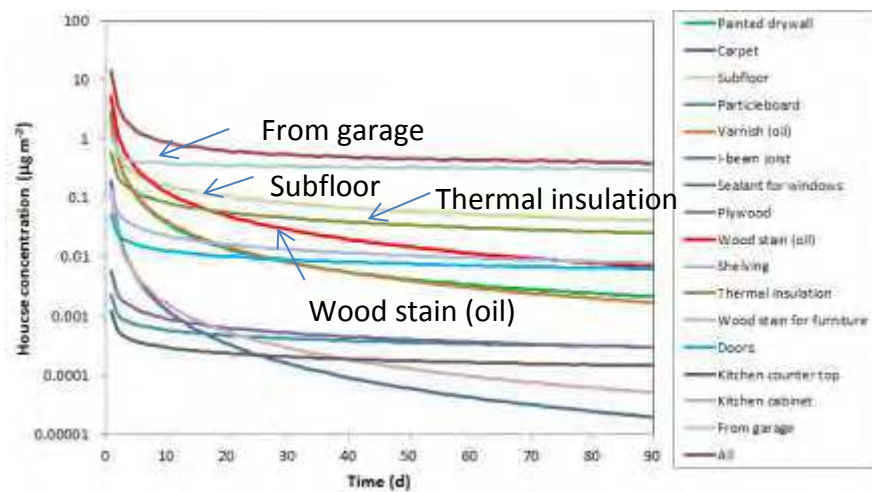


Figure 70 (a): Ethylbenzene (house, new equipment, winter)

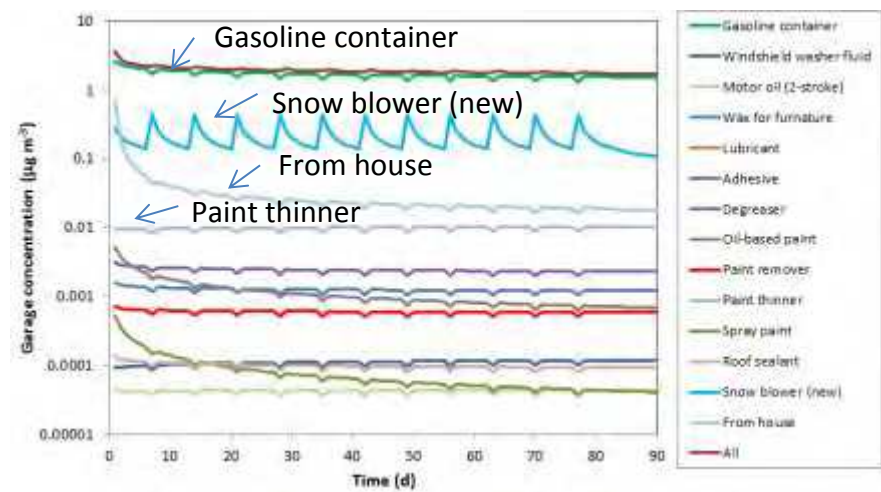


Figure 70 (b): Ethylbenzene (garage, new equipment, winter)

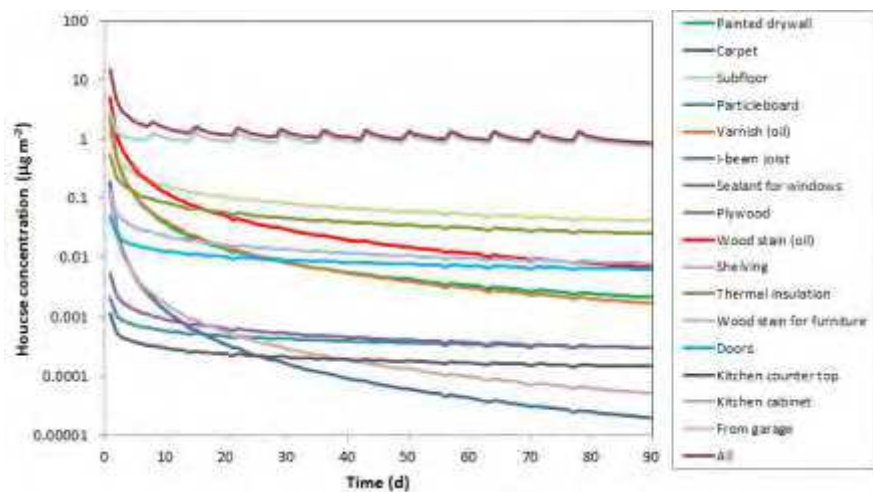


Figure 70 (c): Ethylbenzene (house, used equipment, winter)

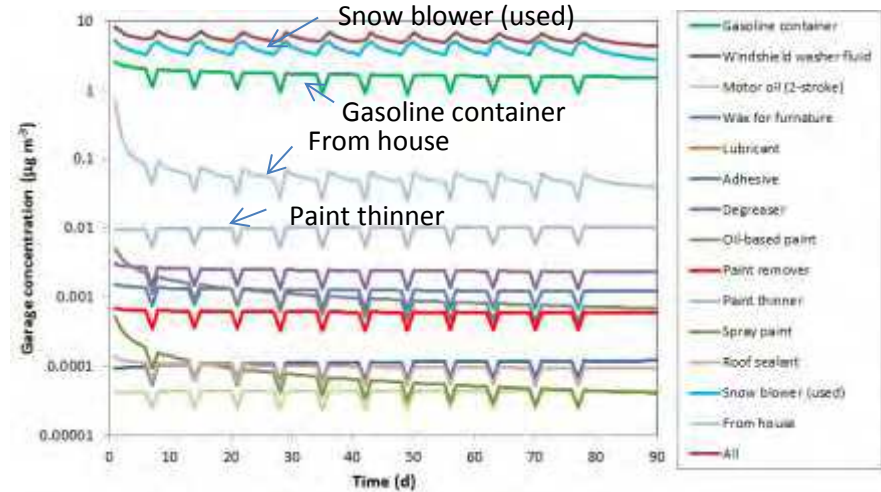


Figure 70 (d): Ethylbenzene (garage, used equipment, winter)

Figure 70: Predicted concentration of ethylbenzene in the house and garage (winter)

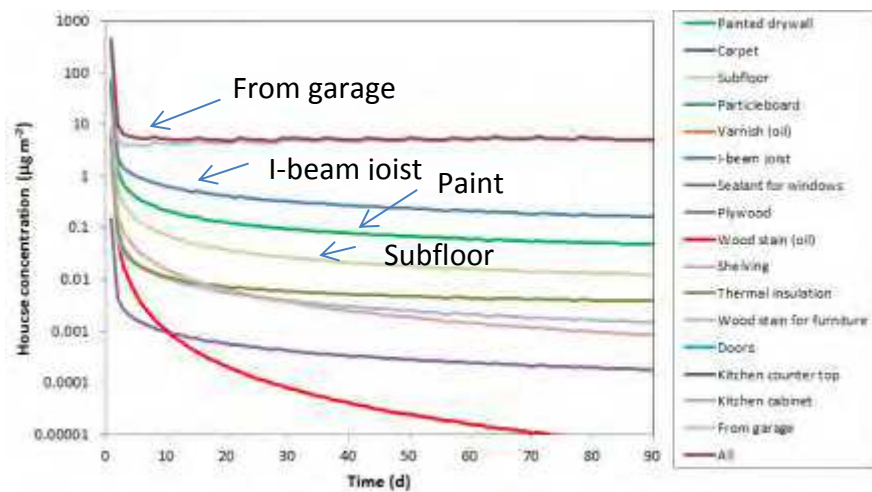


Figure 71 (a): Toluene house, new equipment, summer)

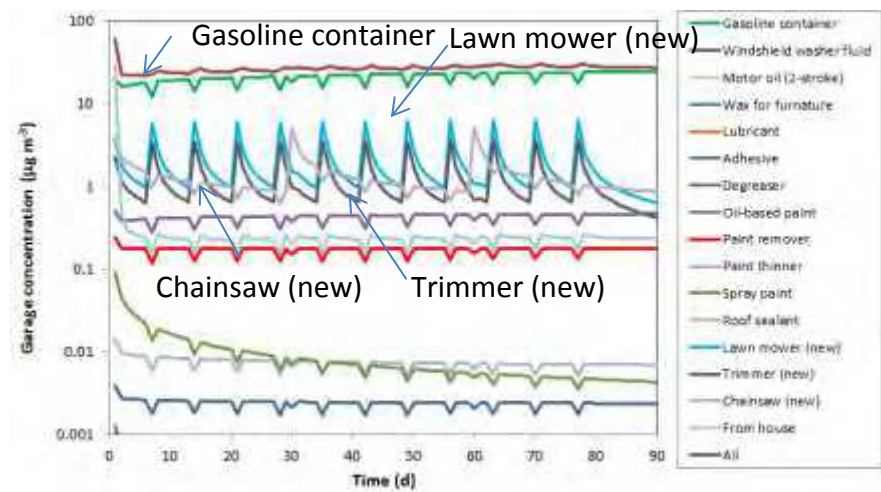


Figure 71 (b): Toluene (garage, new equipment, summer)

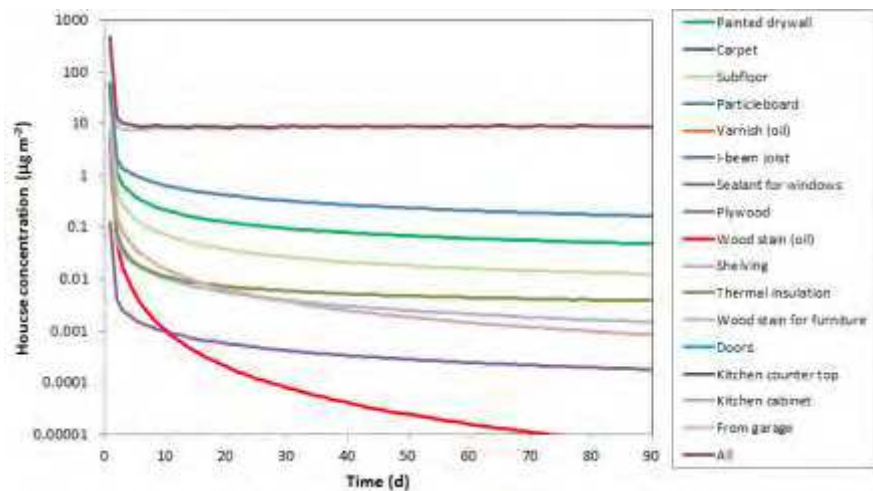


Figure 71 (c): Toluene (house, used equipment, summer)

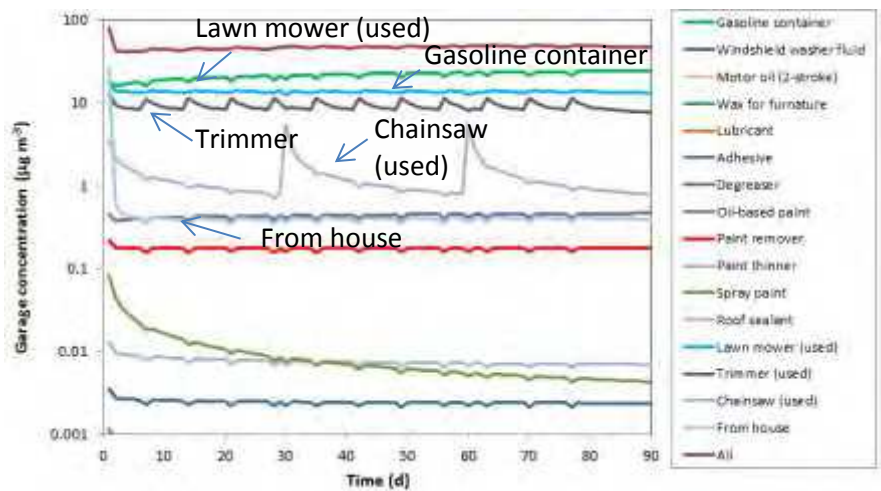


Figure 71 (d) : Toluene (garage, used equipment, summer)

Figure 71: Predicted concentration of toluene in the house and garage (summer)

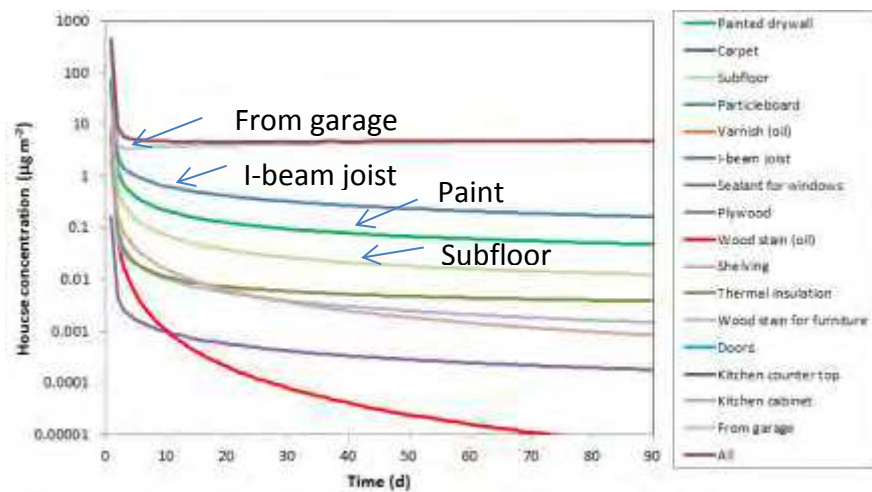


Figure 72 (a): Toluene (house, new equipment, winter)

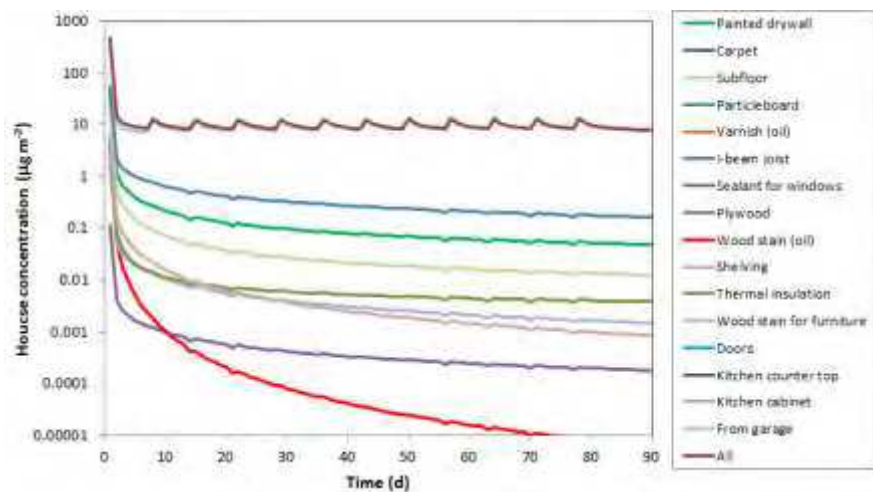


Figure 72 (c): Toluene (house, used equipment, winter)

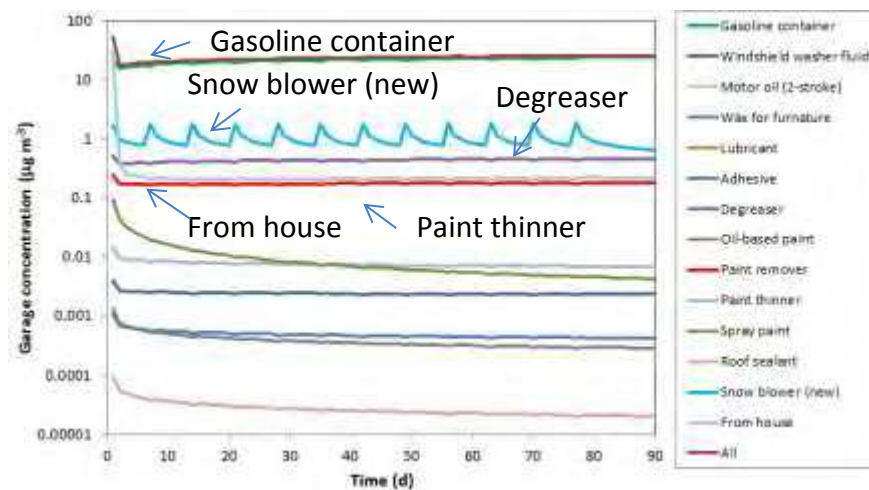


Figure 72 (b): Toluene (garage, new equipment, winter)

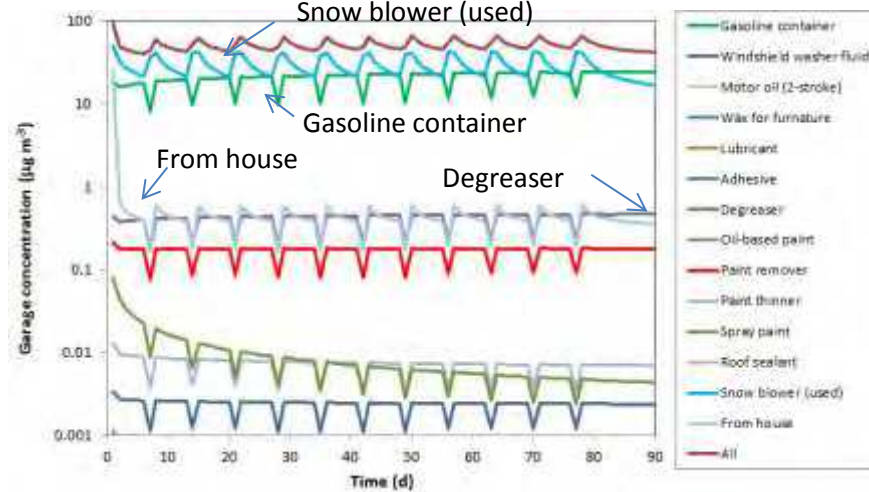


Figure 72 (d): Toluene (garage, used equipment, winter)

Figure 72: Predicted concentration of toluene in the house and garage (winter)

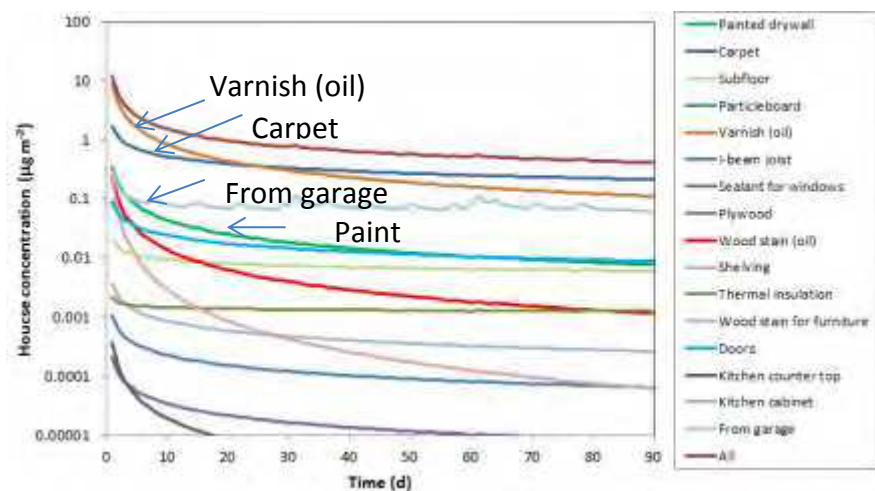


Figure 73 (a): Naphthalene house, new equipment, summer)

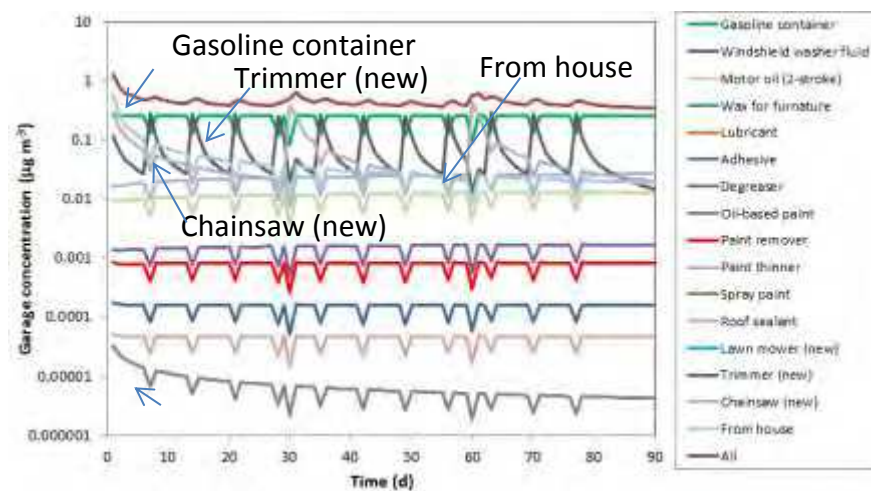


Figure 73 (b): Naphthalene (garage, new equipment, summer)

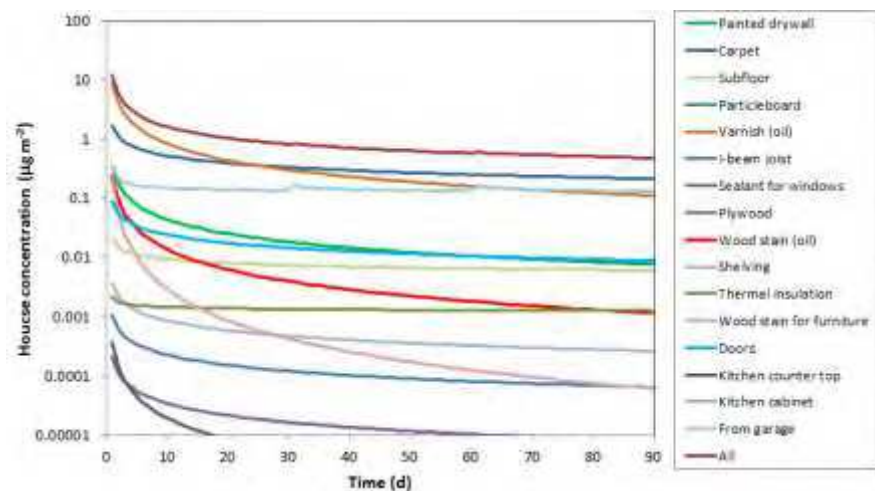


Figure 73 (c): Naphthalene (house, used equipment, summer)

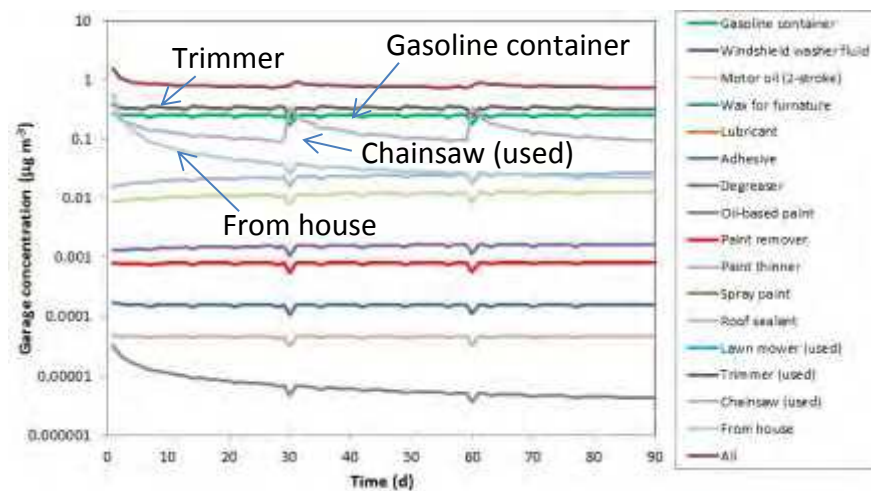


Figure 73 (d) : Naphthalene (garage, used equipment, summer)

Figure 73: Predicted concentration of naphthalene in the house and garage (summer)

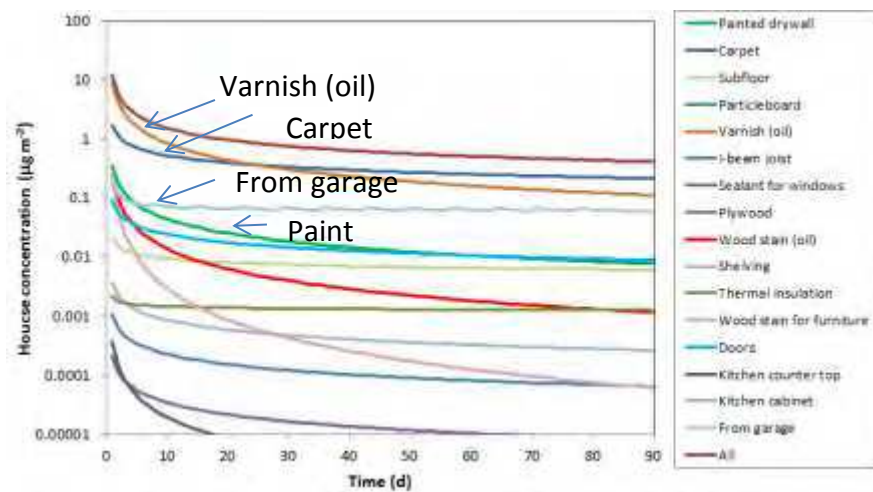


Figure 74 (a): Naphthalene (house, new equipment, winter)

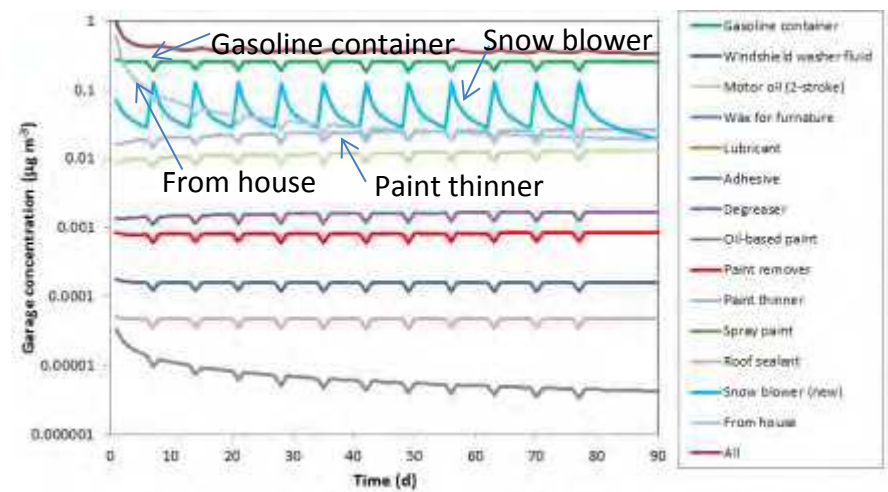


Figure 74 (b): Naphthalene garage, new equipment, winter)

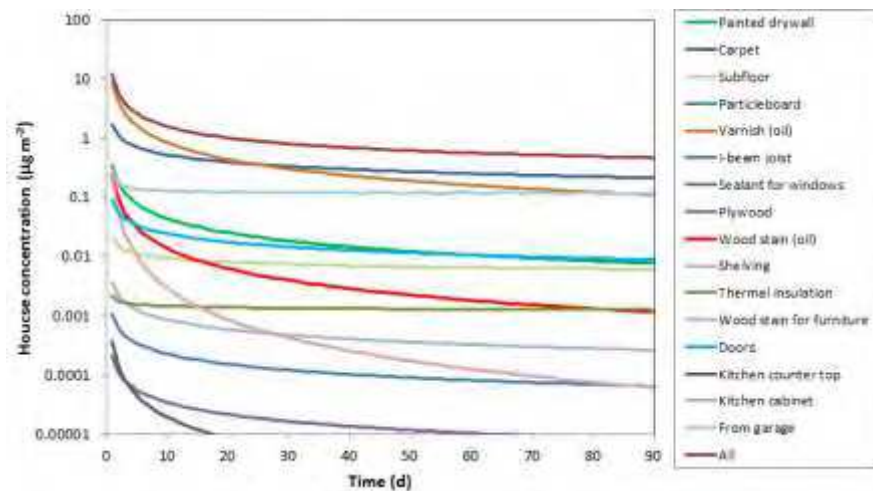


Figure 74 (c): Naphthalene (house, used equipment, winter)

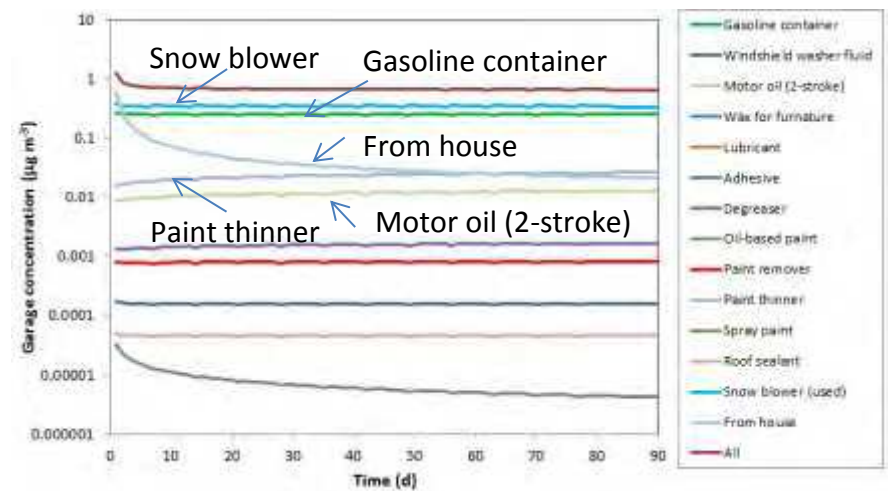


Figure 74 (d): Naphthalene (garage, used equipment, winter)

Figure 74: Predicted concentration of naphthalene in the house and garage (winter)

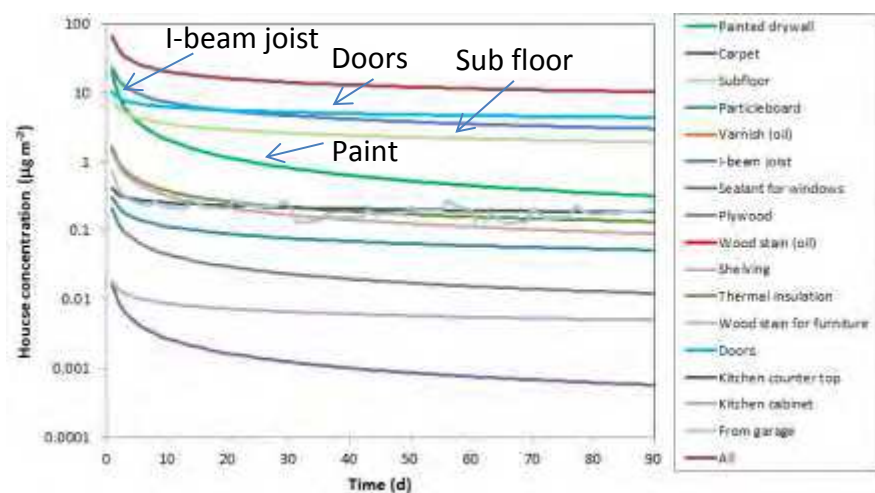


Figure 75 (a): Acetaldehyde house, new equipment, summer)

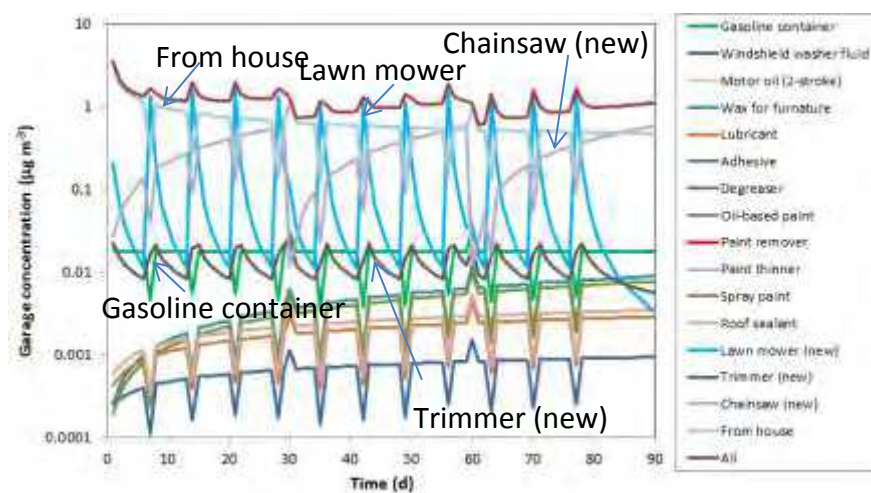


Figure 75 (b): Acetaldehyde (garage, new equipment, summer)

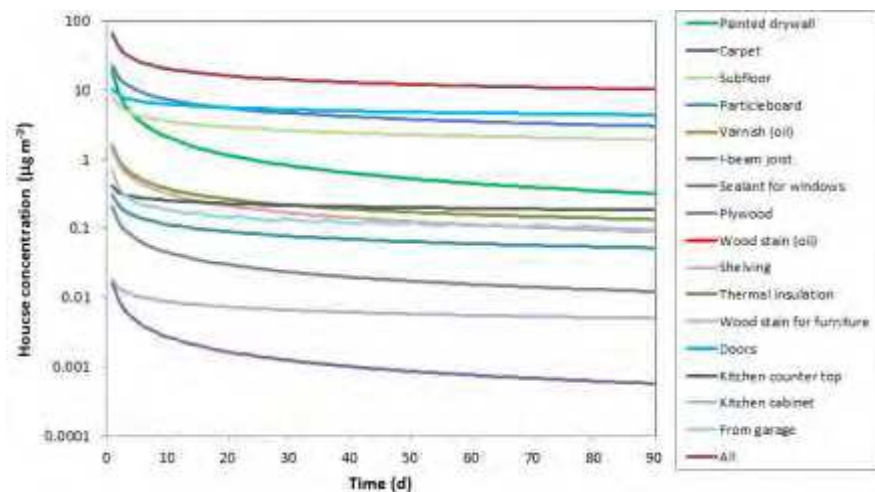


Figure 75 (c): Acetaldehyde (house, used equipment, summer)

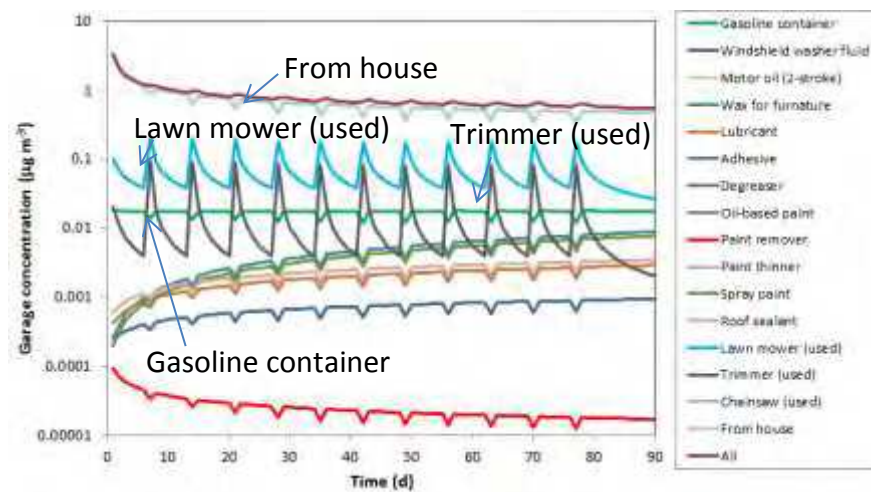


Figure 75 (d) : Acetaldehyde (garage, used equipment, summer)

Figure 75: Predicted concentration of acetaldehyde in the house and garage (summer)

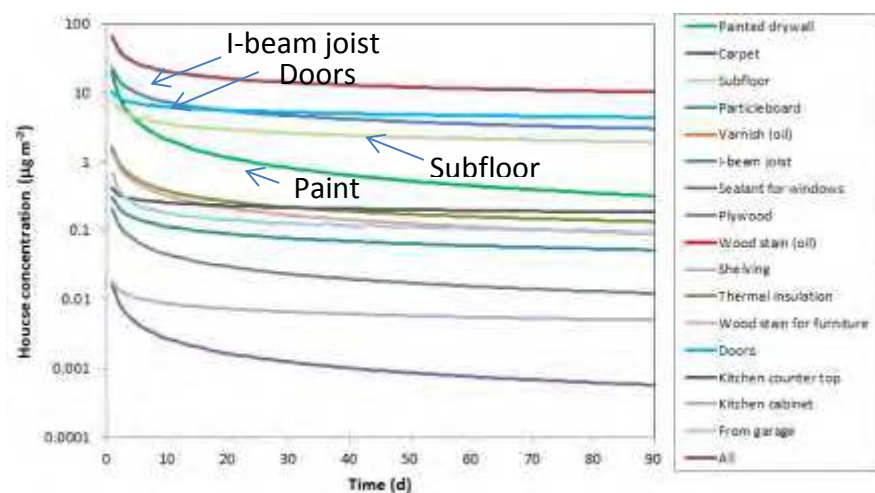


Figure 76 (a): Acetaldehyde (house, new equipment, winter)

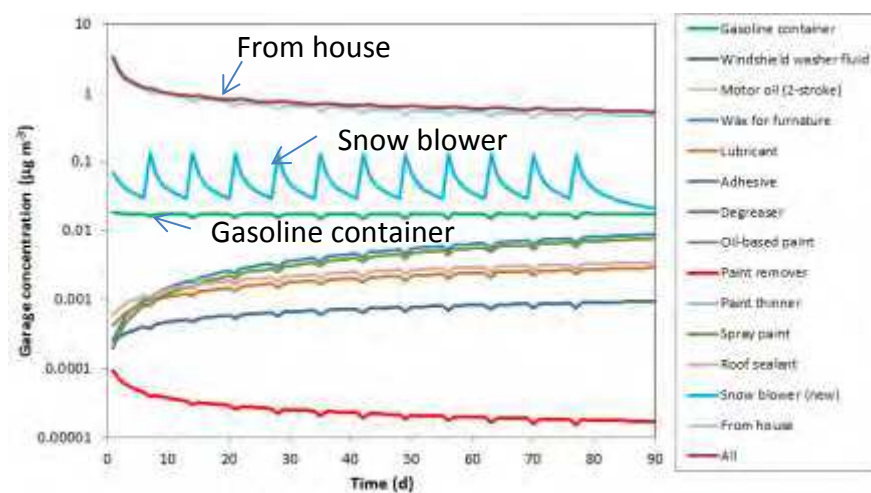


Figure 76 (b): Acetaldehyde garage, new equipment, winter)

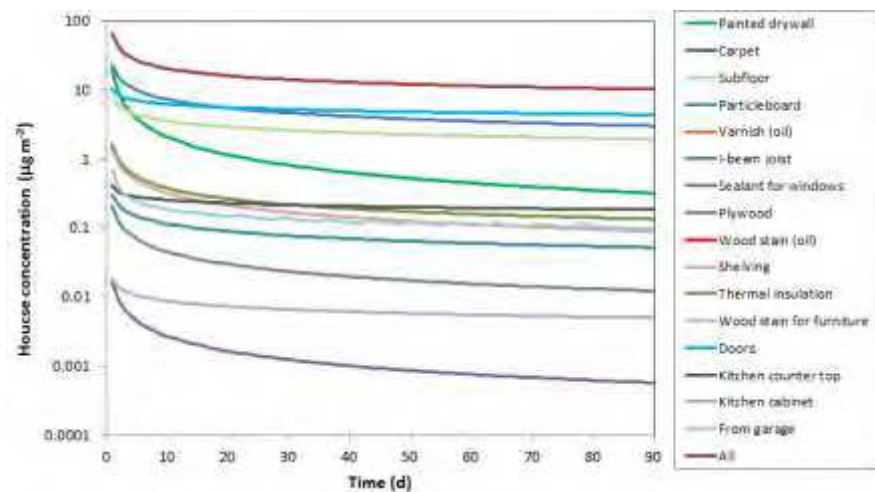


Figure 76 (c): Acetaldehyde (house, used equipment, winter)

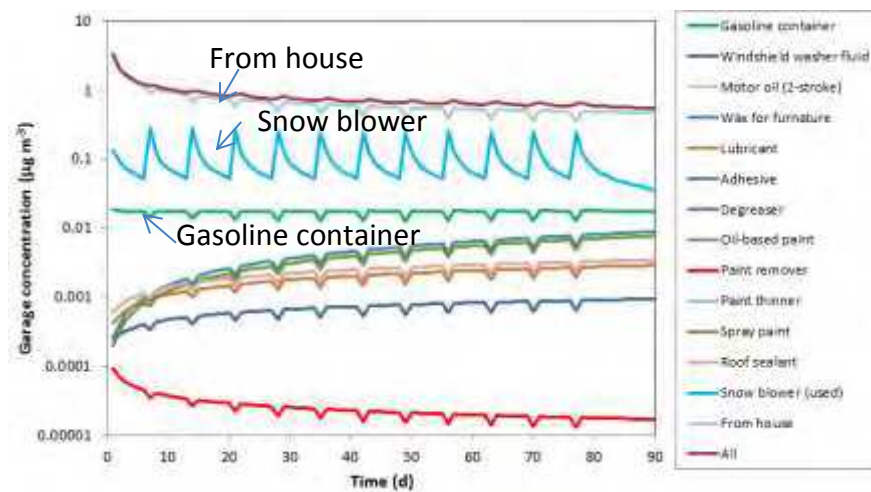


Figure 76 (d): Acetaldehyde (garage, used equipment, winter)

Figure 76: Predicted concentration of acetaldehyde in the house and garage (winter)

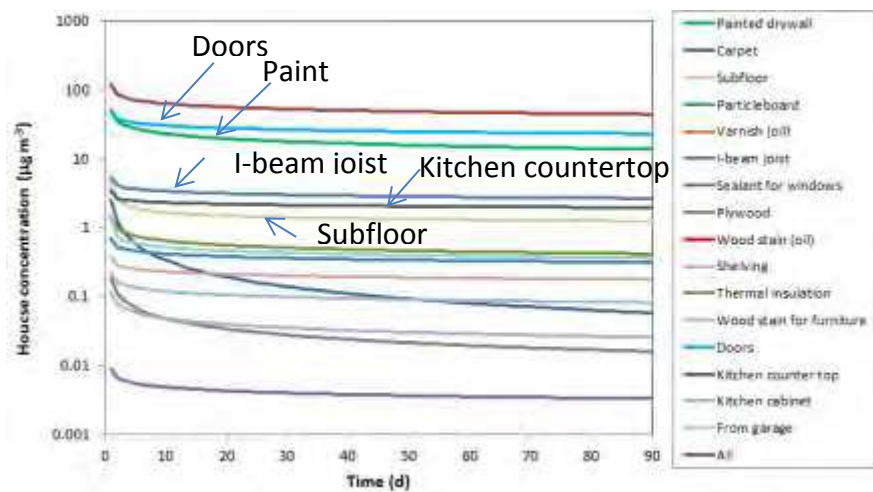


Figure 77 (a): Formaldehyde house, new equipment, summer)

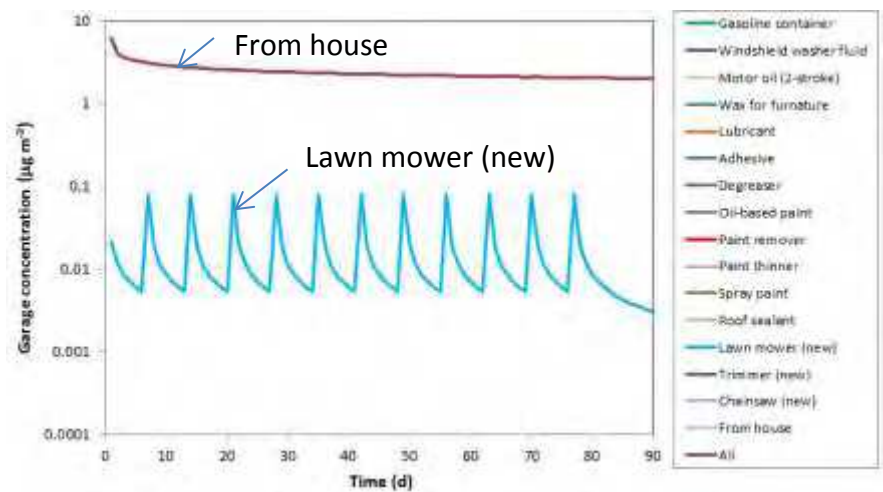


Figure 77 (b): Formaldehyde (garage, new equipment, summer)

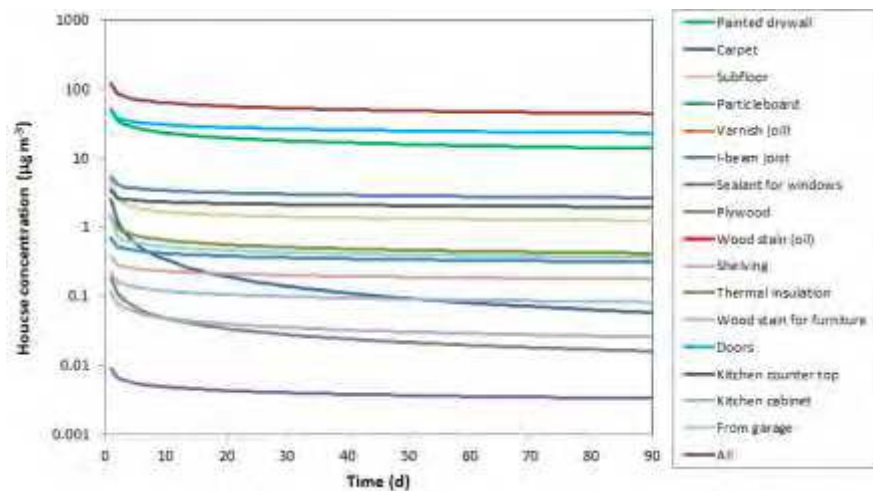


Figure 77 (c): Formaldehyde (house, used equipment, summer)

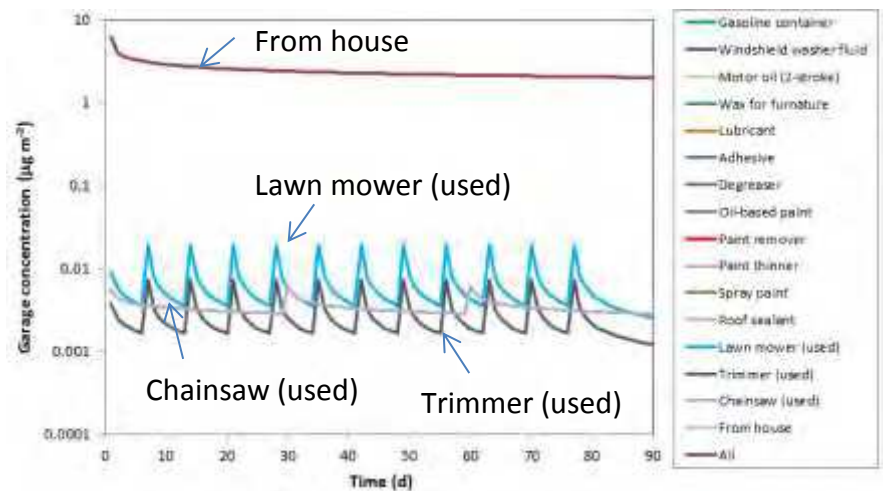


Figure 77 (d) : Formaldehyde (garage, used equipment, summer)

Figure 77: Predicted concentration of formaldehyde in the house and garage (summer)

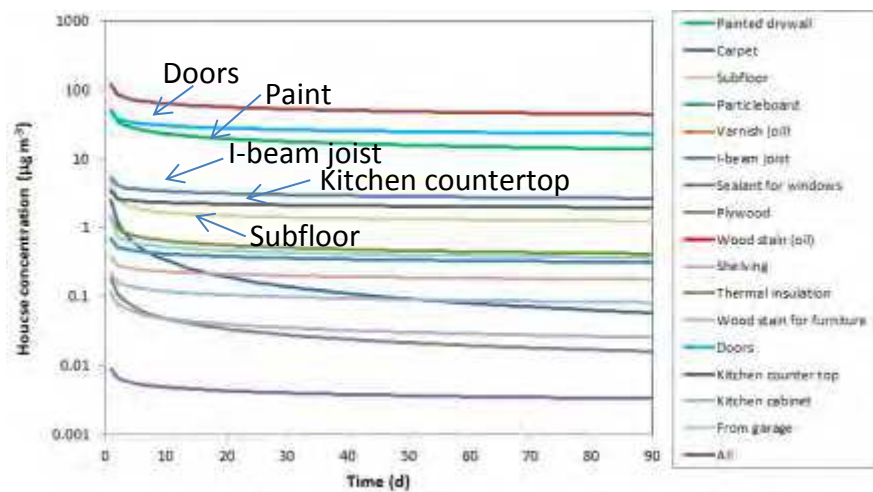


Figure 78 (a): Formaldehyde (house, new equipment, winter)

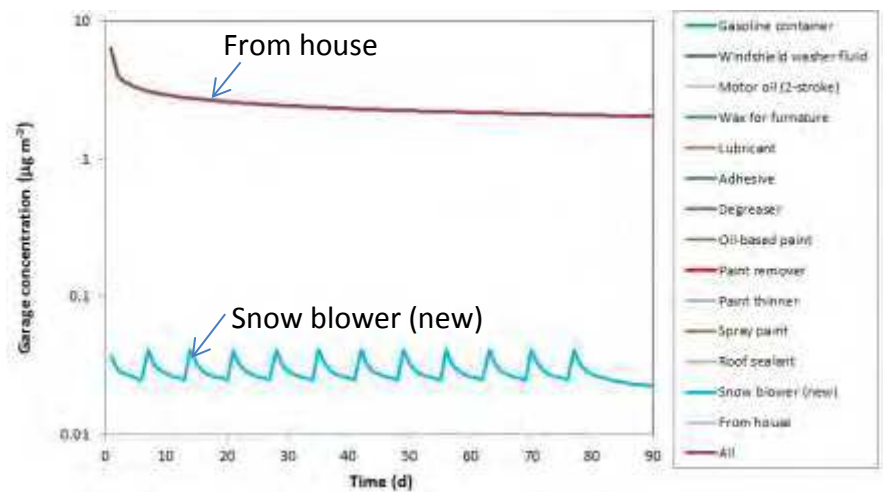


Figure 78 (b): Formaldehyde garage, new equipment, winter

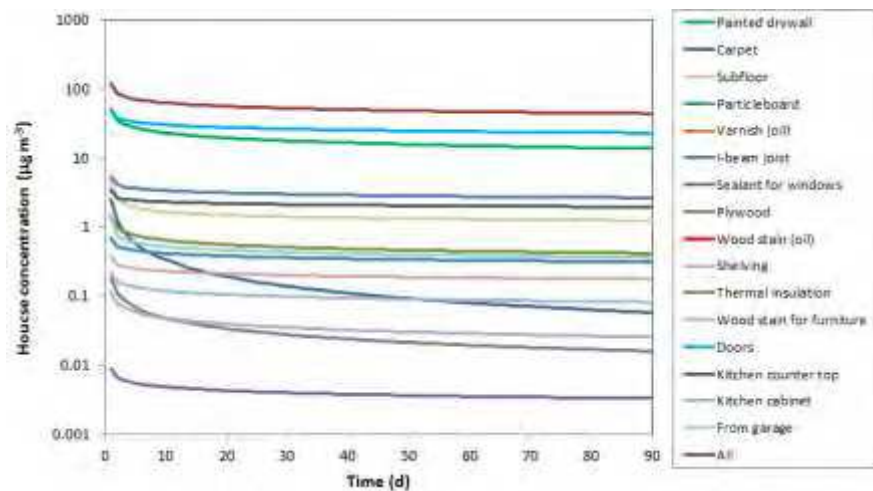


Figure 78 (c): Formaldehyde (house, used equipment, winter)

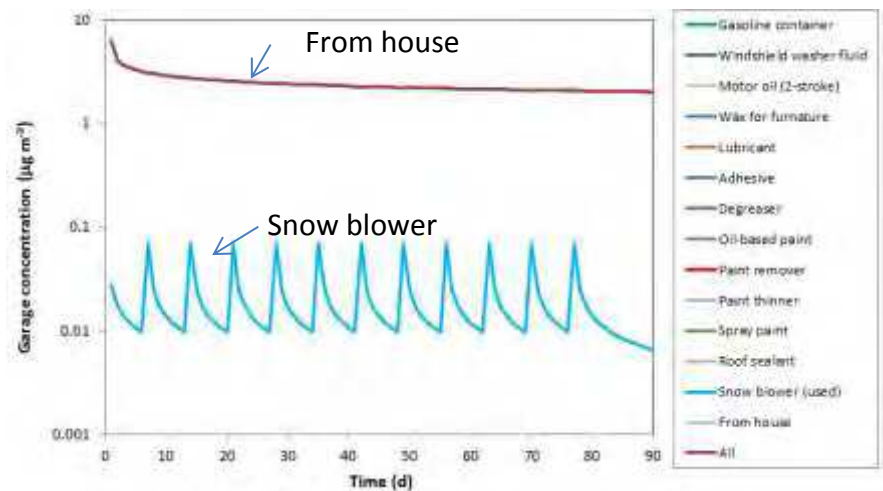


Figure 78 (d): Formaldehyde (garage, used equipment, winter)

Figure 78: Predicted concentration of formaldehyde in the house and garage (winter)

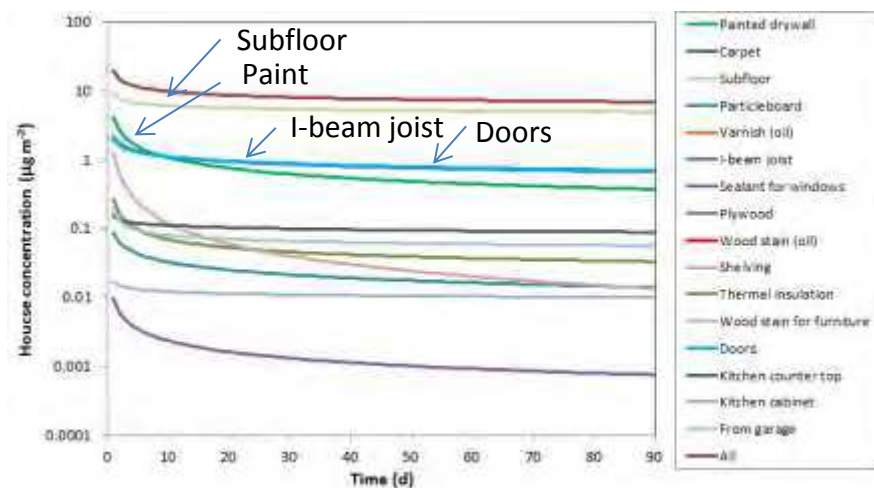


Figure 79 (a): Propanal house, new equipment, summer)

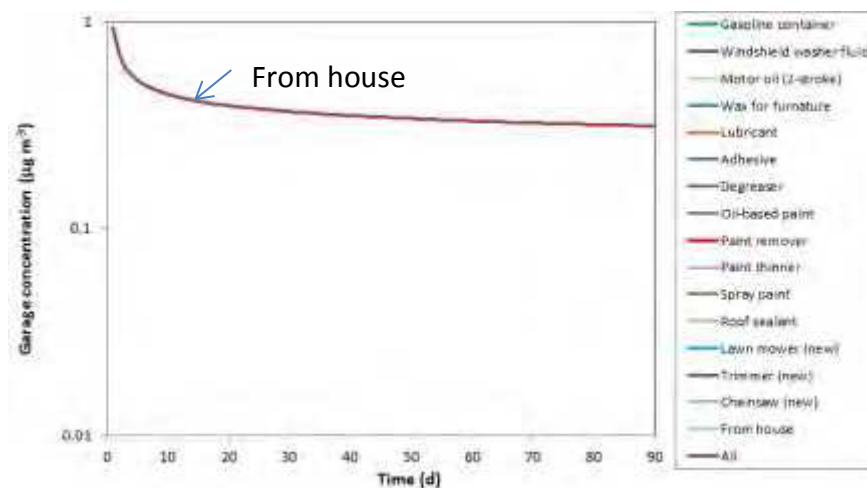


Figure 79 (b): Propanal (garage, new equipment, summer)

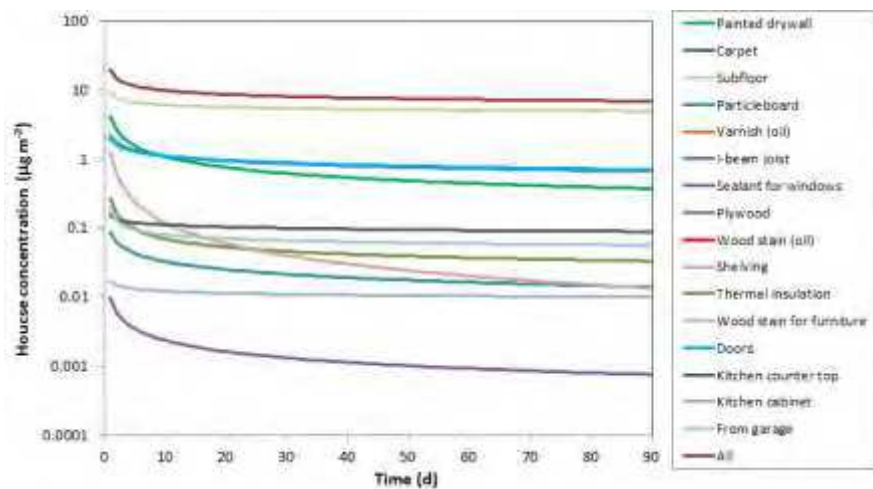


Figure 79 (c): Propanal (house, used equipment, summer)

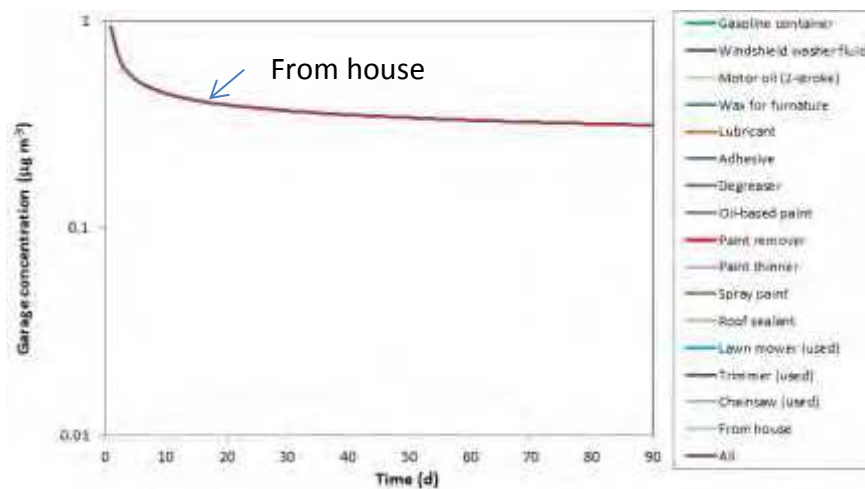


Figure 79 (d): Propanal (garage, used equipment, summer)

Figure 79: Predicted concentration of propanal in the house and garage (summer)

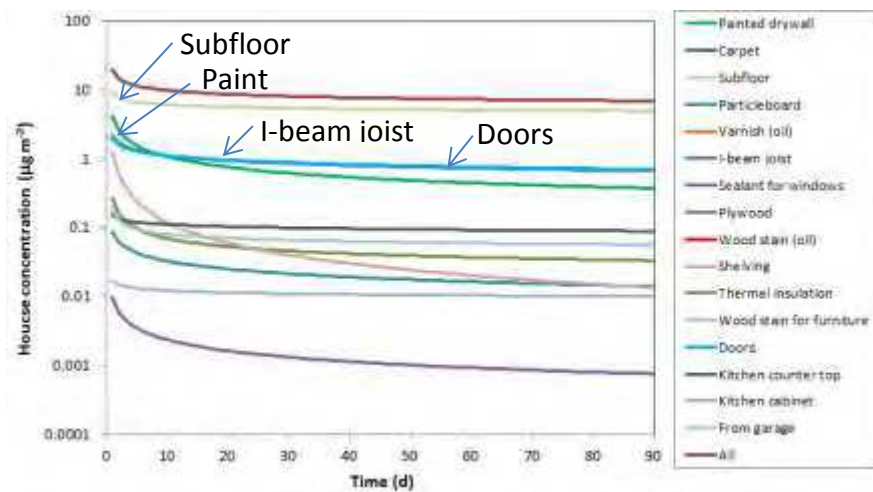


Figure 80 (a): Propanal (house, new equipment, winter)

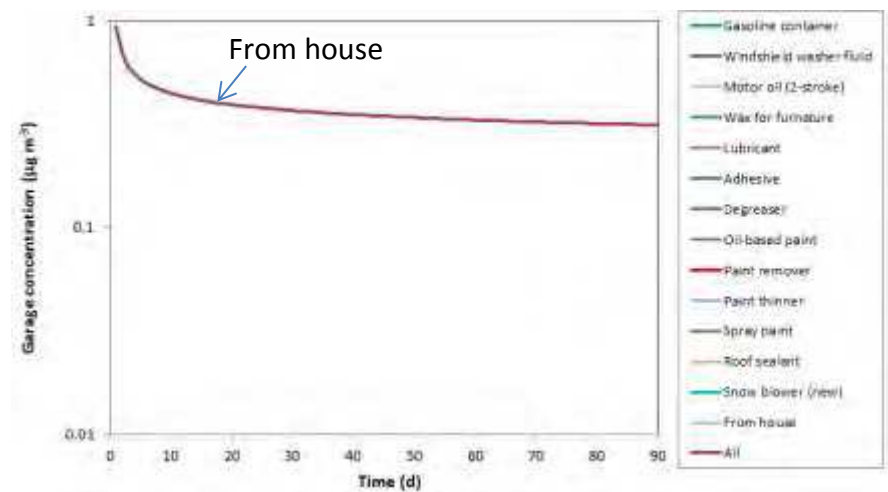


Figure 80 (b): Propanal (garage, new equipment, winter)

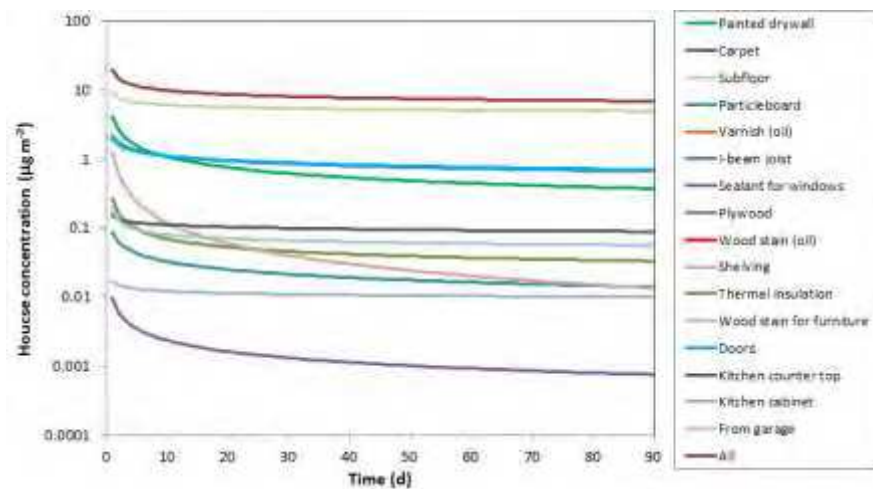


Figure 80 (c): Propanal (house, used equipment, winter)

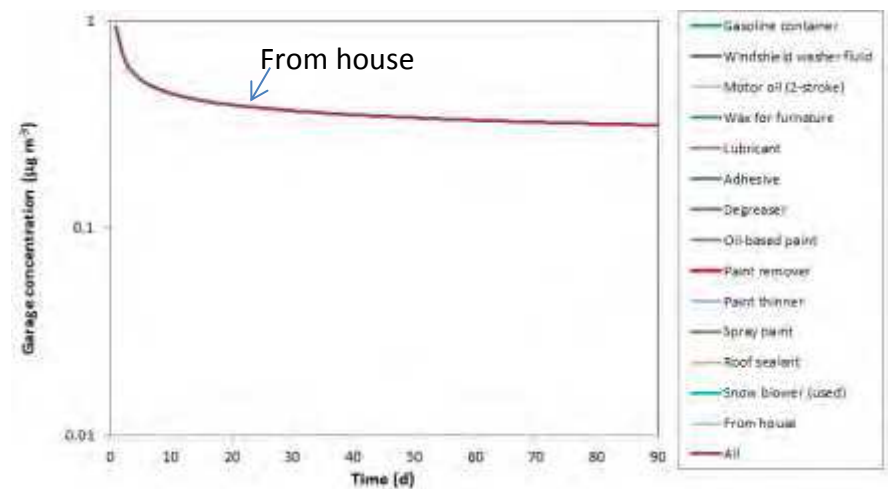


Figure 80 (d): Propanal (garage, used equipment, winter)

Figure 80: Predicted concentration of propanal in the house and garage (winter)

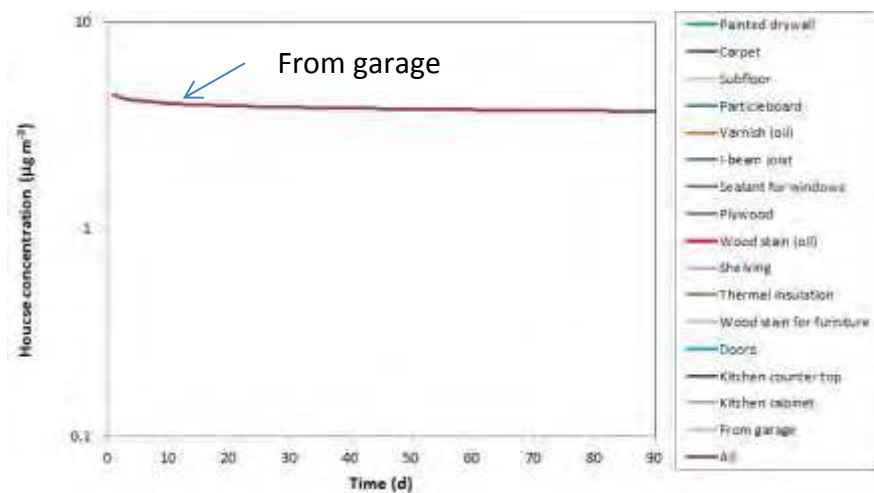


Figure 81 (a): Dichloromethane (house, new, summer)

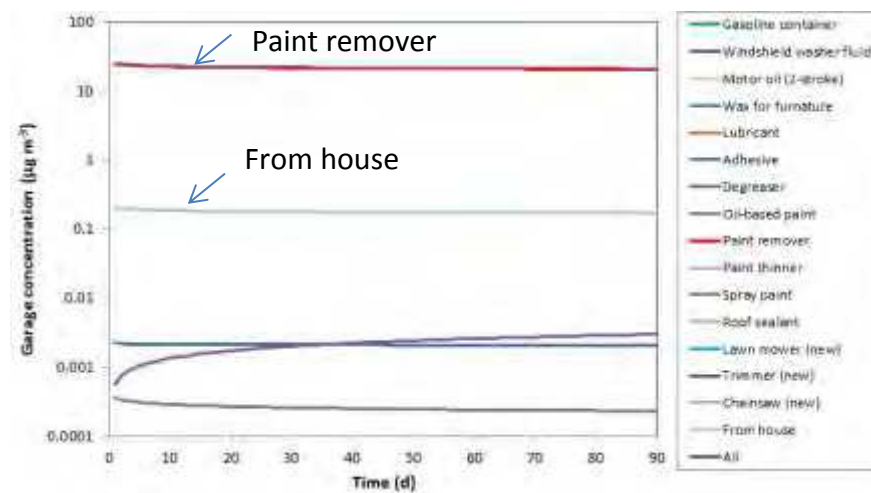


Figure 81 (b): Dichloromethane (garage, new equipment, summer)

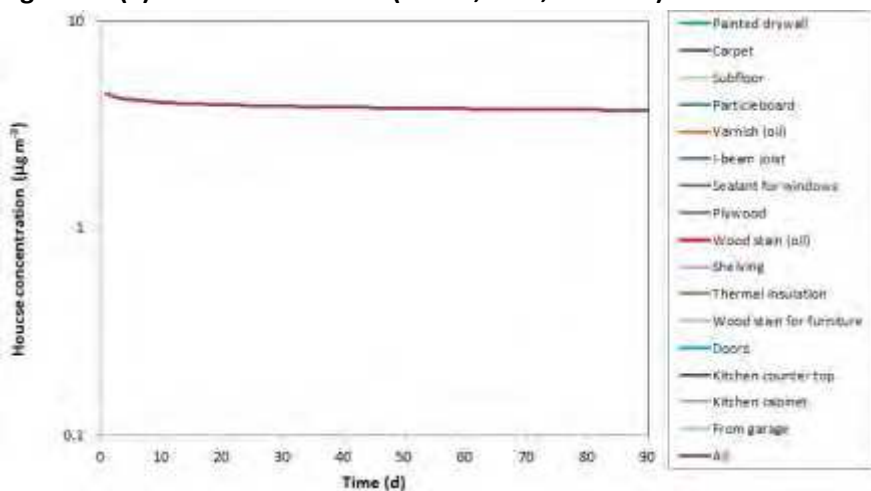


Figure 81 (c): Dichloromethane (house, used equipment, summer)

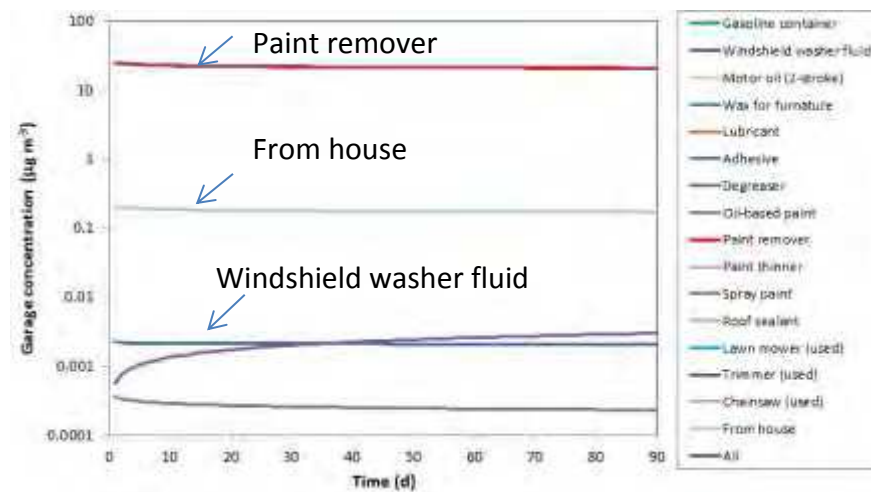


Figure 81 (d): Dichloromethane (garage, used equipment, summer)

Figure 81: Predicted concentration of dichloromethane in the house and garage (summer)

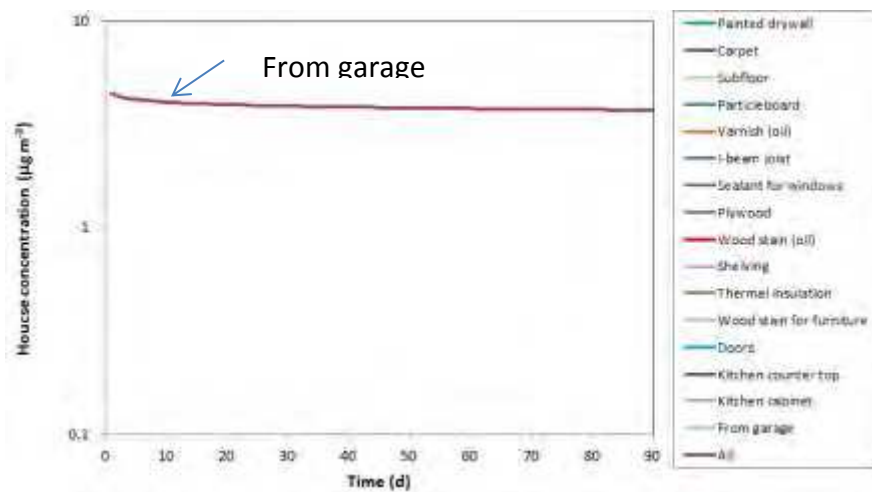


Figure 82 (a): Dichloromethane (house, new equipment, winter)

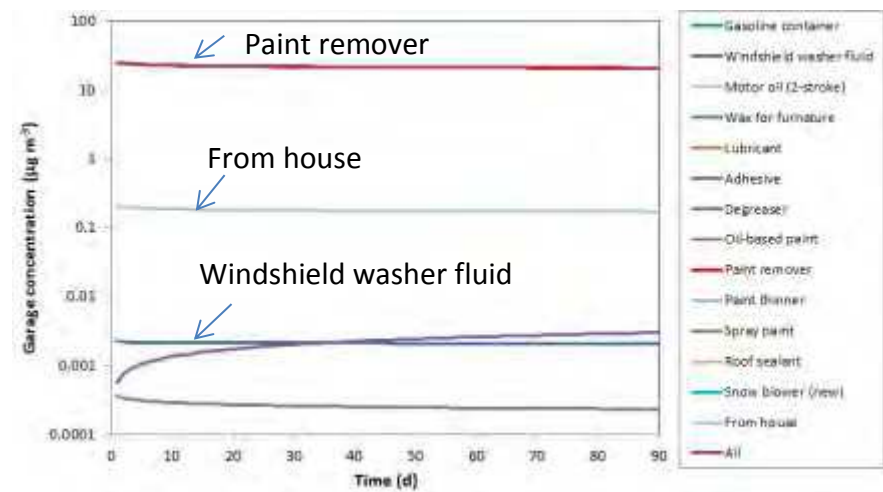


Figure 82 (b): Dichloromethane (garage, new equipment, winter)

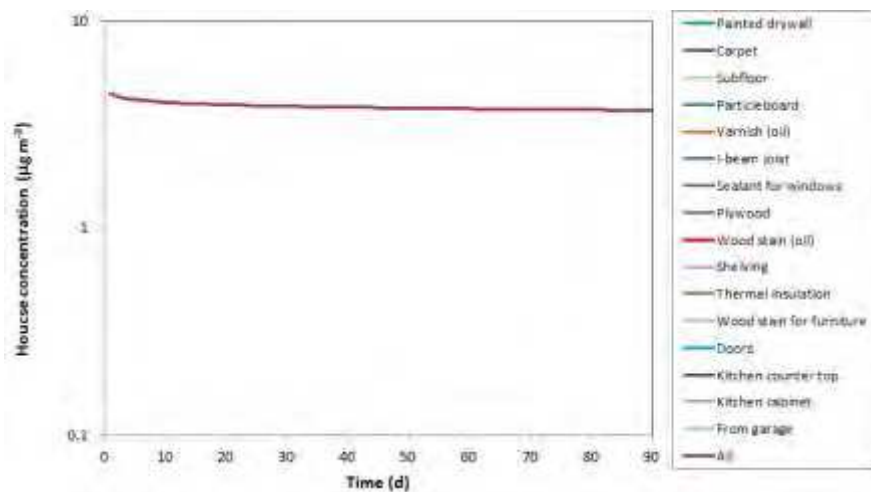


Figure 82 (c): Dichloromethane (house, used equipment, winter)

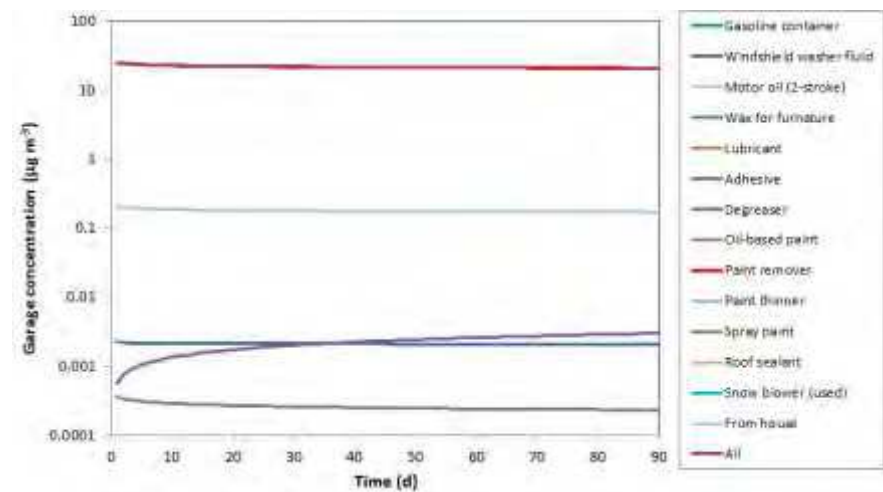


Figure 82 (d): Dichloromethane (garage, used equipment, winter)

Figure 82: Predicted concentration of dichloromethane in the house and garage (winter)

Table 26: Contribution (%) of different materials to concentrations of “priority chemicals” in the house and garage in summer

	House																	Garage																		
	House concentration	Painted drywall	Carpet	Subfloor	Particleboard	Varnish (oil)	I-beam joist	Sealant for windows	Plywood	Wood stain (oil)	Shelving	Thermal insulation	Wood stain for furniture	Doors	Kitchen counter top	Kitchen cabinet	From garage	Garage concentration	Gasoline container	Windshield washer fluid	Motor oil (2-stroke)	Wax for furniture	Lubricant	Adhesive	Degreaser	Oil-based paint	Paint remover	Paint thinner	Spray paint	Roof sealant	Lawn mower (new)	Trimmer (new)	Chainsaw (new)	From house		
	($\mu\text{g m}^{-3}$)	Contribution (%) at 7 day (summer, new equipment)																	($\mu\text{g m}^{-3}$)	Contribution (%) at 7 day (summer, new equipment)																
Benzene	1.2	18	0	0	0	0	2	0	0	0	3	0	0	0	0	0	77	5.1	60	0	0	0	0	0	0	0	0	0	0	0	18	18	3	1		
1,2-Dimethylbenzene	1.7	6	0	1	0	13	0	0	0	37	2	1	0	1	0	0	39	4.1	31	0	0	0	0	0	0	0	0	0	0	0	53	11	4	1		
1,3-Dimethylbenzene	3.4	7	0	0	0	10	0	0	0	24	0	0	0	1	0	0	57	12.1	35	0	0	0	0	0	0	0	0	0	0	0	51	10	3	1		
Ethylbenzene	1.1	6	0	18	0	6	0	0	0	18	2	9	0	1	0	0	39	2.7	32	0	0	0	0	0	0	0	0	0	0	0	53	10	3	1		
Naphthalene	2.0	3	31	1	0	59	0	0	0	1	0	0	0	1	0	0	4	0.5	26	0	1	0	0	0	0	0	2	0	0	0	55	6	9			
Toluene	5.2	6	0	2	0	0	15	0	0	0	0	0	0	0	0	0	76	22.9	54	0	0	0	0	1	0	1	0	0	0	25	15	4	1			
Acetaldehyde	23.5	12	0	17	1	0	36	0	0	0	0	2	2	28	1	0	1	1.7	0	0	0	0	0	0	0	0	0	0	0	79	1	2	17			
Formaldehyde	67.1	38	1	3	1	0	5	0	0	0	0	1	0	47	4	0	1	3.1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	97			
Propanal	10.5	12	0	60	0	0	12	0	0	0	0	1	2	11	1	0	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
Dichloromethane	4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	23.0	0	0	0	0	0	0	0	0	99	0	0	0	0	0	0	1		
2-Propanol	2.1	39	0	0	0	0	41	7	0	6	3	2	2	0	0	0	1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
	($\mu\text{g m}^{-3}$)	Contribution (%) at 3 month (summer, new equipment)																	($\mu\text{g m}^{-3}$)	Contribution (%) at 3 month (summer, new equipment)																
Benzene	0.9	13	0	0	0	0	2	0	0	0	0	2	0	0	0	0	84	4.2	83	0	0	0	0	0	0	0	0	0	0	12	2	3	1			
1,2-Dimethylbenzene	0.5	1	0	1	0	1	0	0	0	4	1	1	0	1	0	0	90	2.8	85	0	0	0	0	0	0	0	0	1	0	0	3	3	8	1		
1,3-Dimethylbenzene	1.8	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	97	9.7	89	0	0	0	0	0	0	0	0	0	0	3	2	6	1			
Ethylbenzene	0.4	1	0	10	0	0	0	0	0	2	2	6	0	2	0	0	78	1.8	84	0	0	0	0	0	0	0	1	0	0	4	3	8	1			
Naphthalene	0.4	2	52	1	0	27	0	0	0	0	0	0	0	2	0	0	15	0.4	73	0	4	0	0	0	0	0	8	0	0	0	4	6	5			
Toluene	5.0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	96	27.0	90	0	0	0	0	2	0	1	0	0	0	2	2	3	1			
Acetaldehyde	10.3	3	0	19	1	0	29	0	0	0	0	1	1	42	2	0	2	1.1	2	0	0	1	0	0	0	0	0	1	0	0	53	42				
Formaldehyde	43.9	31	0	3	1	0	6	0	0	0	0	1	0	52	4	0	1	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
Propanal	6.9	5	0	72	0	0	10	0	0	0	0	0	0	10	1	0	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
Dichloromethane	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	20.7	0	0	0	0	0	0	0	99	0	0	0	0	0	0	0	1		
2-Propanol	0.3	25	0	0	0	0	33	1	0	27	8	4	1	0	0	0	1	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100		
	($\mu\text{g m}^{-3}$)	Contribution (%) at 7 day (summer, used equipment)																	($\mu\text{g m}^{-3}$)	Contribution (%) at 7 day (summer, used equipment)																
Benzene	2.1	10	0	0	0	0	1	0	0	0	0	2	0	0	0	0	87	10.2	44	0	0	0	0	0	0	0	0	0	0	35	19	1	1			
1,2-Dimethylbenzene	2.6	4	0	1	0	9	0	0	0	24	1	0	0	0	0	0	60	9.0	27	0	0	0	0	0	0	0	0	0	0	47	22	3	1			
1,3-Dimethylbenzene	5.8	4	0	0	0	6	0	0	0	14	0	0	0	0	0	0	75	24.5	33	0	0	0	0	0	0	0	0	0	0	42	21	3	1			
Ethylbenzene	1.7	4	0	12	0	4	0	0	0	12	2	6	0	1	0	0	60	6.0	28	0	0	0	0	0	0	0	0	0	0	47	22	3	1			
Naphthalene	2.1	3	30	0	0	57	0	0	0	1	0	0	0	1	0	0	7	0.9	28	0	1	0	0	0	0	0	2	0	0	0	43	16	10			
Toluene	8.7	3	0	1	0	0	9	0	0	0	0	0	0	0	0	0	86	42.4	38	0	0	0	0	1	0	0	0	0	0	31	26	3	1			
Acetaldehyde	23.5	12	0	17	1	0	36	0	0	0	0	2	2	28	1	0	1	1.2	1	0	0	0	0	0	0	0	0	0	0	17	8	0	73			
Formaldehyde	67.1	38	1	3	1	0	5	0	0	0	0	1	0	47	4	0	1	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
Propanal	10.5	12	0	60	0	0	12	0	0	0	0	1	2	11	1	0	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
Dichloromethane	4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	23.0	0	0	0	0	0	0	0	99	0	0	0	0	0	0	0	1		
2-Propanol	2.1	39	0	0	0	0	41	7	0	6	3	2	2	0	0	0	1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100		
	($\mu\text{g m}^{-3}$)	Contribution (%) at 3 month (summer, used equipment)																	($\mu\text{g m}^{-3}$)	Contribution (%) at 3 month (summer, used equipment)																
Benzene	1.9	6	0	0	0	0	1	0	0	0	0	1	0	0	0	0	92	9.9	36	0	0	0	0	0	0	0	0	0	0	51	12	1	1			
1,2-Dimethylbenzene	1.4	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	96	7.8	30	0	0	0	0	0	0	0	0	0	0	50	16	2	1			
1,3-Dimethylbenzene	4.2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	99	22.9	37	0	0	0	0	0	0	0	0	0	0	45	14	2	1			
Ethylbenzene	1.0	0	0	4	0	0	0	0	0	1	1	3	0	1	0	0	91	5.1	30	0	0	0	0	0	0	0	0	0	0	51	16	2	1			
Naphthalene	0.5	2	45	1	0	23	0	0	0	0	0	0	0	2	0	0	27	0.7	35	0	2	0	0	0	0	0	4	0	0	0	43	13	3			
Toluene	8.6	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	97	46.7	52	0	0	0	0	1	0	0	0	0	0	28	16	2	1			
Acetaldehyde	10.2	3	0	19	1	0	29	0	0	0	0	1	1	43	2	0	1	0.5	3	0	0	2	1	0	0	0	0	1	1	5	0	0	87			
Formaldehyde	43.9	31	0	3	1	0	6	0	0	0	0	1	0	52	4	0	1	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
Propanal	6.9	5	0	72	0	0	10	0	0	0	0	0	0	10	1	0	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
Dichloromethane	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	20.7	0	0	0	0	0	0	0	99	0	0	0	0	0	0	0	1		
2-Propanol	0.3	25	0	0	0	0	33	1	0	27	8	4	1	0	0	0	1	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100		

Note: High contributions are highlighted (green for >50% and yellow for 10 – 50%)

Table 27: Contribution (%) of different materials to concentrations of “priority chemicals” in the house and garage in winter

	House																Garage																	
	House concentration	Painted drywall	Carpet	Subfloor	Particleboard	Varnish (oil)	I-beam joist	Sealant for windows	Plywood	Wood stain (oil)	Shelving	Thermal insulation	Wood stain for furniture	Doors	Kitchen counter top	Kitchen cabinet	From garage	Garage concentration	Gasoline container	Windshield washer fluid	Motor oil (2-stroke)	Wax for furniture	Lubricant	Adhesive	Degreaser	Oil-based paint	Paint remover	Paint thinner	Spray paint	Roof sealant	Snow blower (new)	From house		
	(µg m ⁻³)	Contribution (%) at 7 day (winter, new equipment)																(µg m ⁻³)	Contribution (%) at 7 day (winter, new equipment)															
Benzene	1.1	20	0	0	0	0	2	0	0	0	3	0	0	0	0	0	74	4.4	96	0	0	0	0	0	0	0	0	0	0	0	2	1		
1,2-Dimethylbenzene	1.7	6	0	1	0	14	0	0	0	39	2	1	0	1	0	0	36	3.3	74	0	0	0	0	0	0	0	0	0	0	0	24	2		
1,3-Dimethylbenzene	3.3	8	0	0	0	10	0	0	0	25	0	0	0	1	0	0	55	10.0	80	0	0	0	0	0	0	0	0	0	0	0	18	1		
Ethylbenzene	1.1	6	0	19	0	6	0	0	0	19	3	9	0	1	0	0	36	2.2	78	0	0	0	0	0	0	0	0	0	0	20	2			
Naphthalene	2.0	3	31	1	0	59	0	0	0	1	0	0	0	1	0	0	4	0.4	46	0	2	0	0	0	0	0	3	0	0	32	17			
Toluene	4.8	6	0	2	0	0	17	0	0	0	0	0	1	0	0	0	74	19.8	87	0	0	0	0	0	2	0	1	0	0	9	1			
Acetaldehyde	23.5	12	0	17	1	0	36	0	0	0	2	2	2	28	1	0	1	1.1	1	0	0	0	0	0	0	0	0	0	0	12	86			
Formaldehyde	67.1	38	1	3	1	0	5	0	0	0	0	1	0	47	4	0	1	3.1	0	0	0	0	0	0	0	0	0	0	0	1	99			
Propanal	10.5	12	0	60	0	0	12	0	0	0	0	1	2	11	1	0	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	100		
Dichloromethane	4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	23.0	0	0	0	0	0	0	0	0	99	0	0	0	0	1		
2-Propanol	2.1	39	0	0	0	0	41	7	0	6	3	2	2	0	0	0	1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	100		
	(µg m ⁻³)	Contribution (%) at 3 month (winter, new equipment)																(µg m ⁻³)	Contribution (%) at 3 month (winter, new equipment)															
Benzene	0.8	14	0	0	0	0	2	0	0	0	0	2	0	0	0	0	82	3.9	91	0	0	0	0	0	0	0	0	0	0	8	1			
1,2-Dimethylbenzene	0.5	1	0	2	0	1	0	0	0	4	1	1	0	1	0	0	89	2.6	92	0	0	0	0	0	0	0	0	1	0	0	7	1		
1,3-Dimethylbenzene	1.7	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	96	9.1	94	0	0	0	0	0	0	0	0	0	0	5	1			
Ethylbenzene	0.4	1	0	11	0	0	0	0	0	2	2	7	0	2	0	0	76	1.7	92	0	0	0	0	0	0	0	1	0	0	6	1			
Naphthalene	0.4	2	52	1	0	27	0	0	0	0	0	0	0	2	0	0	15	0.3	76	0	4	0	0	0	1	0	8	0	0	6	6			
Toluene	4.8	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	95	25.7	94	0	0	0	0	0	2	0	1	0	0	2	1			
Acetaldehyde	10.2	3	0	19	1	0	29	0	0	0	0	1	1	43	2	0	1	0.5	3	0	0	2	1	0	0	0	0	0	1	1	4	88		
Formaldehyde	43.9	31	0	3	1	0	6	0	0	0	0	1	0	52	4	0	1	2.0	0	0	0	0	0	0	0	0	0	0	0	1	99			
Propanal	6.9	5	0	72	0	0	10	0	0	0	0	0	0	10	1	0	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	100			
Dichloromethane	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	20.7	0	0	0	0	0	0	0	0	99	0	0	0	0	1		
2-Propanol	0.3	25	0	0	0	0	33	1	0	27	8	4	1	0	0	0	1	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	100		
	(µg m ⁻³)	Contribution (%) at 7 day (winter, used equipment)																(µg m ⁻³)	Contribution (%) at 7 day (winter, used equipment)															
Benzene	1.7	12	0	0	0	0	2	0	0	0	0	2	0	0	0	0	84	8.1	48	0	0	0	0	0	0	0	0	0	0	52	1			
1,2-Dimethylbenzene	2.5	4	0	1	0	9	0	0	0	25	1	0	0	0	0	0	58	8.7	19	0	0	0	0	0	0	0	0	0	0	0	81	1		
1,3-Dimethylbenzene	5.4	5	0	0	0	6	0	0	0	15	0	0	0	0	0	0	73	23.2	22	0	0	0	0	0	0	0	0	0	0	0	77	1		
Ethylbenzene	1.6	4	0	12	0	4	0	0	0	12	2	6	0	1	0	0	58	5.6	19	0	0	0	0	0	0	0	0	0	0	80	1			
Naphthalene	2.0	3	30	1	0	57	0	0	0	1	0	0	0	1	0	0	6	0.7	33	0	1	0	0	0	0	0	3	0	0	50	12			
Toluene	8.4	3	0	1	0	0	10	0	0	0	0	0	0	0	0	0	85	44.7	18	0	0	0	0	0	0	0	0	0	0	81	0			
Acetaldehyde	23.5	12	0	17	1	0	36	0	0	0	0	2	2	28	1	0	1	1.2	1	0	0	0	0	0	0	0	0	0	0	24	75			
Formaldehyde	67.1	38	1	3	1	0	5	0	0	0	0	1	0	47	4	0	1	3.1	0	0	0	0	0	0	0	0	0	0	0	2	98			
Propanal	10.5	12	0	60	0	0	12	0	0	0	0	1	2	11	1	0	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	100			
Dichloromethane	4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	23.0	0	0	0	0	0	0	0	0	99	0	0	0	0	1		
2-Propanol	2.1	39	0	0	0	0	41	7	0	6	3	2	2	0	0	0	1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	100		
	(µg m ⁻³)	Contribution (%) at 3 month (winter, used equipment)																(µg m ⁻³)	Contribution (%) at 3 month (winter, used equipment)															
Benzene	1.5	8	0	0	0	0	1	0	0	0	0	1	0	0	0	0	90	7.4	47	0	0	0	0	0	0	0	0	0	0	52	1			
1,2-Dimethylbenzene	1.2	0	0	1	0	0	0	0	0	2	1	0	0	0	0	0	96	6.7	35	0	0	0	0	0	0	0	0	0	0	0	64	1		
1,3-Dimethylbenzene	3.5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	98	19.3	44	0	0	0	0	0	0	0	0	0	0	0	54	1		
Ethylbenzene	0.9	0	0	5	0	0	0	0	0	1	1	3	0	1	0	0	89	4.3	35	0	0	0	0	0	0	0	0	0	0	63	1			
Naphthalene	0.5	2	46	1	0	24	0	0	0	0	0	0	0	2	0	0	25	0.6	39	0	2	0	0	0	0	0	4	0	0	51	3			
Toluene	7.7	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	97	41.7	58	0	0	0	0	0	1	0	0	0	0	39	1			
Acetaldehyde	10.2	3	0	19	1	0	29	0	0	0	0	1	1	43	2	0	1	0.5	3	0	0	2	1	0	0	0	0	0	1	1	7	86		
Formaldehyde	43.9	31	0	3	1	0	6	0	0	0	0	1	0	52	4	0	1	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	100		
Propanal	6.9	5	0	72	0	0	10	0	0	0	0	0	0	10	1	0	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	100			
Dichloromethane	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	20.7	0	0	0	0	0	0	0	0	99	0	0	0	0	1		
2-Propanol	0.3	25	0	0	0	0	33	1	0	27	8	4	1	0	0	0	1	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	100		

3.4.2 Comparison to literature values

Table 28 summarizes the predicted concentrations in the house, averaged over 3 months for “priority” chemicals. For BTEX, the house concentrations were higher with used gas-powered equipment than with brand-new gas-powered equipment by a factor of 2 to 3. For aldehydes, there was no difference between used and new gas-powered equipment since the main sources of these compounds were not gas-powered equipment.

When no temperature effects were taken into account, the VOC levels were similar in summer (Case 2 & 3) and winter (Case 4 & 5). This is partly due to the fact that the only variable was the presence of different gas-powered equipment. When the temperature effects were accounted for summer (Case 6 & 7) and winter (Case 8 & 9), the BTEX concentrations were higher in summer than in winter by a factor of 2 to 3. The aldehyde concentrations were not affected since their sources were inside the house, where the indoor temperature was assumed to be relatively constant at 23 °C.

The predicted indoor concentrations with garage sources (Case 2 – 9) were in good agreement with literature values. In the simulation without garage sources (Case 1), BTEX were under-predicted. The predictions improved with garage sources in Case 2 to 9. The comparison with Health Canada’s residential IAQ guideline (RIAQG) or indoor air reference levels (IARL) shows that the concentration of formaldehyde, acetaldehyde and propanal are close to or higher than RIAQG or IARL. The same observation applies to benzene based on the lower limit of the range of concentrations associated with risks per 1×10^5 . ($0.6 - 4.5 \mu\text{g m}^{-3}$). More attention should be paid to these compounds in terms of developing mitigation strategies.

Table 29 presents the predicted concentration in the garage (3 month average). The effects of used equipment and temperature were similar to those with the concentrations in the house. One exception is that the acetaldehyde concentration was lower with the scenario with used equipment. This is due to the relatively high emission of acetaldehyde from new lawn mower and chainsaw.

Overall, the garage concentrations were under-predicted compared to the literature values except for dichloromethane. It appears that the sources in the garage were under-represented for BTEX and aldehydes in the simulation. One possible explanation is that the emissions from a parked car were not considered. For dichloromethane, there was relatively good agreement between the predicted and literature value. This is likely to be explained by the presence of paint remover, which is the main source of dichloromethane.

Table 28: Comparison of predicted concentrations in the house (mean values of 3 months) with literature data

	Predicted concentration in the house ($\mu\text{g m}^{-3}$)									Concentration in literature ($\mu\text{g m}^{-3}$)	Health Canada data Guideline ($\mu\text{g m}^{-3}$) ^{e, f, g}
Case #	1	2	3	4	5	6	7	8	9		
Case ID	Base	Summer & New	Summer & Used	Winter & New	Winter & Used	Summer, New & 30 °C	Summer, Used & 30 °C	Winter, New & 4 °C	Winter, Used & 4 °C		
House sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources		
Garage sources	No garage sources	12 small products & 3 gas-powered equipment, new	12 small products & 3 gas-powered equipment, used	12 small products & 1 gas-powered equipment, new	12 small products & 1 gas-powered equipment, used	12 small products + 3 gas-powered new equipment at 30 °C	12 small products + 3 gas-powered used equipment at 30 °C	12 small products + 1 gas-powered new equipment at 4 °C	12 small products + 1 gas-powered used equipment at 4 °C		
Benzene	0.1	0.9	1.9	0.8	1.5	1.2	2.6	0.6	0.9	0.025 - 20.99 (2.15) ^a 0.23 – 7.38 (1.04) ^c	0.6 ^g
1,2-Dimethylbenzene	0.1	0.5	1.4	0.5	1.2	0.7	2.0	0.3	0.8	0.01 - 205.11 (1.22) ^a 0.26 – 16.52 (1.41) ^c	100 ^f
1,3(4)-Dimethylbenzene	0.1	1.8	4.2	1.7	3.5	2.5	5.8	1.0	2.1	0.02 - 138.97 (3.59) ^a 0.91 – 56.32 (4.88) ^c	
Ethylbenzene	0.1	0.4	1.0	0.4	0.9	0.5	1.4	0.3	0.6	0.005 - 201.41 (1.05) ^a 0.25 – 13.63 (1.35) ^c	2000 ^f
Naphthalene	0.3	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.01 - 144.44 (0.39) ^a 0.18 – 7.74 (0.85) ^c	10 ^e
Toluene	0.2	5.0	8.6	4.8	7.7	7.0	11.9	3.0	4.7	0.015 - 112.9 (5.53) ^a 1.69 – 73.42 (7.94) ^c	2300 ^e
Acetaldehyde	10.1	10.3	10.2	10.2	10.2	10.3	10.2	10.2	10.2	0.49 – 48.8 (12.69) ^b	17 ^f
Formaldehyde	43.5	43.9	43.9	43.9	43.9	43.9	43.9	43.9	43.9	5.09 – 93.88 (35.46) ^b	50 ^e
Propanal	6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	-	8 ^f
Dichloromethane	0.0	3.7	3.7	3.7	3.7	5.2	5.2	2.2	2.2	0.06 – 408.4 (1.87) ^a 0.1 - 1687.4 (7.04) ^d	600 ^f
2-Propanol	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	7000 ^f

^a Min – Max (Median) measured in winter in 75 homes (Zhu et al., 2005); ^b Min – Max (Mean) measured in summer in 69 homes (Héroux et al., 2010)

^c 5th – 95th percentile (Geometric mean) measured in 3218 houses, 546 apartments, and 93 other dwelling types in Canada (Zhu et al., 2013)

^d Min – Max (Median) measured in winter or early in 96 homes (Quebec City) (Héroux et al., 2008)

^e Health Canada Residential Indoor Air Quality Guidelines (RIAQG); ^f Health Canada Indoor Air Reference Levels (IARLs); ^g The lower limit of the range of concentrations associated with risks per 1×10^5 ($0.6 - 45 \mu\text{g m}^{-3}$)

Table 29: Comparison of predicted concentrations in the garage (mean values of 3 months) with literature data

	Predicted concentration in the garage ($\mu\text{g m}^{-3}$)									Concentration in literature ($\mu\text{g m}^{-3}$)		
Case #	1	2	3	4	5	6	7	8	9			
Case ID	Base	Summer & New	Summer & Used	Winter & New	Winter & Used	Summer, New & 30 °C	Summer, Used & 30 °C	Winter, New & 4 °C	Winter, Used & 4 °C			
House sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources	46 sources			
Garage sources	No garage sources	12 small products & 3 gas-powered equipment, new	12 small products & 3 gas-powered equipment, used	12 small products & 1 gas-powered equipment, new	12 small products & 1 gas-powered equipment, used	12 small products + 3 gas-powered new equipment at 30 °C	12 small products + 3 gas-powered used equipment at 30 °C	12 small products + 1 gas-powered new equipment at 4 °C	12 small products + 1 gas-powered new equipment at 4 °C	RAGI ^a	Dodson et al. (2008) ^b	Batterman et al. (2007) ^c
Benzene	-	4.2	9.9	3.9	7.4	5.9	13.9	2.3	4.5	16.3	58.0	36.6
1,2-Dimethylbenzene	-	2.8	7.8	2.6	6.7	3.9	10.9	1.5	4.0		35.0	38.0
1,3(4)-Dimethylbenzene	-	9.7	22.9	9.1	19.3	13.5	32.1	5.5	11.6		90.0	114.0
Ethylbenzene	-	1.8	5.1	1.7	4.3	2.5	7.2	1.0	2.6	9.2	35.0	28.0
Naphthalene	-	0.4	0.7	0.3	0.6	0.5	1.0	0.2	0.4			8.9
Toluene	-	27.0	46.7	25.7	41.7	37.8	65.4	15.4	25.0	80.0	102.0	214.3
Acetaldehyde	-	1.1	0.5	0.5	0.5	1.4	0.6	0.5	0.5	6.5	8.9	
Formaldehyde	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	6.7	
Propanal	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3			
Dichloromethane	-	20.7	20.7	20.7	20.7	29.0	29.0	12.4	12.4		9.8	
2-Propanol	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			

^a Measurements in winter before intervention in Ottawa (n = 33)

^b Mean values of 16 residences in Boston, USA (Dodson et al., 2008)

^c Mean values of 15 residences in Michigan, USA (Batterman et al., 2007)

4 Conclusions and recommendations

Emissions of 121 VOCs, including formaldehyde, acetaldehyde, and propanal, were investigated using 4 day tests in a 2 m³ chamber for gas-powered equipment (10 products). Typically the test product was chosen to represent new and used (> 10 years old) equipment. Additionally, a total of 20 small size products commonly found in attached garages were tested in small-scale (50 L) chambers. For selected small products, the effects of temperature and cap tightness on emission factors were tested.

The following conclusions can be made for factors affecting evaporative emissions. First, the age of a product can affect the emissions. On average, the emission factors of used products (> 10 years) were greater than those of new products by a factor of 5 to 14. This is based on the comparison of emission factors between from brand-new and used (> 10 years) snow blowers, lawn mowers and chainsaws. On the other hand, the small age difference in two trimmers (brand-new and 2 years old) did not affect emissions. More tests with different age groups of a product are recommended. Also, a more systematic study with gradual aging of a product and different fuel system components is recommended to understand the critical age and components of gas-powered equipment in terms of VOC emissions.

Second, the temperature test with selected products (adhesive, gasoline container, and paint remover) showed that emissions depended on the test temperature. On average, the emission factors at 4, 14, and 30 °C were 40%, 60%, and 160% of those at 23 °C. The relationship between temperature and emission factors was well described with the Clausius-Clapeyron equation. However, it was difficult to come up with one equation that can describe the temperature dependence of a chemical from various sources. This is likely due to the fact that emissions from an evaporative source depend on mass-transfer mechanisms such as diffusion and permeation, for which both chemical and material properties are important. Both chemical and material properties need to be considered in understanding the temperature dependence of emissions from evaporative sources.

Third, the cap/cover tightness affected the emissions, but the impact on long-term emissions was not proportional to the degree of opening. This observation is based on the tests with cap/cover tightness varied in three levels (fully closed, opened by half turn or 0.4 mm, opened by one turn or 1 mm) for selected high emitters (paint thinner, motor oil for 2-stroke engines and paint/primer). Overall, emission factors with an opening showed higher emissions compared to those with a cap/cover closed tightly, although the difference in the opening size did not make much difference in the emissions at 72 h and 96 h. This is particularly true for short-term emissions (≤ 24 h) for all three products and long-term emissions for paint/primer. This emphasizes the importance of closing a product when it is stored.

However, for a high emitter such as 2-stroke motor oil, the additional emissions due to a loose cap were not significant at 72 h and 96 h. This shows that closing an evaporative source completely may not be a good enough solution for some high emitters. Dichloromethane, which was emitted from a container of paint remover with a cap closed, can be another example. To mitigate the emissions from closed evaporative sources, better storage containers (e.g., materials and design) need to be developed.

Two-zone modeling was performed to predict the concentrations in the house and garage based on a typical scenario on the presence of building materials and evaporative sources. Power-law decay emission models were used to present the time-variant emission factors. The median values of air flow rates measured in winter seasons in the RAGI study were used to represent the typical air change rates between the house, garage and outdoor. The results reinforced the findings from the chamber tests. That is, gasoline container and gas-powered equipment were the main sources of BTEX in the garage. The contribution from the gas-powered equipment of ~ 10 years was highest. Consequently, the transport from the garage was the main source of BTEX in the house. This is based on the assumption that gasoline containing products are mostly stored in the garage. For aldehydes in the house, the main sources were wood-based building materials and paint. Since evaporative sources in the garage were not main sources of aldehydes, the main contributor of aldehydes in the garage was the transport from the house. It should be noted that no wood-based materials were assumed to be present in the garage.

The predicted concentrations in the house for different scenarios (winter vs. summer, new equipment vs old equipment) were in good agreement with literature values. This is particularly encouraging for BTEX, for which the concentrations were under-predicted when building materials were only sources in the previous study (Won et al., 2014). This shows that the importance of the transport of pollutants between the house and garage. Additionally, the importance of the scenario analysis as a tool to understand the combined effects of different sources and identify main sources was demonstrated one more time.

However, the predicted concentrations in the garage were generally lower than the literature values. This is likely due to the fact that important sources such as a parked car were not considered in the scenarios analysis. While this research has expanded the knowledge on the evaporative sources in the garage, there still exists the need for more information on the sources to improve the accuracy of the IAQ predictions. In particular, the presence of a parked car needs to be accounted for in the future simulation.

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Appendix

A.1 Chamber concentrations & emission factors for products tested in 2 m³

Table A. 1: Concentration & emission factor for SB2 (snow blower, new)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1.2 h	3.1 h	6.2 h	24.3 h	48.2 h	72.2 h	96.2 h	0 h	1.2 h	3.1 h	6.2 h	24.3 h	48.2 h	72.2 h	96.2 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol				32.6								64.1							
5		64-17-5	Ethanol		4235.8	2202.0	1567.6	1002.7	653.6	883.2	821.6		8315.4	4322.8	3077.3	1968.4	1283.0	1733.7	1612.8	5518.63	0.30	0.86
6		108-95-2	Phenol				2.8	2.8							5.5	5.4						
7	Aldehydes & ketones	78-93-3	Methylethyl ketone																			
8		67-64-1	Acetone																			
9		98-86-2	Acetophenone	0.2	4.7	3.2	3.3	1.4	0.7	0.8	0.8		8.9	6.0	6.1	2.4	1.0	1.3	1.3	12.91	0.55	0.89
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	1.0																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21	Aliphatic Hydrocarbons	2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23		107-83-5	Pentane, 2-methyl-		17577.8	6618.5	3483.8	2679.4	1873.3	2349.4	2189.9		34507	12992.9	6839.1	5260.1	3677.6	4612.1	4299.0	14497.9	0.30	0.82
24		96-14-0	Pentane, 3-methyl-		9423.9	2546.0	1392.7	1080.6	745.3	957.9	937.4		18500.2	4998.1	2734.0	2121.3	1463.0	1880.6	1840.3	5489.0	0.28	0.79
25		540-84-1	2,2,4-Trimethylpentane	1.5	613.8	216.9	97.6	60.7	50.9	65.8	60.8		1202.0	422.9	188.7	116.2	97.1	126.2	116.5	447.64	0.34	0.75
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		50.6	29.7	18.8	8.3	5.2	6.2	5.5		99.3	58.4	36.9	16.3	10.1	12.1	10.9	94.28	0.51	0.95
28		112-40-3	Dodecane		9.4	7.0	5.8	3.9	2.1	2.7	3.1		18.4	13.8	11.5	7.6	4.2	5.3	6.0	19.06	0.30	0.84
29		142-82-5	Heptane		522.5	197.7	94.9	65.7	57.4	73.7	68.1		1025.7	388.1	186.4	128.9	112.8	144.6	133.6	388.49	0.27	0.70
30		544-76-3	Hexadecane		1.0	0.3							1.9	0.6								
31		110-54-3	Hexane																			
32		111-84-2	Nonane		128.3	61.5	33.0	14.6	10.8	14.7	11.8		251.9	120.8	64.8	28.7	21.1	28.8	23.1	166.22	0.47	0.88
33		111-65-9	Octane		229.9	96.7	48.2	28.1	22.7	33.5	30.1		451.3	189.7	94.7	55.2	44.6	65.7	59.0	202.32	0.32	0.72
34		629-62-9	Pentadecane				0.9								1.8							
35		629-59-4	Tetradecane		2.1	1.4	1.3	1.0		0.8	0.9		4.1	2.7	2.5	2.0		1.6	1.7	3.22	0.15	0.98
36		629-50-5	Tridecane		3.5	2.4	2.3	1.5	0.9	1.0	1.1		6.9	4.8	4.5	2.9	1.7	1.9	2.1	7.02	0.30	0.90
37		1120-21-4	Undecane		19.5	14.5	10.6	5.3	3.1	3.4	3.0		38.2	28.4	20.8	10.3	6.0	6.7	5.9	48.40	0.48	0.97
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		34.0	23.2	15.9	6.5	3.8	4.5	3.7		66.8	45.5	31.2	12.7	7.5	8.8	7.2	82.32	0.56	0.97
39		611-14-3	Toluene, 2-ethyl-	0.1	153.9	79.6	47.3	21.8	15.0	19.9	15.5		302.0	156.2	92.6	42.6	29.2	38.8	30.3	229.01	0.47	0.92
40		620-14-4	Toluene, 3-ethyl-	0.1	311.6	159.0	94.9	44.2	31.8	40.4	33.1		611.5	312.0	186.0	86.5	62.3	79.1	64.8	446.87	0.45	0.92
41		622-96-8	Toluene, 4-ethyl-	0.1	197.8	101.6	60.4	29.0	19.2	24.5	22.2		388.1	199.3	118.3	56.7	37.5	47.9	43.4	286.14	0.45	0.91
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene		129.8	37.2	10.8	10.8	37.3	48.4	49.8		254.9	73.0	21.3	21.3	73.2	95.1	97.8	25.13	-0.24	0.21
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.1	152.3	86.1	53.6	22.7	16.4	18.8	15.3		298.7	168.7	105.0	44.2	32.0	36.6	29.9	267.17	0.50	0.95
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.4	713.7	385.7	238.1	105.2	74.0	87.8	69.0		1400.2	756.2	466.6	205.6	144.4	171.5	134.6	1184.49	0.50	0.95
46		95-47-6	Benzene, 1,2-dimethyl-		380.9	183.8	105.9	55.6	45.5	61.0	45.3		747.7	360.8	208.0	109.1	89.2	119.7	89.0	454.53	0.37	0.86
47		108-67-8	Benzene, 1,3,5-trimethyl-	0.1	221.1	115.2	68.6	30.8	21.4	27.4	23.3		433.8	226.0	134.5	60.1	41.8	53.5	45.4	330.83	0.47	0.92
48		108-38-3	Benzene, 1,3-dimethyl-	0.2	874.3	413.4	239.2	126.5	108.0	142.2	111.1		1715.9	811.1	469.0	247.9	211.5	278.7	217.6	988.93	0.35	0.85
49		98-82-8	Benzene, isopropyl		38.0	18.5	10.4	5.2	3.8	5.4	4.5		74.6	36.3	20.4	10.2	7.5	10.7	8.9	46.45	0.40	0.85
50		103-65-1	Benzene, propyl-		167.1	84.2	49.9	23.6	16.8	22.2	19.1		327.9	165.3	98.0	46.3	33.0	43.7	37.5	228.15	0.43	0.89
51		100-41-4	Ethylbenzene	0.0	213.1	100.8	57.1	31.9	25.4	36.0	29.5		418.2	197.7	112.0	62.6	49.8	70.6	57.9	232.03	0.33	0.81
52		91-20-3	Naphthalene	0.2	37.3	27.3	21.3	10.9	6.9	7.0	6.0		72.8	53.1	41.4	20.9	13.0	13.3	11.3	92.28	0.47	0.99
53	Esters	99-87-6	p-Cymene		5.4	3.3	2.0	0.9	0.7	0.8	0.6		10.6	6.5	3.9	1.9	1.3	1.5	1.1	10.11	0.49	0.96
54		100-42-5	Styrene																			
55		108-88-3	Toluene	5.6	931.1	404.0	229.5	154.4	128.5	181.2	176.8		1816.9	782.1	439.6	292.1	241.3	344.7	336.1	788.85	0.24	0.64
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene		2.0	1.0	0.8	0.7	0.4	0.3	0.3		4.0	2.1	1.5	1.3	0.7	0.7	0.5	3.28	0.38	0.92
58		108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 1 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^b with t > 1 h		
				0 h	1.2 h	3.1 h	6.2 h	24.3 h	48.2 h	72.2 h	96.2 h	0 h	1.2 h	3.1 h	6.2 h	24.3 h	48.2 h	72.2 h	96.2 h	a	b	R ²		
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																					
68		110-49-6	2-Methoxyethylacetate																					
69		111-90-0	Diethylene glycol monoethyl ether																					
70		107-98-2	Propanol, 1-methoxy-2-methyl-																					
71		111-76-2	Ethanol, 2-butoxy-																					
72		112-34-5	Ethanol, 2-butoxyethoxy-																					
73		110-80-5	Ethanol, 2-ethoxy-																					
74		109-86-4	Ethanol, 2-methoxy-																					
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																					
76		71-55-6	1,1,1-Trichloroethane																					
77		95-50-1	1,2-Dichlorobenzene																					
78		107-06-2	1,2-Dichloroethane																					
79		78-87-5	1,2-Dichloropropane																					
80		106-46-7	1,4-Dichlorobenzene																					
81		75-27-4	Bromodichloromethane																					
82		56-23-5	Carbon tetrachloride																					
83	Cyclo Alkanes	67-66-3	Chloroform																					
84		124-48-1	Dibromochloromethane																					
85		75-09-2	Dichloromethane																					
86		127-18-4	Tetrachloroethylene																					
87		79-01-6	Trichloroethylene																					
88		79-34-5	1,1,2,2-Tetrachloroethane																					
89		108-87-2	Methylcyclohexane		615.0	221.5	102.5	64.3	56.1	75.6	61.2		1207.3	434.9	201.2	126.1	110.1	148.5	120.1	457.94	0.32	0.75		
90		110-82-7	Cyclohexane		249.8	80.9	63.3	54.5	40.7	48.0	55.2		490.3	158.8	124.3	107.0	79.8	94.1	108.3	169.19	0.14	0.66		
91	Terpenes	1678-93-9	Cyclohexane, butyl-																					
92		1678-91-7	Cyclohexane, ethyl-		99.3	42.0	22.3	11.2	9.7	13.9	11.8		194.9	82.4	43.7	21.9	19.1	27.3	23.1	93.73	0.35	0.76		
93		1678-92-8	Cyclohexane, propyl-		25.9	12.9	7.1	3.0	2.4	3.1	2.4		50.9	25.3	14.0	5.9	4.7	6.2	4.7	35.37	0.47	0.89		
94		91-17-8	Decahydronaphthalene																					
95	Acids	80-56-8	alpha-Pinene				1.2	0.8		0.6	0.6				2.4	1.6		1.1	1.2	3.92	0.28	0.96		
96		99-86-5	alpha-Terpinene																					
97		127-91-3	beta-Pinene																					
98		99-85-4	gamma-Terpinene																					
99		13466-78-9	3-Carene																					
100		79-92-5	Camphene																					
101	Other	5989-27-5	Limonene																					
102		64-19-7	Acetic acid																					
103		79-31-2	Isobutyric acid																					
104		107-92-6	Butyric acid					2.0								3.9								
105		111-14-8	Heptanoic acid					14.5								28.4								
106		149-57-5	2-Ethylhexanoic acid																					
107		142-62-1	Hexanoic acid					6.9								13.5								
108		109-52-4	Pentanoic Acid					5.2								10.3								
109	DNP	3777-69-3	Furan, 2-pentyl																					
110		872-50-4	2-Pyrrolidinone, 1-methyl-																					
111		123-91-1	1,4-Dioxane																					
112		78-40-0	Triethyl phosphate																					
113		142-96-1	n-Butyl ether																					
114		96-29-7	2-Butanone oxime																					
115		121-44-8	Triethylamine																					
116		75-21-8	Ethylene oxide																					
117		75-56-9	Propylene oxide																					
118		106-99-0	1,3-Butadiene																					
119	0-00-0	TVOC		22.9	20066.1	9089.5	5128.1	3161.0	2409.7	2993.8	2676.3		39347.1	17798.8	10022.0	6160.4	4685.5	5832.2	5208.9	21401.4	0.34	0.87		
				Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^b with t > 3 h		
#	Class	CAS #	Compound	0 h	2.2 h	4.1 h	7.2 h	25.3 h	49.3 h	73.2 h	97.2 h	0 h	2.2 h	4.1 h	7.2 h	25.3 h	49.3 h	73.2 h	97.2 h	a	b	R ²		
D1	DNP	75-07-0	Acetaldehyde	1.3	39.7	27.5	18.7	11.1	7.4	9.0	7.4		75.4	51.6	34.1	19.3	12.1	15.2	12.0	87.41	0.45	0.94		
D2		50-00-0	Formaldehyde		8.3	6.2	7.0	4.8	4.4	5.1	4.0		16.2	12.1	13.6	9.5	8.6	10.0	7.9	15.94	0.14	0.77		
D3		123-38-6	Propanal		11.8								23.2											

Note: Levels below the method detection limit are highlighted.

Table A. 2: Concentration & emission factor for SB3 (snow blower, used)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)											
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168 h	191.6 h	216 h	240 h
1	Alcohols	71-36-3	1-Butanol												
2		71-23-8	1-Propanol												
3		104-76-7	Hexanol, 2-ethyl-1-												
4		67-63-0	2-Propanol												
5		64-17-5	Ethanol		10719.5	6536.7	3942.9	4253.8	4338.3	3692.1	3359.1	3422.6	2890.5	2736.5	2367.2
6		108-95-2	Phenol								15.2				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone												
8		67-64-1	Acetone		20.8	12.2									
9		98-86-2	Acetophenone												
10		108-94-1	Cyclohexanone												
11		108-10-1	Methylisobutyl ketone												
12		100-52-7	Benzaldehyde												
13		123-72-8	Butanal												
14		112-31-2	Decanal												
15		3913-81-3	2-Decenal												
16		98-01-1	Furfural												
17		111-71-7	Heptanal												
18		66-25-1	Hexanal												
19		124-19-6	Nonanal												
20		18829-56-6	2-Nonenal												
21		2548-87-0	2-Octenal												
22		110-62-3	Pentanal												
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		7095.9	3034.6	2086.3	1626.5	1791.6	1814.9	2007.7	2217.8	2113.5	2021.2	1704.1
24		96-14-0	Pentane, 3-methyl-		3774.7	1687.7	1147.7	1036.4	998.2	1031.9	1110.7	1254.3	1182.1	1129.1	939.8
25		540-84-1	2,2,4-Trimethylpentane		1892.2	1149.6	796.5	729.5	746.9	687.3	729.9	800.4	702.5	663.8	578.4
26		108-08-7	2,4-Dimethylpentane												
27		124-18-5	Decane		136.6	121.6	73.1	62.2	51.0	53.5	48.9	55.7	45.6	52.2	44.1
28		112-40-3	Dodecane		26.7	24.7		15.0		11.3	11.5	18.0	8.6	9.9	
29		142-82-5	Heptane		1231.7	956.7	747.8	695.2	768.6	756.8	789.3	966.1	841.1	810.1	773.0
30		544-76-3	Hexadecane								30.0				
31		110-54-3	Hexane		4167.8	2358.3	1780.7	1580.7	1674.5	1717.5	1920.1	2301.5	2051.1	2053.4	1734.4
32		111-84-2	Nonane		219.5	199.7	154.8	139.0	147.5	138.5	148.0	175.4	145.8	160.0	133.5
33		111-65-9	Octane		413.5	369.3	345.8	288.2	319.9	291.3	350.2	400.2	347.6	341.9	341.8
34		629-62-9	Pentadecane								11.1				
35		629-59-4	Tetradecane												
36		629-50-5	Tridecane												
37		1120-21-4	Undecane		51.8	44.8	32.3	28.6	24.0	26.3	25.8	27.0	19.8	20.9	19.5
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		100.1	81.3	62.0	52.6	48.2	45.6	41.7	44.1	36.2	33.8	32.7
39		611-14-3	Toluene, 2-ethyl-		488.8	456.1	314.5	235.8	262.7	227.8	204.4	213.6	176.1	192.2	161.2
40		620-14-4	Toluene, 3-ethyl-		1451.5	1373.2	962.6	813.0	827.3	679.4	683.3	687.2	576.8	619.6	526.7
41		622-96-8	Toluene, 4-ethyl-		603.1	592.4	426.4	368.1	347.7	324.6	288.1	312.3	251.3	291.4	242.3
42		4994-16-5	Cyclohexene, 4-phenyl								6.2				
43		71-43-2	Benzene		1042.6	805.2	626.2	637.0	654.9	629.2	654.5	732.5	617.8	654.0	570.1
44		526-73-8	Benzene, 1,2,3-trimethyl-		546.0	500.1	345.2	264.7	274.4	270.1	230.4	228.0	190.5	210.6	171.5
45		95-63-6	Benzene, 1,2,4-trimethyl-		2480.5	2365.5	1637.0	1257.2	1379.0	1231.1	1157.6	1166.9	955.1	1089.7	880.9
46		95-47-6	Benzene, 1,2-dimethyl-		2106.0	1995.8	1685.9	1316.8	1209.2	994.3	947.8	885.1	717.4	712.4	666.8
47		108-67-8	Benzene, 1,3,5-trimethyl-		628.4	587.7	410.3	311.4	342.5	298.3	281.7	286.5	242.2	267.6	218.0
48		108-38-3	Benzene, 1,3-dimethyl-		5034.0	4872.3	4292.1	3409.0	2886.9	2313.7	2267.5	2201.3	1763.5	1790.9	1702.7
49		98-82-8	Benzene, isopropyl		82.9	73.6	56.3	46.8	41.6	37.2	35.3	33.8	27.7	28.2	24.8
50		103-65-1	Benzene, propyl-		361.4	338.5	240.5	194.2	202.3	165.6	160.9	167.5	136.6	146.9	125.8
51		100-41-4	Ethylbenzene		1318.9	1244.2	1109.3	867.5	734.0	600.3	585.0	573.7	459.5	466.9	444.2
52		91-20-3	Naphthalene		88.0	66.4	55.6	54.8	61.1	55.8	57.9	64.0	52.5	54.6	47.3
53		99-87-6	p-Cymene		10.9	8.3	5.4	3.9	4.5	4.6	4.5	4.0	3.4	3.6	3.0
54		100-42-5	Styrene		10.4	7.6	5.4	4.7	3.3	5.4					
55		108-88-3	Toluene	5.2	14805.8	13106.6	10417.7	7167.6	5525.7	4277.4	3832.2	3658.6	3234.1	2931.3	2698.1
56		98-83-9	2-Phenylpropene												
57		95-13-6	Indene		9.8	7.5	6.8	4.0	4.1	3.8	2.9	2.8	2.5	2.9	2.8
58	Esters	108-21-4	Acetic acid, 1-methylethyl												
59		111-15-9	Acetic acid, 2-ethoxyethyl												
60		123-86-4	Acetic acid, butyl ester												
61		141-78-6	Acetic acid, ethyl ester												
62		80-62-6	Methyl methacrylate												
63		103-09-3	2-Ethylhexyl acetate												
64		96-48-0	Butyrolactone												
65		25265-77-4	Texanol												
66		6846-50-0	TXIB								16.3	39.3		14.8	

Table A. 2 (continued)

				Chamber concentration (µg m ⁻³)											
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168 h	191.6 h	216 h	240 h
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol												
68		110-49-6	2-Methoxyethylacetate												
69		111-90-0	Diethylene glycol monoeth												
70		107-98-2	Propanol, 1-methoxy-2-												
71		111-76-2	Ethanol, 2-butoxy-												
72		112-34-5	Ethanol, 2-butoxyethoxy-												30.9
73		110-80-5	Ethanol, 2-ethoxy-												
74		109-86-4	Ethanol, 2-methoxy-												
75		75-65-0	Propanol, 2-methyl-2-												
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane												
77		95-50-1	1,2-Dichlorobenzene												
78		107-06-2	1,2-Dichloroethane												
79		78-87-5	1,2-Dichloropropane												
80		106-46-7	1,4-Dichlorobenzene												
81		75-27-4	Bromodichloromethane												
82		56-23-5	Carbon tetrachloride												
83		67-66-3	Chloroform												
84		124-48-1	Dibromochloromethane												
85		75-09-2	Dichloromethane												
86	127-18-4	Tetrachloroethylene		6.0	8.3	8.5				4.7	5.8				
87	79-01-6	Trichloroethylene													
88	79-34-5	1,1,2,2-Tetrachloroethane													
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		556.0	411.1	297.9	295.7	320.3	315.1	346.2	423.9	352.5	366.8	341.6
90		110-82-7	Cyclohexane		548.1	344.6	263.3	223.9	221.0	213.6	243.6	277.3	246.1	248.8	208.5
91		1678-93-9	Cyclohexane, butyl-												
92		1678-91-7	Cyclohexane, ethyl-		65.9	60.5	50.4	44.0	48.0	49.9	54.7	61.6	57.8	53.5	51.9
93		1678-92-8	Cyclohexane, propyl-		18.7	18.8	14.5	10.7	14.6	11.1	11.3	14.6	11.7	13.1	12.1
94	91-17-8	Decahydronaphthalene													
95	Terpenes	80-56-8	alpha-Pinene												
96		99-86-5	alpha-Terpinene												
97		127-91-3	beta-Pinene												
98		99-85-4	gamma-Terpinene												
99		13466-78-9	3-Carene												
100	79-92-5	Camphene													
101	5989-27-5	Limonene													
102	Acids	64-19-7	Acetic acid												
103		79-31-2	Isobutyric acid												
104		107-92-6	Butyric acid												
105		111-14-8	Heptanoic acid									138.3		39.2	
106		149-57-5	2-Ethylhexanoic acid									73.4			
107		142-62-1	Hexanoic acid												
108	109-52-4	Pentanoic Acid													
109	Other	3777-69-3	Furan, 2-pentyl												
110		872-50-4	2-Pyrrolidinone, 1-methyl												
111		123-91-1	1,4-Dioxane												
112		78-40-0	Triethyl phosphate												
113		142-96-1	n-Butyl ether												
114		96-29-7	2-Butanone oxime												
115		121-44-8	Triethylamine												
116		75-21-8	Ethylene oxide												
117		75-56-9	Propylene oxide												
118		106-99-0	1,3-Butadiene												
119	0-00-0	TVOC		257	101736	63443	45230	38114	36001	33090	34171	34635	32137	30012	25862
A1	Abundant	106-97-8	Butane		7567.8	893.7	573.8	527.2	1439.5	1193.1	1638.7	546.2	1335.3	1177.8	439.2
A2		78-78-4	Butane, 2-methyl-	4.5	13764.6	4598.7	1960.9	2083.5	1938.6	1902.8	2338.3	2178.5	2470.4	1838.6	1528.1
A3		109-66-0	Pentane		6614.3	2255.1	1077.5	1187.9	1368.4	1358.8	1591.3	1685.6	1780.0	1389.9	1182.1
A4		1630-94-0	Cyclopropane, 1,1-dimeth		3534.7	1768.3	1085.6	1011.8	1038.5	961.3	940.2	962.2	929.2	804.2	683.2
				Chamber concentration (µg m ⁻³)											
#	Class	CAS #	Compound	0 h	2 h	4 h	7 h	25 h	49 h	73 h	97 h	169 h	241 h		
D1	DNPH	75-07-0	Acetaldehyde		84.5	48.0	32.9	21.5	16.4	12.5	10.3	6.4	6.8		
D2		50-00-0	Formaldehyde	0.1	23.9	16.5	8.7	3.0	3.7	1.7	2.2	1.4	1.6		
D3		123-38-6	Propanal		18.0	14.7	12.5								

Table A. 2 (continued)

#	Class	CAS #	Compound	Emission factor ($\mu\text{g h}^{-1}$)												Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168 h	191.6 h	216 h	240 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol															
2		71-23-8	1-Propanol															
3		104-76-7	Hexanol, 2-ethyl-1-															
4		67-63-0	2-Propanol															
5		64-17-5	Ethanol		21043.7	12832.3	7740.4	8350.8	8516.6	7248.0	6594.3	6719.1	5674.3	5372.0	4647.1	13564.3	0.16	0.76
6		108-95-2	Phenol								29.8							
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone															
8		67-64-1	Acetone		40.7	24.0												
9		98-86-2	Acetophenone															
10		108-94-1	Cyclohexanone															
11		108-10-1	Methylisobutyl ketone															
12		100-52-7	Benzaldehyde															
13		123-72-8	Butanal															
14		112-31-2	Decanal															
15		3913-81-3	2-Decenal															
16		98-01-1	Furfural															
17		111-71-7	Heptanal															
18		66-25-1	Hexanal															
19		124-19-6	Nonanal															
20		18829-56-6	2-Nonenal															
21		2548-87-0	2-Octenal															
22		110-62-3	Pentanal															
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		13930.2	5957.2	4095.6	3193.0	3517.0	3562.8	3941.4	4353.9	4149.0	3967.8	3345.3	4929.3	0.06	0.23
24		96-14-0	Pentane, 3-methyl-		7410.2	3313.1	2253.1	2034.7	1959.5	2025.7	2180.5	2462.3	2320.6	2216.5	1844.9	2820.6	0.06	0.30
25		540-84-1	2,2,4-Trimethylpentane		3714.6	2256.7	1563.6	1432.1	1466.2	1349.2	1433.0	1571.2	1379.2	1303.2	1135.5	2114.3	0.09	0.62
26		108-08-7	2,4-Dimethylpentane															
27		124-18-5	Decane		268.2	238.7	143.6	122.1	100.2	105.1	96.0	109.3	89.6	102.5	86.6	228.9	0.17	0.81
28		112-40-3	Dodecane		52.4	48.5		29.4		22.2	22.6	35.3	16.9	19.4		56.5	0.19	0.61
29		142-82-5	Heptane		2417.9	1878.1	1468.1	1364.7	1508.8	1485.6	1549.6	1896.6	1651.2	1590.3	1517.4	1592.2	0.00	0.00
30		544-76-3	Hexadecane								58.8							
31		110-54-3	Hexane		8181.8	4629.5	3495.8	3103.1	3287.3	3371.6	3769.4	4518.1	4026.6	4031.0	3404.8	3770.5	0.00	0.00
32		111-84-2	Nonane		430.8	392.0	303.9	272.9	289.5	271.9	290.6	344.3	286.2	314.1	262.1	349.9	0.04	0.23
33		111-65-9	Octane		811.7	724.9	678.9	565.8	627.9	571.8	687.4	785.7	682.4	671.2	671.0	655.4	0.00	0.00
34		629-62-9	Pentadecane								21.7							
35		629-59-4	Tetradecane															
36		629-50-5	Tridecane															
37		1120-21-4	Undecane		101.7	88.0	63.5	56.1	47.1	51.6	50.7	53.0	38.9	41.0	38.3	92.7	0.15	0.83
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		196.5	159.6	121.6	103.2	94.5	89.6	81.8	86.7	71.2	66.3	64.1	183.1	0.18	0.93
39		611-14-3	Toluene, 2-ethyl-		959.5	895.5	617.5	462.9	515.6	447.3	401.3	419.3	345.8	377.3	316.5	967.2	0.19	0.89
40		620-14-4	Toluene, 3-ethyl-		2849.5	2695.7	1889.7	1596.0	1624.0	1333.7	1341.3	1349.1	1132.3	1216.4	1033.9	2921.8	0.17	0.91
41		622-96-8	Toluene, 4-ethyl-		1184.0	1163.0	837.1	722.7	682.6	637.2	565.6	613.0	493.3	572.1	475.7	1255.0	0.16	0.90
42		4994-16-5	Cyclohexene, 4-phenyl								12.2							
43		71-43-2	Benzene		2046.8	1580.7	1229.2	1250.6	1285.6	1235.2	1284.8	1437.9	1212.9	1283.8	1119.2	1451.7	0.03	0.24
44		526-73-8	Benzene, 1,2,3-trimethyl-		1071.9	981.8	677.7	519.6	538.8	530.2	452.3	447.6	373.9	413.4	336.6	1075.9	0.19	0.90
45		95-63-6	Benzene, 1,2,4-trimethyl-		4869.6	4643.8	3213.7	2468.0	2707.2	2416.8	2272.5	2290.8	1875.0	2139.2	1729.3	4900.5	0.17	0.87
46		95-47-6	Benzene, 1,2-dimethyl-		4134.4	3918.0	3309.7	2585.0	2373.7	1951.9	1860.7	1737.6	1408.3	1398.5	1309.1	5296.6	0.24	0.96
47		108-67-8	Benzene, 1,3,5-trimethyl-		1233.6	1153.8	805.5	611.2	672.4	585.7	553.0	562.5	475.4	525.3	428.0	1222.0	0.17	0.88
48		108-38-3	Benzene, 1,3-dimethyl-		9882.4	9564.9	8426.0	6692.2	5667.4	4542.1	4451.3	4321.4	3462.0	3515.8	3342.6	13138.7	0.24	0.97
49		98-82-8	Benzene, isopropyl		162.7	144.5	110.6	91.8	81.7	73.0	69.4	66.4	54.4	55.4	48.8	178.3	0.22	0.96
50		103-65-1	Benzene, propyl-		709.4	664.6	472.2	381.2	397.1	325.1	316.0	328.8	268.2	288.4	246.9	731.9	0.18	0.91
51		100-41-4	Ethylbenzene		2589.1	2442.5	2177.8	1703.0	1441.0	1178.5	1148.5	1126.3	902.1	916.5	872.0	3333.2	0.23	0.97
52		91-20-3	Naphthalene		172.7	130.3	109.2	107.6	119.9	109.6	113.7	125.7	103.0	107.2	92.8	126.3	0.03	0.24
53		99-87-6	p-Cymene		21.4	16.4	10.6	7.6	8.8	9.1	8.9	7.8	6.6	7.0	6.0	16.3	0.16	0.77
54		100-42-5	Styrene		20.4	14.9	10.5	9.3	6.4	10.5						15.5	0.16	0.49
55		108-88-3	Toluene		29055	25719.6	20441.0	14060.8	10837.4	8386.9	7513.0	7172.1	6338.8	5744.3	5286.5	39229.0	0.35	0.99
56		98-83-9	2-Phenylpropene															
57		95-13-6	Indene		19.2	14.7	13.3	7.9	8.0	7.5	5.8	5.4	4.9	5.7	5.6	19.2	0.24	0.95
58	Esters	108-21-4	Acetic acid, 1-methylethyl															
59		111-15-9	Acetic acid, 2-ethoxyethyl															
60		123-86-4	Acetic acid, butyl ester															
61		141-78-6	Acetic acid, ethyl ester															
62		80-62-6	Methyl methacrylate															
63		103-09-3	2-Ethylhexyl acetate															
64		96-48-0	Butyrolactone															
65		25265-77-4	Texanol															
66		6846-50-0	TXIB									32.0	77.1		29.0			

Table A. 2 (continued)

				Emission factor (μg h ⁻¹)												Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168 h	191.6 h	216 h	240 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol															
68		110-49-6	2-Methoxyethylacetate															
69		111-90-0	Diethylene glycol monoeth															
70		107-98-2	Propanol, 1-methoxy-2-															
71		111-76-2	Ethanol, 2-butoxy-															
72		112-34-5	Ethanol, 2-butoxyethoxy-												60.7			
73		110-80-5	Ethanol, 2-ethoxy-															
74		109-86-4	Ethanol, 2-methoxy-															
75		75-65-0	Propanol, 2-methyl-2-															
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane															
77		95-50-1	1,2-Dichlorobenzene															
78		107-06-2	1,2-Dichloroethane															
79		78-87-5	1,2-Dichloropropane															
80		106-46-7	1,4-Dichlorobenzene															
81		75-27-4	Bromodichloromethane															
82		56-23-5	Carbon tetrachloride															
83		67-66-3	Chloroform															
84		124-48-1	Dibromochloromethane															
85	75-09-2	Dichloromethane																
86	127-18-4	Tetrachloroethylene		11.8	16.3	16.7					9.2	11.4				19.5	0.13	0.80
87	79-01-6	Trichloroethylene																
88	79-34-5	1,1,2,2-Tetrachloroethane																
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		1091.5	807.0	584.9	580.4	628.8	618.6	679.6	832.3	691.9	720.1	670.7	644.8	-0.01	0.02
90		110-82-7	Cyclohexane		1076.0	676.4	517.0	439.5	433.9	419.4	478.2	544.4	483.1	488.5	409.3	603.3	0.06	0.32
91		1678-93-9	Cyclohexane, butyl-															
92		1678-91-7	Cyclohexane, ethyl-		129.4	118.8	98.9	86.4	94.3	98.0	107.3	121.0	113.4	105.0	101.8	101.1	-0.01	0.01
93		1678-92-8	Cyclohexane, propyl-		36.8	36.9	28.5	21.1	28.7	21.7	22.2	28.8	22.9	25.8	23.8	33.3	0.06	0.33
94	91-17-8	Decahydronaphthalene																
95	Terpenes	80-56-8	alpha-Pinene															
96		99-86-5	alpha-Terpinene															
97		127-91-3	beta-Pinene															
98		99-85-4	gamma-Terpinene															
99		13466-78-9	3-Carene															
100		79-92-5	Camphene															
101	5989-27-5	Limonene																
102	Acids	64-19-7	Acetic acid															
103		79-31-2	Isobutyric acid															
104		107-92-6	Butyric acid															
105		111-14-8	Heptanoic acid									271.6		77.0				
106		149-57-5	2-Ethylhexanoic acid									144.1						
107		142-62-1	Hexanoic acid															
108	109-52-4	Pentanoic Acid																
109	Other	3777-69-3	Furan, 2-pentyl															
110		872-50-4	2-Pyrrolidinone, 1-methyl															
111		123-91-1	1,4-Dioxane															
112		78-40-0	Triethyl phosphate															
113		142-96-1	n-Butyl ether															
114		96-29-7	2-Butanone oxime															
115		121-44-8	Triethylamine															
116		75-21-8	Ethylene oxide															
117	75-56-9	Propylene oxide																
118	106-99-0	1,3-Butadiene																
119	0-00-0	TVOC			199216	124041	88288	74318	70170	64455	66577	67489	62585	58413	50267	1.3E+05	0.15	0.87
A1	Abundant	106-97-8	Butane		14856.5	1754.4	1126.5	1035.0	2825.9	2342.2	3217.0	1072.3	2621.3	2312.1	862.3	1422.2	-0.05	0.02
A2		78-78-4	Butane, 2-methyl-		27012.8	9018.9	3840.7	4081.3	3796.9	3726.5	4581.6	4267.8	4840.9	3600.5	2991.1	6816.7	0.12	0.37
A3		109-66-0	Pentane		12984.6	4427.0	2115.3	2331.9	2686.3	2667.4	3123.9	3308.9	3494.3	2728.5	2320.6	3049.1	0.02	0.01
A4		1630-94-0	Cyclopropane, 1,1-dimeth		6939.0	3471.3	2131.1	1986.2	2038.7	1887.1	1845.7	1888.8	1824.2	1578.8	1341.2	3343.0	0.14	0.73
				Emission factor (μg h ⁻¹)												Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	2 h	4 h	7 h	25 h	49 h	73 h	97 h	169 h	241 h			a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde		165.9	94.3	64.6	42.3	32.3	24.6	20.3	12.6	13.4			186.35	0.49	0.96
D2		50-00-0	Formaldehyde		46.7	32.2	16.9	5.7	7.1	3.1	4.1	2.5	2.9			39.26	0.51	0.86
D3		123-38-6	Propanal		35.3	28.9	24.6											

Note: Levels below the method detection limit are highlighted.

Table A. 3: Concentration & emission factor for LM1 (lawn mower, 4-cycle, 22" blade, new)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol		13002.7	4691.3	3071.5	2389.8	2050.5	1956.8	1969.4		25525.8	9209.7	6029.7	4691.5	4025.4	3841.5	3866.2	10473.20	0.24	0.92
6		108-95-2	Phenol																			
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		4868.9	3166.8	1386.8	91.8	32.4	11.4	6.6		9558.3	6216.9	2722.5	180.1	63.6	22.5	13.0	55655.75	1.80	1.00
8		67-64-1	Acetone		637.5	570.8	351.5	34.6	13.9	8.1	3.3		1251.5	1120.6	690.0	68.0	27.2	15.9	6.4	7372.19	1.48	0.99
9		98-86-2	Acetophenone		7.1	6.6	6.8	5.8	5.0	3.6	2.6		13.9	13.0	13.3	11.3	9.8	7.1	5.2	19.38	0.23	0.75
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde																			
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21	Aliphatic Hydrocarbons	2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23		107-83-5	Pentane, 2-methyl-		1572.0	607.8	411.4	411.9	373.7	335.8	368.6		3086.1	1193.2	807.6	808.6	733.6	659.3	723.5	1200.03	0.13	0.74
24		96-14-0	Pentane, 3-methyl-		1027.0	378.1	244.7	245.3	225.0	206.8	223.1		2016.1	742.3	480.4	481.5	441.7	405.9	438.0	731.16	0.13	0.71
25		540-84-1	2,2,4-Trimethylpentane		3406.2	1098.9	400.2	231.2	215.8	191.2	240.5		6686.7	2157.2	785.6	453.8	423.6	375.4	472.1	2300.07	0.42	0.79
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		104.3	102.0	91.9	30.5	12.4	9.0	7.8		204.8	200.2	180.5	59.8	24.4	17.8	15.4	616.16	0.81	0.97
28		112-40-3	Dodecane		7.3	7.3	7.8	8.6	6.6	5.3	4.7		14.3	14.3	15.3	16.8	12.9	10.3	9.2	18.57	0.12	0.50
29		142-82-5	Heptane		2981.2	983.4	340.3	215.8	197.9	172.5	205.8		5852.4	1930.5	668.0	423.6	388.5	338.7	403.9	2029.32	0.41	0.79
30		544-76-3	Hexadecane		1.8	4.1							3.6	8.1								
31		110-54-3	Hexane		9484.8	3435.5	2023.0	2058.2	1878.5	1699.3	1948.5		18619.7	6744.3	3971.5	4040.6	3687.7	3335.8	3825.2	6441.12	0.14	0.63
32		111-84-2	Nonane		546.5	479.2	322.0	47.5	28.5	23.7	22.8		1072.8	940.8	632.2	93.3	56.0	46.5	44.8	2788.74	0.96	0.97
33		111-65-9	Octane		1366.7	899.8	352.1	69.8	63.4	56.9	56.8		2682.9	1766.4	691.2	136.9	124.4	111.7	111.6	3175.64	0.81	0.92
34		629-62-9	Pentadecane		3.1	4.7							6.1	9.3								
35		629-59-4	Tetradecane		2.6	2.4	2.4		2.0	1.7	2.1		5.0	4.6	4.7		3.8	3.4	4.0	5.12	0.07	0.72
36		629-50-5	Tridecane		2.3	2.0	2.0	2.2	2.1	1.8	1.8		4.6	3.9	4.0	4.3	4.1	3.4	3.6	4.12	0.02	0.13
37		1120-21-4	Undecane		21.9	21.2	21.8	17.4	9.2	6.0	4.8		43.1	41.6	42.8	34.1	18.0	11.8	9.4	85.84	0.43	0.84
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		22.3	24.3	25.5	24.4	16.9	10.6	9.4		43.7	47.8	50.1	47.9	33.2	20.9	18.4	78.27	0.27	0.72
39		611-14-3	Toluene, 2-ethyl-		223.7	233.4	214.7	72.2	31.1	24.6	22.7		439.1	458.3	421.5	141.7	61.0	48.4	44.5	1287.01	0.75	0.97
40		620-14-4	Toluene, 3-ethyl-		527.6	538.7	480.6	132.1	61.8	47.6	44.9		1035.8	1057.5	943.4	259.3	121.4	93.5	88.1	3079.56	0.80	0.98
41		622-96-8	Toluene, 4-ethyl-		294.8	299.3	277.4	79.9	39.1	30.6	28.1		578.8	587.6	544.5	156.9	76.7	60.1	55.3	1648.23	0.76	0.98
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene		811.4	246.6	127.4	122.0	117.7	95.4	120.5		1592.9	484.2	250.1	239.5	231.0	187.3	236.5	459.96	0.18	0.64
44		526-73-8	Benzene, 1,2,3-trimethyl-		163.6	176.5	177.6	95.5	41.3	30.5	27.4		321.1	346.5	348.6	187.5	81.1	60.0	53.8	850.00	0.59	0.93
45		95-63-6	Benzene, 1,2,4-trimethyl-		965.6	1001.7	970.8	410.2	172.1	139.0	125.3		1895.7	1966.5	1905.9	805.2	337.8	272.9	246.1	5139.61	0.67	0.96
46		95-47-6	Benzene, 1,2-dimethyl-		886.2	807.7	555.5	101.3	60.8	55.5	54.2		1739.6	1585.5	1090.6	198.9	119.4	108.9	106.3	4121.58	0.86	0.97
47		108-67-8	Benzene, 1,3,5-trimethyl-		322.9	333.6	311.9	100.6	42.9	32.9	30.9		634.0	654.9	612.2	197.6	84.3	64.7	60.7	1904.44	0.77	0.97
48		108-38-3	Benzene, 1,3-dimethyl-		2511.7	2255.1	1377.6	238.4	176.7	148.7	141.6		4930.7	4427.0	2704.3	468.0	346.9	292.0	278.0	10708.46	0.86	0.96
49		98-82-8	Benzene, isopropyl																			
50		103-65-1	Benzene, propyl-																			
51	Esters	100-41-4	Ethylbenzene		680.8	579.2	342.4	56.2	45.2	38.7	36.6		1336.5	1136.9	672.3	110.4	88.6	75.9	71.9	2652.31	0.85	0.95
52		91-20-3	Naphthalene																			
53		99-87-6	p-Cymene																			
54		100-42-5	Styrene																			
55		108-88-3	Toluene		2867.4	2005.2	702.1	286.6	277.6	248.6	253.2		5629.1	3936.5	1378.4	562.7	545.0	488.0	497.1	4968.76	0.56	0.87
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58		108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester					2.9								5.7						
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 3 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83	Cyclo Alkanes	67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane																			
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene					6.9	1.8	10.8						13.6	3.6	21.1		5.75	-0.15	0.01
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		1142.6	391.3	135.1	69.0	63.2	65.0	71.0		2243.0	768.3	265.3	135.4	124.0	127.6	139.3	834.86	0.46	0.80
90		110-82-7	Cyclohexane																			
91	Terpenes	1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95		80-56-8	alpha-Pinene		39.3	23.1	11.0	2.0	0.6				77.1	45.4	21.5	3.9	1.1			209.69	1.31	0.99
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99	Acids	13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene		30.1	19.9	10.5						59.1	39.1	20.6							
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115	Abundant	121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC		59621	33351	19905	8097	5921	5216	5107		117044	65472	39075	15896	11624	10240	10026	109023	0.56	0.98
A1		78-78-4	Butane, 2-methyl-		711.8	82.6	53.1	48.7	42.6	38.1	34.0		1397.4	162.2	104.3	95.6	83.7	74.7	66.8	181.9	0.21	0.90
A2	Abundant	109-66-0	Pentane		1123.0	179.9	92.8	47.1	24.0	18.8	27.3		2204.5	353.1	182.3	92.4	47.1	36.9	53.6	604.4	0.61	0.94
A3		107-83-5	Pentane, 2-methyl-		1572.0	607.8	411.4	411.9	373.7	335.8	368.6		3086.1	1193.2	807.6	808.6	733.6	659.3	723.5	1200.0	0.13	0.74
A4		96-14-0	Pentane, 3-methyl-		1027.0	378.1	244.7	245.3	225.0	206.8	223.1		2016.1	742.3	480.4	481.5	441.7	405.9	438.0	731.2	0.13	0.71
A5		96-37-7	Cyclopentane, methyl-		1068.4	350.2	192.4	179.2	166.0	147.9	181.7		2097.3	687.4	377.8	351.7	325.8	290.4	356.6	657.89	0.17	0.65
A6		591-76-4	Hexane, 2-methyl-		1023.9	306.5	130.4	96.5	92.9	79.3	102.2		2010.0	601.6	256.1	189.5	182.4	155.6	200.6	594.05	0.30	0.73
A7		96-14-0	Hexane, 3-methyl-		1027.0	378.1	244.7	245.3	225.0	206.8	223.1		2016.1	742.3	480.4	481.5	441.7	405.9	438.0	731.16	0.13	0.71
A8		594-82-1	Butane, 2,2,3,3-tetramethyl-		1931.3	622.5	229.5	133.8	128.6	111.9	140.8		3791.4	1222.0	450.5	262.7	252.4	219.7	276.4	1291.35	0.41	0.78
A9		108-87-2	Cyclohexane, methyl-		1142.6	391.3	135.1	69.0	63.2	65.0	71.0		2243.0	768.3	265.3	135.4	124.0	127.6	139.3	834.86	0.46	0.80
A10	Abundant	565-75-3	Pentane, 2,3,4-trimethyl-		1065.5	451.6	139.1	43.1	40.4	42.3	42.1		2091.7	886.5	273.0	84.6	79.3	83.0	82.6	1160.47	0.65	0.85
A11		560-21-4	Pentane, 2,3,3-trimethyl-		974.4	428.8	129.0	37.6	34.7	36.3	40.7		1912.8	841.8	253.1	73.8	68.2	71.4	79.9	1095.84	0.67	0.84
A12		592-27-8	Heptane, 2-methyl-		743.3	358.1	115.0	28.5	29.3	27.7	27.7		1459.1	703.1	225.8	56.0	57.5	54.4	54.3	1012.94	0.72	0.87
A13		589-81-1	Heptane, 3-methyl-		845.5	439.5	143.5	36.8	39.1	38.5	41.7		1659.9	862.8	281.6	72.3	76.8	75.5	81.8	1156.17	0.67	0.84
A14		535-77-3	Benzene, 1-methyl-3-(1-methyl-2-propenyl)-		108.1	118.2	123.1	97.0	56.0	35.9	30.2		212.3	232.0	241.7	190.4	109.9	70.5	59.2	456.59	0.40	0.84
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.4 h	3.2 h	6.2 h	24.2 h	48.2 h	72.2 h	96.2 h	0 h	1.4 h	3.2 h	6.2 h	24.2 h	48.2 h	72.2 h	96.2 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde		6.1	767.9	543.1	333.9	63.6	12.2	4.5		1495.4	1054.1	643.4	112.8	11.9			9003.32	1.57	0.93
D2		50-00-0	Formaldehyde		1.0	32.3	16.0	6.8	4.9	3.3	2.1		61.4	29.4	11.3	7.6	4.4	2.1		57.55	0.71	0.93
D3		123-38-6	Propanal			67.9	55.3	24.7					133.3	108.5	48.5							

Note: Levels below the method detection limit are highlighted.

Table A. 4: Concentration & emission factor for LM2 (lawn mower, 4-cycle, 21" blade, new)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol		5778.8	1933.1	1231.8	1150.2	1006.1	1220.3	1183.7		11344.4	3794.9	2418.2	2258.1	1975.0	2395.7	2323.8	3547.61	0.12	0.53
6		108-95-2	Phenol																			
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.4	40.2	35.4	18.6	1.9	0.5	0.3	0.8		78.1	68.8	35.8	3.0	0.3		0.8	412.83	1.57	0.90
8		67-64-1	Acetone		22.0	12.4	7.8	3.1	1.2		6.1		43.2	24.3	15.3	6.1	2.3		11.9	29.45	0.41	0.40
9		98-86-2	Acetophenone	2.1	24.2	14.6	11.7	9.7	7.0	6.6	6.1		43.4	24.4	18.8	15.0	9.5	8.8	7.9	35.17	0.32	0.97
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	5.8																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20	Aliphatic Hydrocarbons	18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23		107-83-5	Pentane, 2-methyl-		1091.5	382.9	249.2	236.3	209.7	221.3	239.4		2142.8	751.6	489.1	464.0	411.6	434.5	470.0	721.08	0.12	0.63
24		96-14-0	Pentane, 3-methyl-		681.7	238.1	154.7	147.6	131.2	138.4	151.9		1338.3	467.3	303.6	289.8	257.5	271.8	298.2	444.88	0.12	0.60
25		540-84-1	2,2,4-Trimethylpentane		796.0	304.3	189.2	199.2	155.6	176.8	190.2		1562.6	597.4	371.5	391.0	305.5	347.0	373.4	565.04	0.12	0.54
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane	1.0	20.0	12.3	9.9	4.9	4.2	3.4	3.1		37.4	22.2	17.5	7.7	6.2	4.7	4.2	39.59	0.49	0.99
28		112-40-3	Dodecane		205.3	127.2	91.7	43.4	24.6	16.0	12.6		403.1	249.6	180.0	85.2	48.2	31.4	24.6	576.86	0.66	0.98
29		142-82-5	Heptane		486.6	190.2	117.2	123.9	99.1	113.2	118.3		955.3	373.4	230.2	243.3	194.5	222.2	232.3	349.50	0.12	0.53
30		544-76-3	Hexadecane		1.4	0.8	0.6		2.2	0.4			2.7	1.6	1.2		4.4	0.8		1.36	-0.06	0.02
31		110-54-3	Hexane		5622.1	2015.2	1322.8	1317.9	1138.0	1229.3	1300.2		11036.8	3956.1	2596.9	2587.2	2234.0	2413.2	2552.4	3765.24	0.11	0.59
32		111-84-2	Nonane		59.0	31.8	19.7	10.8	7.9	8.1	8.5		115.8	62.5	38.6	21.1	15.6	15.9	16.7	84.33	0.40	0.94
33		111-65-9	Octane		137.8	61.7	38.2	32.5	24.0	24.7	25.7		270.5	121.2	74.9	63.8	47.1	48.6	50.5	136.32	0.24	0.88
34		629-62-9	Pentadecane		5.0	3.4	2.2		3.1	1.2	1.2		9.8	6.7	4.4		6.1	2.4	2.3	8.02	0.22	0.50
35		629-59-4	Tetradecane		42.3	24.7	20.8	14.3	10.1	6.8	5.8		83.0	48.4	40.8	28.0	19.8	13.3	11.3	84.12	0.41	0.94
36		629-50-5	Tridecane		225.0	131.3	102.6	60.1	37.3	25.3	20.4		441.6	257.8	201.5	118.0	73.2	49.8	40.1	512.54	0.53	0.97
37		1120-21-4	Undecane	1.0	32.6	21.0	13.7	5.9	3.6	2.6	2.4		62.1	39.4	25.0	9.7	5.2	3.2	2.8	98.67	0.77	0.99
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		25.5	15.9	11.2	5.6	3.8	2.6	2.1		50.1	31.2	22.1	10.9	7.5	5.0	4.2	61.42	0.57	0.99
39		611-14-3	Toluene, 2-ethyl-		28.9	18.6	13.7	9.3	7.9	7.1	7.1		56.8	36.6	26.8	18.3	15.4	13.9	13.9	46.60	0.28	0.98
40		620-14-4	Toluene, 3-ethyl-		90.5	57.3	42.2	28.8	23.8	23.3	23.2		177.6	112.4	82.8	56.6	46.6	45.7	45.5	139.51	0.26	0.97
41		622-96-8	Toluene, 4-ethyl-		48.2	30.2	22.1	17.2	14.8	12.8	14.3		94.6	59.3	43.3	33.7	29.1	25.1	28.1	69.97	0.22	0.94
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene		280.2	102.7	67.2	73.3	65.9	71.1	76.3		550.0	201.5	131.9	144.0	129.4	139.6	149.8	180.01	0.06	0.30
44		526-73-8	Benzene, 1,2,3-trimethyl-		37.2	24.1	17.8	11.3	9.0	7.2	7.0		73.0	47.4	34.9	22.1	17.6	14.2	13.7	68.60	0.36	1.00
45		95-63-6	Benzene, 1,2,4-trimethyl-		144.6	94.2	71.8	50.3	41.7	37.5	38.2		283.8	184.9	140.9	98.7	81.8	73.5	74.9	236.13	0.27	0.98
46		95-47-6	Benzene, 1,2-dimethyl-	0.2	118.4	65.1	43.5	33.5	27.9	28.0	28.9		232.1	127.4	85.0	65.3	54.5	54.5	56.4	143.90	0.23	0.91
47		108-67-8	Benzene, 1,3,5-trimethyl-		41.0	26.3	19.7	13.5	11.1	10.1	10.3		80.5	51.7	38.7	26.5	21.8	19.8	20.2	66.36	0.28	0.98
48		108-38-3	Benzene, 1,3-dimethyl-	0.5	313.0	163.3	107.7	88.0	72.3	74.2	78.1		613.3	319.5	210.3	171.6	140.9	144.6	152.3	348.27	0.21	0.87
49		98-82-8	Benzene, isopropyl																			
50		103-65-1	Benzene, propyl-																			
51		100-41-4	Ethylbenzene	0.1	85.7	43.4	28.1	23.9	19.7	20.5	21.5		168.1	84.9	54.8	46.7	38.4	40.0	41.9	90.10	0.19	0.84
52		91-20-3	Naphthalene																			
53		99-87-6	p-Cymene																			
54		100-42-5	Styrene	0.2																		
55	Esters	108-88-3	Toluene	1.5	929.6	391.7	244.0	265.1	221.4	250.9	268.8		1822.0	766.2	476.1	517.6	431.7	489.7	524.8	690.90	0.09	0.39
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58		108-21-4	Acetic acid, 1-methylethyl																			
59	Esters	111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 4 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74	Halo Carbons	109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81	Cyclo Alkanes	75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane																			
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene	1.0								8.3							14.3			
88	Terpenes	79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		253.5	100.3	62.5	65.0	51.0	58.4	62.8		497.7	196.8	122.7	127.5	100.2	114.6	123.2	186.07	0.12	0.54
90		110-82-7	Cyclohexane																			
91		1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95	Acids	80-56-8	alpha-Pinene	0.5	31.9	11.3	5.0	0.6	0.4	0.3	0.3		61.8	21.3	8.9	0.3				263.47	2.08	0.98
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene		4.3								8.5									
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene		57.4	21.6	8.1	1.6					112.6	42.3	15.9	3.1				159.73	1.25	1.00
102	Other	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109	Other	3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116	Other	75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	64.2	23519.6	9983.7	6719.9	5271.2	4254.0	4390.7	4526.2		46045.8	19473.2	13065.9	10222.0	8225.1	8493.4	8759.4	21981.0	0.23	0.90
A1		78-78-4	Butane, 2-methyl-	6.9	1489.6	368.3	285.5	290.4	280.3	269.1	318.9		2910.6	709.4	546.8	556.4	536.6	514.8	612.4	664.3	0.05	0.30
A2	Other	109-66-0	Pentane	6.4	1059.3	299.1	172.3	155.6	157.8	176.2	187.4		2067.0	574.5	325.6	292.9	297.3	333.3	355.3	496.5	0.11	0.38
A3		107-83-5	Pentane, 2-methyl-		1091.5	382.9	249.2	236.3	209.7	221.3	239.4		2142.8	751.6	489.1	464.0	411.6	434.5	470.0	721.1	0.12	0.63
A4		96-14-0	Pentane, 3-methyl-		681.7	238.1	154.7	147.6	131.2	138.4	151.9		1338.3	467.3	303.6	289.8	257.5	271.8	298.2	444.9	0.12	0.60
A5		96-37-7	Cyclopentane, methyl-		621.6	218.3	142.1	143.3	122.7	133.7	144.4		1220.2	428.6	279.0	281.4	240.9	262.4	283.5	403.05	0.10	0.54
A6		591-76-4	Hexane, 2-methyl-		326.8	116.0	72.9	78.7	62.0	69.4	75.0		641.5	227.8	143.2	154.4	121.7	136.3	147.3	213.90	0.11	0.51
A7		96-14-0	Hexane, 3-methyl-		681.7	238.1	154.7	147.6	131.2	138.4	151.9		1338.3	467.3	303.6	289.8	257.5	271.8	298.2	444.88	0.12	0.60
A8		594-82-1	Butane, 2,2,3,3-tetramethyl-		546.5	207.7	129.4	136.0	105.3	121.3	130.7		1072.8	407.7	254.0	266.9	206.8	238.2	256.6	385.16	0.12	0.53
A9	Other	108-87-2	Cyclohexane, methyl-		253.5	100.3	62.5	65.0	51.0	58.4	62.8		497.7	196.8	122.7	127.5	100.2	114.6	123.2	186.07	0.12	0.54
A10		565-75-3	Pentane, 2,3,4-trimethyl-		180.2	75.0	45.1	47.5	33.8	41.8	42.0		353.7	147.2	88.5	93.3	66.4	82.2	82.5	142.46	0.15	0.59
A11		560-21-4	Pentane, 2,3,3-trimethyl-		155.5	65.0	38.8	37.2	27.5	32.3	34.8		305.3	127.5	76.1	73.0	54.0	63.3	68.4	126.06	0.17	0.66
A12		592-27-8	Heptane, 2-methyl-		99.1	42.5	25.4	23.5	18.0	20.3	20.6		194.5	83.4	49.8	46.2	35.4	39.8	40.5	85.03	0.19	0.76
A13		589-81-1	Heptane, 3-methyl-		110.0	50.3	29.6	30.7	18.5	22.1	23.1		215.9	98.7	58.1	60.3	36.3	43.4	45.3	105.71	0.21	0.74
A14		535-77-3	Benzene, 1-methyl-3-(1-methyl-2-propenyl)-		71.7	44.8	31.7	16.5	11.5	9.5	8.7		140.8	87.9	62.2	32.4	22.5	18.7	17.1	147.58	0.48	1.00
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde		43.7	19.1	8.3	3.1	2.5	2.6	3.1		85.7	37.5	16.2	6.0	4.9	5.0	6.0	78.20	0.75	0.96
D2		50-00-0	Formaldehyde		3.2	0.9							6.3	1.8								
D3		123-38-6	Propanal		12.6								24.7									

Note: Levels below the method detection limit are highlighted.

Table A. 5: Concentration & emission factor for LM3 (lawn mower, 4-cycle, 22" blade, used)

#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h					
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²			
1	Alcohols	71-36-3	1-Butanol																						
2		71-23-8	1-Propanol		2.3								4.4												
3		104-76-7	Hexanol, 2-ethyl-1-																						
4		67-63-0	2-Propanol																						
5		64-17-5	Ethanol		2670.5	2510.7	2776.8	2461.7	2952.0	2872.2	2996.3		5242.5	4928.8	5451.2	4832.7	5795.2	5638.5	5882.1	5019.39	-0.03	0.35			
6		108-95-2	Phenol																						
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		36.0	26.6	14.1					70.7	52.2	27.6											
8		67-64-1	Acetone		25.9	18.3	10.6	6.8	6.1	4.5	8.4		50.8	35.9	20.8	13.3	11.9	8.8	16.5	45.44	0.33	0.83			
9		98-86-2	Acetophenone	0.4	3.6	3.3	3.2	2.6	3.9	3.4	3.9		6.4	5.8	5.6	4.4	7.0	6.0	6.9	5.74	-0.01	0.02			
10		108-94-1	Cyclohexanone																						
11		108-10-1	Methylisobutyl ketone																						
12		100-52-7	Benzaldehyde	1.1																					
13		123-72-8	Butanal																						
14		112-31-2	Decanal																						
15		3913-81-3	2-Decenal																						
16		98-01-1	Furfural																						
17		111-71-7	Heptanal																						
18		66-25-1	Hexanal																						
19		124-19-6	Nonanal		3.4	4.9		2.6	2.7	2.8	3.0		6.7	9.6		5.2	5.3	5.5	6.0	7.86	0.08	0.40			
20		18829-56-6	2-Nonenal																						
21		2548-87-0	2-Octenal																						
22		110-62-3	Pentanal																						
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		417.2	469.5	498.1	448.0	558.7	514.5	503.6		819.0	921.7	977.9	879.5	1096.8	1009.9	988.6	856.08	-0.04	0.52			
24		96-14-0	Pentane, 3-methyl-		265.1	299.9	315.7	277.0	362.7	327.7	319.8		520.4	588.7	619.8	543.7	712.0	643.4	627.8	543.15	-0.04	0.44			
25		540-84-1	2,2,4-Trimethylpentane		460.5	416.9	392.3	310.4	417.2	413.4	425.5		904.0	818.4	770.2	609.3	819.0	811.6	835.3	830.08	0.02	0.07			
26		108-08-7	2,4-Dimethylpentane																						
27		124-18-5	Decane		14.4	11.2	9.1	7.4	9.5	8.5	9.9		28.2	21.9	17.8	14.5	18.6	16.7	19.4	24.13	0.09	0.49			
28		112-40-3	Dodecane		3.4	2.9	2.5	1.9	2.2	2.4	2.8		6.7	5.7	4.9	3.7	4.3	4.6	5.5	5.99	0.07	0.39			
29		142-82-5	Heptane		292.2	267.5	244.6	200.4	264.6	263.6	269.5		573.6	525.2	480.2	393.4	519.4	517.4	529.0	526.95	0.02	0.07			
30		544-76-3	Hexadecane		1.4	1.4	1.2	3.0	1.6	2.0	2.3		2.8	2.7	2.4	5.9	3.2	3.9	4.5	2.52	-0.12	0.41			
31		110-54-3	Hexane		2498.7	2684.3	2809.3	2493.1	3152.4	2934.5	2991.1		4905.2	5269.5	5515.0	4894.3	6188.5	5760.7	5871.8	4967.65	-0.04	0.48			
32		111-84-2	Nonane		42.4	36.7	27.1	20.6	23.9	23.1	23.9		83.2	72.1	53.2	40.5	47.0	45.3	46.9	77.06	0.13	0.78			
33		111-65-9	Octane		96.5	85.2	66.6	53.3	66.5	62.9	65.6		189.4	167.3	130.8	104.7	130.6	123.6	128.8	173.66	0.09	0.61			
34		629-62-9	Pentadecane		3.5	3.3	3.4	4.4	5.7	6.0	6.2		6.9	6.5	6.7	8.6	11.2	11.7	12.1	5.91	-0.15	0.86			
35		629-59-4	Tetradecane		2.8	2.7	2.9	2.6	3.3	3.7	4.0		5.4	5.4	5.7	5.1	6.4	7.3	7.9	5.01	-0.07	0.59			
36		629-50-5	Tridecane		2.6	2.1	1.6	1.1	1.3	1.5	1.5		5.2	4.0	3.1	2.1	2.6	3.0	2.9	4.46	0.13	0.60			
37		1120-21-4	Undecane		6.7	5.2	4.1	3.1	3.7	3.4	4.8		13.1	10.2	8.1	6.0	7.2	6.7	9.4	11.20	0.11	0.49			
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		7.9	5.8	4.9	3.6	4.4	4.8	5.1		15.5	11.4	9.6	7.1	8.5	9.4	10.1	12.98	0.10	0.49			
39		611-14-3	Toluene, 2-ethyl-		35.2	26.8	22.8	19.6	25.2	23.0	26.1		69.0	52.6	44.7	38.5	49.5	45.2	51.2	58.07	0.06	0.34			
40		620-14-4	Toluene, 3-ethyl-		110.8	84.8	69.5	65.7	84.1	73.8	84.2		217.6	166.4	136.4	129.1	165.1	144.9	165.3	181.30	0.05	0.25			
41		622-96-8	Toluene, 4-ethyl-		59.0	46.6	39.2	36.7	47.8	43.6	49.2		115.7	91.5	77.0	72.1	93.9	85.7	96.6	97.16	0.03	0.12			
42		4994-16-5	Cyclohexene, 4-phenyl																						
43		71-43-2	Benzene		141.2	145.4	147.3	132.1	171.8	169.0	174.5		277.2	285.3	289.2	259.3	337.2	331.8	342.5	268.13	-0.04	0.48			
44		526-73-8	Benzene, 1,2,3-trimethyl-		31.9	24.5	20.5	17.2	21.0	21.8	23.5		62.6	48.2	40.2	33.8	41.2	42.9	46.1	52.57	0.06	0.34			
45		95-63-6	Benzene, 1,2,4-trimethyl-		169.0	129.2	110.2	99.5	119.7	120.2	133.5		331.8	253.6	216.3	195.3	235.0	235.9	262.2	276.73	0.05	0.24			
46		95-47-6	Benzene, 1,2-dimethyl-		104.5	86.7	71.0	65.1	81.4	74.3	85.7		205.2	170.2	139.4	127.8	159.7	145.9	168.2	177.75	0.04	0.25			
47		108-67-8	Benzene, 1,3,5-trimethyl-		50.0	37.5	31.0	28.0	35.9	32.5	36.9		98.1	73.7	60.8	55.1	70.4	63.7	72.5	81.26	0.06	0.30			
48		108-38-3	Benzene, 1,3-dimethyl-		254.8	228.9	177.6	168.0	213.4	201.2	212.7		500.2	449.4	348.6	329.8	418.9	395.0	417.6	445.01	0.04	0.18			
49		98-82-8	Benzene, isopropyl																						
50		103-65-1	Benzene, propyl-																						
51		100-41-4	Ethylbenzene		69.6	64.0	49.3	46.1	59.0	56.0	59.2		136.6	125.5	96.8	90.6	115.9	110.0	116.2	122.61	0.03	0.17			
52		Esters	91-20-3	Naphthalene																					
53	99-87-6		p-Cymene																						
54	100-42-5		Styrene		4.2								8.2												
55	108-88-3		Toluene	0.2	621.1	580.5	482.1	457.9	615.9	588.2	594.6		1218.9	1139.2	946.0	898.4	1208.7	1154.2	1166.8	1097.30	0.00	0.00			
56	98-83-9		2-Phenylpropene																						
57	95-13-6		Indene																						
58	108-21-4		Acetic acid, 1-methylethyl																						
59	111-15-9		Acetic acid, 2-ethoxyethyl																						
60	123-86-4		Acetic acid, butyl ester																						
61	141-78-6		Acetic acid, ethyl ester																						
62	80-62-6		Methyl methacrylate																						
63	103-09-3		2-Ethylhexyl acetate																						
64	96-48-0		Butyrolactone																						
65	25265-77-4		Texanol																						
66	6846-50-0		TXIB																						

Table A. 5 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83	Cyclo Alkanes	67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane																			
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene			8.3		16.0	4.5	4.3	5.8			16.2		31.4	8.8	8.5	11.5	24.99	0.18	0.22
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		150.1	137.1	116.8	101.5	131.2	133.6	128.5		294.6	269.1	229.4	199.2	257.5	262.3	252.3	268.06	0.03	0.12
90		110-82-7	Cyclohexane																			
91	Terpenes	1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95		80-56-8	alpha-Pinene		39.9	23.4	11.6	1.0	0.6	0.4	0.4		78.4	46.0	22.8	1.9	1.1	0.9	0.7	113.89	1.15	0.97
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene		5.8	3.8	2.5						11.4	7.5	4.9							
98		99-85-4	gamma-Terpinene																			
99	Acids	13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene		26.4	14.0	7.4						51.9	27.5	14.6							
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115	DMPH	121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	32.5	8831.0	8035.8	7446.1	6790.1	8114.9	7579.6	7851.4		17272.5	15711.3	14553.8	13266.0	15866.7	14815.7	15349.4	16129.8	0.02	0.21
A1		78-78-4	Butane, 2-methyl-	6.7	49.5	66.8	75.0	109.1	63.2	60.1	63.1		84.1	118.0	134.0	201.1	110.9	104.9	110.8	108.0	-0.04	0.06
A2	DMPH	109-66-0	Pentane	8.4	71.5	104.4	193.8	243.4	90.4	77.8	90.4		124.0	188.6	364.0	461.4	161.0	136.2	161.0	202.9	0.00	0.00
A3		107-83-5	Pentane, 2-methyl-		417.2	469.5	498.1	448.0	558.7	514.5	503.6		819.0	921.7	977.9	879.5	1096.8	1009.9	988.6	856.1	-0.04	0.52
A4		96-14-0	Pentane, 3-methyl-		265.1	299.9	315.7	277.0	362.7	327.7	319.8		520.4	588.7	619.8	543.7	712.0	643.4	627.8	543.2	-0.04	0.44
A5		96-37-7	Cyclopentane, methyl-		275.2	286.4	287.7	252.8	337.7	312.1	311.9		540.2	562.3	564.8	496.2	662.9	612.8	612.3	532.91	-0.03	0.29
A6		591-76-4	Hexane, 2-methyl-		168.0	159.9	158.4	129.4	167.2	164.0	170.8		329.9	313.8	311.0	254.1	328.3	321.9	335.3	312.87	0.00	0.00
A7		96-14-0	Hexane, 3-methyl-		265.1	299.9	315.7	277.0	362.7	327.7	319.8		520.4	588.7	619.8	543.7	712.0	643.4	627.8	543.15	-0.04	0.44
A8		594-82-1	Butane, 2,2,3,3-tetramethyl-		314.1	284.6	267.9	214.4	284.5	282.2	289.5		616.7	558.7	525.9	420.9	558.6	553.9	568.3	567.22	0.02	0.07
A9		108-87-2	Cyclohexane, methyl-		150.1	137.1	116.8	101.5	131.2	133.6	128.5		294.6	269.1	229.4	199.2	257.5	262.3	252.3	268.06	0.03	0.12
A10	DMPH	565-75-3	Pentane, 2,3,4-trimethyl-		120.8	102.2	84.7	71.4	96.4	93.4	89.4		237.2	200.6	166.3	140.2	189.3	183.3	175.5	209.10	0.05	0.29
A11		560-21-4	Pentane, 2,3,3-trimethyl-		106.8	89.6	72.4	59.4	81.7	78.3	76.4		209.6	175.9	142.0	116.7	160.4	153.7	149.9	183.75	0.06	0.34
A12		592-27-8	Heptane, 2-methyl-		71.5	60.1	47.9	38.8	52.0	49.2	48.8		140.4	118.0	94.0	76.2	102.1	96.5	95.7	124.24	0.07	0.46
A13		589-81-1	Heptane, 3-methyl-		82.3	74.6	62.2	49.5	64.1	55.6	52.8		161.5	146.5	122.0	97.2	125.9	109.1	103.7	154.27	0.09	0.69
A14		535-77-3	Benzene, 1-methyl-3-(1-methyl-2-propenyl)-		32.9	25.3	20.0	17.3	20.4	22.1	23.6		64.6	49.7	39.2	33.9	40.0	43.4	46.3	53.75	0.07	0.36
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DMPH	75-07-0	Acetaldehyde		95.7	49.8	24.3		24.9	23.8	24.4		187.8	97.8	47.7		48.9	46.8	48.0	88.7	0.15	0.51
D2		50-00-0	Formaldehyde		6.6	4.1	0.4	1.2	9.2	7.6	0.0		13.0	8.0	0.9	2.4	18.1	14.9	0.0	1.19	-0.52	0.28
D3		123-38-6	Propanal		18.1	11.6							35.6	22.8								

Note: Levels below the method detection limit are highlighted.

Table A. 6: Concentration & emission factor for LM4 (lawn mower, 4-cycle, 21" blade, used)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h			
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²	
1	Alcohols	71-36-3	1-Butanol																				
2		71-23-8	1-Propanol																				
3		104-76-7	Hexanol, 2-ethyl-1-																				
4		67-63-0	2-Propanol																				
5		64-17-5	Ethanol		3305.1	4098.2	3836.4	3809.0	4046.5	3907.2	3520.1		6488.4	8045.3	7531.3	7477.5	7943.7	7670.2	6910.3	8078.89	0.02	0.27	
6		108-95-2	Phenol																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		116.0	105.7	38.5	3.3	2.7	2.8	2.1		227.8	207.5	75.7	6.6	5.2	5.5	4.1	556.29	1.15	0.93	
8		67-64-1	Acetone	1.1	36.9	26.4	17.6	3.3	3.6	6.6	3.8		70.3	49.7	32.5	4.4	5.0	10.9	5.4	80.37	0.63	0.72	
9		98-86-2	Acetophenone	0.9	10.9	10.6	7.9	7.5	9.5	9.5	7.5		19.7	19.0	13.7	12.9	16.9	17.0	13.0	17.00	0.03	0.09	
10		108-94-1	Cyclohexanone																				
11		108-10-1	Methylisobutyl ketone																				
12		100-52-7	Benzaldehyde	2.9																			
13		123-72-8	Butanal																				
14		112-31-2	Decanal																				
15		3913-81-3	2-Decenal																				
16		98-01-1	Furfural																				
17		111-71-7	Heptanal																				
18		66-25-1	Hexanal																				
19		124-19-6	Nonanal																				
20	18829-56-6	2-Nonenal																					
21	2548-87-0	2-Octenal																					
22	110-62-3	Pentanal																					
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	0.0	1246.6	895.0	795.9	832.2	863.8	901.7	758.7		2447.3	1757.1	1562.5	1633.6	1695.8	1770.1	1489.5	1702.20	0.01	0.04	
24		96-14-0	Pentane, 3-methyl-	0.0	801.5	566.4	502.7	525.3	542.4	569.6	480.3		1573.3	1112.0	986.9	1031.1	1064.9	1118.1	942.9	1076.48	0.01	0.05	
25		540-84-1	2,2,4-Trimethylpentane		1481.1	973.4	777.7	784.3	793.4	772.0	640.2		2907.6	1910.8	1526.7	1539.6	1557.6	1515.6	1256.8	1940.95	0.07	0.61	
26		108-08-7	2,4-Dimethylpentane																				
27		124-18-5	Decane		73.4	59.4	48.0	48.7	48.4	49.5	43.8		144.0	116.7	94.3	95.6	95.0	97.2	86.0	114.64	0.05	0.56	
28		112-40-3	Dodecane		6.3	5.1	4.7	4.9	5.0	5.4	4.8		12.5	9.9	9.2	9.6	9.8	10.6	9.5	9.48	-0.01	0.08	
29		142-82-5	Heptane		1251.7	947.6	790.9	856.9	889.0	917.7	810.9		2457.3	1860.3	1552.6	1682.2	1745.3	1801.6	1591.9	1740.63	0.01	0.02	
30		544-76-3	Hexadecane		0.9								1.7										
31		110-54-3	Hexane		8345	6340	5802	6408	6628	7065	6132		16382	12446	11391	12580	13012	13869	12038	11654.7	-0.02	0.24	
32		111-84-2	Nonane		189.5	145.2	120.8	123.0	125.5	132.0	118.7		372.0	285.1	237.2	241.5	246.3	259.1	233.0	272.04	0.03	0.26	
33		111-65-9	Octane		419.3	340.3	274.2	275.9	287.0	312.5	275.8		823.1	668.0	538.4	541.6	563.5	613.6	541.3	622.76	0.03	0.16	
34		629-62-9	Pentadecane		1.2	0.8		0.8	0.9	0.8	0.7		2.4	1.6		1.6	1.8	1.5	1.4	1.66	0.02	0.07	
35		629-59-4	Tetradecane		1.2	0.8	0.8	0.7	1.0	1.0	0.8		2.4	1.5	1.5	1.4	1.9	2.0	1.6	1.39	-0.06	0.33	
36		629-50-5	Tridecane		2.7	1.9	1.5	1.5	2.0	2.0	1.7		5.2	3.7	3.0	2.9	3.8	3.9	3.2	3.18	-0.02	0.05	
37		1120-21-4	Undecane		21.8	17.5	16.6	15.3	16.6	16.5	14.2		42.8	34.3	32.6	30.0	32.7	32.5	28.0	35.11	0.03	0.41	
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		47.4	39.9	35.8	40.0	39.3	40.9	36.1		93.0	78.2	70.3	78.5	77.2	80.3	70.9	75.26	0.00	0.00
39			611-14-3	Toluene, 2-ethyl-		255.5	217.1	182.9	192.6	188.8	192.9	167.8		501.5	426.1	359.0	378.1	370.6	378.7	329.3	421.02	0.04	0.43
40			620-14-4	Toluene, 3-ethyl-		827.4	707.7	598.4	642.6	630.7	652.4	571.0		1624.3	1389.4	1174.7	1261.5	1238.1	1280.7	1121.0	1351.23	0.03	0.26
41	622-96-8		Toluene, 4-ethyl-		466.9	416.0	360.4	399.6	412.0	443.4	392.8		916.5	816.7	707.6	784.5	808.8	870.4	771.1	749.12	-0.02	0.13	
42	4994-16-5		Cyclohexene, 4-phenyl																				
43	71-43-2		Benzene		606.2	544.9	501.6	651.1	711.7	751.0	664.2		1190.1	1069.7	984.8	1278.3	1397.2	1474.4	1304.0	910.36	-0.10	0.78	
44	526-73-8		Benzene, 1,2,3-trimethyl-		254.8	216.7	186.9	197.1	193.9	200.4	175.0		500.3	425.4	367.0	386.9	380.7	393.3	343.6	418.33	0.03	0.33	
45	95-63-6		Benzene, 1,2,4-trimethyl-		1376.4	1186.5	1019.1	1098.1	1097.8	1142.3	1011.7		2702.1	2329.2	2000.6	2155.8	2155.1	2242.4	1986.0	2231.65	0.01	0.09	
46	95-47-6		Benzene, 1,2-dimethyl-		997.2	861.1	725.9	751.6	716.2	723.9	628.6		1957.6	1690.5	1425.0	1475.4	1406.0	1421.0	1234.1	1718.49	0.06	0.64	
47	108-67-8		Benzene, 1,3,5-trimethyl-		356.2	297.9	248.2	262.9	258.5	267.4	234.5		699.2	584.8	487.3	516.1	507.6	524.9	460.4	569.52	0.03	0.35	
48	108-38-3		Benzene, 1,3-dimethyl-		2049.8	1917.7	1798.0	1813.9	1779.7	1813.8	1674.0		4024.0	3764.6	3529.7	3561.0	3493.7	3560.8	3286.2	3798.43	0.02	0.57	
49	98-82-8		Benzene, isopropyl																				
50	103-65-1		Benzene, propyl-																				
51	100-41-4		Ethylbenzene		634.9	565.4	481.9	492.9	473.1	478.7	419.5		1246.3	1109.9	946.0	967.5	928.8	939.8	823.4	1128.09	0.06	0.66	
52	Esters		91-20-3	Naphthalene																			
53			99-87-6	p-Cymene																			
54			100-42-5	Styrene	0.2																		
55		108-88-3	Toluene	0.5	2576.4	2446.8	2350.9	2270.3	2240.4	2242.9	2165.8		5056.9	4802.5	4614.2	4455.9	4397.2	4402.1	4250.8	4917.23	0.03	0.94	
56		98-83-9	2-Phenylpropene																				
57		95-13-6	Indene																				
58		108-21-4	Acetic acid, 1-methylethyl																				
59		111-15-9	Acetic acid, 2-ethoxyethyl																				
60		123-86-4	Acetic acid, butyl ester																				
61		141-78-6	Acetic acid, ethyl ester																				
62		80-62-6	Methyl methacrylate																				
63		103-09-3	2-Ethylhexyl acetate																				
64		96-48-0	Butyrolactone																				
65		25265-77-4	Texanol																				
66		6846-50-0	TXIB																				

Table A. 6 (continued)

				Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																					
68		110-49-6	2-Methoxyethylacetate																					
69		111-90-0	Diethylene glycol monoethyl ether																					
70		107-98-2	Propanol, 1-methoxy-2-																					
71		111-76-2	Ethanol, 2-butoxy-																					
72		112-34-5	Ethanol, 2-butoxyethoxy-																					
73		110-80-5	Ethanol, 2-ethoxy-																					
74		109-86-4	Ethanol, 2-methoxy-																					
75		75-65-0	Propanol, 2-methyl-2-																					
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																					
77		95-50-1	1,2-Dichlorobenzene																					
78		107-06-2	1,2-Dichloroethane																					
79		78-87-5	1,2-Dichloropropane																					
80		106-46-7	1,4-Dichlorobenzene																					
81		75-27-4	Bromodichloromethane																					
82		56-23-5	Carbon tetrachloride																					
83		67-66-3	Chloroform																					
84		124-48-1	Dibromochloromethane																					
85	Cyclo Alkanes	75-09-2	Dichloromethane																					
86		127-18-4	Tetrachloroethylene																					
87		79-01-6	Trichloroethylene	0.8	7.0								12.2											
88		79-34-5	1,1,2,2-Tetrachloroethane																					
89		108-87-2	Methylcyclohexane	0.0	533.6	384.4	309.0	322.4	338.7	344.6	300.3		1047.5	754.6	606.6	632.9	665.0	676.5	589.5	714.83	0.03	0.22		
90		110-82-7	Cyclohexane																					
91		1678-93-9	Cyclohexane, butyl-																					
92		1678-91-7	Cyclohexane, ethyl-																					
93		1678-92-8	Cyclohexane, propyl-																					
94	91-17-8	Decahydronaphthalene																						
95	Terpenes	80-56-8	alpha-Pinene		22.9	10.1	2.4	0.4					45.0	19.9	4.8	0.7				97.91	1.57	0.99		
96		99-86-5	alpha-Terpinene																					
97		127-91-3	beta-Pinene																					
98		99-85-4	gamma-Terpinene																					
99		13466-78-9	3-Carene																					
100	Acids	79-92-5	Camphene																					
101		5989-27-5	Limonene		53.3	23.4	9.7						104.7	45.9	19.1									
102		64-19-7	Acetic acid																					
103		79-31-2	Isobutyric acid																					
104		107-92-6	Butyric acid																					
105		111-14-8	Heptanoic acid																					
106		149-57-5	2-Ethylhexanoic acid																					
107		142-62-1	Hexanoic acid																					
108		109-52-4	Pentanoic Acid																					
109	Other	3777-69-3	Furan, 2-pentyl																					
110		872-50-4	2-Pyrrolidinone, 1-methyl-																					
111		123-91-1	1,4-Dioxane																					
112		78-40-0	Triethyl phosphate																					
113		142-96-1	n-Butyl ether																					
114		96-29-7	2-Butanone oxime																					
115		121-44-8	Triethylamine																					
116		75-21-8	Ethylene oxide																					
117		75-56-9	Propylene oxide																					
118		106-99-0	1,3-Butadiene																					
119	0-00-0	TVOC		80	40941	33533	28535	29642	30139	30659	26745		80214	65671	55861	58032	59010	60030	52345	64130.8	0.03	0.31		
A1	78-78-4	Butane, 2-methyl-		8.4	1103.7	729.5	502.8	558.3	662.6	631.1	479.9		2150.2	1415.6	970.4	1079.4	1284.2	1222.5	925.5	1273.3	0.04	0.09		
A2	109-66-0	Pentane		7.9	981.5	776.4	610.5	686.3	791.8	802.2	640.6		1911.2	1508.6	1183.0	1331.6	1538.8	1559.2	1242.1	1345.4	-0.01	0.01		
A3	107-83-5	Pentane, 2-methyl-		0.0	1246.6	895.0	795.9	832.2	863.8	901.7	758.7		2447.3	1757.1	1562.5	1633.6	1695.8	1770.1	1489.5	1702.2	0.01	0.04		
A4	96-14-0	Pentane, 3-methyl-		0.0	801.5	566.4	502.7	525.3	542.4	569.6	480.3		1573.3	1112.0	986.9	1031.1	1064.9	1118.1	942.9	1076.5	0.01	0.05		
A5	96-37-7	Cyclopentane, methyl-		0.0	908.2	654.8	567.9	603.1	621.2	648.0	550.9		1783.0	1285.4	1114.8	1183.9	1219.4	1272.2	1081.4	1233.68	0.01	0.05		
A6	591-76-4	Hexane, 2-methyl-		0.0	602.0	428.4	358.4	379.1	391.2	402.1	345.4		1181.8	840.9	703.5	744.1	768.0	789.5	678.1	805.41	0.02	0.15		
A7	96-14-0	Hexane, 3-methyl-		0.0	801.5	566.4	502.7	525.3	542.4	569.6	480.3		1573.3	1112.0	986.9	1031.1	1064.9	1118.1	942.9	1076.48	0.01	0.05		
A8	594-82-1	Butane, 2,2,3,3-tetramethyl-		0.0	1012.8	674.6	540.5	551.4	562.2	552.2	462.9		1988.3	1324.3	1061.0	1082.5	1103.7	1084.1	908.7	1323.52	0.06	0.54		
A9	108-87-2	Cyclohexane, methyl-		0.0	533.6	384.4	309.0	322.4	338.7	344.6	300.3		1047.5	754.6	606.6	632.9	665.0	676.5	589.5	714.83	0.03	0.22		
A10	565-75-3	Pentane, 2,3,4-trimethyl-		0.0	407.6	282.9	222.9	217.8	221.8	215.1	184.0		800.2	555.4	437.5	427.6	435.4	422.3	361.3	563.6	0.08	0.69		
A11	560-21-4	Pentane, 2,3,3-trimethyl-		0.0	326.0	221.2	172.5	165.8	169.5	164.0	140.3		640.1	434.3	338.6	325.4	332.7	321.9	275.4	442.4	0.09	0.72		
A12	592-27-8	Heptane, 2-methyl-		0.0	257.9	191.1	173.0	153.9	158.1	161.3	141.5		506.3	375.1	339.6	302.2	310.3	316.6	277.8	391.2	0.07	0.79		
A13	589-81-1	Heptane, 3-methyl-		0.0	258.4	204.6	161.5	151.8	154.4	163.7	146.2		507.2	401.6	317.1	297.9	303.1	321.4	287.0	392.0	0.07	0.59		
A14	535-77-3	Benzene, 1-methyl-3-(1-methyl-2-propenyl)-		0.0	216.1	183.9	164.1	178.0	184.0	194.5	173.1		424.2	361.0	322.1	349.5	361.3	381.8	339.8	337.90	-0.01	0.10		
				Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
D1	DNPH	75-07-0	Acetaldehyde		34.0	40.8	28.3	13.1	11.6	11.5	8.7		66.7	80.1	55.6	25.7	22.7	22.6	17.1	140.3	0.49	0.98		
D2		50-00-0	Formaldehyde		7.4	2.7	2.4	1.1	1.8		0.5		14.5	5.4	4.7	2.1	3.5		0.9	10.2	0.44	0.71		
D3		123-38-6	Propanal																					

Note: Levels below the method detection limit are highlighted.

	Chamber concentration ($\mu\text{g m}^{-3}$)	Emission factor
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#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1.2 h	3.2 h	6.4 h	24.2 h	48.2 h	72.2 h	96.2 h	192.4 h	0 h	1.2 h	3.2 h	6.4 h	24.2 h	48.2 h	72.2 h	96.2 h	192.4 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol																							
2		71-23-8	1-Propanol																							
3		104-76-7	Hexanol, 2-ethyl-1-								0.3									0.5						
4		67-63-0	2-Propanol																							
5		64-17-5	Ethanol		4698.6	2676.4	2813.8	1437.9	649.7	215.2	156.0	77.9		9224.0	5254.1	5523.9	2822.7	1275.4	422.5	306.2	152.8	26371.9	0.92	0.96		
6	Aldehydes & ketones	108-95-2	Phenol					1.3	0.8	0.3	0.8	0.9					2.6	1.5	0.6	1.6	1.8					
7		78-93-3	Methylethyl ketone		19.1	41.2	2.7	0.5						37.5	80.8	5.3	1.0									
8		67-64-1	Acetone		10.9	6.2	6.3	1.4	3.6	0.9	0.8	0.6		21.3	12.1	12.4	2.7	7.1	1.8	1.5	1.2	28.96	0.60	0.75		
9		98-86-2	Acetophenone	0.4				1.5	1.3	0.7	0.8	0.7					2.2	1.8	0.6	0.7	0.6					
10		108-94-1	Cyclohexanone																							
11		108-10-1	Methylisobutyl ketone																							
12		100-52-7	Benzaldehyde	1.4																						
13		123-72-8	Butanal																							
14		112-31-2	Decanal																							
15		3913-81-3	2-Decenal																							
16		98-01-1	Furfural																							
17		111-71-7	Heptanal																							
18		66-25-1	Hexanal																							
19		124-19-6	Nonanal																							
20		18829-56-6	2-Nonenal																							
21		2548-87-0	2-Octenal																							
22		110-62-3	Pentanal																							
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		1969.0	780.8	488.0	160.1	159.4	101.4	92.9	60.9		3865.3	1532.8	958.0	314.2	312.9	199.0	182.3	119.5	2927.04	0.62	0.98		
24		96-14-0	Pentane, 3-methyl-		1171.3	454.2	277.6	89.4	89.0	56.0	50.2	34.0		2299.4	891.6	545.0	175.6	174.8	109.9	98.6	66.8	1711.42	0.63	0.98		
25		540-84-1	2,2,4-Trimethylpentane		1362.4	420.1	184.3	57.9	45.4	33.7	31.8	22.7		2674.6	824.7	361.9	113.7	89.1	66.1	62.4	44.6	1450.41	0.70	0.97		
26		108-08-7	2,4-Dimethylpentane		133.6	43.6	23.4	6.4	6.4	4.2	3.7	2.6		262.3	85.6	46.0	12.5	12.5	8.2	7.2	5.0	162.92	0.69	0.97		
27		124-18-5	Decane		169.4	71.9	24.4	5.3	2.9	2.3	1.5	1.0		332.5	141.1	48.0	10.3	5.7	4.6	2.9	2.0	362.80	1.04	0.98		
28		112-40-3	Dodecane		44.0	27.7	19.5	7.7	2.9	2.3	1.5	0.8		86.4	54.4	38.3	15.1	5.7	4.5	3.0	1.6	186.16	0.89	0.98		
29		142-82-5	Heptane		904.9	297.1	150.7	64.2	47.3	35.0	30.8	20.2		1776.4	583.3	295.9	126.1	92.8	68.8	60.5	39.7	1067.49	0.64	0.99		
30		544-76-3	Hexadecane		2.0	1.3	1.3	1.2	0.9					4.0	2.6	2.6	2.3	1.8				3.23	0.14	0.83		
31		110-54-3	Hexane		4766.8	2022.9	1329.9	483.8	434.0	279.8	250.7	156.9		9357.7	3971.2	2610.7	949.8	852.0	549.2	492.2	308.0	8002.29	0.62	0.99		
32		111-84-2	Nonane		331.2	104.3	31.9	10.5	6.7	5.0	3.7	2.6		650.2	204.8	62.6	20.6	13.1	9.8	7.3	5.1	405.69	0.87	0.97		
33		111-65-9	Octane		450.3	137.9	54.7	22.4	14.2	11.8	9.8	7.1		883.9	270.7	107.3	43.9	27.9	23.1	19.2	13.9	475.81	0.70	0.98		
34		629-62-9	Pentadecane		3.9	2.5	2.1	1.3	1.1	1.2				7.6	4.8	4.1	2.5	2.1	2.4			6.48	0.27	0.94		
35		629-59-4	Tetradecane		5.3	3.4	2.7	1.8	1.5	1.4	1.0	0.6		10.4	6.6	5.3	3.6	3.0	2.7	1.9	1.1	11.48	0.39	0.92		
36		629-50-5	Tridecane		10.2	5.4	4.6	2.8	1.7	1.2	0.5	0.3		19.9	10.7	9.1	5.6	3.4	2.4	1.1	0.6	32.88	0.68	0.89		
37		1120-21-4	Undecane		72.6	42.1	24.3	4.1	2.1	1.7	1.3			142.6	82.7	47.8	8.1	4.1	3.3	2.5		297.39	1.07	0.99		
38		95-93-2	Benzene, 1,2,4,5-tetramet		83.5	46.3	25.8	4.5	2.3	1.8	1.2	0.8		163.8	91.0	50.6	8.9	4.6	3.6	2.4	1.5	300.28	1.04	0.99		
39		611-14-3	Toluene, 2-ethyl-		323.6	123.8	39.6	16.7	11.4	9.2	7.0	4.5		635.2	243.1	77.8	32.7	22.5	18.0	13.7	8.7	426.39	0.76	0.97		
40	620-14-4	Toluene, 3-ethyl-		962.7	347.8	111.3	50.5	35.9	28.4	22.3	14.5		1889.9	682.8	218.6	99.2	70.6	55.8	43.8	28.4	1133.31	0.72	0.97			
41	622-96-8	Toluene, 4-ethyl-		580.0	208.4	69.1	34.1	24.1	19.5	15.2	9.3		1138.5	409.2	135.7	66.9	47.4	38.2	29.8	18.2	678.19	0.69	0.97			
42	4994-16-5	Cyclohexene, 4-phenyl																								
43	Aromatic Hydrocarbons	71-43-2	Benzene		312.0	147.3	119.5	70.7	51.3	27.8	21.9	9.9		612.4	289.1	234.7	138.9	100.7	54.6	43.0	19.4	771.10	0.63	0.97		
44		526-73-8	Benzene, 1,2,3-trimethyl-		340.3	151.9	55.8	17.1	11.1	9.3	6.9	4.3		668.0	298.2	109.5	33.5	21.8	18.3	13.5	8.5	609.77	0.84	0.98		
45		95-63-6	Benzene, 1,2,4-trimethyl-		1716.4	719.5	245.5	91.9	63.9	51.3	41.0	26.4		3369.4	1412.5	481.9	180.5	125.4	100.8	80.5	51.9	2518.65	0.76	0.97		
46		95-47-6	Benzene, 1,2-dimethyl-		688.9	209.6	78.2	52.3	37.4	29.4	23.1	13.4		1352.4	411.5	153.4	102.6	73.5	57.8	45.4	26.3	655.00	0.59	0.98		
47		108-67-8	Benzene, 1,3,5-trimethyl-		474.4	180.5	57.6	22.2	15.5	12.4	9.9	6.4		931.2	354.4	113.1	43.6	30.5	24.4	19.3	12.6	614.89	0.76	0.97		
48		108-38-3	Benzene, 1,3-dimethyl-		1562.8	469.1	192.5	135.6	98.0	75.5	60.0	33.9		3068.0	920.9	377.9	266.2	192.3	148.2	117.9	66.6	1493.27	0.56	0.98		
49		98-82-8	Benzene, isopropyl		72.6	23.1	7.7	3.8	2.7	2.1	1.5	0.9		142.5	45.4	15.1	7.5	5.3	4.1	2.9	1.8	80.05	0.72	0.97		
50		103-65-1	Benzene, propyl-		344.9	120.3	39.8	19.7	14.1	11.1	8.4	5.2		677.1	236.1	78.2	38.6	27.6	21.8	16.5	10.1	398.51	0.70	0.97		
51		100-41-4	Ethylbenzene		385.9	114.6	49.3	35.8	25.7	19.7	15.3	8.4		757.5	225.0	96.8	70.3	50.5	38.7	30.0	16.4	376.28	0.56	0.99		
52		91-20-3	Naphthalene		133.0	73.0	49.2	21.7	10.3	7.5	5.5	3.2		261.1	143.3	96.7	42.7	20.3	14.8	10.9	6.2	402.19	0.78	0.99		
53		99-87-6	p-Cymene		16.8	7.8	2.6	0.7	0.4	0.3	0.2	0.2		33.0	15.2	5.1	1.3	0.8	0.7	0.5	0.3	33.75	0.94	0.98		
54		100-42-5	Styrene		20.1									39.4												
55		108-88-3	Toluene		0.3	1931.7	702.3	437.4	359.5	238.7	165.5	129.9	59.7		3791.7	1378.3	858.2	705.3	468.1	324.4	254.5	116.7	2835.61	0.53	0.97	
56	98-83-9	2-Phenylpropene																								
57	95-13-6	Indene		6.6	3.1	1.4	0.5	0.4	0.2	0.2			12.9	6.0	2.7	0.9	0.8	0.5	0.4		12.82	0.77	0.98			
58	Esters	108-21-4	Acetic acid, 1-methylethyl																							
59		111-15-9	Acetic acid, 2-ethoxyethyl																							
60		123-86-4	Acetic acid, butyl ester																							
61		141-78-6	Acetic acid, ethyl ester																							
62		80-62-6	Methyl methacrylate																							
63		103-09-3	2-Ethylhexyl acetate																							
64		96-48-0	Butyrolactone																							
65		25265-77-4	Texanol																							
66		6846-50-0	TXIB																							

Table A. 7 (continued)

				Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1.2 h	3.2 h	6.4 h	24.2 h	48.2 h	72.2 h	96.2 h	192.4 h	0 h	1.2 h	3.2 h	6.4 h	24.2 h	48.2 h	72.2 h	96.2 h	192.4 h	a	b	R ²		
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																							
68		110-49-6	2-Methoxyethylacetate																							
69		111-90-0	Diethylene glycol monoeth																							
70		107-98-2	Propanol, 1-methoxy-2-																							
71		111-76-2	Ethanol, 2-butoxy-																							
72		112-34-5	Ethanol, 2-butoxyethoxy-																							
73		110-80-5	Ethanol, 2-ethoxy-																							
74		109-86-4	Ethanol, 2-methoxy-																							
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																							
76		71-55-6	1,1,1-Trichloroethane																							
77		95-50-1	1,2-Dichlorobenzene																							
78		107-06-2	1,2-Dichloroethane																							
79		78-87-5	1,2-Dichloropropane																							
80		106-46-7	1,4-Dichlorobenzene																							
81		75-27-4	Bromodichloromethane																							
82		56-23-5	Carbon tetrachloride																							
83		67-66-3	Chloroform																							
84		124-48-1	Dibromochloromethane																							
85		75-09-2	Dichloromethane																							
86		127-18-4	Tetrachloroethylene																							
87		79-01-6	Trichloroethylene				6.0		4.6								11.9		9.1							
88		79-34-5	1,1,2,2-Tetrachloroethane																							
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		624.9	202.0	97.0	38.6	27.2	19.8	17.8	11.8		1226.8	396.5	190.4	75.7	53.5	38.8	35.0	23.1	744.86	0.68	0.99		
90		110-82-7	Cyclohexane		404.9	147.5	84.8	28.5	24.5	16.2	14.5	9.7		794.9	289.6	166.5	55.9	48.1	31.8	28.4	19.0	570.47	0.66	0.99		
91		1678-93-9	Cyclohexane, butyl-																							
92		1678-91-7	Cyclohexane, ethyl-		130.9	39.1	14.9	6.1	3.6	2.9	2.2	1.5		257.0	76.7	29.2	11.9	7.1	5.7	4.3	2.9	150.17	0.77	0.99		
93		1678-92-8	Cyclohexane, propyl-		55.4	18.6	5.8	1.8	1.0	1.0	0.5	0.3		108.8	36.5	11.4	3.4	2.0	1.9	1.0	0.6	85.05	0.95	0.98		
94	Terpenes	91-17-8	Decahydronaphthalene																							
95		80-56-8	alpha-Pinene		4.1	1.3								8.0	2.5											
96		99-86-5	alpha-Terpinene																							
97		127-91-3	beta-Pinene																							
98		99-85-4	gamma-Terpinene																							
99		13466-78-9	3-Carene																							
100	Acids	79-92-5	Camphene																							
101		5989-27-5	Limonene																							
102		64-19-7	Acetic acid																							
103		79-31-2	Isobutyric acid																							
104		107-92-6	Butyric acid																							
105		111-14-8	Heptanoic acid																							
106		149-57-5	2-Ethylhexanoic acid																							
107		142-62-1	Hexanoic acid																							
108	Other	109-52-4	Pentanoic Acid																							
109		3777-69-3	Furan, 2-pentyl																							
110		872-50-4	2-Pyrrolidinone, 1-methyl																							
111		123-91-1	1,4-Dioxane																							
112		78-40-0	Triethyl phosphate																							
113		142-96-1	n-Butyl ether																							
114		96-29-7	2-Butanone oxime																							
115		121-44-8	Triethylamine																							
116		75-21-8	Ethylene oxide																							
117		75-56-9	Propylene oxide																							
118	DNPH	106-99-0	1,3-Butadiene																							
119		0-00-0	TVOC	50	35549	13714	6614	2803	2043	1312	1124	680		69689	26824	12888	5406	3913	2479	2110	1238	56372.6	0.72	0.99		
				Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1.6 h	3.6 h	7.1 h	24.9 h	48.8 h	72.9 h	96.6 h	192.7 h	0 h	1.6 h	3.6 h	7.1 h	24.9 h	48.8 h	72.9 h	96.6 h	192.7 h	a	b	R ²		
D1	DNPH	75-07-0	Acetaldehyde	0.3	5.4	8.5	7.5	3.5	2.7	2.4	1.9	1.3		10.1	16.2	14.3	6.3	4.8	4.2	3.2	2.1	35.17	0.52	0.99		
D2		50-00-0	Formaldehyde				0.3									0.5										
D3		123-38-6	Propanal																							

Note: Levels below the method detection limit are highlighted.

Table A. 8: Concentration & emission factor for TR2 (trimmer, used)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol		3799.8	4818.8	6695.7	4594.3	2879.2	2287.6	2064.3		7459.4	9459.9	13144.5	9019.2	5652.2	4490.8	4052.5	17517.23	0.29	0.78
6		108-95-2	Phenol					1.3	1.6		0.7					2.5	3.1		1.4	12.83	0.46	0.54
7	Aldehydes & Ketones	78-93-3	Methyl ethyl ketone		2.6	1.7	1.5	1.1	0.8				5.1	3.4	2.9	2.1	1.6			4.69	0.27	0.98
8		67-64-1	Acetone	0.9	11.6	5.4	3.3	3.6	1.9	2.1	0.7		21.1	8.9	4.9	5.4	2.0	2.5		12.46	0.39	0.78
9		98-86-2	Acetophenone	0.4																		
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methyl isobutyl ketone																			
12		100-52-7	Benzaldehyde	1.5																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18	Aliphatic Hydrocarbons	66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23		107-83-5	Pentane, 2-methyl-		1058.4	1052.9	1225.3	817.8	744.4	682.6	657.7		2077.7	2067.0	2405.4	1605.5	1461.4	1340.0	1291.2	2783.26	0.17	0.88
24		96-14-0	Pentane, 3-methyl-		613.3	603.9	693.7	459.8	419.7	379.9	364.0		1204.0	1185.6	1361.9	902.6	824.0	745.8	714.5	1607.31	0.18	0.90
25		540-84-1	2,2,4-Trimethylpentane		566.8	469.2	492.7	338.2	292.1	264.1	256.4		1112.8	921.1	967.3	663.9	573.3	518.6	503.4	1244.35	0.20	0.96
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		50.5	31.1	22.1	13.5	11.6	10.5	11.5		99.2	61.1	43.4	26.4	22.8	20.7	22.5	77.93	0.30	0.95
28		112-40-3	Dodecane		19.9	11.8	9.5	4.8	3.5	3.2	3.0		39.1	23.1	18.6	9.4	6.9	6.2	6.0	36.95	0.42	0.99
29		142-82-5	Heptane		373.3	321.6	365.0	307.3	278.7	261.3	256.2		732.8	631.3	716.5	603.3	547.1	513.0	502.9	759.53	0.09	0.78
30		544-76-3	Hexadecane		1.1	1.1	0.9						2.2	2.2	1.7							
31	Aliphatic Hydrocarbons	110-54-3	Hexane		2554.5	2527.3	3025.0	2280.0	2197.5	2018.4	1966.3		5014.8	4961.5	5938.4	4476.0	4314.0	3962.3	3860.1	6168.27	0.10	0.74
32		111-84-2	Nonane		92.0	56.6	41.1	32.4	27.5	25.4	28.0		180.6	111.1	80.6	63.6	53.9	49.9	55.0	127.56	0.21	0.93
33		111-65-9	Octane		149.3	101.1	91.6	89.1	73.9	74.1	75.6		293.1	198.4	179.8	174.8	145.1	145.6	148.5	216.96	0.09	0.89
34		629-62-9	Pentadecane		2.5	1.5	1.2	1.2					4.9	3.0	2.4	2.4				3.16	0.10	0.60
35		629-59-4	Tetradecane		3.0	1.9	1.7	1.0					5.8	3.8	3.4	1.9				5.73	0.33	0.97
36		629-50-5	Tridecane		5.6	3.8	2.7	1.7	1.2	0.8	0.8		11.1	7.4	5.3	3.3	2.4	1.7	1.6	12.31	0.45	0.99
37		1120-21-4	Undecane		28.6	17.8	12.8	7.1	5.8	5.7	5.2		56.1	35.0	25.2	13.9	11.3	11.2	10.1	48.57	0.36	0.98
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		44.3	30.7	28.0	20.9	17.1	15.3	14.3		87.0	60.3	54.9	41.0	33.5	30.1	28.1	80.16	0.23	0.99
39		611-14-3	Toluene, 2-ethyl-		132.0	99.4	96.5	87.4	68.8	63.7	59.7		259.2	195.2	189.5	171.6	135.1	125.0	117.1	244.37	0.15	0.91
40		620-14-4	Toluene, 3-ethyl-		367.9	277.2	276.6	255.4	203.5	188.4	176.2		722.3	544.2	543.1	501.4	399.4	369.9	345.8	675.01	0.13	0.87
41		622-96-8	Toluene, 4-ethyl-		200.0	159.2	158.3	159.4	125.5	115.9	111.9		392.6	312.5	310.8	312.9	246.3	227.6	219.7	373.49	0.11	0.77
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene	0.3	198.0	220.2	316.9	282.1	236.3	203.3	187.6		388.1	431.8	621.6	553.3	463.3	398.6	367.8	589.20	0.08	0.28
44		526-73-8	Benzene, 1,2,3-trimethyl-		154.9	114.7	109.7	96.8	76.8	70.5	66.5		304.1	225.2	215.3	189.9	150.8	138.5	130.6	283.20	0.16	0.93
45		95-63-6	Benzene, 1,2,4-trimethyl-		664.4	504.5	503.0	465.7	376.2	348.9	329.2		1304.2	990.4	987.4	914.3	738.5	684.9	646.3	1213.29	0.13	0.88
46		95-47-6	Benzene, 1,2-dimethyl-		398.1	339.6	361.3	340.2	263.4	238.3	221.7		781.5	666.7	709.3	667.9	517.0	467.8	435.3	854.38	0.13	0.77
47		108-67-8	Benzene, 1,3,5-trimethyl-		179.1	130.5	122.3	111.2	87.9	81.8	77.7		351.6	256.2	240.1	218.3	172.6	160.6	152.5	315.22	0.15	0.93
48		108-38-3	Benzene, 1,3-dimethyl-		941.1	828.9	903.5	850.7	671.8	605.2	563.1		1847.6	1627.2	1773.7	1670.0	1318.9	1188.0	1105.5	2076.22	0.12	0.73
49	Aromatic Hydrocarbons	98-82-8	Benzene, isopropyl-		33.9	26.3	25.6	22.7	17.5	15.9	15.2		66.5	51.6	50.2	44.6	34.3	31.2	29.9	66.11	0.17	0.91
50		103-65-1	Benzene, propyl-		144.5	112.8	113.6	105.1	82.5	75.5	71.5		283.6	221.4	223.0	206.3	161.9	148.1	140.3	277.71	0.14	0.86
51		100-41-4	Ethylbenzene		249.3	221.9	246.0	227.6	175.8	157.0	144.8		489.5	435.6	482.8	446.9	345.2	308.1	284.2	572.42	0.13	0.74
52		91-20-3	Naphthalene		76.2	57.8	63.8	68.6	56.0	52.8	49.2		149.7	113.4	125.3	134.6	109.9	103.6	96.5	132.04	0.05	0.32
53		99-87-6	p-Cymene		6.3	4.4	3.7	3.0	2.3	2.2	2.0		12.3	8.6	7.3	6.0	4.6	4.2	4.0	11.13	0.22	0.98
54		100-42-5	Styrene	0.3																		
55		108-88-3	Toluene	0.4	1820.4	1800.2	2037.6	1896.0	1561.6	1391.2	1274.1		3572.9	3533.3	3999.2	3721.3	3064.8	2730.3	2500.4	4501.58	0.11	0.67
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene		3.7	3.1	3.6	3.3	2.3	2.1	2.0		7.3	6.1	7.0	6.5	4.4	4.2	4.0	8.30	0.15	0.69
58	Esters	108-21-4	Acetic acid, 1-methylethyl-																			
59		111-15-9	Acetic acid, 2-ethoxyethyl-																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 8 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																					
68		110-49-6	2-Methoxyethylacetate																					
69		111-90-0	Diethylene glycol monoethyl ether																					
70		107-98-2	Propanol, 1-methoxy-2-																					
71		111-76-2	Ethanol, 2-butoxy-																					
72		112-34-5	Ethanol, 2-butoxyethoxy-																					
73		110-80-5	Ethanol, 2-ethoxy-																					
74		109-86-4	Ethanol, 2-methoxy-																					
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																					
76		71-55-6	1,1,1-Trichloroethane																					
77		95-50-1	1,2-Dichlorobenzene																					
78		107-06-2	1,2-Dichloroethane																					
79		78-87-5	1,2-Dichloropropane																					
80		106-46-7	1,4-Dichlorobenzene																					
81		75-27-4	Bromodichloromethane																					
82		56-23-5	Carbon tetrachloride																					
83		67-66-3	Chloroform																					
84		124-48-1	Dibromochloromethane																					
85		75-09-2	Dichloromethane																					
86		127-18-4	Tetrachloroethylene																					
87	79-01-6	Trichloroethylene		3.0	1.3								5.9	2.5										
88	79-34-5	1,1,2,2-Tetrachloroethane																						
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		213.2	168.3	184.3	151.1	133.4	124.6	120.2		418.6	330.4	361.8	296.6	261.9	244.7	235.9	407.78	0.11	0.88		
90		110-82-7	Cyclohexane		176.3	159.8	184.1	137.1	125.5	111.1	104.4		346.0	313.7	361.5	269.1	246.4	218.0	204.9	412.04	0.14	0.85		
91		1678-93-9	Cyclohexane, butyl-																					
92		1678-91-7	Cyclohexane, ethyl-		36.3	22.4	19.7	17.8	15.4	15.1	15.0		71.3	44.0	38.6	35.0	30.2	29.7	29.5	48.98	0.12	0.97		
93		1678-92-8	Cyclohexane, propyl-		13.7	7.5	5.9	4.7	3.6	3.2	3.5		26.8	14.7	11.7	9.2	7.1	6.3	6.9	18.49	0.23	0.97		
94		91-17-8	Decahydronaphthalene																					
95		Terpenes	80-56-8	alpha-Pinene		4.6	1.2							9.0	2.3									
96			99-86-5	alpha-Terpinene																				
97	127-91-3		beta-Pinene																					
98	99-85-4		gamma-Terpinene																					
99	13466-78-9		3-Carene																					
100	79-92-5		Camphene																					
101	Acids	5989-27-5	Limonene		13.8	4.8	1.5						27.0	9.3	3.0									
102		64-19-7	Acetic acid																					
103		79-31-2	Isobutyric acid																					
104		107-92-6	Butyric acid																					
105		111-14-8	Heptanoic acid																					
106		149-57-5	2-Ethylhexanoic acid																					
107		142-62-1	Hexanoic acid																					
108		109-52-4	Pentanoic Acid																					
109	Other	3777-69-3	Furan, 2-pentyl																					
110		872-50-4	2-Pyrrolidinone, 1-methyl-																					
111		123-91-1	1,4-Dioxane																					
112		78-40-0	Triethyl phosphate																					
113		142-96-1	n-Butyl ether																					
114		96-29-7	2-Butanone oxime																					
115		121-44-8	Triethylamine																					
116		75-21-8	Ethylene oxide																					
117		75-56-9	Propylene oxide																					
118		106-99-0	1,3-Butadiene																					
119		0-00-0	TVOC	26.1	16535.3	13718.9	14675.4	11867.2	9555.1	8627.4	8176.4		32409.5	26880.5	28758.3	23245.4	18706.6	16885.2	16000.0	35755.1	0.17	0.90		
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²		
D1	DNPH	75-07-0	Acetaldehyde	0.4	12.0	11.3	10.5	7.6	2.5	2.2	0.7		22.8	21.4	19.8	14.2	4.0	3.6	0.6	98.09	0.88	0.75		
D2		50-00-0	Formaldehyde		1.0	1.5	0.7	0.6	0.2	0.3	0.6		1.9	2.9	1.4	1.2	0.3	0.6	1.3	3.54	0.39	0.46		
D3		123-38-6	Propanal																					

Note: Levels below the method detection limit are highlighted.

Table A. 9: Concentration & emission factor for CS1 (chainsaw, new)

#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol		2982.0	2838.5	2450.6	1533.7	946.8	564.5	394.9		5853.9	5572.3	4810.8	3010.8	1858.8	1108.3	775.2	12233.47	0.54	0.91
6		108-95-2	Phenol																			
7	Aldehydes & ketones	78-93-3	Methylethyl ketone		1.2	0.8	0.8	0.5	0.3	0.2		2.3	1.6	1.6	1.1	0.5	0.4		3.16	0.45	0.87	
8		67-64-1	Acetone		7.2	3.5	2.1	3.2	2.2	2.2	2.0	14.1	6.9	4.2	6.2	4.3	4.4	4.0	6.71	0.10	0.37	
9		98-86-2	Acetophenone																			
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	2.2																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		798.7	654.2	630.3	476.6	377.3	307.3	263.1	1567.9	1284.3	1237.3	935.7	740.8	603.3	516.5	1880.44	0.26	0.94	
24		96-14-0	Pentane, 3-methyl-		510.4	403.1	380.0	293.1	233.1	188.7	159.6	1002.0	791.3	746.1	575.3	457.6	370.5	313.3	1149.22	0.26	0.93	
25		540-84-1	2,2,4-Trimethylpentane		436.2	292.7	230.6	204.3	166.2	136.6	106.4	856.3	574.6	452.7	401.1	326.3	268.1	208.8	765.81	0.25	0.90	
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		252.7	109.1	31.1	13.2	10.3	8.2	7.1	496.1	214.1	61.1	26.0	20.2	16.1	13.9	321.14	0.72	0.93	
28		112-40-3	Dodecane		74.4	59.5	45.2	16.7	7.2	4.6	5.0	146.0	116.7	88.8	32.8	14.0	9.0	9.9	322.33	0.79	0.98	
29		142-82-5	Heptane		342.7	253.5	235.5	176.9	135.1	104.9	85.3	672.7	497.6	462.3	347.3	265.2	206.0	167.5	768.89	0.30	0.93	
30		544-76-3	Hexadecane		2.0	1.4	1.0	0.6	0.6	0.7	0.9	3.9	2.7	1.9	1.3	1.3	1.3	1.7	2.71	0.17	0.59	
31		110-54-3	Hexane		2077.5	1786.8	1766.3	1256.0	953.5	761.4	622.9	4078.3	3507.8	3467.5	2465.7	1871.9	1494.7	1222.9	5540.72	0.30	0.93	
32		111-84-2	Nonane		273.9	88.4	39.4	29.2	23.2	18.6	14.0	537.7	173.6	77.4	57.4	45.6	36.5	27.6	231.46	0.45	0.93	
33		111-65-9	Octane		204.2	104.5	80.2	65.1	49.8	39.8	30.0	400.9	205.2	157.4	127.7	97.7	78.2	58.9	298.50	0.32	0.93	
34		629-62-9	Pentadecane		3.5	1.7	1.2	1.3	1.3	1.2	1.3	6.9	3.3	2.4	2.5	2.5	2.4	2.6	3.05	0.05	0.32	
35		629-59-4	Tetradecane		6.5	4.1	3.5	3.1	2.7	2.1	2.3	12.7	8.1	6.8	6.0	5.3	4.2	4.6	9.72	0.17	0.93	
36		629-50-5	Tridecane		13.7	10.7	9.3	7.5	3.7	2.4	2.3	26.8	21.0	18.2	14.6	7.2	4.7	4.4	41.69	0.47	0.89	
37		1120-21-4	Undecane		141.5	97.1	52.5	8.4	6.1	4.7	4.1	277.7	190.6	103.1	16.4	12.0	9.1	8.1	504.39	0.95	0.97	
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		149.6	94.3	47.5	9.5	6.9	5.5	4.8	293.6	185.1	93.2	18.6	13.6	10.7	9.4	433.61	0.88	0.98	
39		611-14-3	Toluene, 2-ethyl-		387.5	125.5	44.8	39.2	31.0	23.3	19.9	760.8	246.4	88.0	77.0	60.8	45.7	39.0	294.20	0.44	0.87	
40		620-14-4	Toluene, 3-ethyl-		988.7	327.4	133.6	120.9	95.1	71.8	59.6	1941.0	642.7	262.2	237.3	186.6	140.9	117.0	782.82	0.40	0.88	
41		622-96-8	Toluene, 4-ethyl-		622.4	206.0	91.0	85.3	65.1	47.9	40.7	1221.8	404.4	178.7	167.4	127.8	94.0	79.9	504.28	0.39	0.88	
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene		221.5	186.7	169.0	110.9	69.3	47.0	38.4	434.9	366.5	331.7	217.8	136.0	92.3	75.4	710.07	0.45	0.93	
44		526-73-8	Benzene, 1,2,3-trimethyl-		489.9	192.8	59.9	38.4	31.0	23.6	20.5	961.8	378.5	117.5	75.3	60.9	46.3	40.2	488.14	0.56	0.90	
45		95-63-6	Benzene, 1,2,4-trimethyl-		1858.8	755.6	265.6	212.6	169.4	127.9	110.5	3649.0	1483.4	521.3	417.3	332.5	251.1	216.8	1812.13	0.46	0.88	
46		95-47-6	Benzene, 1,2-dimethyl-		486.5	184.5	119.2	123.5	91.7	65.7	53.3	955.1	362.3	234.1	242.5	179.9	128.9	104.7	485.53	0.30	0.84	
47		108-67-8	Benzene, 1,3,5-trimethyl-		584.8	192.6	65.7	54.3	43.1	32.6	27.9	1148.1	378.0	129.0	106.7	84.5	63.9	54.8	455.45	0.46	0.87	
48		108-38-3	Benzene, 1,3-dimethyl-		972.6	424.5	322.0	315.8	228.9	162.8	130.0	1909.4	833.3	632.2	620.0	449.4	319.6	255.3	1202.15	0.29	0.84	
49		98-82-8	Benzene, isopropyl		66.1	21.2	10.9	10.1	7.8	5.9	4.7	129.8	41.6	21.3	19.9	15.3	11.6	9.2	53.51	0.36	0.89	
50		103-65-1	Benzene, propyl-		368.2	117.1	54.0	51.1	39.5	29.4	24.1	722.7	229.8	106.0	100.2	77.5	57.6	47.4	286.89	0.37	0.88	
51		100-41-4	Ethylbenzene		231.3	107.9	87.0	82.9	59.3	41.6	33.2	454.1	211.9	170.9	162.7	116.5	81.6	65.1	317.51	0.30	0.84	
52		91-20-3	Naphthalene	0.1	271.2	193.4	127.2	35.2	24.8	17.7	16.4	532.1	379.3	249.5	68.8	48.4	34.5	31.9	866.76	0.75	0.99	
53		99-87-6	p-Cymene		26.6	11.0	3.2	1.7	1.3	1.0	0.9	52.2	21.6	6.3	3.4	2.6	2.1	1.8	29.94	0.64	0.92	
54		100-42-5	Styrene																			
55		108-88-3	Toluene	0.2	1018.2	793.8	779.8	632.1	420.1	285.3	223.1	1998.4	1557.8	1530.5	1240.5	824.3	559.7	437.5	2752.82	0.35	0.84	
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene		10.2	3.9	1.5	1.2	1.0	0.8	0.6	20.1	7.6	2.9	2.3	1.9	1.6	1.1	9.48	0.45	0.88	
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 9 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h					
				0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²			
67	Glycols, GlycolEthers	57-55-6	1,2-Propanediol																						
68		110-49-6	2-Methoxyethylacetate																						
69		111-90-0	Diethylene glycol monoethyl ether																						
70		107-98-2	Propanol, 1-methoxy-2-																						
71		111-76-2	Ethanol, 2-butoxy-																						
72		112-34-5	Ethanol, 2-butoxyethoxy-																						
73		110-80-5	Ethanol, 2-ethoxy-																						
74		109-86-4	Ethanol, 2-methoxy-																						
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																						
76		71-55-6	1,1,1-Trichloroethane																						
77		95-50-1	1,2-Dichlorobenzene																						
78		107-06-2	1,2-Dichloroethane																						
79		78-87-5	1,2-Dichloropropane																						
80		106-46-7	1,4-Dichlorobenzene																						
81		75-27-4	Bromodichloromethane																						
82		56-23-5	Carbon tetrachloride																						
83	Cyclo Alkanes	67-66-3	Chloroform																						
84		124-48-1	Dibromochloromethane																						
85		75-09-2	Dichloromethane		13.9			8.4					27.2			16.6									
86		127-18-4	Tetrachloroethylene																						
87		79-01-6	Trichloroethylene																						
88		79-34-5	1,1,2,2-Tetrachloroethane																						
89		108-87-2	Methylcyclohexane		274.2	184.4	153.2	126.9	98.9	78.7	63.5		538.3	362.0	300.7	249.1	194.2	154.4	124.7	515.73	0.28	0.93			
90		110-82-7	Cyclohexane		183.0	135.8	118.6	92.3	70.9	56.0	46.0		359.2	266.6	232.8	181.3	139.2	110.0	90.3	395.70	0.29	0.94			
91	Cyclo Alkanes	1678-93-9	Cyclohexane, butyl-																						
92		1678-91-7	Cyclohexane, ethyl-		79.2	35.9	23.5	19.9	15.6	12.2	9.5		155.4	70.4	46.0	39.1	30.6	24.0	18.6	96.50	0.33	0.93			
93		1678-92-8	Cyclohexane, propyl-		61.7	18.7	7.7	5.4	4.3	3.7	2.8		121.2	36.7	15.1	10.7	8.5	7.2	5.4	47.62	0.46	0.92			
94		91-17-8	Decahydronaphthalene																						
95	Terpenes	80-56-8	alpha-Pinene																						
96		99-86-5	alpha-Terpinene																						
97		127-91-3	beta-Pinene																						
98		99-85-4	gamma-Terpinene																						
99		13466-78-9	3-Carene																						
100		79-92-5	Camphene																						
101	Acids	5989-27-5	Limonene																						
102		64-19-7	Acetic acid																						
103		79-31-2	Isobutyric acid																						
104		107-92-6	Butyric acid																						
105		111-14-8	Heptanoic acid																						
106		149-57-5	2-Ethylhexanoic acid																						
107	Other	142-62-1	Hexanoic acid																						
108		109-52-4	Pentanoic Acid																						
109		3777-69-3	Furan, 2-pentyl																						
110		872-50-4	2-Pyrrolidinone, 1-methyl-																						
111		123-91-1	1,4-Dioxane																						
112		78-40-0	Triethyl phosphate																						
113	Other	142-96-1	n-Butyl ether																						
114		96-29-7	2-Butanone oxime																						
115		121-44-8	Triethylamine																						
116		75-21-8	Ethylene oxide																						
117		75-56-9	Propylene oxide																						
118		106-99-0	1,3-Butadiene																						
119	DNP	0-00-0	TVOC	26.7	29529.9	15396.9	9341.9	5831.0	4286.8	3316.8	2848.3		57918.4	30173.5	18287.0	11394.7	8363.1	6458.8	5539.2	46873.5	0.46	0.99			
				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h					
				0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.5 h	96.4 h	0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.5 h	96.4 h	a	b	R ²			
D1		75-07-0	Acetaldehyde	4.2	5.1	4.0	5.3	9.8	10.6	2.0	0.5		1.7		2.1	10.9	12.6			0.42	-0.93	0.93			
D2	DNP	50-00-0	Formaldehyde	1.3	2.1		0.4			2.6			1.4					2.4							
D3		123-38-6	Propanal																						

Note: Levels below the method detection limit are highlighted.

Table A. 10: Concentration & emission factor for CS2 (chainsaw, used)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-	1.5																		
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol		3546.1	2786.7	2084.0	836.5	470.6	319.0	290.2		6961.5	5470.6	4091.1	1642.2	923.9	626.2	569.7	12831.84	0.68	0.99
6		108-95-2	Phenol	1.8						1.4	0.7											
7	Aldehydes & ketones	78-93-3	Methylethyl ketone	0.2	1.3	0.5	0.4	0.3	0.2				2.1	0.5	0.3	0.1				1.21	0.79	1.00
8		67-64-1	Acetone	2.3	13.1	3.9	3.3	4.1	2.2		1.1		21.3	3.1	2.0	3.6				2.22	-0.12	0.17
9		98-86-2	Acetophenone																			
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	2.2																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal	1.4																		
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		1890.3	851.7	589.2	293.0	226.6	190.6	158.0		3710.9	1671.9	1156.6	575.1	444.9	374.2	310.2	2744.44	0.47	1.00
24		96-14-0	Pentane, 3-methyl-		1201.9	532.3	363.2	177.9	139.8	117.9	98.3		2359.5	1044.9	713.1	349.3	274.4	231.5	193.0	1701.30	0.48	1.00
25		540-84-1	2,2,4-Trimethylpentane		998.3	411.1	232.2	114.6	100.1	90.7			1959.8	806.9	455.9	225.0	196.5	178.1		1173.29	0.47	0.96
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		120.9	48.5	23.0	10.8	7.5	7.1	6.0		237.3	95.2	45.2	21.1	14.6	13.9	11.8	148.63	0.58	0.97
28		112-40-3	Dodecane		43.8	19.5	11.1	6.8	5.2	3.6	3.6		85.9	38.2	21.8	13.4	10.2	7.1	7.1	58.20	0.47	0.98
29		142-82-5	Heptane	1.1	667.0	278.4	168.6	94.0	78.6	68.6	55.7		1307.2	544.3	328.8	182.3	152.2	132.5	107.1	791.31	0.43	0.98
30		544-76-3	Hexadecane		2.1	1.2	0.5		0.9		2.5		4.0	2.4	1.0		1.8		5.0	1.11	-0.23	0.34
31		110-54-3	Hexane	7.1	4201.4	1999.1	1440.3	721.0	553.6	467.8	374.3		8233.9	3910.4	2813.6	1401.5	1072.8	904.4	720.8	6566.94	0.47	1.00
32		111-84-2	Nonane		214.6	72.1	30.3	18.9	14.2	12.9	11.5		421.3	141.6	59.5	37.0	27.8	25.3	22.6	185.22	0.48	0.93
33		111-65-9	Octane	0.8	291.6	109.1	52.1	35.3	26.8	24.3	22.1		571.0	212.7	100.7	67.7	51.1	46.1	41.9	274.59	0.43	0.94
34		629-62-9	Pentadecane		3.3	1.5	0.8		1.2		2.4		6.5	2.9	1.7		2.3		4.8	1.80	-0.14	0.29
35		629-59-4	Tetradecane		4.5	2.0	1.3		1.4		1.9		8.8	3.9	2.6		2.8		3.7	3.19	0.00	0.00
36		629-50-5	Tridecane		9.8	4.5	2.5	1.5	1.9	0.9	2.0		19.3	8.8	4.9	2.9	3.7	1.8	3.9	9.76	0.30	0.61
37		1120-21-4	Undecane		68.8	31.4	17.8	9.7	7.3	4.8	5.0		135.1	61.7	34.9	19.1	14.3	9.5	9.7	100.76	0.53	0.98
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		89.6	38.9	22.3	14.5	10.2	8.4	7.0		175.9	76.3	43.9	28.5	20.1	16.6	13.8	115.25	0.46	0.98
39		611-14-3	Toluene, 2-ethyl-		302.3	117.9	59.2	41.1	30.0	26.5	22.5		593.5	231.4	116.3	80.6	58.9	52.1	44.2	313.05	0.43	0.96
40		620-14-4	Toluene, 3-ethyl-	0.2	825.4	326.3	161.9	115.3	84.8	74.9	62.2		1620.0	640.3	317.4	226.0	166.1	146.6	121.8	857.55	0.42	0.95
41		622-96-8	Toluene, 4-ethyl-	0.1	498.5	204.3	103.4	74.6	54.2	47.1	40.0		978.5	400.8	202.8	146.3	106.3	92.2	78.4	540.44	0.42	0.96
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene	0.7	316.0	162.3	114.9	70.6	44.6	32.5	23.3		619.0	317.2	224.2	137.1	86.1	62.4	44.4	606.98	0.53	0.97
44		526-73-8	Benzene, 1,2,3-trimethyl-		323.3	136.6	71.1	47.0	33.7	28.0	25.1		634.7	268.1	139.5	92.3	66.1	55.1	49.2	381.47	0.45	0.97
45		95-63-6	Benzene, 1,2,4-trimethyl-		1368.3	628.3	330.9	223.6	162.3	143.8	120.4		2686.2	1233.5	649.6	439.0	318.6	282.3	236.3	1711.65	0.43	0.97
46		95-47-6	Benzene, 1,2-dimethyl-	0.6	673.1	254.5	131.4	110.3	81.4	71.4	59.2		1320.1	498.4	256.8	215.3	158.6	139.0	115.1	631.20	0.36	0.93
47		108-67-8	Benzene, 1,3,5-trimethyl-	0.1	418.3	163.9	80.4	52.8	39.1	34.5	29.5		821.0	321.6	157.6	103.6	76.7	67.6	57.8	438.78	0.45	0.96
48		108-38-3	Benzene, 1,3-dimethyl-	1.3	1405.5	561.6	300.7	261.4	191.3	164.2	134.2		2756.6	1099.9	587.8	510.6	372.9	319.8	260.8	1410.17	0.35	0.93
49		98-82-8	Benzene, isopropyl		72.0	26.8	13.0	9.9	7.3	6.4	5.4		141.4	52.7	25.5	19.5	14.3	12.6	10.6	68.29	0.41	0.94
50		103-65-1	Benzene, propyl-	0.2	333.0	131.6	65.6	49.0	35.6	31.3	26.0		653.5	258.1	128.5	96.0	69.6	61.1	50.8	342.80	0.41	0.95
51		100-41-4	Ethylbenzene	0.4	385.8	145.0	79.3	69.5	50.2	43.1	34.8		756.6	283.9	155.0	135.6	97.8	84.0	67.5	368.33	0.35	0.93
52		91-20-3	Naphthalene	0.3	209.0	90.5	57.7	46.5	36.3	31.9	27.7		409.6	177.1	112.6	90.8	70.6	62.0	53.8	226.69	0.31	0.96
53		99-87-6	p-Cymene		15.6	6.4	3.3	1.9	1.3	1.2	1.0		30.6	12.6	6.5	3.7	2.6	2.3	1.9	19.07	0.51	0.98
54		100-42-5	Styrene	0.3																		
55		108-88-3	Toluene	4.3	1544.1	989.1	649.5	564.7	390.9	304.5	224.3		3022.7	1933.2	1266.6	1100.0	758.9	589.3	431.9	2877.74	0.37	0.92
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene		9.1	3.8	2.0	1.7	1.2	1.0	0.9		17.8	7.5	3.9	3.3	2.3	1.9	1.8	9.70	0.37	0.94
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester	0.4																		
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB	0.7																		

Table A. 10 (continued)

[illegible]

Note: Levels below the method detection limit are highlighted.

A.2 Chamber concentrations & emission factors for products tested in 50 L chambers with cap/cover closed

Table A. 11: Concentration & emission factor for GC (gasoline container)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	4.7 h	7 h	24 h	48 h	72 h	96 h	0 h	1 h	4.7 h	7 h	24 h	48 h	72 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol																					
2		71-23-8	1-Propanol																					
3		104-76-7	Hexanol, 2-ethyl-1-																					
4		67-63-0	2-Propanol																					
5		64-17-5	Ethanol		37473.0	51376.7	73556.5	69589.3	62088.3	64459.8	58041.8		1873.7	2568.8	3677.8	3479.5	3104.4	3223.0	2902.1	3078.98	-0.01	0.00		
6		108-95-2	Phenol																					
7	Aldehydes & ketones	78-93-3	Methylethyl ketone																					
8		67-64-1	Acetone								42.3								2.1					
9		98-86-2	Acetophenone																					
10		108-94-1	Cyclohexanone																					
11		108-10-1	Methylisobutyl ketone																					
12		100-52-7	Benzaldehyde																					
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17		111-71-7	Heptanal																					
18		66-25-1	Hexanal																					
19		124-19-6	Nonanal																					
20		18829-56-6	2-Nonenal																					
21		2548-87-0	2-Octenal																					
22		110-62-3	Pentanal																					
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		48283.9	67159.4	78596.0	70901.5	63707.0	63566.8	57923.7		2414.2	3358.0	3929.8	3545.1	3185.4	3178.3	2896.2	4089.83	0.06	0.57		
24		96-14-0	Pentane, 3-methyl-		29104.9	39839.7	45208.5	40438.5	35560.5	35731.9	32473.8		1455.2	1992.0	2260.4	2021.9	1778.0	1786.6	1623.7	2458.71	0.08	0.72		
25		540-84-1	2,2,4-Trimethylpentane		16919.0	23699.6	32077.8	26975.9	22032.6	22989.4	20085.3		845.9	1185.0	1603.9	1348.8	1101.6	1149.5	1004.3	1623.96	0.09	0.45		
26		108-08-7	2,4-Dimethylpentane																					
27		124-18-5	Decane		1352.1	1665.8	1827.5	1624.1	1455.5	1405.7	1089.3		67.6	83.3	91.4	81.2	72.8	70.3	54.5	110.53	0.12	0.71		
28		112-40-3	Dodecane		85.5	106.0	80.3	109.2	124.3	86.7	77.0		4.3	5.3	4.0	5.5	6.2	4.3	3.9	5.16	0.02	0.02		
29		142-82-5	Heptane		28486.7	37968.3	46250.1	40070.1	37380.2	38768.0	32883.8		1424.3	1898.4	2312.5	2003.5	1869.0	1938.4	1644.2	2317.61	0.06	0.40		
30		544-76-3	Hexadecane						132.0										6.6					
31		110-54-3	Hexane		252957	371030	470113	414023	370788	384270	342150		12647.8	18551.5	23505.6	20701.1	18539.4	19213.5	17107.5	22840.2	0.05	0.31		
32		111-84-2	Nonane		3642.9	5183.9	5709.1	4767.8	4500.6	4583.0	3790.4		182.1	259.2	285.5	238.4	225.0	229.2	189.5	322.87	0.10	0.76		
33		111-65-9	Octane		9796.4	13366.0	14213.5	12944.1	11782.7	12311.5	9891.6		489.8	668.3	710.7	647.2	589.1	615.6	494.6	806.33	0.08	0.67		
34		629-62-9	Pentadecane						327.6										16.4					
35		629-59-4	Tetradecane						313.1	43.1									15.7	2.2				
36		629-50-5	Tridecane		23.6				133.5	44.7			1.2						6.7	2.2				
37		1120-21-4	Undecane		342.4	388.7	383.3	396.1	346.3	353.4	257.9		17.1	19.4	19.2	19.8	17.3	17.7	12.9	23.48	0.09	0.50		
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		867.6	961.0	973.3	961.0	901.9	837.8	718.8		43.4	48.1	48.7	48.1	45.1	41.9	35.9	56.62	0.08	0.64	
39			611-14-3	Toluene, 2-ethyl-		5631.5	6257.2	6834.1	6100.8	5526.7	5471.4	4705.4		281.6	312.9	341.7	305.0	276.3	273.6	235.3	387.99	0.09	0.77	
40			620-14-4	Toluene, 3-ethyl-		18068.0	21832.9	23434.9	21527.1	19311.6	18626.8	15898.3		903.4	1091.6	1171.7	1076.4	965.6	931.3	794.9	1365.81	0.10	0.76	
41	622-96-8		Toluene, 4-ethyl-		12424.2	15165.5	15835.5	14915.3	13157.7	12411.7	10757.9		621.2	758.3	791.8	745.8	657.9	620.6	537.9	951.94	0.10	0.79		
42	4994-16-5		Cyclohexene, 4-phenyl							13.2									0.7					
43	71-43-2		Benzene	0.9	21416.5	28353.3	34113.9	30453.3	27675.5	28204.8	24825.5		1070.8	1417.6	1705.6	1522.6	1383.7	1410.2	1241.2	1727.70	0.06	0.44		
44	526-73-8		Benzene, 1,2,3-trimethyl-		5410.4	5864.8	6478.9	5921.0	5536.5	5429.0	4668.6		270.5	293.2	323.9	296.1	276.8	271.5	233.4	353.15	0.07	0.64		
45	95-63-6		Benzene, 1,2,4-trimethyl-		29220.6	34320.7	39364.6	36412.2	33528.4	32366.1	27990.2		1461.0	1716.0	1968.2	1820.6	1676.4	1618.3	1399.5	2103.77	0.07	0.54		
46	95-47-6		Benzene, 1,2-dimethyl-		20527.8	24843.9	26219.5	23508.6	21091.4	21200.0	18667.5		1026.4	1242.2	1311.0	1175.4	1054.6	1060.0	933.4	1511.77	0.09	0.85		
47	108-67-8		Benzene, 1,3,5-trimethyl-		8146.1	9252.7	10198.3	9016.2	8510.4	8281.7	7016.1		407.3	462.6	509.9	450.8	425.5	414.1	350.8	569.61	0.09	0.71		
48	108-38-3		Benzene, 1,3-dimethyl-		33114.3	51046.3	75235.9	68502.3	60485.8	60120.2	52683.3		1655.7	2552.3	3761.8	3425.1	3024.3	3006.0	2634.2	3288.69	0.02	0.04		
49	98-82-8		Benzene, isopropyl-		850.4	979.3	1040.5	897.9	817.6	822.2	706.8		42.5	49.0	52.0	44.9	40.9	41.1	35.3	60.82	0.10	0.86		
50	103-65-1		Benzene, propyl-		4552.9	5405.4	5584.4	5157.8	4568.2	4347.8	3702.3		227.6	270.3	279.2	257.9	228.4	217.4	185.1	341.91	0.11	0.82		
51	100-41-4		Ethylbenzene		13990.2	17259.7	17976.8	16367.7	14441.3	14252.6	12405.6		699.5	863.0	898.8	818.4	722.1	712.6	620.3	1069.96	0.10	0.85		
52	91-20-3		Naphthalene		1365.8	1646.6	1430.3	1890.1	1658.3	1670.9	1435.1		68.3	82.3	71.5	94.5	82.9	83.5	71.8	80.38	0.00	0.00		
53	99-87-6		p-Cymene		130.2	142.6	150.2	139.3	125.7	132.3	100.9		6.5	7.1	7.5	7.0	6.3	6.6	5.0	8.69	0.09	0.61		
54	100-42-5		Styrene																					
55	108-88-3		Toluene		34261	53473	115024	105490	103892	102336	96579		1713.1	2673.7	5751.2	5274.5	5194.6	5116.8	4829.0	3248.9	-0.11	0.25		
56	98-83-9	2-Phenylpropene																						
57	95-13-6	Indene		85.0	95.8					77.9		4.3	4.8					3.9						
58	Esters	108-21-4	Acetic acid, 1-methylethyl																					
59		111-15-9	Acetic acid, 2-ethoxyethyl																					
60		123-86-4	Acetic acid, butyl ester																					
61		141-78-6	Acetic acid, ethyl ester																					
62		80-62-6	Methyl methacrylate																					
63		103-09-3	2-Ethylhexyl acetate								79.9								4.0					
64		96-48-0	Butyrolactone																					
65		25265-77-4	Texanol																					
66		6846-50-0	TXIB							400.1									20.0					

Table A. 11 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1 h	4.7 h	7 h	24 h	48 h	72 h	96 h	0 h	1 h	4.7 h	7 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane						60818.3													
86		127-18-4	Tetrachloroethylene																			
87	Cyclo Alkanes	79-01-6	Trichloroethylene																			
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		11471.6	14321.3	17213.2	14979.8	13534.4	13479.5	12124.6		573.6	716.1	860.7	749.0	676.7	674.0	606.2	895.05	0.07	0.58
90		110-82-7	Cyclohexane		9713.5	12120.7	13630.5	12046.4	10663.9	10459.3	9703.5		485.7	606.0	681.5	602.3	533.2	523.0	485.2	754.37	0.09	0.78
91		1678-93-9	Cyclohexane, butyl-		101.9	121.0	150.3	118.6	126.0	126.6	98.1		5.1	6.1	7.5	5.9	6.3	6.3	4.9	7.49	0.06	0.32
92		1678-91-7	Cyclohexane, ethyl-		1636.1	2271.8	2522.8	2223.6	1971.3	2034.5	1802.1		81.8	113.6	126.1	111.2	98.6	101.7	90.1	139.06	0.08	0.77
93		1678-92-8	Cyclohexane, propyl-		364.8	526.1	595.6	533.0	447.3	453.2	438.0		18.2	26.3	29.8	26.7	22.4	22.7	21.9	32.65	0.09	0.74
94		91-17-8	Decahydronaphthalene		75.9	88.9	108.9	101.7	86.8	84.5	74.5		3.8	4.4	5.4	5.1	4.3	4.2	3.7	5.71	0.07	0.45
95	Terpenes	80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104	Acids	107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108	Other	109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119	A1	0-00-0	TVOC	92	778753	1024206	1251938	1100857	1022632	997325	879791		38933	51206	62592	55038	51127	49862	43985	63797.0	0.06	0.46
A1		78-78-4	Butane, 2-methyl-		3946.0	51225.8	67334.3	61820.1	53774.4	52548.1	48151.6		197.3	2561.3	3366.7	3091.0	2688.7	2627.4	2407.6	3251.61	0.05	0.24
A2		109-66-0	Pentane		34175.4	47890.7	72305.5	62437.4	54563.3	56538.2	49856.0		1708.8	2394.5	3615.3	3121.9	2728.2	2826.9	2492.8	3120.47	0.03	0.06
A3		513-35-9	2-Butene, 2-methyl-		22481.7	27260.7	42297.1	33506.0	32900.8	36141.8	30553.9		1124.1	1363.0	2114.9	1675.3	1645.0	1807.1	1527.7	1677.36	0.00	0.00
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1.4 h	3.4 h	7.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	7.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde		85.5	104.5	114.5	108.2	107.9	109.7	110.9		4.3	5.2	5.7	5.4	5.4	5.5	5.5	5.37	-0.01	0.06
D2		50-00-0	Formaldehyde																			
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 12: Concentration & emission factor for WW (windshield washer fluid)

#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol					0.6		0.5					0.0		0.0					
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-		0.8		0.8	0.5	0.5		0.5		0.0		0.0	0.0	0.0		0.0	0.05	0.19	0.59
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol		5.8	2.9	1.7						0.3	0.1	0.1							
6		108-95-2	Phenol																			
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		1.7	1.5	1.1	1.2	1.0	1.2	1.2		0.1	0.1	0.1	0.1	0.1	0.1	0.07	0.06	0.35	
8		67-64-1	Acetone		11.2	4.8	4.9	3.3	3.3	3.9	3.0		0.6	0.2	0.2	0.2	0.2	0.2	0.28	0.12	0.74	
9		98-86-2	Acetophenone		0.3			0.4					0.0			0.0						
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	0.9	2.1	1.8	2.3	3.5	2.6	3.5	3.5		0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.04	-0.29	0.78
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																			
24		96-14-0	Pentane, 3-methyl-																			
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane	0.2	1.8	2.1	2.0	3.0	2.5	2.9	2.9		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.08	-0.12	0.75
28		112-40-3	Dodecane		0.4			0.9	0.9	1.0	1.0		0.0			0.0	0.0	0.0	0.0	0.04	-0.07	0.83
29		142-82-5	Heptane																			
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane																			
32		111-84-2	Nonane		0.4	0.5	0.4	0.6	0.4	0.7	0.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	-0.07	0.33
33		111-65-9	Octane				0.4									0.0						
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane	1.0	3.6	4.8	5.0	6.4	6.3	6.6	6.6		0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.17	-0.12	0.92
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-			0.1	0.2	0.2	0.2	0.2	0.2			0.0	0.0	0.0	0.0	0.0	0.01	-0.07	0.67	
39		611-14-3	Toluene, 2-ethyl-		0.3	0.3	0.3	0.4	0.3	0.4	0.4		0.0	0.0	0.0	0.0	0.0	0.0	0.01	-0.07	0.71	
40		620-14-4	Toluene, 3-ethyl-		0.4	0.5	0.4	0.6	0.5	0.6	0.5		0.0	0.0	0.0	0.0	0.0	0.0	0.02	-0.03	0.06	
41		622-96-8	Toluene, 4-ethyl-		0.2	0.2	0.3	0.3	0.2	0.4	0.3		0.0	0.0	0.0	0.0	0.0	0.0	0.01	-0.09	0.21	
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene	0.5	0.3					0.4												
44		526-73-8	Benzene, 1,2,3-trimethyl-		0.5	0.6	0.6	0.7	0.7	0.8	0.8		0.0	0.0	0.0	0.0	0.0	0.0	0.03	-0.07	0.75	
45		95-63-6	Benzene, 1,2,4-trimethyl-		1.1	1.4	1.3	1.9	1.7	1.9	1.9		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.06	-0.10	0.72
46		95-47-6	Benzene, 1,2-dimethyl-		0.6	0.7	0.7	1.0	0.8	0.9	0.8		0.0	0.0	0.0	0.0	0.0	0.0	0.03	-0.07	0.53	
47		108-67-8	Benzene, 1,3,5-trimethyl-		0.2	0.2	0.2	0.3	0.3	0.3	0.3		0.0	0.0	0.0	0.0	0.0	0.0	0.01	-0.11	0.73	
48		108-38-3	Benzene, 1,3-dimethyl-		1.1	1.4	1.4	1.9	1.5	1.9	1.8		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.06	-0.08	0.66
49		98-82-8	Benzene, isopropyl																			
50		103-65-1	Benzene, propyl-		0.3	0.3	0.3	0.2	0.2	0.3	0.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.10	0.68
51		100-41-4	Ethylbenzene		0.4	0.5	0.5	0.7	0.5	0.6	0.6		0.0	0.0	0.0	0.0	0.0	0.0	0.02	-0.07	0.43	
52		91-20-3	Naphthalene	0.2	1.1	1.2	1.4	1.2	1.1	1.3	1.4		0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.05	0.00	0.06
53		99-87-6	p-Cymene		0.1	0.2		0.1	0.1	0.1	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.01	0.12	0.62
54		100-42-5	Styrene	0.2	0.2	0.2		0.1	0.2	0.4			0.0	0.0			0.0	0.0		0.00	-0.43	0.79
55		108-88-3	Toluene	0.1	11.9	15.6	24.6	17.2	15.8	17.1	17.2		0.6	0.8	1.2	0.9	0.8	0.9	0.9	0.98	0.04	0.09
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 12 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g m}^{-2} \text{h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene					0.1	0.1		0.1					0.0	0.0		0.0	0.01	-0.05	0.24
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83	Cyclo Alkanes	67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane		14.4	14.9		12.8	13.6	14.2	14.4		0.7	0.7		0.6	0.7	0.7	0.7	0.73	0.01	0.09
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene	1.1	4.6	0.5	0.9	0.5	0.2		0.2		0.2									
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane																			
90		110-82-7	Cyclohexane																			
91	Terpenes	1678-93-9	Cyclohexane, butyl-			0.3	0.3	0.2		0.1				0.0	0.0	0.0		0.0		0.02	0.25	0.96
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-							0.1								0.0				
94		91-17-8	Decahydronaphthalene																			
95		80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99	Acids	13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115	A	121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	14.6	273.2	232.3	759.8	144.3	174.0	174.1	214.5		12.9	10.9	37.3	6.5	8.0	8.0	10.0	23.24	0.24	0.29
A1		67-56-1	Methanol		167.0	130.7	112.7	42.8	73.8	58.2	58.2		8.4	6.5	5.6	2.1	3.7	2.9	2.9	7.80	0.24	0.62
A2		106-97-8	Butane																			
A3		616-38-6	Carbonic acid, dimethyl es																			
A4		107-87-9	2-Pentanone																			
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.2 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.2 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde	0.9	1.7	1.7	0.6	0.3		2.2	4.3		0.0	0.0				0.1	0.2	0.03	-0.31	0.63
D2		50-00-0	Formaldehyde								0.7								0.0			
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 13: Concentration & emission factor for MO2 (2-stroke motor oil)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h			
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²	
1	Alcohols	71-36-3	1-Butanol																				
2		71-23-8	1-Propanol																				
3		104-76-7	Hexanol, 2-ethyl-1-																				
4		67-63-0	2-Propanol																				
5		64-17-5	Ethanol																				
6		108-95-2	Phenol																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																				
8		67-64-1	Acetone		2.19	1.77	4.02		4.82				0.11	0.09	0.20		0.24			0.08	-0.30	0.65	
9		98-86-2	Acetophenone																				
10		108-94-1	Cyclohexanone																				
11		108-10-1	Methylisobutyl ketone																				
12		100-52-7	Benzaldehyde		2.85								0.14										
13		123-72-8	Butanal																				
14		112-31-2	Decanal																				
15		3913-81-3	2-Decenal																				
16		98-01-1	Furfural																				
17		111-71-7	Heptanal																				
18		66-25-1	Hexanal																				
19		124-19-6	Nonanal																				
20		18829-56-6	2-Nonenal																				
21		2548-87-0	2-Octenal																				
22		110-62-3	Pentanal																				
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																				
24		96-14-0	Pentane, 3-methyl-																				
25		540-84-1	2,2,4-Trimethylpentane																				
26		108-08-7	2,4-Dimethylpentane																				
27		124-18-5	Decane		34.33	63.43	66.59	64.51	68.44	77.29	66.42		1.72	3.17	3.33	3.23	3.42	3.86	3.32	3.09	-0.03	0.33	
28		112-40-3	Dodecane		116.08	200.88	233.78	272.10	278.75	313.67	285.21		5.80	10.04	11.69	13.60	13.94	15.68	14.26	9.30	-0.11	0.90	
29		142-82-5	Heptane																				
30		544-76-3	Hexadecane																				
31		110-54-3	Hexane		3.90																		
32		111-84-2	Nonane																				
33		111-65-9	Octane																				
34		629-62-9	Pentadecane																				
35		629-59-4	Tetradecane																				
36		629-50-5	Tridecane		1.62	3.89	4.72	6.00	6.91	7.73	6.84		0.08	0.19	0.24	0.30	0.35	0.39	0.34	0.17	-0.18	0.94	
37		1120-21-4	Undecane		381.76	636.03	713.97	735.17	760.28	835.58	760.19		19.09	31.80	35.70	36.76	38.01	41.78	38.01	30.94	-0.06	0.77	
38		95-93-2	Benzene, 1,2,4,5-tetramet		14.42	23.36	26.64	27.24	29.80	30.85	29.08		0.72	1.17	1.33	1.36	1.49	1.54	1.45	1.13	-0.07	0.84	
39		611-14-3	Toluene, 2-ethyl-																				
40		620-14-4	Toluene, 3-ethyl-		0.31	0.53	0.52	0.45	0.52	0.54	0.41		0.02	0.03	0.03	0.02	0.03	0.03	0.02	0.03	0.04	0.21	
41		622-96-8	Toluene, 4-ethyl-		0.18	0.44	0.35	0.29	0.41	0.44	0.28		0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.04	0.09	
42	4994-16-5	Cyclohexene, 4-phenyl																					
43	Aromatic Hydrocarbons	71-43-2	Benzene		1.34	0.85	0.28		0.10														
44		526-73-8	Benzene, 1,2,3-trimethyl-			3.55	5.85	6.32	6.22	6.36	7.09	6.15		0.18	0.29	0.32	0.31	0.32	0.35	0.31	0.29	-0.03	0.33
45		95-63-6	Benzene, 1,2,4-trimethyl-			1.22								0.06									
46		95-47-6	Benzene, 1,2-dimethyl-			0.19	0.35	0.33	0.27	0.36	0.37	0.25		0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.03	0.09
47		108-67-8	Benzene, 1,3,5-trimethyl-																				
48		108-38-3	Benzene, 1,3-dimethyl-		0.13	0.71	1.21	1.28	1.03	1.37	1.43	1.02		0.03	0.05	0.06	0.04	0.06	0.06	0.04	0.05	0.01	0.00
49		98-82-8	Benzene, isopropyl																				
50		103-65-1	Benzene, propyl-							0.05								0.00					
51		100-41-4	Ethylbenzene		0.20	0.28	0.26	0.22	0.32	0.31	0.23		0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	-0.01	0.00	
52		91-20-3	Naphthalene		23.67	41.30	49.45	55.07	56.82	62.56	56.56		1.18	2.06	2.47	2.75	2.84	3.13	2.83	1.97	-0.10	0.85	
53		99-87-6	p-Cymene		0.68	1.28	1.35	1.26	1.38	1.49	1.27		0.03	0.06	0.07	0.06	0.07	0.07	0.06	0.06	-0.02	0.11	
54		100-42-5	Styrene			0.51		0.30		0.21				0.03		0.02		0.01		0.04	0.28	0.99	
55		108-88-3	Toluene		0.75	0.59	0.58	0.82	0.31	1.67	0.48	0.28				0.00		0.05					
56		98-83-9	2-Phenylpropene																				
57		95-13-6	Indene																				
58		Esters	108-21-4	Acetic acid, 1-methylethyl																			
59	111-15-9		Acetic acid, 2-ethoxyethyl																				
60	123-86-4		Acetic acid, butyl ester																				
61	141-78-6		Acetic acid, ethyl ester																				
62	80-62-6		Methyl methacrylate																				
63	103-09-3		2-Ethylhexyl acetate																				
64	96-48-0		Butyrolactone																				
65	25265-77-4		Texanol																				
66	6846-50-0		TXIB																				

Table A. 13 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg m ⁻² h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85	Cyclo Alkanes	75-09-2	Dichloromethane		3.23		2.25		3.63			0.16		0.11		0.18						
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene		3.74	0.92	1.30		1.42			0.19	0.05	0.07		0.07		0.09	-0.13	0.67		
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane																			
90		110-82-7	Cyclohexane																			
91		1678-93-9	Cyclohexane, butyl-		8.28	14.41	15.74	14.79	14.82	17.28	15.34		0.41	0.72	0.79	0.74	0.74	0.86	0.77	0.72	-0.02	0.19
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-																			
94	Terpenes	91-17-8	Decahydronaphthalene		5.82	8.84	9.16	9.34	9.27	10.81	9.84		0.29	0.44	0.46	0.47	0.46	0.54	0.49	0.42	-0.04	0.56
95		80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		Acids	64-19-7	Acetic acid																		
103	79-31-2		Isobutyric acid																			
104	107-92-6		Butyric acid																			
105	111-14-8		Heptanoic acid																			
106	149-57-5		2-Ethylhexanoic acid																			
107	142-62-1		Hexanoic acid																			
108	109-52-4		Pentanoic Acid																			
109	Other		3777-69-3	Furan, 2-pentyl																		
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118	106-99-0	1,3-Butadiene																				
119	0-00-0	TVOC		13.2	2472.7	4058.7	4431.4	4565.1	4745.1	5183.5	4709.9		122.98	202.27	220.91	227.59	236.59	258.52	234.83	195.79	-0.05	0.77
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde	1.8	1.2	1.0	1.8	0.1	0.1	0.5					0.0							
D2		50-00-0	Formaldehyde			0.7								0.0								
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 14: Concentration & emission factor for WXF (oil based wax for furniture)

	Clas			Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h			
#	ss	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	a	b	R ²	
1	Alcohols	71-36-3	1-Butanol																				
2		71-23-8	1-Propanol																				
3		104-76-7	Hexanol, 2-ethyl-1-																				
4		67-63-0	2-Propanol																				
5		64-17-5	Ethanol								8.5									0.4			
6		108-95-2	Phenol																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																				
8		67-64-1	Acetone		3.2	2.7	2.1	2.0	0.8		4.4									0.1			
9		98-86-2	Acetophenone						1.0								0.0						
10		108-94-1	Cyclohexanone																				
11		108-10-1	Methylisobutyl ketone																				
12		100-52-7	Benzaldehyde		1.7	2.1	2.9	2.8	4.3					0.0	0.1	0.1	0.1						
13		123-72-8	Butanal																				
14		112-31-2	Decanal																				
15		3913-81-3	2-Decenal																				
16		98-01-1	Furfural																				
17		111-71-7	Heptanal																				
18		66-25-1	Hexanal																				
19		124-19-6	Nonanal																				
20	Aliphatic Hydrocarbons	18829-56-6	2-Nonenal																				
21		2548-87-0	2-Octenal																				
22		110-62-3	Pentanal																				
23		107-83-5	Pentane, 2-methyl-																				
24		96-14-0	Pentane, 3-methyl-																				
25		540-84-1	2,2,4-Trimethylpentane																				
26		108-08-7	2,4-Dimethylpentane																				
27		124-18-5	Decane			51.6	96.5	119.5	135.0	122.9	115.5	109.1		2.6	4.8	6.0	6.7	6.1	5.8	5.5	5.28	-0.03	0.13
28		112-40-3	Dodecane				0.6		1.4	1.1	1.1	1.0			0.0		0.1	0.1	0.1	0.0	0.03	-0.16	0.46
29		142-82-5	Heptane																				
30		544-76-3	Hexadecane																				
31		110-54-3	Hexane	3.8								3.6											
32		111-84-2	Nonane		46.5	81.1	90.3	103.4	95.3	88.1	82.5			2.3	4.1	4.5	5.2	4.8	4.4	4.1	4.34	-0.01	0.03
33		111-65-9	Octane																				
34		629-62-9	Pentadecane																				
35		629-59-4	Tetradecane					0.2									0.0						
36		629-50-5	Tridecane																				
37		1120-21-4	Undecane			7.2	13.0	15.5	20.8	19.3	19.1	17.5		0.4	0.7	0.8	1.0	1.0	1.0	0.9	0.64	-0.10	0.61
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-					0.1			0.1					0.0			0.0				
39		611-14-3	Toluene, 2-ethyl-																				
40		620-14-4	Toluene, 3-ethyl-					0.2			0.2						0.0		0.0				
41		622-96-8	Toluene, 4-ethyl-					0.1			0.1	0.5					0.0		0.0	0.0	0.00	-0.82	0.54
42		4994-16-5	Cyclohexene, 4-phenyl																				
43		71-43-2	Benzene	5.6								0.4											
44		526-73-8	Benzene, 1,2,3-trimethyl-					0.2				0.2					0.0			0.0			
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.3	0.5	0.5	0.6	0.5		0.5	0.6			0.0	0.0	0.0	0.0		0.0	0.0	0.01	0.03	0.04
46		95-47-6	Benzene, 1,2-dimethyl-	0.3							0.5									0.0			
47		108-67-8	Benzene, 1,3,5-trimethyl-				0.2	0.2	0.2	0.3	0.3	0.2			0.0	0.0	0.0	0.0	0.0	0.0	0.01	-0.03	0.13
48		108-38-3	Benzene, 1,3-dimethyl-	1.8		0.5			0.4	0.4	0.5	1.2											
49		98-82-8	Benzene, isopropyl																				
50		103-65-1	Benzene, propyl-																				
51		100-41-4	Ethylbenzene	0.5								0.4											
52	Esters	91-20-3	Naphthalene	0.6	0.8	0.7	0.6	0.5	0.3	0.4	0.3		0.0	0.0									
53		99-87-6	p-Cymene																				
54		100-42-5	Styrene	0.2	1.0	0.2	0.2	0.2	0.1	0.2	0.9		0.0							0.0			
55		108-88-3	Toluene	20.6	0.6	0.3	0.2	0.4	0.1	0.3	2.4												
56		98-83-9	2-Phenylpropene																				
57		95-13-6	Indene																				
58		108-21-4	Acetic acid, 1-methylethyl																				
59		111-15-9	Acetic acid, 2-ethoxyethyl																				
60		123-86-4	Acetic acid, butyl ester																				
61		141-78-6	Acetic acid, ethyl ester																				
62		80-62-6	Methyl methacrylate																				
63		103-09-3	2-Ethylhexyl acetate					0.2									0.0						
64		96-48-0	Butyrolactone																				
65		25265-77-4	Texanol																				
66		6846-50-0	TXIB																				

Table A. 14 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g m}^{-2} \text{h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	a	b	R^2
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform		0.3								0.0									
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane	1.8	1.9	2.0				2.0		0.0	0.0						0.0			
86		127-18-4	Tetrachloroethylene																			
87	Cyclo Alkanes	79-01-6	Trichloroethylene	4.9	2.3	1.0	1.8			0.2	3.9											
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane																			
90		110-82-7	Cyclohexane																			
91		1678-93-9	Cyclohexane, butyl-		11.6	24.0	27.9	19.9	19.0	17.7	15.5		0.6	1.2	1.4	1.0	1.0	0.9	0.8	1.56	0.14	0.83
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-		27.2	52.0	56.7	37.6	34.7	32.5	29.5		1.4	2.6	2.8	1.9	1.7	1.6	1.5	3.47	0.18	0.93
94		91-17-8	Decahydronaphthalene		5.8	11.4	12.5	11.0	9.9	7.9	8.5		0.3	0.6	0.6	0.5	0.5	0.4	0.4	0.71	0.11	0.74
95		80-56-8	alpha-Pinene																			
96	Terpenes	99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105	Acids	111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109	Other	3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	108.0	654.7	1166.6	1336.5	1537.6	1493.7	1371.4	1289.9		27.3	52.9	61.4	71.5	69.3	63.2	59.1	55.53	-0.04	0.24
A1		67-56-1	Methanol																			
A2		106-97-8	Butane																			
A3		616-38-6	Carbonic acid, dimethyl es																			
A4		107-87-9	2-Pentanone																			
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.3 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.3 h	96.4 h	a	b	R^2
D1	DNPH	75-07-0	Acetaldehyde	1.0	1.5	1.3	1.0	0.5	0.0	4.8	5.1		0.0	0.0				0.2	0.2	0.01	-0.81	1.00
D2		50-00-0	Formaldehyde																			
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 15: Concentration & emission factor for LUB (lubricant, multi-purpose, spray)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol								58.6									2.9		
6		108-95-2	Phenol							0.6								0.0				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone								10.4									0.5		
8		67-64-1	Acetone	1.8	50.4	39.4	47.5	13.4	9.5	10.7	12.5		2.4	1.9	2.3	0.6	0.4	0.4	0.5	3.77	0.50	0.84
9		98-86-2	Acetophenone		0.3					0.9	0.7		0.0					0.0	0.0			
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	1.1	2.3	1.7	1.1		2.2	3.3	3.0		0.1	0.0	0.0		0.1	0.1	0.1			
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18	Aliphatic Hydrocarbons	66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23		107-83-5	Pentane, 2-methyl-																			
24		96-14-0	Pentane, 3-methyl-																			
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		12.4	21.4	20.3		18.6	19.7	19.4		0.6	1.1	1.0		0.9	1.0	1.0			
28		112-40-3	Dodecane								0.3								0.0			
29		142-82-5	Heptane																			
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane																			
32		111-84-2	Nonane		10.3	12.2	10.1		9.0	10.9	9.4		0.5	0.6	0.5		0.5	0.5	0.5			
33		111-65-9	Octane		1.0	1.1	0.8		0.6	0.9	0.8		0.0	0.1	0.0		0.0	0.0	0.0			
34	Aromatic Hydrocarbons	629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane		3.2	6.2	7.0		7.6	8.4	8.7		0.2	0.3	0.4		0.4	0.4	0.4			
38		95-93-2	Benzene, 1,2,4,5-tetramethyl-																			
39		611-14-3	Toluene, 2-ethyl-																			
40		620-14-4	Toluene, 3-ethyl-																			
41		622-96-8	Toluene, 4-ethyl-																			
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene		0.2						1.2		0.0						0.1			
44		526-73-8	Benzene, 1,2,3-trimethyl-																			
45		95-63-6	Benzene, 1,2,4-trimethyl-								0.3								0.0			
46		95-47-6	Benzene, 1,2-dimethyl-								0.4								0.0			
47		108-67-8	Benzene, 1,3,5-trimethyl-																			
48		108-38-3	Benzene, 1,3-dimethyl-								1.9								0.1			
49		98-82-8	Benzene, isopropyl																			
50		103-65-1	Benzene, propyl-																			
51	Esters	100-41-4	Ethylbenzene								0.6								0.0			
52		91-20-3	Naphthalene																			
53		99-87-6	p-Cymene																			
54		100-42-5	Styrene	0.3	0.9	0.2			0.4	0.1	0.4		0.0				0.0		0.0			
55		108-88-3	Toluene	0.3	1.0	0.4	0.2		0.1	0.1	9.1		0.0	0.0					0.4			
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58		108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

[illegible]

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Table A. 16: Concentration & emission factor for ADH12 (adhesive, contact cement)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol		73.7	101.4	92.5	104.8	90.3	85.3	76.0		3.7	5.1	4.6	5.2	4.5	4.3	3.8	5.47	0.06	0.49
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol																			
6		108-95-2	Phenol																			
7	Aldehydes & Ketones	78-93-3	Methyl ethyl ketone		8833.2	12910.6	12065.3	12891.9	12167.8	11978.9	10753.4		441.7	645.5	603.3	644.6	608.4	598.9	537.7	666.24	0.03	0.41
8		67-64-1	Acetone		85.1	118.4	112.3	112.7	108.0	109.0	98.6		4.3	5.9	5.6	5.6	5.4	5.4	4.9	6.14	0.04	0.69
9		98-86-2	Acetophenone																			
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde		1.9								0.1									
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		7.4	9.7	9.5	9.2	10.3	10.6	7.7		0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.50	0.02	0.04
24		96-14-0	Pentane, 3-methyl-		11.3	14.7	14.0	14.0	13.5	14.3	12.5		0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.75	0.03	0.44
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane																			
28		112-40-3	Dodecane																			
29		142-82-5	Heptane		3171.3	5006.7	4593.7	5251.4	4904.0	4757.3	4117.8		158.6	250.3	229.7	262.6	245.2	237.9	205.9	256.52	0.02	0.16
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane		538.4	765.9	715.1	752.7	694.5	725.4	618.2		26.9	38.3	35.8	37.6	34.7	36.3	30.9	39.71	0.04	0.43
32		111-84-2	Nonane																			
33		111-65-9	Octane		116.6	185.2	174.4	198.4	184.2	172.6	142.3		5.8	9.3	8.7	9.9	9.2	8.6	7.1	9.89	0.04	0.23
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane																			
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet			0.6								0.0								
39		611-14-3	Toluene, 2-ethyl-			3.3	1.2		0.5					0.2	0.1		0.0			0.25	0.61	0.90
40		620-14-4	Toluene, 3-ethyl-			3.4	1.6		1.0					0.2	0.1		0.1			0.21	0.38	0.84
41		622-96-8	Toluene, 4-ethyl-			2.4	1.1		1.0					0.1	0.1		0.1			0.12	0.24	0.52
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene	0.1	0.3	0.6	0.1	1.4	0.9	1.0	1.5		0.0	0.0		0.1	0.0	0.0	0.1	0.02	-0.22	0.56
44		526-73-8	Benzene, 1,2,3-trimethyl-			2.8								0.1								
45		95-63-6	Benzene, 1,2,4-trimethyl-			11.5	6.9		3.3	1.6				0.6	0.3		0.2	0.1		0.99	0.54	0.93
46		95-47-6	Benzene, 1,2-dimethyl-		3.9	9.7	8.7	7.8	8.6	7.3	5.8		0.2	0.5	0.4	0.4	0.4	0.4	0.3	0.54	0.10	0.65
47		108-67-8	Benzene, 1,3,5-trimethyl-			2.6	1.2		0.6					0.1	0.1		0.0			0.18	0.48	0.91
48		108-38-3	Benzene, 1,3-dimethyl-		18.3	38.0	35.9	36.7	37.9	32.8	25.0		0.9	1.9	1.8	1.8	1.9	1.6	1.3	2.12	0.07	0.38
49		98-82-8	Benzene, isopropyl																			
50		103-65-1	Benzene, propyl-			1.1	0.6							0.1	0.0							
51		100-41-4	Ethylbenzene		5.5	10.1	9.5	10.4	10.5	9.5	7.2		0.3	0.5	0.5	0.5	0.5	0.5	0.4	0.55	0.05	0.22
52		91-20-3	Naphthalene			1.3	0.7							0.1	0.0							
53		99-87-6	p-Cymene																			
54		100-42-5	Styrene				2.0								0.1							
55		108-88-3	Toluene		2.9	6.8	5.0	4.1	7.0	4.6	2.9		0.1	0.3	0.3	0.2	0.3	0.2	0.1	0.36	0.13	0.30
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB							1.0								0.1				

Table A. 16 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane																			
86		127-18-4	Tetrachloroethylene																			
87	Cyclo Alkanes	79-01-6	Trichloroethylene			4.0								0.2								
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		2463.2	3739.3	3666.6	3744.3	3624.8	3541.8	3384.8		123.2	187.0	183.3	187.2	181.2	177.1	169.2	192.72	0.02	0.56
90		110-82-7	Cyclohexane		458.1	664.6	672.7	670.1	630.1	633.5	604.5		22.9	33.2	33.6	33.5	31.5	31.7	30.2	34.90	0.03	0.67
91		1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-		16.1	25.1	23.4	26.2	24.4	24.1	22.4		0.8	1.3	1.2	1.3	1.2	1.2	1.1	1.26	0.01	0.13
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95		80-56-8	alpha-Pinene																			
96	Terpenes	99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102	Acids	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111	Other	123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	108.8	12091.3	17982.5	17219.3	18474.8	17439.2	16894.0	15407.1		599.1	893.7	855.5	918.3	866.5	839.3	764.9	928.23	0.03	0.34
A1	A	589-34-4	Hexane, 3-methyl-		646.4	951.7	919.4	957.3	911.6	895.6	834.5		32.3	47.6	46.0	47.9	45.6	44.8	41.7	49.21	0.02	0.48
A2		1192-18-3	Cyclopentane, 1,2-dimethyl-		526.2	773.4	766.5	762.0	735.7	725.0	690.0		26.3	38.7	38.3	38.1	36.8	36.2	34.5	40.32	0.03	0.75
A3		109-60-4	Propyl acetate		984.2	1562.3	1492.0	1705.8	1551.7	1475.1	1216.8		49.2	78.1	74.6	85.3	77.6	73.8	60.8	83.81	0.04	0.21
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde																			
D2		50-00-0	Formaldehyde				0.0									0.0						
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 17: Concentration & emission factor for DG (degreaser)

				Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-	0.14																		
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol																			
6		108-95-2	Phenol	0.07																		
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		0.19					0.70			0.01					0.04				
8		67-64-1	Acetone	3.64	1.99	4.49	1.45	3.19		13.09				0.04				0.47				
9		98-86-2	Acetophenone																			
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	1.53																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21	2548-87-0	2-Octenal																				
22	110-62-3	Pentanal																				
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		2.84	3.33	3.01	2.02	1.68	2.27			0.14	0.17	0.15	0.10	0.08	0.11		0.20	0.18	0.74
24		96-14-0	Pentane, 3-methyl-		2.45	2.73	2.60	1.52	1.13	1.74	1.37		0.12	0.14	0.13	0.08	0.06	0.09	0.07	0.17	0.22	0.73
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane				1.60								0.08							
27		124-18-5	Decane	207.83	307.27	349.20	332.91	319.74	395.36	364.33		10.39	15.36	17.46	16.65	15.99	19.77	18.22	15.15	-0.04	0.38	
28		112-40-3	Dodecane	9.85	15.02	18.79	20.63	19.16	26.07	22.85		0.49	0.75	0.94	1.03	0.96	1.30	1.14	0.70	-0.11	0.73	
29		142-82-5	Heptane	10.88	14.00	14.59	8.32	7.06	9.97	7.34		0.54	0.70	0.73	0.42	0.35	0.50	0.37	0.90	0.19	0.73	
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane	32.79	41.20	38.05	21.80	17.54	26.24	18.94		1.64	2.06	1.90	1.09	0.88	1.31	0.95	2.59	0.22	0.76	
32		111-84-2	Nonane	68.44	99.32	108.86	96.69	87.67	110.92	98.06		3.42	4.97	5.44	4.83	4.38	5.55	4.90	5.17	0.01	0.03	
33		111-65-9	Octane	39.62	54.85	57.74	44.93	39.08	50.81	43.25		1.98	2.74	2.89	2.25	1.95	2.54	2.16	3.05	0.08	0.52	
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane	129.03	197.99	234.53	243.68	237.58	301.49	270.13		6.45	9.90	11.73	12.18	11.88	15.07	13.51	9.38	-0.09	0.72	
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet	5.32	8.82	10.61	9.74	8.99	12.43	10.68		0.27	0.44	0.53	0.49	0.45	0.62	0.53	0.44	-0.04	0.24
39			611-14-3	Toluene, 2-ethyl-	12.75	18.63	20.76	18.26	17.30	21.07	19.19		0.64	0.93	1.04	0.91	0.87	1.05	0.96	0.96	0.00	0.00
40	620-14-4		Toluene, 3-ethyl-	26.63	39.87	43.17	37.54	35.98	43.71	41.23		1.33	1.99	2.16	1.88	1.80	2.19	2.06	2.03	0.00	0.00	
41	622-96-8		Toluene, 4-ethyl-	13.95	21.69	24.36	22.75	20.86	26.21	22.29		0.70	1.08	1.22	1.14	1.04	1.31	1.11	1.12	-0.01	0.02	
42	4994-16-5		Cyclohexene, 4-phenyl																			
43	71-43-2		Benzene	5.34	7.74	6.68	4.79	4.57	9.07	11.61		0.27	0.39	0.33	0.24	0.23	0.45	0.58	0.29	-0.06	0.05	
44	526-73-8		Benzene, 1,2,3-trimethyl-	34.44	52.57	59.44	54.12	51.15	62.86	57.21		1.72	2.63	2.97	2.71	2.56	3.14	2.86	2.68	-0.01	0.07	
45	95-63-6		Benzene, 1,2,4-trimethyl-	70.96	107.01	120.43	112.10	105.37	127.72	116.81		3.55	5.35	6.02	5.60	5.27	6.39	5.84	5.45	-0.02	0.10	
46	95-47-6		Benzene, 1,2-dimethyl-	14.68	21.28	22.82	18.79	17.25	22.41	18.82		0.73	1.06	1.14	0.94	0.86	1.12	0.94	1.13	0.04	0.22	
47	108-67-8		Benzene, 1,3,5-trimethyl-	13.80	20.59	22.70	20.61	18.81	23.35	21.10		0.69	1.03	1.13	1.03	0.94	1.17	1.05	1.06	0.00	0.00	
48	108-38-3		Benzene, 1,3-dimethyl-	38.18	55.50	58.28	50.04	45.69	57.53	50.62		1.91	2.78	2.91	2.50	2.28	2.88	2.53	2.91	0.03	0.21	
49	98-82-8		Benzene, isopropyl	1.99	2.83	3.03	2.48	2.30	2.93	2.54		0.10	0.14	0.15	0.12	0.12	0.15	0.13	0.15	0.04	0.23	
50	103-65-1		Benzene, propyl-	7.85	11.84	13.06	11.35	10.52	13.78	12.09		0.39	0.59	0.65	0.57	0.53	0.69	0.60	0.61	0.00	0.00	
51	100-41-4		Ethylbenzene	14.01	20.40	21.63	17.96	15.69	20.15	17.31		0.70	1.02	1.08	0.90	0.78	1.01	0.87	1.11	0.05	0.39	
52	Esters		91-20-3	Naphthalene	3.83	6.52	8.26	7.92	7.16	9.81	8.65		0.19	0.33	0.41	0.40	0.36	0.49	0.43	0.33	-0.06	0.40
53		99-87-6	p-Cymene	3.21	4.88	5.57	4.93	4.58	5.86	5.16		0.16	0.24	0.28	0.25	0.23	0.29	0.26	0.25	-0.01	0.01	
54		100-42-5	Styrene			1.38	1.09								0.07	0.05						
55		108-88-3	Toluene	0.50	1860.62	2081.52	2048.36	2494.34	2257.43	2619.92	2354.07		93.01	104.05	102.39	124.69	112.85	130.97	117.68	97.12	-0.05	0.60
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58		108-21-4	Acetic acid, 1-methylethyl																			
59	111-15-9	Acetic acid, 2-ethoxyethyl																				
60	123-86-4	Acetic acid, butyl ester																				
61	141-78-6	Acetic acid, ethyl ester																				
62	80-62-6	Methyl methacrylate																				
63	103-09-3	2-Ethylhexyl acetate																				
64	96-48-0	Butyrolactone																				
65	25265-77-4	Texanol																				
66	6846-50-0	TXIB																				

Table A. 17 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg m ⁻² h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																					
68		110-49-6	2-Methoxyethylacetate																					
69		111-90-0	Diethylene glycol monoeth																					
70		107-98-2	Propanol, 1-methoxy-2-																					
71		111-76-2	Ethanol, 2-butoxy-		294.40	533.12	585.57	339.98	273.07	422.70	316.04		14.72	26.66	29.28	17.00	13.65	21.14	15.80	33.58	0.17	0.61		
72		112-34-5	Ethanol, 2-butoxyethoxy-																					
73		110-80-5	Ethanol, 2-ethoxy-																					
74		109-86-4	Ethanol, 2-methoxy-																					
75		75-65-0	Propanol, 2-methyl-2-																					
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																					
77		95-50-1	1,2-Dichlorobenzene																					
78		107-06-2	1,2-Dichloroethane																					
79		78-87-5	1,2-Dichloropropane																					
80		106-46-7	1,4-Dichlorobenzene																					
81		75-27-4	Bromodichloromethane																					
82		56-23-5	Carbon tetrachloride																					
83		67-66-3	Chloroform		0.29									0.01										
84		124-48-1	Dibromochloromethane																					
85		75-09-2	Dichloromethane	1.07	3.16	2.66		5.49		5.88			0.10	0.08		0.22		0.24		0.06	-0.37	0.93		
86	Cyclo Alkanes	127-18-4	Tetrachloroethylene																					
87		79-01-6	Trichloroethylene	6.38	4.38	5.32	0.77	2.53		37.58							1.56							
88		79-34-5	1,1,2,2-Tetrachloroethane																					
89		108-87-2	Methylcyclohexane		13.96	18.18	17.66	10.59	8.74	12.33	9.15		0.70	0.91	0.88	0.53	0.44	0.62	0.46	1.14	0.20	0.77		
90	Cyclo Alkanes	110-82-7	Cyclohexane		1.58	2.13	2.33	1.66	1.50	2.33	1.57		0.08	0.11	0.12	0.08	0.08	0.12	0.08	0.12	0.07	0.26		
91		1678-93-9	Cyclohexane, butyl-		15.26	20.47	23.98	21.31	19.29	26.46	23.68		0.76	1.02	1.20	1.07	0.96	1.32	1.18	1.03	-0.03	0.09		
92		1678-91-7	Cyclohexane, ethyl-		9.39	12.90	13.39	9.58	8.25	10.90	9.03		0.47	0.64	0.67	0.48	0.41	0.55	0.45	0.75	0.11	0.64		
93		1678-92-8	Cyclohexane, propyl-		9.58	12.93	13.73	11.45	10.36	12.64	12.21		0.48	0.65	0.69	0.57	0.52	0.63	0.61	0.68	0.04	0.26		
94		91-17-8	Decahydronaphthalene		6.74	10.41	12.14	10.57	10.05	12.51	11.16		0.34	0.52	0.61	0.53	0.50	0.63	0.56	0.54	-0.01	0.02		
95		80-56-8	alpha-Pinene																					
96	Terpenes	99-86-5	alpha-Terpinene																					
97		127-91-3	beta-Pinene																					
98		99-85-4	gamma-Terpinene																					
99		13466-78-9	3-Carene																					
100		79-92-5	Camphene																					
101		5989-27-5	Limonene																					
102	Acids	64-19-7	Acetic acid																					
103		79-31-2	Isobutyric acid																					
104		107-92-6	Butyric acid																					
105		111-14-8	Heptanoic acid																					
106		149-57-5	2-Ethylhexanoic acid																					
107		142-62-1	Hexanoic acid																					
108		109-52-4	Pentanoic Acid																					
109	Other	3777-69-3	Furan, 2-pentyl																					
110		872-50-4	2-Pyrrolidinone, 1-methyl																					
111		123-91-1	1,4-Dioxane																					
112		78-40-0	Triethyl phosphate																					
113		142-96-1	n-Butyl ether																					
114		96-29-7	2-Butanone oxime																					
115		121-44-8	Triethylamine																					
116		75-21-8	Ethylene oxide																					
117		75-56-9	Propylene oxide																					
118		106-99-0	1,3-Butadiene																					
119		0-00-0	TVOC	47.6	4817.5	6639.5	7002.9	6361.8	5845.6	7105.1	6337.7		238.49	329.59	347.76	315.71	289.90	352.87	314.50	341.05	0.02	0.10		
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1.4 h	3.4 h	6.4 h	24.3 h	48.4 h	72.3 h	96.3 h	0 h	1.4 h	3.4 h	6.4 h	24.3 h	48.4 h	72.3 h	96.3 h	a	b	R ²		
D1	DNPH	75-07-0	Acetaldehyde	1.0	0.9	1.8	0.2			1.2	0.0				0.0				0.0					
D2		50-00-0	Formaldehyde																					
D3		123-38-6	Propanal																					

Note: Levels below the method detection limit are highlighted.

Table A. 18: Concentration & emission factor for PTO (oil based primer/sealer)

				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h			
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²	
1	Alcohols	71-36-3	1-Butanol				0.62								0.03								
2		71-23-8	1-Propanol																				
3		104-76-7	Hexanol, 2-ethyl-1-																				
4		67-63-0	2-Propanol																				
5		64-17-5	Ethanol																				
6		108-95-2	Phenol																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		49.82	23.86	13.70	8.39	10.17	7.35	5.30		2.49	1.19	0.68	0.42	0.51	0.37	0.26	1.52	0.35	0.87	
8		67-64-1	Acetone	0.45	9.08	5.39	8.93	2.31	2.99	3.63	2.25		0.43	0.25	0.42	0.09	0.13	0.16	0.09	0.45	0.33	0.58	
9		98-86-2	Acetophenone					1.25		1.19	0.94					0.06		0.06	0.05	0.11	0.16	0.61	
10		108-94-1	Cyclohexanone																				
11		108-10-1	Methylisobutyl ketone																				
12		100-52-7	Benzaldehyde					5.98		5.20	3.61						0.30		0.26	0.18	0.80	0.30	0.70
13		123-72-8	Butanal																				
14		112-31-2	Decanal																				
15		3913-81-3	2-Decenal																				
16		98-01-1	Furfural																				
17		111-71-7	Heptanal																				
18		66-25-1	Hexanal			24.66	12.38	12.11	13.57	10.11	7.19			1.23	0.62	0.61	0.68	0.51	0.36	1.31	0.24	0.68	
19		124-19-6	Nonanal																				
20		18829-56-6	2-Nonenal																				
21		2548-87-0	2-Octenal																				
22		110-62-3	Pentanal		3.20	2.55	1.86	1.43	2.23	1.32	1.07		0.16	0.13	0.09	0.07	0.11	0.07	0.05	0.14	0.17	0.53	
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																				
24		96-14-0	Pentane, 3-methyl-																				
25		540-84-1	2,2,4-Trimethylpentane							1.20									0.06				
26		108-08-7	2,4-Dimethylpentane																				
27		124-18-5	Decane	2705.03	1129.98	523.74	238.04	237.34	142.22	114.21		135.25	56.50	26.19	11.90	11.87	7.11	5.71	92.27	0.60	0.96		
28		112-40-3	Dodecane	263.87	158.79	69.08	26.01	21.64	11.94	7.73		13.19	7.94	3.45	1.30	1.08	0.60	0.39	16.95	0.79	0.97		
29		142-82-5	Heptane	5.21					2.93				0.26				0.15						
30		544-76-3	Hexadecane																				
31		110-54-3	Hexane							16.37								0.82					
32		111-84-2	Nonane	1349.84	543.27	258.28	131.42	135.85	82.60	67.48		67.49	27.16	12.91	6.57	6.79	4.13	3.37	41.23	0.53	0.94		
33		111-65-9	Octane	67.92	30.72	15.71	8.00	8.75	6.27	3.39		3.40	1.54	0.79	0.40	0.44	0.31	0.17	2.38	0.52	0.90		
34		629-62-9	Pentadecane																				
35		629-59-4	Tetradecane																				
36		629-50-5	Tridecane		3.29	3.23	1.25						0.16	0.16	0.06								
37		1120-21-4	Undecane		844.64	395.75	173.56	71.59	66.57	38.68	29.38		42.23	19.79	8.68	3.58	3.33	1.93	1.47	35.68	0.68	0.97	
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet																			
39	611-14-3		Toluene, 2-ethyl-		6.69	2.80	1.30	0.64	0.66	0.59	0.35		0.33	0.14	0.06	0.03	0.03	0.03	0.02	0.20	0.50	0.91	
40	620-14-4		Toluene, 3-ethyl-		18.75	7.33	3.24	1.71	1.93	1.63	0.94		0.94	0.37	0.16	0.09	0.10	0.08	0.05	0.48	0.47	0.88	
41	622-96-8		Toluene, 4-ethyl-		9.27	3.91	2.08	1.08	1.08	1.12	0.55		0.46	0.20	0.10	0.05	0.05	0.06	0.03	0.27	0.45	0.88	
42	4994-16-5		Cyclohexene, 4-phenyl																				
43	71-43-2		Benzene		3.84	1.60	3.28	0.97	1.84	3.41			0.19	0.08	0.16	0.05	0.09	0.17					
44	526-73-8		Benzene, 1,2,3-trimethyl-		6.25	2.69		0.61	0.66	0.51	0.28		0.31	0.13		0.03	0.03	0.03	0.01	0.25	0.58	0.92	
45	95-63-6		Benzene, 1,2,4-trimethyl-					2.28	1.95	1.04							0.11	0.10	0.05	8.24	1.08	0.83	
46	95-47-6		Benzene, 1,2-dimethyl-		351.22	138.34	66.00	36.24	37.90	25.29	20.98		17.56	6.92	3.30	1.81	1.89	1.26	1.05	9.63	0.48	0.93	
47	108-67-8		Benzene, 1,3,5-trimethyl-		8.45	3.55	1.69	0.87	0.82	0.71	0.47		0.42	0.18	0.08	0.04	0.04	0.04	0.02	0.25	0.50	0.94	
48	108-38-3		Benzene, 1,3-dimethyl-		896.88	373.05	190.86	110.68	120.54	79.62	66.64		44.84	18.65	9.54	5.53	6.03	3.98	3.33	25.22	0.43	0.92	
49	98-82-8		Benzene, isopropyl		8.41	3.28	1.52	0.76	0.79	0.56	0.45		0.42	0.16	0.08	0.04	0.04	0.03	0.02	0.23	0.51	0.94	
50	103-65-1		Benzene, propyl-			4.05	1.82	0.95	1.11	0.85	0.57			0.20	0.09	0.05	0.06	0.04	0.03	0.27	0.46	0.89	
51	100-41-4		Ethylbenzene		205.24	88.58	46.87	26.61	29.20	19.41	15.43		10.26	4.43	2.34	1.33	1.46	0.97	0.77	6.13	0.43	0.93	
52	91-20-3		Naphthalene		0.77	0.47	0.37	0.19					0.04	0.02	0.02	0.01				0.04	0.44	0.99	
53	99-87-6		p-Cymene																				
54	100-42-5		Styrene					1.16		2.61	0.90					0.06		0.13	0.05	0.05	-0.07	0.01	
55	108-88-3	Toluene		0.12	24.01	11.64	7.76	3.99	4.88	10.89	2.46		1.19	0.58	0.38	0.19	0.24	0.54	0.12	0.65	0.26	0.33	
56	98-83-9	2-Phenylpropene																					
57	95-13-6	Indene																					
58	Esters	108-21-4	Acetic acid, 1-methylethyl																				
59		111-15-9	Acetic acid, 2-ethoxyethyl																				
60		123-86-4	Acetic acid, butyl ester																				
61		141-78-6	Acetic acid, ethyl ester																				
62		80-62-6	Methyl methacrylate																				
63		103-09-3	2-Ethylhexyl acetate																				
64		96-48-0	Butyrolactone																				
65		25265-77-4	Texanol						2.48	4.37	3.48	2.03					0.12	0.22	0.17	0.10	0.2	0.07	0.01
66		6846-50-0	TXIR																				

Table A. 18 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g m}^{-2} \text{h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform		0.65								0.03									
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane		7.21	2.87	2.62				2.01		0.36	0.14	0.13				0.10	0.16	0.10	1.00
86		127-18-4	Tetrachloroethylene																			
87	Cyclo Alkanes	79-01-6	Trichloroethylene	0.39	6.76	2.93	9.59	0.48		0.28			0.32	0.13	0.46					2.80	1.87	0.68
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		12.88	3.87	1.65	0.67		1.54			0.64	0.19	0.08	0.03		0.08		0.18	0.32	0.39
90		110-82-7	Cyclohexane		1.81								0.09									
91		1678-93-9	Cyclohexane, butyl-		591.96	218.33	88.33	37.75	34.74	22.47	17.44		29.60	10.92	4.42	1.89	1.74	1.12	0.87	18.13	0.66	0.96
92		1678-91-7	Cyclohexane, ethyl-		70.47	27.89	13.17	6.78	6.61	3.96	3.11		3.52	1.39	0.66	0.34	0.33	0.20	0.16	2.22	0.56	0.95
93		1678-92-8	Cyclohexane, propyl-		813.06	262.33	114.76	50.08	51.31	31.89	25.84		40.65	13.12	5.74	2.50	2.57	1.59	1.29	20.79	0.60	0.95
94		91-17-8	Decahydronaphthalene		356.97	127.53	48.18	20.80	17.74	9.78	7.61		17.85	6.38	2.41	1.04	0.89	0.49	0.38	11.73	0.73	0.96
95		80-56-8	alpha-Pinene																			
96	Terpenes	99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102	Acids	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111	Other	123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime		96.09	31.38	9.81	2.92	3.60	1.76	1.01		4.80	1.57	0.49	0.15	0.18	0.09	0.05	3.05	0.85	0.93
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	6.6	34597.4	13473.6	5715.4	2460.2	2306.8	1379.0	1095.4		1729.5	673.3	285.4	122.7	115.0	68.6	54.4	1151.30	0.66	0.96
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.3 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNIPH	75-07-0	Acetaldehyde																			
D2		50-00-0	Formaldehyde						8.0								0.4					
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 19: Concentration & emission factor for PTR (paint/stain remover)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h					
				0 h	1 h	3 h	6.9 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6.9 h	24 h	48 h	72 h	96 h	a	b	R ²			
1	Alcohols	71-36-3	1-Butanol																						
2		71-23-8	1-Propanol																						
3		104-76-7	Hexanol, 2-ethyl-1-																						
4		67-63-0	2-Propanol																						
5		64-17-5	Ethanol																						
6		108-95-2	Phenol																						
7	Aldehydes & ketones	78-93-3	Methylethyl ketone																						
8		67-64-1	Acetone			7.3	14.3						0.4	0.7											
9		98-86-2	Acetophenone																						
10		108-94-1	Cyclohexanone																						
11		108-10-1	Methylisobutyl ketone																						
12		100-52-7	Benzaldehyde																						
13		123-72-8	Butanal																						
14		112-31-2	Decanal																						
15		3913-81-3	2-Decenal																						
16		98-01-1	Furfural																						
17		111-71-7	Heptanal																						
18		66-25-1	Hexanal																						
19		124-19-6	Nonanal																						
20		18829-56-6	2-Nonenal																						
21		2548-87-0	2-Octenal																						
22		110-62-3	Pentanal																						
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																						
24		96-14-0	Pentane, 3-methyl-																						
25		540-84-1	2,2,4-Trimethylpentane																						
26		108-08-7	2,4-Dimethylpentane																						
27		124-18-5	Decane		33.4	56.3	46.3	55.0	70.1	42.1	59.2		1.7	2.8	2.3	2.7	3.5	2.1	3.0	2.58	-0.01	0.01			
28		112-40-3	Dodecane																						
29		142-82-5	Heptane																						
30		544-76-3	Hexadecane																						
31		110-54-3	Hexane																						
32		111-84-2	Nonane		15.0	27.4	21.6	22.1	35.6	20.3	22.6		0.8	1.4	1.1	1.1	1.8	1.0	1.1	1.28	0.01	0.01			
33		111-65-9	Octane		5.2		10.8		20.7				0.3		0.5		1.0								
34		629-62-9	Pentadecane																						
35		629-59-4	Tetradecane																						
36		629-50-5	Tridecane																						
37		1120-21-4	Undecane		13.3	25.1	25.8	29.3	34.1	23.5	30.0		0.7	1.3	1.3	1.5	1.7	1.2	1.5	1.23	-0.04	0.15			
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet			4.0								0.2											
39		611-14-3	Toluene, 2-ethyl-		1.1	14.0	2.7	6.4	19.2	6.7	4.6		0.1	0.7	0.1	0.3	1.0	0.3	0.2	0.39	0.02	0.00			
40		620-14-4	Toluene, 3-ethyl-		2.1	22.0	5.7	11.5	26.0	12.0	9.6		0.1	1.1	0.3	0.6	1.3	0.6	0.5	0.66	0.01	0.00			
41		622-96-8	Toluene, 4-ethyl-		1.0	10.0	3.3	8.3	16.3	6.4	7.6		0.1	0.5	0.2	0.4	0.8	0.3	0.4	0.30	-0.08	0.05			
42		4994-16-5	Cyclohexene, 4-phenyl																						
43		71-43-2	Benzene	0.4	2.5	6.1	4.8	2.3	10.0	8.1	4.8		0.1	0.3	0.2	0.1	0.5	0.4	0.2	0.20	-0.07	0.03			
44		526-73-8	Benzene, 1,2,3-trimethyl-		2.0	13.5		9.3	16.0	10.3	8.7		0.1	0.7		0.5	0.8	0.5	0.4	0.73	0.08	0.17			
45		95-63-6	Benzene, 1,2,4-trimethyl-		4.5	64.6	16.1	34.2	57.3	37.4	34.6		0.2	3.2	0.8	1.7	2.9	1.9	1.7	1.80	-0.01	0.00			
46		95-47-6	Benzene, 1,2-dimethyl-		1.0		3.6	10.0	24.5	8.6	6.5		0.1		0.2	0.5	1.2	0.4	0.3	0.14	-0.32	0.23			
47		108-67-8	Benzene, 1,3,5-trimethyl-		1.3	15.3	3.0	7.7	14.0	7.8	7.5		0.1	0.8	0.2	0.4	0.7	0.4	0.4	0.39	-0.02	0.00			
48		108-38-3	Benzene, 1,3-dimethyl-		3.0	41.1	9.9	22.1	53.9	19.6	16.5		0.2	2.1	0.5	1.1	2.7	1.0	0.8	1.24	0.02	0.00			
49		98-82-8	Benzene, isopropyl																						
50		103-65-1	Benzene, propyl-		0.8	6.5		3.7	8.5	3.8			0.0	0.3		0.2	0.4	0.2		0.34	0.08	0.07			
51		100-41-4	Ethylbenzene		1.2	6.6	2.3	3.8	10.1	3.2	3.2		0.1	0.3	0.1	0.2	0.5	0.2	0.2	0.23	0.03	0.00			
52		91-20-3	Naphthalene			5.7		3.0		7.0				0.3		0.1		0.3		0.23	-0.02	0.00			
53		99-87-6	p-Cymene																						
54		100-42-5	Styrene		1.0	3.9		2.1					0.1	0.2		0.1									
55		108-88-3	Toluene	0.8	703.4	1114.2	1039.4	1097.0	1193.6	960.2	1194.5		35.1	55.7	51.9	54.8	59.6	48.0	59.7	53.62	-0.01	0.01			
56		98-83-9	2-Phenylpropene																						
57		95-13-6	Indene																						
58	Esters	108-21-4	Acetic acid, 1-methylethyl																						
59		111-15-9	Acetic acid, 2-ethoxyethyl																						
60		123-86-4	Acetic acid, butyl ester																						
61		141-78-6	Acetic acid, ethyl ester																						
62		80-62-6	Methyl methacrylate																						
63		103-09-3	2-Ethylhexyl acetate																						
64		96-48-0	Butyrolactone																						
65		25265-77-4	Texanol																						
66		6846-50-0	TXIB							8.3								0.4							

Table A. 19 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6.9 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6.9 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane		60457	169211	165381	161345	150168	152701	145868		3022.9	8460.5	8269.1	8067.3	7508.4	7635.0	7293.4	8931.14	0.04	0.90
86		127-18-4	Tetrachloroethylene																			
87	Cyclo Alkanes	79-01-6	Trichloroethylene	3.7	3.2		12.6								0.4							
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane																			
90		110-82-7	Cyclohexane																			
91		1678-93-9	Cyclohexane, butyl-		3.2	5.0		4.6	6.9	6.0			0.2	0.2		0.2	0.3	0.3		0.22	-0.08	0.35
92		1678-91-7	Cyclohexane, ethyl-		1.8								0.1									
93		1678-92-8	Cyclohexane, propyl-		4.3	5.8	5.5		7.0	6.0	7.0		0.2	0.3	0.3		0.3	0.3	0.3	0.26	-0.05	0.58
94		91-17-8	Decahydronaphthalene		1.9								0.1									
95	Terpenes	80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102	Acids	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111	Other	123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	94	27591	62491	59058	57636	54808	54900	84970		1375	3120	2948	2877	2736	2740	4244	2817.12	-0.03	0.05
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.4 h	3.4 h	7.3 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	7.3 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde	0.98	0.98	2.60	1.46	0.23		1.39	0.81		0.00	0.08	0.02			0.02		0.08	0.36	0.58
D2		50-00-0	Formaldehyde																			
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 20: Concentration & emission factor for PTH (paint thinner)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol	0.46																				
2		71-23-8	1-Propanol																					
3		104-76-7	Hexanol, 2-ethyl-1-	2.00																				
4		67-63-0	2-Propanol																					
5		64-17-5	Ethanol				47.23							2.36										
6		108-95-2	Phenol	0.81																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.13	0.98	0.47	0.23						0.04	0.02	0.01									
8		67-64-1	Acetone	3.57	3.11	6.26	5.81	0.99						0.13	0.11									
9		98-86-2	Acetophenone	0.80																				
10		108-94-1	Cyclohexanone																					
11		108-10-1	Methylisobutyl ketone																					
12		100-52-7	Benzaldehyde	2.08																				
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17		111-71-7	Heptanal																					
18		66-25-1	Hexanal																					
19		124-19-6	Nonanal	1.28																				
20	18829-56-6	2-Nonenal																						
21	2548-87-0	2-Octenal																						
22	110-62-3	Pentanal																						
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		6.31	7.42	5.63	3.37	4.64	3.38	3.23		0.32	0.37	0.28	0.17	0.23	0.17	0.16	0.43	0.21	0.79		
24		96-14-0	Pentane, 3-methyl-		5.03	5.85	4.15	3.34	3.28	2.83	2.19		0.25	0.29	0.21	0.17	0.16	0.14	0.11	0.35	0.23	0.90		
25		540-84-1	2,2,4-Trimethylpentane																					
26		108-08-7	2,4-Dimethylpentane																					
27		124-18-5	Decane	569.12	778.75	741.04	938.95	1118.38	1030.12	1044.76		28.46	38.94	37.05	46.95	55.92	51.51	52.24	32.96	-0.11	0.85			
28		112-40-3	Dodecane	90.04	106.39	98.83	119.41	143.15	136.37	142.75		4.50	5.32	4.94	5.97	7.16	6.82	7.14	4.44	-0.10	0.86			
29		142-82-5	Heptane	33.23	39.63	32.09	32.30	33.70	29.83	27.21		1.66	1.98	1.60	1.61	1.68	1.49	1.36	2.02	0.07	0.65			
30		544-76-3	Hexadecane																					
31		110-54-3	Hexane	25.77	28.11	34.21	20.80	20.84	18.74	15.05		1.29	1.41	1.71	1.04	1.04	0.94	0.75	2.00	0.19	0.82			
32		111-84-2	Nonane	331.74	458.75	425.34	512.77	582.21	530.94	523.33		16.59	22.94	21.27	25.64	29.11	26.55	26.17	20.52	-0.06	0.66			
33		111-65-9	Octane	102.98	133.04	114.91	128.29	138.85	124.88	122.15		5.15	6.65	5.75	6.41	6.94	6.24	6.11	6.28	0.00	0.00			
34		629-62-9	Pentadecane																					
35		629-59-4	Tetradecane	1.05	1.11	0.96	1.10	0.87	0.98	0.79		0.05	0.06	0.05	0.05	0.04	0.05	0.04	0.06	0.06	0.46			
36		629-50-5	Tridecane	0.88	1.03	0.68	1.01	0.92	0.79	0.77		0.04	0.05	0.03	0.05	0.05	0.04	0.04	0.05	0.02	0.05			
37		1120-21-4	Undecane	412.92	535.38	507.02	649.05	781.25	722.90	752.00		20.65	26.77	25.35	32.45	39.06	36.14	37.60	22.20	-0.12	0.87			
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	17.50	23.16	21.84	27.71	33.97	30.92	31.65		0.88	1.16	1.09	1.39	1.70	1.55	1.58	0.97	-0.12	0.84		
39			611-14-3	Toluene, 2-ethyl-	60.71	84.75	80.22	97.04	114.14	104.77	103.78		3.04	4.24	4.01	4.85	5.71	5.24	5.19	3.71	-0.08	0.78		
40			620-14-4	Toluene, 3-ethyl-	132.68	184.93	175.50	214.19	253.02	229.06	227.57		6.63	9.25	8.77	10.71	12.65	11.45	11.38	8.10	-0.09	0.76		
41	622-96-8		Toluene, 4-ethyl-	72.60	102.15	97.20	120.86	142.14	129.66	130.09		3.63	5.11	4.86	6.04	7.11	6.48	6.50	4.42	-0.10	0.81			
42	4994-16-5		Cyclohexene, 4-phenyl																					
43	71-43-2		Benzene	2.18	2.75	5.08	15.84	2.62	1.77	1.99	3.75		0.03	0.14	0.68	0.02			0.08	0.42	0.49	0.28		
44	526-73-8		Benzene, 1,2,3-trimethyl-	113.30	156.64	149.64	184.54	220.45	202.70	203.35		5.67	7.83	7.48	9.23	11.02	10.13	10.17	6.72	-0.10	0.83			
45	95-63-6		Benzene, 1,2,4-trimethyl-	287.97	398.51	382.07	470.52	559.62	516.56	518.87		14.40	19.93	19.10	23.53	27.98	25.83	25.94	17.13	-0.10	0.84			
46	95-47-6		Benzene, 1,2-dimethyl-	51.21	69.38	63.70	73.05	82.82	74.90	73.78		2.56	3.47	3.19	3.65	4.14	3.74	3.69	3.18	-0.04	0.48			
47	108-67-8		Benzene, 1,3,5-trimethyl-	66.93	92.92	88.74	107.58	127.22	116.10	115.61		3.35	4.65	4.44	5.38	6.36	5.81	5.78	4.06	-0.09	0.79			
48	108-38-3		Benzene, 1,3-dimethyl-	0.15	124.79	167.90	158.90	179.47	202.84	183.61	179.64		6.23	8.39	7.94	8.97	10.13	9.17	8.97	7.80	-0.04	0.51		
49	98-82-8		Benzene, isopropyl	21.13	28.55	26.26	30.38	34.72	31.10	30.64		1.06	1.43	1.31	1.52	1.74	1.56	1.53	1.30	-0.05	0.50			
50	103-65-1		Benzene, propyl-	88.05	123.82	116.63	140.78	165.43	150.61	149.28		4.40	6.19	5.83	7.04	8.27	7.53	7.46	5.44	-0.08	0.75			
51	100-41-4		Ethylbenzene	0.05	41.11	55.93	51.24	57.26	64.28	57.95	56.96		2.05	2.79	2.56	2.86	3.21	2.90	2.85	2.60	-0.03	0.32		
52	Esters	91-20-3	Naphthalene	61.57	77.22	73.47	94.11	114.64	107.20	110.09		3.08	3.86	3.67	4.71	5.73	5.36	5.50	3.18	-0.13	0.88			
53		99-87-6	p-Cymene	23.57	32.68	31.07	38.99	46.78	42.21	42.65		1.18	1.63	1.55	1.95	2.34	2.11	2.13	1.40	-0.10	0.81			
54		100-42-5	Styrene	0.10																				
55		108-88-3	Toluene	0.86	53.42	69.39	89.88	62.33	65.82	59.57	56.66		2.63	3.43	4.45	3.07	3.25	2.94	2.79	4.32	0.09	0.55		
56		98-83-9	2-Phenylpropene																					
57		95-13-6	Indene																					
58		108-21-4	Acetic acid, 1-methylethyl																					
59		111-15-9	Acetic acid, 2-ethoxyethyl																					
60		123-86-4	Acetic acid, butyl ester																					
61		141-78-6	Acetic acid, ethyl ester	0.23			0.46								0.01									
62		80-62-6	Methyl methacrylate																					
63		103-09-3	2-Ethylhexyl acetate																					
64		96-48-0	Butyrolactone																					
65		25265-77-4	Texanol																					
66		6846-50-0	TXIB																					

Table A. 20 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g m}^{-2} \text{h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R^2
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83	Cyclo Alkanes	67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane	1.59	1.67	2.75	2.32						0.00	0.06	0.04							
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene	4.13	3.15	8.65	10.99	0.53						0.23	0.34							
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		77.99	87.65	66.95	61.83	62.64	57.07	52.77		3.90	4.38	3.35	3.09	3.13	2.85	2.64	4.57	0.11	0.84
90		110-82-7	Cyclohexane		11.24	13.59	11.09	10.99	11.18	9.16	8.19		0.56	0.68	0.55	0.55	0.56	0.46	0.41	0.74	0.11	0.74
91	Terpenes	1678-93-9	Cyclohexane, butyl-		85.16	109.33	109.97	139.01	159.34	145.08	144.70		4.26	5.47	5.50	6.95	7.97	7.25	7.23	4.83	-0.10	0.84
92		1678-91-7	Cyclohexane, ethyl-		57.81	73.69	61.61	65.47	69.33	64.08	61.79		2.89	3.68	3.08	3.27	3.47	3.20	3.09	3.54	0.02	0.21
93		1678-92-8	Cyclohexane, propyl-		100.67	144.10	128.01	150.14	174.80	161.44	152.99		5.03	7.21	6.40	7.51	8.74	8.07	7.65	6.41	-0.05	0.49
94		91-17-8	Decahydronaphthalene		41.81	58.17	55.00	68.45	81.19	75.12	73.85		2.09	2.91	2.75	3.42	4.06	3.76	3.69	2.50	-0.10	0.81
95		80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99	Acids	13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115	DNP	121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	71.9	8222.5	10979.5	10427.8	12458.6	14709.4	13318.7	13441.9		407.5	545.4	517.8	619.3	731.9	662.3	668.5	479.28	-0.08	0.77
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1.2 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.2 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R^2
D1	DNP	75-07-0	Acetaldehyde																			
D2		50-00-0	Formaldehyde																			
D3		123-38-6	Propanal																			

Note: Levels below the method detection limit are highlighted.

Table A. 21: Concentration & emission factor for PTS (aerosol paint, spray)

			Chamber concentration (μg m ⁻³)									Emission factor (μg h ⁻¹)									Coefficient: E = a t ^b with t > 3 h			
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol							0.9								0.0						
2		71-23-8	1-Propanol																					
3		104-76-7	Hexanol, 2-ethyl-1-								0.8	0.3							0.0	0.0				
4		67-63-0	2-Propanol																					
5		64-17-5	Ethanol							2.1		1.9						0.1		0.1				
6		108-95-2	Phenol								1.7								0.1					
7	Aldehydes & ketones	78-93-3	Methylethyl ketone			9.9	10.6	2.6	0.7	0.3	0.9	0.4		0.5	0.5	0.1	0.0	0.0	0.0	0.0	0.82	0.86	0.82	
8		67-64-1	Acetone		2.9	6850.4	4881.6	853.9	305.4	322.1	363.9	298.3			342.4	243.9	42.5	15.1	16.0	18.0	14.8	259.19	0.69	0.77
9		98-86-2	Acetophenone																					
10		108-94-1	Cyclohexanone																					
11		108-10-1	Methylisobutyl ketone						3.4	1.4	2.1	1.4					0.2	0.1	0.1	0.1	0.81	0.54	0.59	
12		100-52-7	Benzaldehyde		1.0	2.2	2.4	2.0	2.0	1.6	4.8	2.9			0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.04	-0.14	0.10
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17		111-71-7	Heptanal																					
18		66-25-1	Hexanal																					
19		124-19-6	Nonanal																					
20		18829-56-6	2-Nonenal																					
21		2548-87-0	2-Octenal																					
22		110-62-3	Pentanal																					
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-			5.1	1.9				0.6			0.3	0.1				0.0					
24		96-14-0	Pentane, 3-methyl-			6.5	2.5							0.3	0.1									
25		540-84-1	2,2,4-Trimethylpentane																					
26		108-08-7	2,4-Dimethylpentane																					
27		124-18-5	Decane				0.3			0.2						0.0		0.0						
28		112-40-3	Dodecane							0.4							0.0			0.0				
29		142-82-5	Heptane			0.7								0.0										
30		544-76-3	Hexadecane									0.4								0.0				
31		110-54-3	Hexane			32.2	13.5	2.2		1.8	4.6			1.6	0.7	0.1		0.1	0.2		0.45	0.30	0.25	
32		111-84-2	Nonane			17.8	25.2	17.5	7.7	4.8	5.7	4.7		0.9	1.3	0.9	0.4	0.2	0.3	0.2	2.08	0.50	0.96	
33		111-65-9	Octane			24.5	29.9	15.1	4.3	2.7	3.8	3.1		1.2	1.5	0.8	0.2	0.1	0.2	0.2	2.55	0.67	0.92	
34		629-62-9	Pentadecane								0.3									0.0				
35		629-59-4	Tetradecane								0.4									0.0				
36		629-50-5	Tridecane						0.3		0.3						0.0		0.0					
37		1120-21-4	Undecane					0.3			0.5	0.3					0.0		0.0	0.0	0.01	-0.10	0.27	
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-																					
39		611-14-3	Toluene, 2-ethyl-			0.4	0.8	0.5	0.4	0.2	0.4	0.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.30	0.79	
40		620-14-4	Toluene, 3-ethyl-			1.1	2.2	1.6	1.2	0.6	1.2	0.6		0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.15	0.30	0.70	
41		622-96-8	Toluene, 4-ethyl-			0.8	1.2	0.9	1.1	0.3	0.8	0.4		0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.08	0.26	0.49	
42		4994-16-5	Cyclohexene, 4-phenyl																					
43		71-43-2	Benzene								0.8								0.0					
44		526-73-8	Benzene, 1,2,3-trimethyl-			0.3	0.6	0.4	0.4	0.2	0.5	0.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03	0.15	0.39	
45		95-63-6	Benzene, 1,2,4-trimethyl-			0.8	1.5	1.1	1.0	0.5	1.1	0.6		0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.09	0.21	0.52	
46		95-47-6	Benzene, 1,2-dimethyl-			7.1	11.5	8.9	3.9	2.2	3.0	2.2		0.4	0.6	0.4	0.2	0.1	0.1	0.1	1.00	0.50	0.94	
47		108-67-8	Benzene, 1,3,5-trimethyl-			0.5	1.1	0.7	0.6	0.3	0.5	0.3		0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.06	0.29	0.76	
48		108-38-3	Benzene, 1,3-dimethyl-			24.1	38.3	31.1	13.8	8.0	10.0	7.9		1.2	1.9	1.6	0.7	0.4	0.5	0.4	3.33	0.48	0.95	
49		98-82-8	Benzene, isopropyl			0.3	0.6	0.4	0.2		0.1			0.0	0.0	0.0	0.0		0.0					
50		103-65-1	Benzene, propyl-			0.7	1.3	0.8	0.6	0.2	0.4			0.0	0.1	0.0	0.0	0.0	0.0		0.10	0.45	0.76	
51		100-41-4	Ethylbenzene			6.3	9.9	7.8	2.9	1.5	2.1	1.6		0.3	0.5	0.4	0.1	0.1	0.1	0.1	0.92	0.56	0.93	
52		91-20-3	Naphthalene		0.2			0.2	0.2	0.3	0.1	0.7	0.1					0.0		0.0				
53		99-87-6	p-Cymene								0.1								0.0					
54		100-42-5	Styrene		0.1	1.0						0.4							0.0					
55	Esters	108-88-3	Toluene		0.5	1230.2	1535.9	1144.8	309.3	229.8	243.8	220.7		61.5	76.8	57.2	15.4	11.5	12.2	11.0	145.81	0.61	0.95	
56		98-83-9	2-Phenylpropene																					
57		95-13-6	Indene																					
58		108-21-4	Acetic acid, 1-methylethyl																					
59	111-15-9	Acetic acid, 2-ethoxyethyl																						
60	123-86-4	Acetic acid, butyl ester																						
61	141-78-6	Acetic acid, ethyl ester			1.8	1.9	0.5						0.1	0.1	0.0									
62	80-62-6	Methyl methacrylate																						
63	103-09-3	2-Ethylhexyl acetate																						
64	96-48-0	Butyrolactone																						
65	25265-77-4	Texanol																						
66	6846-50-0	TXIB								1.6								0.1						

Table A. 21 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg m ⁻² h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	71.9 h	96 h	a	b	R ²	
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																				
68		110-49-6	2-Methoxyethylacetate																				
69		111-90-0	Diethylene glycol monoeth																				
70		107-98-2	Propanol, 1-methoxy-2-																				
71		111-76-2	Ethanol, 2-butoxy-																				
72		112-34-5	Ethanol, 2-butoxyethoxy-																				
73		110-80-5	Ethanol, 2-ethoxy-																				
74		109-86-4	Ethanol, 2-methoxy-																				
75		75-65-0	Propanol, 2-methyl-2-																				
76		71-55-6	1,1,1-Trichloroethane																				
77	95-50-1	1,2-Dichlorobenzene																					
78	107-06-2	1,2-Dichloroethane																					
79	78-87-5	1,2-Dichloropropane																					
80	106-46-7	1,4-Dichlorobenzene																					
81	75-27-4	Bromodichloromethane																					
82	56-23-5	Carbon tetrachloride																					
83	67-66-3	Chloroform																					
84	124-48-1	Dibromochloromethane																					
85	75-09-2	Dichloromethane			2.3				1.6				0.1				0.1						
86	127-18-4	Tetrachloroethylene																					
87	79-01-6	Trichloroethylene		6.8	3.2	0.6			13.3								0.3						
88	79-34-5	1,1,2,2-Tetrachloroethane																					
89	108-87-2	Methylcyclohexane			10.4	8.5	1.9	0.8		0.6	0.4		0.5	0.4	0.1	0.0		0.0	0.59	0.76	0.88		
90	110-82-7	Cyclohexane																					
91	1678-93-9	Cyclohexane, butyl-																					
92	1678-91-7	Cyclohexane, ethyl-			41.6	48.5	27.8	7.6	2.5	3.7	2.7		2.1	2.4	1.4	0.4	0.1	0.2	0.1	6.20	0.88	0.96	
93	1678-92-8	Cyclohexane, propyl-			1.6	1.7	1.3	0.6		0.4	0.3		0.1	0.1	0.1	0.0		0.0	0.0	0.16	0.53	0.99	
94	91-17-8	Decahydronaphthalene																					
95	80-56-8	alpha-Pinene																					
96	99-86-5	alpha-Terpinene																					
97	127-91-3	beta-Pinene																					
98	99-85-4	gamma-Terpinene																					
99	13466-78-9	3-Carene																					
100	79-92-5	Camphene																					
101	5989-27-5	Limonene																					
102	64-19-7	Acetic acid																					
103	79-31-2	Isobutyric acid																					
104	107-92-6	Butyric acid																					
105	111-14-8	Heptanoic acid																					
106	149-57-5	2-Ethylhexanoic acid																					
107	142-62-1	Hexanoic acid																					
108	109-52-4	Pentanoic Acid																					
109	3777-69-3	Furan, 2-pentyl																					
110	872-50-4	2-Pyrrolidinone, 1-methyl																					
111	123-91-1	1,4-Dioxane																					
112	78-40-0	Triethyl phosphate																					
113	142-96-1	n-Butyl ether																					
114	96-29-7	2-Butanone oxime																					
115	121-44-8	Triethylamine																					
116	75-21-8	Ethylene oxide																					
117	75-56-9	Propylene oxide																					
118	106-99-0	1,3-Butadiene																					
119	0-00-0	TVOC		86.0	5222.7	4516.8	2166.9	791.3	550.9	588.0	478.9		256.8	221.5	104.0	35.3	23.2	25.1	19.6	388.85	0.68	0.96	
A1	106-97-8	Butane			255.1	88.4	68.7	79.6	61.8	72.7	62.7		12.8	4.4	3.4	4.0	3.1	3.6	3.1	4.41	0.07	0.44	
A2	616-38-6	Carbonic acid, dimethyl es			198.8	267.2	103.5	16.2	11.6	13.6	11.7		9.9	13.4	5.2	0.8	0.6	0.7	0.6	27.63	0.92	0.92	
A3	107-87-9	2-Pentanone			130.2	208.7	122.6	12.9	7.7	9.3	7.6		6.5	10.4	6.1	0.6	0.4	0.5	0.4	30.33	1.04	0.94	
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²	
D1	DNPH	75-07-0	Acetaldehyde		0.9	1.5	1.7	1.0	0.2	0.6	0.0	5.8		0.0	0.0	0.0				0.2	0.00	-0.84	0.50
D2		50-00-0	Formaldehyde																				
D3		123-38-6	Propanal																				

Note: Levels below the method detection limit are highlighted.

Table A. 22: Concentration & emission factor for RS (roof sealant)

				Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h			
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96.7 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96.7 h	a	b	R ²	
1	Alcohols	71-36-3	1-Butanol						0.63	0.57							0.03	0.03					
2		71-23-8	1-Propanol																				
3		104-76-7	Hexanol, 2-ethyl-1-	0.45																			
4		67-63-0	2-Propanol																				
5		64-17-5	Ethanol																				
6		108-95-2	Phenol							0.83								0.04					
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																				
8		67-64-1	Acetone	2.06	3.06	3.01	1.66	1.40	1.15	1.58	1.59		0.05	0.05									
9		98-86-2	Acetophenone	0.69																			
10		108-94-1	Cyclohexanone																				
11		108-10-1	Methylisobutyl ketone																				
12		100-52-7	Benzaldehyde	1.94																			
13		123-72-8	Butanal																				
14		112-31-2	Decanal																				
15		3913-81-3	2-Decenal																				
16		98-01-1	Furfural																				
17		111-71-7	Heptanal																				
18		66-25-1	Hexanal																				
19		124-19-6	Nonanal																				
20		18829-56-6	2-Nonenal																				
21		2548-87-0	2-Octenal																				
22		110-62-3	Pentanal																				
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																				
24		96-14-0	Pentane, 3-methyl-																				
25		540-84-1	2,2,4-Trimethylpentane																				
26		108-08-7	2,4-Dimethylpentane																				
27		124-18-5	Decane	3.04	55.62	76.00	82.75	98.72	92.47	98.71	76.16		2.63	3.65	3.99	4.78	4.47	4.78	3.66	3.74	-0.04	0.16	
28		112-40-3	Dodecane	0.87	7.15	6.57	7.25	9.48	10.41	11.06	8.51		0.31	0.28	0.32	0.43	0.48	0.51	0.38	0.26	-0.14	0.69	
29		142-82-5	Heptane																				
30		544-76-3	Hexadecane																				
31		110-54-3	Hexane																				
32		111-84-2	Nonane		30.04	42.53	45.19	50.66	46.68	48.93	36.94		1.50	2.13	2.26	2.53	2.33	2.45	1.85	2.28	0.00	0.00	
33		111-65-9	Octane		1.93	2.75	2.62	2.53	2.12	2.19	1.66		0.10	0.14	0.13	0.13	0.11	0.11	0.08	0.16	0.11	0.73	
34		629-62-9	Pentadecane																				
35		629-59-4	Tetradecane																				
36		629-50-5	Tridecane																				
37		1120-21-4	Undecane	8.37	47.49	59.23	68.89	80.50	79.16	85.90	67.03		1.96	2.54	3.03	3.61	3.54	3.88	2.93	2.57	-0.07	0.42	
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	0.20	0.93	1.09	1.14	1.36	1.28	1.39	1.01		0.04	0.04	0.05	0.06	0.05	0.06	0.04	0.05	-0.03	0.07
39			611-14-3	Toluene, 2-ethyl-	0.20	1.64	2.44	2.39	2.91	2.61	2.64	2.16		0.07	0.11	0.11	0.14	0.12	0.12	0.10	0.12	0.00	0.00
40			620-14-4	Toluene, 3-ethyl-	0.20	4.08	5.73	6.24	6.86	6.51	6.73	5.06		0.19	0.28	0.30	0.33	0.32	0.33	0.24	0.30	0.00	0.00
41	622-96-8		Toluene, 4-ethyl-	0.16	1.93	2.67	2.95	3.32	2.90	2.98	2.71		0.09	0.13	0.14	0.16	0.14	0.14	0.13	0.13	-0.01	0.02	
42	4994-16-5		Cyclohexene, 4-phenyl																				
43	71-43-2		Benzene	0.58			1.29	0.30	16.27	0.67	0.47					0.04		0.78	0.00		0.06	0.08	0.00
44	526-73-8		Benzene, 1,2,3-trimethyl-	0.61	4.11	5.42	5.93	6.72	6.21	6.30	5.26		0.18	0.24	0.27	0.31	0.28	0.28	0.23	0.26	-0.01	0.03	
45	95-63-6		Benzene, 1,2,4-trimethyl-	1.05	11.99	16.38	17.22	19.35	18.64	19.39	15.08		0.55	0.77	0.81	0.92	0.88	0.92	0.70	0.80	-0.01	0.02	
46	95-47-6		Benzene, 1,2-dimethyl-		1.59	2.17	2.14	2.35	2.12	2.19	1.65		0.08	0.11	0.11	0.12	0.11	0.11	0.08	0.12	0.04	0.19	
47	108-67-8		Benzene, 1,3,5-trimethyl-	0.15	3.89	5.35	5.67	6.74	6.28	6.75	5.06		0.19	0.26	0.28	0.33	0.31	0.33	0.25	0.27	-0.03	0.08	
48	108-38-3		Benzene, 1,3-dimethyl-		3.52	4.83	4.86	5.21	4.55	4.80	3.63		0.18	0.24	0.24	0.26	0.23	0.24	0.18	0.27	0.05	0.28	
49	98-82-8		Benzene, isopropyl		0.26	0.34	0.38	0.42	0.36	0.42	0.31		0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.00	
50	103-65-1		Benzene, propyl-		0.96	1.39	1.44	1.65	1.51	1.56	1.24		0.05	0.07	0.07	0.08	0.08	0.08	0.06	0.07	0.00	0.00	
51	100-41-4		Ethylbenzene		0.64	0.89	0.89	0.92	0.79	0.82	0.62		0.03	0.04	0.04	0.05	0.04	0.04	0.03	0.05	0.07	0.49	
52	91-20-3		Naphthalene	0.31	0.49	0.56	0.63	0.69	0.68	0.61	0.53		0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	
53	99-87-6		p-Cymene		0.44	0.54	0.57	0.68	0.63	0.70	0.53		0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-0.03	0.14	
54	100-42-5		Styrene			0.25			1.72		0.27			0.01			0.09		0.01	0.01	-0.21	0.13	
55	108-88-3		Toluene	0.27	1.18	0.99	0.86	0.68	0.70	0.61	0.51		0.05	0.04	0.03	0.02	0.02	0.02	0.01	0.05	0.26	0.89	
56	Esters	98-83-9	2-Phenylpropene																				
57		95-13-6	Indene																				
58		108-21-4	Acetic acid, 1-methylethyl																				
59		111-15-9	Acetic acid, 2-ethoxyethyl																				
60		123-86-4	Acetic acid, butyl ester																				
61		141-78-6	Acetic acid, ethyl ester																				
62		80-62-6	Methyl methacrylate																				
63		103-09-3	2-Ethylhexyl acetate																				
64		96-48-0	Butyrolactone																				
65		25265-77-4	Texanol																				
66		6846-50-0	TXIB																				

Table A. 22 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg m ⁻² h ⁻¹)								Coefficient: E = a t ^b with t > 3 h			
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96.7 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96.7 h	a	b	R ²	
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol				7.19	12.84	20.83	6.33					0.36	0.64	1.04	0.32		0.35	-0.12	0.06	
68		110-49-6	2-Methoxyethylacetate																				
69		111-90-0	Diethylene glycol monoeth																				
70		107-98-2	Propanol, 1-methoxy-2-																				
71		111-76-2	Ethanol, 2-butoxy-																				
72		112-34-5	Ethanol, 2-butoxyethoxy-																				
73		110-80-5	Ethanol, 2-ethoxy-																				
74		109-86-4	Ethanol, 2-methoxy-																				
75		75-65-0	Propanol, 2-methyl-2-																				
76		Halo Carbons	71-55-6	1,1,1-Trichloroethane																			
77	95-50-1		1,2-Dichlorobenzene																				
78	107-06-2		1,2-Dichloroethane																				
79	78-87-5		1,2-Dichloropropane																				
80	106-46-7		1,4-Dichlorobenzene																				
81	75-27-4		Bromodichloromethane																				
82	56-23-5		Carbon tetrachloride																				
83	67-66-3		Chloroform																				
84	124-48-1		Dibromochloromethane																				
85	75-09-2		Dichloromethane		1.22	0.68							0.06	0.03									
86	127-18-4	Tetrachloroethylene		0.56	0.68	0.66	0.67	0.56	0.58	0.37		0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.04	0.12	0.52		
87	Cyclo Alkanes	79-01-6	Trichloroethylene	4.54	1.94	0.62	0.46																
88		79-34-5	1,1,2,2-Tetrachloroethane																				
89		108-87-2	Methylcyclohexane		0.24	0.26	0.25						0.01	0.01	0.01								
90		110-82-7	Cyclohexane																				
91		1678-93-9	Cyclohexane, butyl-		3.30	4.93	5.28	5.61	5.65	5.72	4.63		0.16	0.25	0.26	0.28	0.28	0.29	0.23	0.26	-0.01	0.02	
92		1678-91-7	Cyclohexane, ethyl-		0.84	1.19	1.13	1.11	0.94	0.96	0.66		0.04	0.06	0.06	0.06	0.05	0.05	0.03	0.07	0.12	0.62	
93		1678-92-8	Cyclohexane, propyl-		2.92	4.21	4.46	4.90	4.50	4.54	3.49		0.15	0.21	0.22	0.24	0.23	0.23	0.17	0.23	0.02	0.06	
94		91-17-8	Decahydronaphthalene		1.93	2.85	3.00	3.63	3.59	3.73	2.81		0.10	0.14	0.15	0.18	0.18	0.19	0.14	0.14	-0.04	0.19	
95		Terpenes	80-56-8	alpha-Pinene																			
96			99-86-5	alpha-Terpinene																			
97	127-91-3		beta-Pinene																				
98	99-85-4		gamma-Terpinene																				
99	13466-78-9		3-Carene																				
100	79-92-5		Camphene																				
101	5989-27-5	Limonene																					
102	Acids	64-19-7	Acetic acid																				
103		79-31-2	Isobutyric acid																				
104		107-92-6	Butyric acid																				
105		111-14-8	Heptanoic acid																				
106		149-57-5	2-Ethylhexanoic acid																				
107		142-62-1	Hexanoic acid																				
108		109-52-4	Pentanoic Acid																				
109	Other	3777-69-3	Furan, 2-pentyl																				
110		872-50-4	2-Pyrrolidinone, 1-methyl																				
111		123-91-1	1,4-Dioxane																				
112		78-40-0	Triethyl phosphate																				
113		142-96-1	n-Butyl ether																				
114		96-29-7	2-Butanone oxime																				
115		121-44-8	Triethylamine																				
116		75-21-8	Ethylene oxide																				
117		75-56-9	Propylene oxide																				
118		106-99-0	1,3-Butadiene																				
119	0-00-0	TVOC		81.3	759.7	969.3	1027.6	1268.8	1174.9	1252.5	961.7		33.92	44.40	47.31	59.37	54.68	58.56	44.02	45.09	-0.04	0.16	
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h			
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²	
D1	DNPH	75-07-0	Acetaldehyde	0.7	1.3	1.5	5.2	4.2	0.1	6.1	6.0		0.0	0.0	0.2	0.2		0.3	0.3	0.05	-0.41	0.57	
D2		50-00-0	Formaldehyde																				
D3		123-38-6	Propanal																				

Note: Levels below the method detection limit are highlighted.

Table A. 23: Concentration & emission factor for AF_f (antifreeze)

NRC-CNRC

Table A. 23 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	0.8 h	2.9 h	5.9 h	23.9 h	47.9 h	71.9 h	95.9 h	170.2 h	0 h	0.8 h	2.9 h	5.9 h	23.9 h	47.9 h	71.9 h	95.9 h	170.2 h	a	b	R ²		
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																							
68		110-49-6	2-Methoxyethylacetate																							
69		111-90-0	Diethylene glycol monoet																							
70		107-98-2	Propanol, 1-methoxy-2-																							
71		111-76-2	Ethanol, 2-butoxy-							0.53								0.03								
72		112-34-5	Ethanol, 2-butoxyethoxy-																							
73		110-80-5	Ethanol, 2-ethoxy-																							
74		109-86-4	Ethanol, 2-methoxy-																							
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																							
76		71-55-6	1,1,1-Trichloroethane																							
77		95-50-1	1,2-Dichlorobenzene																							
78		107-06-2	1,2-Dichloroethane																							
79		78-87-5	1,2-Dichloropropane																							
80		106-46-7	1,4-Dichlorobenzene																							
81		75-27-4	Bromodichloromethane																							
82		56-23-5	Carbon tetrachloride																							
83	Cyclo Alkanes	67-66-3	Chloroform		0.37									0.02												
84		124-48-1	Dibromochloromethane																							
85		75-09-2	Dichloromethane		1.57	1.64	0.50			3.77		0.75		0.08	0.08	0.03		0.19		0.04	0.05	-0.08	0.03			
86		127-18-4	Tetrachloroethylene																							
87		79-01-6	Trichloroethylene		2.05	2.46	0.74			3.01	0.68	2.89		0.10	0.12	0.04		0.15	0.03	0.14	0.07	-0.06	0.02			
88		79-34-5	1,1,2,2-Tetrachloroethane																							
89		108-87-2	Methylcyclohexane																							
90		110-82-7	Cyclohexane																							
91	Terpenes	1678-93-9	Cyclohexane, butyl-				0.33																			
92		1678-91-7	Cyclohexane, ethyl-																							
93		1678-92-8	Cyclohexane, propyl-																							
94		91-17-8	Decahydronaphthalene																							
95		80-56-8	alpha-Pinene																							
96		99-86-5	alpha-Terpinene																							
97		127-91-3	beta-Pinene																							
98		99-85-4	gamma-Terpinene																							
99	Acids	13466-78-9	3-Carene																							
100		79-92-5	Camphene																							
101		5989-27-5	Limonene																							
102		64-19-7	Acetic acid		8.39		8.97	8.91	2.76	3.58	2.63	3.89		0.42		0.45	0.45	0.14	0.18	0.13	0.19	0.88	0.36	0.60		
103		79-31-2	Isobutyric acid																							
104		107-92-6	Butyric acid																							
105		111-14-8	Heptanoic acid																							
106		149-57-5	2-Ethylhexanoic acid																							
107	Other	142-62-1	Hexanoic acid																							
108		109-52-4	Pentanoic Acid																							
109		3777-69-3	Furan, 2-pentyl																							
110		872-50-4	2-Pyrrolidinone, 1-methyl																							
111		123-91-1	1,4-Dioxane																							
112		78-40-0	Triethyl phosphate																							
113		142-96-1	n-Butyl ether																							
114		96-29-7	2-Butanone oxime																							
115	A	121-44-8	Triethylamine																							
116		75-21-8	Ethylene oxide		6.53	9.60	17.84	12.68	11.04	9.03	8.38	3.86		0.33	0.48	0.89	0.63	0.55	0.45	0.42	0.19	0.96	0.21	0.43		
117		75-56-9	Propylene oxide																							
118		106-99-0	1,3-Butadiene																							
119		0-00-0	TVOC	8.1	1614.6	1657.5	1088.3	569.5	459.2	431.9	379.9	291.6		80.33	82.47	54.01	28.07	22.56	21.19	18.59	14.18	116.73	0.41	0.99		
A1		67-56-1	Methanol		65.4	47.7	32.9	39.9	36.4	2.7	20.1	3.0		3.27	2.39	1.64	1.99	1.82	0.14	1.00	0.15	5.87	0.57	0.48		
A2	DNP	107-21-1	1,2-Ethanediol		1356.7	1377.9	861.9	375.9	304.3	260.8	252.5	192.7		67.83	68.90	43.09	18.79	15.22	13.04	12.63	9.63	101.26	0.47	0.98		
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1.2 h	3.2 h	6.2 h	24.2 h	48.2 h	72.2 h	96.2 h		0 h	1.2 h	3.2 h	6.2 h	24.2 h	48.2 h	72.2 h	96.2 h		a	b	R ²		
D1	DNP	75-07-0	Acetaldehyde		8.7	8.3	5.7	3.2	2.8	3.9	0.6			0.4	0.4	0.3	0.2	0.1	0.2	0.0		0.81	0.52	0.62		
D2		50-00-0	Formaldehyde																							
D3		123-38-6	Propanal		0.0						0.4			0.0						0.0						

Note: Levels below the method detection limit are highlighted.

		Chamber concentration ($\mu\text{g m}^{-3}$)	Emission factor ($\mu\text{g h}^{-1}$)	Coef
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NRC-CNRC

Table A. 24 (continued)

				Chamber concentration (µg m ⁻³)												Emission factor (µg h ⁻¹)												Coefficient: E = a t ^b with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168 h	a	b	R ²						
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																											
68		110-49-6	2-Methoxyethylacetate																											
69		111-90-0	Diethylene glycol monoeth																											
70		107-98-2	Propanol, 1-methoxy-2-																											
71		111-76-2	Ethanol, 2-butoxy-																											
72		112-34-5	Ethanol, 2-butoxyethoxy-																											
73		110-80-5	Ethanol, 2-ethoxy-																											
74		109-86-4	Ethanol, 2-methoxy-																											
75		75-65-0	Propanol, 2-methyl-2-																											
76		71-55-6	1,1,1-Trichloroethane																											
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																											
78		107-06-2	1,2-Dichloroethane																											
79		78-87-5	1,2-Dichloropropane																											
80		106-46-7	1,4-Dichlorobenzene																											
81		75-27-4	Bromodichloromethane																											
82		56-23-5	Carbon tetrachloride																											
83		67-66-3	Chloroform		0.52	0.12									0.03	0.01														
84		124-48-1	Dibromochloromethane																											
85		75-09-2	Dichloromethane		1.60	0.45									0.08	0.02														
86		127-18-4	Tetrachloroethylene		0.32	0.13									0.02	0.01														
87	Cyclo Alkanes	79-01-6	Trichloroethylene		3.43	0.92	0.20		1.81		0.25			0.17	0.05	0.01		0.09		0.01		0.03	0.00	0.00						
88		79-34-5	1,1,2,2-Tetrachloroethane																											
89		108-87-2	Methylcyclohexane		2.54	0.89									0.13	0.04														
90		110-82-7	Cyclohexane		1.45	0.48									0.07	0.02														
91		1678-93-9	Cyclohexane, butyl-																											
92		1678-91-7	Cyclohexane, ethyl-			0.16									0.01															
93		1678-92-8	Cyclohexane, propyl-			0.09									0.00															
94		91-17-8	Decahydronaphthalene																											
95		Terpenes	80-56-8	alpha-Pinene		0.31	0.19								0.02	0.01														
96			99-86-5	alpha-Terpinene																										
97	127-91-3		beta-Pinene																											
98	99-85-4		gamma-Terpinene																											
99	13466-78-9		3-Carene																											
100	79-92-5		Camphene			0.12										0.01														
101	5989-27-5		Limonene		2.56	2.45	1.49	0.52		0.18				0.13	0.12	0.07	0.03		0.01			0.32	0.82	1.00						
102	64-19-7		Acetic acid			2.06	0.76			0.75						0.10	0.04		0.04			0.09	0.24	0.46						
103	Acids		79-31-2	Isobutyric acid																										
104			107-92-6	Butyric acid																										
105		111-14-8	Heptanoic acid																											
106		149-57-5	2-Ethylhexanoic acid																											
107		142-62-1	Hexanoic acid																											
108		109-52-4	Pentanoic Acid																											
109	Other	3777-69-3	Furan, 2-pentyl																											
110		872-50-4	2-Pyrrolidinone, 1-methyl																											
111		123-91-1	1,4-Dioxane																											
112		78-40-0	Triethyl phosphate																											
113		142-96-1	n-Butyl ether																											
114		96-29-7	2-Butanone oxime																											
115		121-44-8	Triethylamine																											
116		75-21-8	Ethylene oxide																											
117		75-56-9	Propylene oxide																											
118		106-99-0	1,3-Butadiene																											
119	0-00-0	TVOC		2.7	229.2	76.8	52.2	49.6	41.0	38.5	42.5	31.8			11.33	3.71	2.47	2.35	1.92	1.79	1.99	1.45	4.07	0.19	0.87					
A1	106-97-8	Butane			168.7	24.8	23.5	26.0	22.3	24.6	25.0	24.1			8.43	1.24	1.17	1.30	1.12	1.23	1.25	1.20								
				Chamber concentration (µg m ⁻³)												Emission factor (µg h ⁻¹)												Coefficient: E = a t ^b with t > 3 h		
#	Class	CAS #	Compound	0 h	1.4 h	3.4 h	6.4 h	24.5 h	48.4 h	72.4 h	96.4 h		0 h	1.4 h	3.4 h	6.4 h	24.5 h	48.4 h	72.4 h	96.4 h		a	b	R ²						
D1	DNPH	75-07-0	Acetaldehyde	0.6	1.5	0.4	3.6	0.9	0.6	0.6	1.0			0.0		0.1	0.0	0.0	0.0	0.0		1.76	1.53	0.51						
D2		50-00-0	Formaldehyde		0.7	0.2	0.2				0.2			0.0	0.0	0.0				0.0		0.01	-0.04	0.53						
D3		123-38-6	Propanal																											

Note: Levels below the method detection limit are highlighted.

Table A. 25: Concentration & emission factor for TF_f (transmission fluid)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol		104.92	127.61	196.89	140.77	119.02	99.88	94.67	89.10			5.25	6.38	9.84	7.04	5.95	4.99	4.73	4.46	9.84	0.15	0.62	
2		71-23-8	1-Propanol																							
3		104-76-7	Hexanol, 2-ethyl-1-		1.69	1.35	6.41	4.45	2.59	1.46	2.01	2.55		0.08	0.07	0.32	0.22	0.13	0.07	0.10	0.13	0.16	0.07	0.03		
4		67-63-0	2-Propanol							0.08		0.47								0.00		0.02				
5		64-17-5	Ethanol				2.30	1.59	1.30	0.61	0.81					0.11	0.08	0.06	0.03	0.04		0.27	0.43	0.81		
6		108-95-2	Phenol		1.22		1.39	1.14	0.38	0.47	0.25	0.38		0.06		0.07	0.06	0.02	0.02	0.01	0.02	0.18	0.50	0.75		
7	Aldehydes & ketones	78-93-3	Methylethyl ketone		0.39	0.24	0.59	0.44	0.24	0.25	0.21	0.23		0.02	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.02	0.14	0.27		
8		67-64-1	Acetone	0.44	2.87	0.92	2.36	4.90	1.10	0.58	0.68	2.70		0.12	0.02	0.10	0.22	0.03		0.01	0.11					
9		98-86-2	Acetophenone		1.44	0.74	0.80	0.50	0.28	0.29	0.24	0.32		0.07	0.04	0.04	0.03	0.01	0.01	0.01	0.02	0.06	0.30	0.83		
10		108-94-1	Cyclohexanone				0.82									0.04										
11		108-10-1	Methylisobutyl ketone				0.26				0.17	0.20				0.01				0.01	0.01	0.02	0.10	0.78		
12		100-52-7	Benzaldehyde	1.34	1.97	0.60	1.88	1.82	1.26	1.18	0.95	1.11		0.03		0.03	0.02									
13		123-72-8	Butanal		1.91	3.58	8.10	4.07	4.14	4.48	3.23	2.35		0.10	0.18	0.41	0.20	0.21	0.22	0.16	0.12	0.33	0.15	0.33		
14		112-31-2	Decanal																							
15		3913-81-3	2-Decenal																							
16		98-01-1	Furfural					0.78									0.04									
17		111-71-7	Heptanal				0.59										0.03									
18		66-25-1	Hexanal				0.97	0.86				0.43					0.05	0.04			0.02	0.08	0.25	0.92		
19		124-19-6	Nonanal																							
20		18829-56-6	2-Nonenal																							
21		2548-87-0	2-Octenal																							
22		110-62-3	Pentanal																							
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																							
24		96-14-0	Pentane, 3-methyl-																							
25		540-84-1	2,2,4-Trimethylpentane																							
26		108-08-7	2,4-Dimethylpentane																							
27		124-18-5	Decane		0.86	0.37	5.50	0.74	0.26	0.20	0.15	0.11		0.04	0.02	0.28	0.04	0.01	0.01	0.01	0.01	0.16	0.63	0.50		
28		112-40-3	Dodecane		12.53	11.91	18.02	8.23	4.36	3.00	2.45	1.62		0.63	0.60	0.90	0.41	0.22	0.15	0.12	0.08	1.75	0.56	0.89		
29		142-82-5	Heptane																							
30		544-76-3	Hexadecane		1.32										0.07											
31		110-54-3	Hexane				1.65	1.35				0.78				0.08	0.07			0.04	0.13	0.23	0.97			
32		111-84-2	Nonane				1.88	0.14								0.09	0.01									
33		111-65-9	Octane				0.29										0.01									
34		629-62-9	Pentadecane		1.97										0.10											
35		629-59-4	Tetradecane		1.96		0.67	0.36	0.29	0.23	0.25	0.29		0.10		0.03	0.02	0.01	0.01	0.01	0.01	0.05	0.28	0.79		
36		629-50-5	Tridecane		1.21		1.35	0.49	0.25		0.19	0.20		0.06		0.07	0.02	0.01	0.01	0.01	0.01	0.18	0.62	0.93		
37		1120-21-4	Undecane		23.86	23.72	35.68	13.90	7.49	5.41	4.63	3.50		1.19	1.19	1.78	0.69	0.37	0.27	0.23	0.18	3.31	0.56	0.92		
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		0.77	0.62	1.06	0.33	0.15	0.09	0.06	0.04		0.04	0.03	0.05	0.02	0.01	0.00	0.00	0.00	0.13	0.78	0.90		
39		611-14-3	Toluene, 2-ethyl-				0.39	0.02									0.02	0.00								
40		620-14-4	Toluene, 3-ethyl-				0.18										0.01									
41		622-96-8	Toluene, 4-ethyl-				0.10										0.01									
42		4994-16-5	Cyclohexene, 4-phenyl																							
43		71-43-2	Benzene	0.27			0.71	0.86				0.66														
44		526-73-8	Benzene, 1,2,3-trimethyl-		0.12	0.08	1.18	0.12						0.01	0.00	0.06	0.01					0.01	0.07	0.00		
45		95-63-6	Benzene, 1,2,4-trimethyl-				4.52	0.25								0.23	0.01									
46		95-47-6	Benzene, 1,2-dimethyl-		0.12	0.07	0.24	0.20	0.16	0.15	0.14	0.15		0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-0.07	0.07		
47		108-67-8	Benzene, 1,3,5-trimethyl-				0.59	0.03								0.03	0.00									
48		108-38-3	Benzene, 1,3-dimethyl-		0.37	0.23	0.80	0.68	0.53	0.48	0.46	0.47		0.02	0.01	0.04	0.03	0.03	0.02	0.02	0.02	0.02	-0.06	0.05		
49		98-82-8	Benzene, isopropyl																							
50		103-65-1	Benzene, propyl-																							
51		100-41-4	Ethylbenzene		0.12	0.08	0.24	0.20	0.16	0.13	0.14	0.14		0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-0.04	0.03		
52		91-20-3	Naphthalene		4.34	3.80	6.93	3.13	1.44	0.85	0.59	0.29		0.22	0.19	0.35	0.16	0.07	0.04	0.03	0.01	0.81	0.69	0.84		
53		99-87-6	p-Cymene			0.02	0.23									0.00	0.01									
54		100-42-5	Styrene		0.09		0.20	0.17	0.24	0.17	0.11	0.11		0.00		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.11	0.20		
55		108-88-3	Toluene	0.10	0.32	0.13	0.40	0.75	0.29	0.17	0.19	0.38		0.01	0.00	0.01	0.03	0.01	0.00	0.00	0.01	0.00	-0.21	0.08		
56	Esters	98-83-9	2-Phenylpropene																							

Table A. 25 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	a	b	R ²		
67	Glycols, glycoethers	57-55-6	1,2-Propanediol																							
68		110-49-6	2-Methoxyethylacetate																							
69		111-90-0	Diethylene glycol monoethyl ether																							
70		107-98-2	Propanol, 1-methoxy-2-																							
71		111-76-2	Ethanol, 2-butoxy-																							
72		112-34-5	Ethanol, 2-butoxyethoxy-																							
73		110-80-5	Ethanol, 2-ethoxy-																							
74		109-86-4	Ethanol, 2-methoxy-																							
75		75-65-0	Propanol, 2-methyl-2-			0.86	0.53									0.04	0.03									
76		71-55-6	1,1,1-Trichloroethane																							
77	95-50-1	1,2-Dichlorobenzene																								
78	107-06-2	1,2-Dichloroethane																								
79	78-87-5	1,2-Dichloropropane																								
80	106-46-7	1,4-Dichlorobenzene																								
81	75-27-4	Bromodichloromethane																								
82	56-23-5	Carbon tetrachloride																								
83	67-66-3	Chloroform																								
84	124-48-1	Dibromochloromethane																								
85	75-09-2	Dichloromethane			1.78	0.53	0.47	2.28	0.25	0.22	0.36	0.78		0.09	0.03	0.02	0.11	0.01	0.01	0.02	0.04	0.03	0.08	0.02		
86	127-18-4	Tetrachloroethylene																								
87	79-01-6	Trichloroethylene			2.66	0.43	0.38	1.57			1.56			0.13	0.02	0.02	0.08			0.08						
88	79-34-5	1,1,2,2-Tetrachloroethane																								
89	108-87-2	Methylcyclohexane																								
90	110-82-7	Cyclohexane																								
91	1678-93-9	Cyclohexane, butyl-					0.48		0.14	0.12						0.02		0.01	0.01		0.07	0.56	1.00			
92	1678-91-7	Cyclohexane, ethyl-																								
93	1678-92-8	Cyclohexane, propyl-																								
94	91-17-8	Decahydronaphthalene			0.43	0.40	0.72							0.02	0.02	0.04										
95	80-56-8	alpha-Pinene																								
96	99-86-5	alpha-Terpinene																								
97	127-91-3	beta-Pinene																								
98	99-85-4	gamma-Terpinene																								
99	13466-78-9	3-Carene																								
100	79-92-5	Camphene																								
101	5989-27-5	Limonene			1.10	0.59	1.98	0.98	0.73	0.62	0.57	0.61		0.06	0.03	0.10	0.05	0.04	0.03	0.03	0.03	0.06	0.14	0.23		
102	64-19-7	Acetic acid			11.67		5.03	4.43			1.50			0.58		0.25	0.22			0.07	0.57	0.38	0.90			
103	79-31-2	Isobutyric acid																								
104	107-92-6	Butyric acid																								
105	111-14-8	Heptanoic acid																								
106	149-57-5	2-Ethylhexanoic acid																								
107	142-62-1	Hexanoic acid			2.37									0.12												
108	109-52-4	Pentanoic Acid																								
109	3777-69-3	Furan, 2-pentyl																								
110	872-50-4	2-Pyrrolidinone, 1-methyl-																								
111	123-91-1	1,4-Dioxane																								
112	78-40-0	Triethyl phosphate																								
113	142-96-1	n-Butyl ether																								
114	96-29-7	2-Butanone oxime																								
115	121-44-8	Triethylamine																								
116	75-21-8	Ethylene oxide																								
117	75-56-9	Propylene oxide																								
118	106-99-0	1,3-Butadiene			83.57	77.54	107.50	66.13	56.87	46.55	43.02	32.97		4.18	3.88	5.38	3.31	2.84	2.33	2.15	1.65	6.57	0.24	0.83		
119	0-00-0	TVOC			11.57	308.92	242.74	366.21	211.49	117.85	98.22	90.84	87.56		14.87	11.56	17.73	10.00	5.31	4.33	3.96	3.80	24.78	0.38	0.84	
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^b with t > 3 h		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		a	b	R ²		
D1	DNPH	75-07-0	Acetaldehyde							0.7	0.4							0.0	0.0							
D2		50-00-0	Formaldehyde			3.0	1.3								0.2	0.1										
D3		123-38-6	Propanal							0.3								0.0								

Note: Levels below the method detection limit are highlighted.

[illegible]

Table A. 26 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^b with t > 3 h		
				0 h	0.9 h	2.9 h	5.9 h	23.9 h	47.9 h	71.9 h	95.9 h	170.2 h	0 h	0.9 h	2.9 h	5.9 h	23.9 h	47.9 h	71.9 h	95.9 h	170.2 h	a	b	R ²		
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																							
68		110-49-6	2-Methoxyethylacetate																							
69		111-90-0	Diethylene glycol monoeth																							
70		107-98-2	Propanol, 1-methoxy-2-																							
71		111-76-2	Ethanol, 2-butoxy-																							
72		112-34-5	Ethanol, 2-butoxyethoxy-																							
73		110-80-5	Ethanol, 2-ethoxy-																							
74		109-86-4	Ethanol, 2-methoxy-																							
75		75-65-0	Propanol, 2-methyl-2-			4.40	2.28								0.22	0.11										
76		71-55-6	1,1,1-Trichloroethane																							
77	95-50-1	1,2-Dichlorobenzene																								
78	107-06-2	1,2-Dichloroethane																								
79	78-87-5	1,2-Dichloropropane																								
80	106-46-7	1,4-Dichlorobenzene																								
81	75-27-4	Bromodichloromethane																								
82	56-23-5	Carbon tetrachloride				0.17									0.01											
83	67-66-3	Chloroform							0.13									0.01								
84	124-48-1	Dibromochloromethane																								
85	75-09-2	Dichloromethane		1.59	0.63	0.79		0.22	1.08		0.61		0.08	0.03	0.04		0.01	0.05		0.03	0.03	0.04	0.02			
86	127-18-4	Tetrachloroethylene																								
87	79-01-6	Trichloroethylene		2.16	3.28	0.89		1.02	10.30	0.38	0.70		0.11	0.16	0.04		0.05	0.52	0.02	0.03	0.13	0.18	0.06			
88	79-34-5	1,1,2,2-Tetrachloroethane																								
89	108-87-2	Methylcyclohexane		2.26	2.12	4.90	3.18	2.58	2.49	2.29	2.48		0.11	0.11	0.25	0.16	0.13	0.12	0.11	0.12	0.17	0.06	0.12			
90	110-82-7	Cyclohexane				0.23			0.20						0.01			0.01								
91	1678-93-9	Cyclohexane, butyl-		0.31	0.12	0.31	0.23	0.17	0.19	0.15	0.12		0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.07	0.11				
92	1678-91-7	Cyclohexane, ethyl-		0.96	0.93	2.08	1.61	1.35	1.34	1.23	1.19		0.05	0.05	0.10	0.08	0.07	0.07	0.06	0.06	0.07	0.02	0.01			
93	1678-92-8	Cyclohexane, propyl-		0.45	0.29	0.70	0.52	0.47	0.47	0.40	0.36		0.02	0.01	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.00			
94	91-17-8	Decahydronaphthalene																								
95	80-56-8	alpha-Pinene							0.39								0.02									
96	99-86-5	alpha-Terpinene																								
97	127-91-3	beta-Pinene																								
98	99-85-4	gamma-Terpinene																								
99	13466-78-9	3-Carene																								
100	79-92-5	Camphene																								
101	5989-27-5	Limonene							0.42								0.02									
102	64-19-7	Acetic acid				2.92		2.90	2.51						0.15		0.14	0.13			0.16	0.04	0.44			
103	79-31-2	Isobutyric acid																								
104	107-92-6	Butyric acid																								
105	111-14-8	Heptanoic acid																								
106	149-57-5	2-Ethylhexanoic acid																								
107	142-62-1	Hexanoic acid																								
108	109-52-4	Pentanoic Acid																								
109	3777-69-3	Furan, 2-pentyl																								
110	872-50-4	2-Pyrrolidinone, 1-methyl																								
111	123-91-1	1,4-Dioxane																								
112	78-40-0	Triethyl phosphate																								
113	142-96-1	n-Butyl ether																								
114	96-29-7	2-Butanone oxime																								
115	121-44-8	Triethylamine																								
116	75-21-8	Ethylene oxide																								
117	75-56-9	Propylene oxide																								
118	106-99-0	1,3-Butadiene																								
119	0-00-0	TVOC		21.60	208.94	181.36	238.63	143.04	116.60	168.08	102.57	93.17		9.37	7.99	10.85	6.07	4.75	7.32	4.05	3.58	12.43	0.22	0.67		
A1	128-39-2	Phenol, 2,6-bis(1,1-dimethyl-2-propenyl)-		48.53	37.41	43.10	22.45	10.65	6.04	4.46	2.73		2.43	1.87	2.15	1.12	0.53	0.30	0.22	0.14	5.96	0.68	0.91			
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^b with t > 3 h		
				0 h	1.2 h	3.2 h	6.3 h	24.2 h	48.3 h	72.3 h	96.3 h		0 h	1.2 h	3.2 h	6.3 h	24.2 h	48.3 h	72.3 h	96.3 h		a	b	R ²		
D1	DNPH	75-07-0	Acetaldehyde								11.1								0.6							
D2		50-00-0	Formaldehyde	0.8	1.3									0.0												
D3		123-38-6	Propanal								1.4									0.1						

Note: Levels below the method detection limit are highlighted.

		Chamber concentration ($\mu\text{g m}^{-3}$)	Emission factor ($\mu\text{g h}^{-1}$)
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#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h						
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol		43.61	33.89	42.83	27.23	22.11	17.78	18.76	17.15			2.18	1.69	2.14	1.36	1.11	0.89	0.94	0.86	2.58	0.22	0.81	
2		71-23-8	1-Propanol																							
3		104-76-7	Hexanol, 2-ethyl-1-	113.37	80.94	184.06	121.66	105.86	86.27	86.86	82.22			5.67	4.05	9.20	6.08	5.29	4.31	4.34	4.11	6.88	0.09	0.19		
4		67-63-0	2-Propanol		1.07		0.96	0.58	0.45		0.65					0.05		0.05				0.03	0.07	0.18	0.51	
5		64-17-5	Ethanol																							
6	Aldehydes & ketones	108-95-2	Phenol				1.00	0.91	0.60	0.68	0.87					0.05	0.05	0.03	0.03	0.04						
7		78-93-3	Methylethyl ketone		10.39	6.41	6.74	4.46	3.65	3.40	3.68	3.34			0.52	0.32	0.34	0.22	0.18	0.17	0.18	0.17	0.42	0.19	0.91	
8		67-64-1	Acetone		2.73	1.45	3.78	4.91	1.48	1.38	1.04	1.37			0.14	0.07	0.19	0.25	0.07	0.07	0.05	0.07	0.17	0.18	0.21	
9		98-86-2	Acetophenone		0.69	0.47	0.60	0.32	0.29	0.25	0.39	0.23			0.03	0.02	0.03	0.02	0.01	0.01	0.02	0.01	0.03	0.19	0.61	
10		108-94-1	Cyclohexanone																							
11		108-10-1	Methylisobutyl ketone		27.95	24.21	35.52	22.68	20.11	17.46	16.71	16.48			1.40	1.21	1.78	1.13	1.01	0.87	0.84	0.82	1.79	0.15	0.71	
12		100-52-7	Benzaldehyde	0.82	2.06	1.46	2.35	1.78	1.48	1.18	1.70	0.91			0.06	0.03	0.08	0.05	0.03	0.02	0.04	0.00	0.10	0.38	0.31	
13		123-72-8	Butanal				2.44	1.64	1.40	1.19	1.05	0.91					0.12	0.08	0.07	0.06	0.05	0.05	0.21	0.30	0.91	
14		112-31-2	Decanal																							
15		3913-81-3	2-Decenal																							
16		98-01-1	Furfural					1.08										0.05								
17		111-71-7	Heptanal																							
18		66-25-1	Hexanal																							
19		124-19-6	Nonanal					1.66										0.08								
20		18829-56-6	2-Nonenal																							
21		2548-87-0	2-Octenal																							
22		110-62-3	Pentanal		2.73	2.92	3.05	2.40	2.11	1.82	1.45	1.84			0.14	0.15	0.15	0.12	0.11	0.09	0.07	0.09	0.19	0.16	0.81	
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-				0.27										0.01									
24		96-14-0	Pentane, 3-methyl-		0.56		0.66			0.29	0.28	0.28			0.03		0.03			0.01	0.01	0.01	0.05	0.28	0.91	
25		540-84-1	2,2,4-Trimethylpentane																							
26		108-08-7	2,4-Dimethylpentane																							
27		124-18-5	Decane		2.44	1.35	2.94	1.31	1.04	0.88	0.77	0.82			0.12	0.07	0.15	0.07	0.05	0.04	0.04	0.04	0.13	0.24	0.61	
28		112-40-3	Dodecane		5.14	3.81	5.74	2.68	1.62	1.13	0.85	0.60			0.26	0.19	0.29	0.13	0.08	0.06	0.04	0.03	0.52	0.52	0.81	
29		142-82-5	Heptane		1.54	0.89	1.68	1.20	1.00	0.95	0.86	0.81			0.08	0.04	0.08	0.06	0.05	0.05	0.04	0.04	0.07	0.09	0.21	
30		544-76-3	Hexadecane																							
31		110-54-3	Hexane		6.35	3.10	7.70	5.11	4.39	3.54	3.48	3.24			0.32	0.16	0.39	0.26	0.22	0.18	0.17	0.16	0.28	0.08	0.11	
32		111-84-2	Nonane		1.01	0.69	1.59	0.85	0.65	0.57	0.64	0.61			0.05	0.03	0.08	0.04	0.03	0.03	0.03	0.03	0.06	0.14	0.31	
33		111-65-9	Octane					0.61	0.40			0.39						0.03	0.02			0.02	0.05	0.21	0.61	
34		629-62-9	Pentadecane																							
35		629-59-4	Tetradecane				0.29											0.01								
36		629-50-5	Tridecane				0.39											0.02								
37		1120-21-4	Undecane		8.95	7.11	9.54	3.80	2.24	1.66	1.23	0.95			0.45	0.36	0.48	0.19	0.11	0.08	0.06	0.05	0.96	0.57	0.91	
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		0.27	0.21	0.34	0.14	0.09	0.06	0.05	0.04			0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.03	0.50	0.81
39			611-14-3	Toluene, 2-ethyl-		0.25	0.15	0.29	0.18	0.17	0.15	0.14	0.14			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	0.31
40	620-14-4		Toluene, 3-ethyl-		0.41	0.22	0.49	0.39	0.31	0.28	0.28	0.29			0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.01
41	622-96-8		Toluene, 4-ethyl-		0.18	0.11	0.20	0.16	0.12	0.15	0.14	0.13			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01
42	4994-16-5		Cyclohexene, 4-phenyl																							
43	71-43-2		Benzene				1.16	0.56		0.19		0.03						0.06	0.03							
44	526-73-8		Benzene, 1,2,3-trimethyl-		0.36	0.20	0.67	0.25	0.20	0.18	0.17	0.17			0.02	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.02	0.19	0.31	
45	95-63-6		Benzene, 1,2,4-trimethyl-		0.88	0.45	2.07	0.66	0.55	0.50	0.47	0.44			0.04	0.02	0.10	0.03	0.03	0.03	0.02	0.02	0.06	0.18	0.21	
46	95-47-6		Benzene, 1,2-dimethyl-		0.39	0.21	0.38	0.33	0.27	0.25	0.24	0.24			0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.04	0.01
47	108-67-8		Benzene, 1,3,5-trimethyl-		0.32	0.15	0.47	0.23	0.20	0.19	0.17	0.18			0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.09	0.11	
48	108-38-3		Benzene, 1,3-dimethyl-		1.49	1.13	1.66	1.39	1.21	1.12	1.07	1.07			0.07	0.06	0.08	0.07	0.06	0.06	0.05	0.05	0.08	0.06	0.31	
49	98-82-8		Benzene, isopropyl		0.07		0.08	0.06	0.06	0.05	0.04	0.04			0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.81	
50	103-65-1		Benzene, propyl-		0.18	0.10	0.27	0.22	0.18	0.17	0.16	0.16			0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-0.02	0.01	
51	100-41-4		Ethylbenzene		0.45	0.28	0.42	0.37	0.31	0.28	0.27	0.26			0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.07	0.31
52	91-20-3		Naphthalene		1.78	1.43	2.45	0.93	0.46	0.30	0.23	0.15			0.09	0.07	0.12	0.05	0.02	0.02	0.01	0.01	0.25	0.65	0.81	
53	99-87-6		p-Cymene		0.07		0.12	0.05	0.04	0.04	0.04				0.00		0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.41	0.91	
54	100-42-5		Styrene		0.43	0.11	0.22	0.23	0.20	0.15	0.14	0.12			0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	
55	108-88-3	Toluene	0.07	11.88	10.15	12.71	10.29	8.83	8.04	7.72	7.55			0.59	0.50	0.63	0.51	0.44	0.40	0.38	0.37	0.66	0.11	0.71		
56	98-83-9	2-Phenylpropene																								
57	95-13-6	Indene																								
58	Esters	108-21-4	Acetic acid, 1-methylethyl																							
59		111-15-9	Acetic acid, 2-ethoxyethyl																							
60		123-86-4	Acetic acid, butyl ester		1.54	1.21	2.33	1.55	1.33	1.21	1.18	1.08			0.08	0.06	0.12	0.08	0.07	0.06	0.06	0.05	0.10	0.10	0.31	
61		141-78-6	Acetic acid, ethyl ester																							
62		80-62-6	Methyl methacrylate		0.93	0.72	1.48	1.23	0.90	0.80	0.70	0.72			0.05	0.04	0.07	0.06	0.04	0.04	0.03	0.04	0.06	0.08	0.11	
63		103-09-3	2-Ethylhexyl acetate																							
64		96-48-0	Butyrolactone																							
65		25265-77-4	Texanol																							
66	6846-50-0	TXIB																								

Table A. 27 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	170.1 h	a	b	R ²		
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																							
68		110-49-6	2-Methoxyethylacetate																							
69		111-90-0	Diethylene glycol monoeth																							
70		107-98-2	Propanol, 1-methoxy-2-																							
71		111-76-2	Ethanol, 2-butoxy-																							
72		112-34-5	Ethanol, 2-butoxyethoxy-																							
73		110-80-5	Ethanol, 2-ethoxy-																							
74		109-86-4	Ethanol, 2-methoxy-																							
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-		0.57	0.27								0.03	0.01											
76		71-55-6	1,1,1-Trichloroethane																							
77		95-50-1	1,2-Dichlorobenzene																							
78		107-06-2	1,2-Dichloroethane																							
79		78-87-5	1,2-Dichloropropane																							
80		106-46-7	1,4-Dichlorobenzene																							
81		75-27-4	Bromodichloromethane																							
82		56-23-5	Carbon tetrachloride																							
83	Cyclo Alkanes	67-66-3	Chloroform																							
84		124-48-1	Dibromochloromethane																							
85		75-09-2	Dichloromethane		1.65	0.33	0.23	1.09	0.11	0.11		0.16		0.08	0.02	0.01	0.05	0.01	0.01		0.01	0.02	0.24	0.17		
86		127-18-4	Tetrachloroethylene																							
87		79-01-6	Trichloroethylene		2.69	0.43	0.25	2.33	0.20	0.46		0.47		0.13	0.02	0.01	0.12	0.01	0.02		0.02	0.02	-0.04	0.00		
88		79-34-5	1,1,2,2-Tetrachloroethane																							
89		108-87-2	Methylcyclohexane		0.58	0.40	0.67	0.50	0.43	0.39	0.40	0.37		0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.08	0.31		
90		110-82-7	Cyclohexane																							
91	Terpenes	1678-93-9	Cyclohexane, butyl-		0.54	0.28	0.44	0.24	0.28	0.15	0.23	0.22		0.03	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.14	0.41			
92		1678-91-7	Cyclohexane, ethyl-																							
93		1678-92-8	Cyclohexane, propyl-		0.41		0.41	0.27	0.23	0.29	0.30	0.28		0.02		0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.09	0.36		
94		91-17-8	Decahydronaphthalene																							
95		80-56-8	alpha-Pinene																							
96		99-86-5	alpha-Terpinene																							
97		127-91-3	beta-Pinene																							
98		99-85-4	gamma-Terpinene																							
99	Acids	13466-78-9	3-Carene																							
100		79-92-5	Camphene																							
101		5989-27-5	Limonene																							
102		64-19-7	Acetic acid																							
103		79-31-2	Isobutyric acid																							
104		107-92-6	Butyric acid																							
105		111-14-8	Heptanoic acid																							
106		149-57-5	2-Ethylhexanoic acid																							
107	Other	142-62-1	Hexanoic acid																							
108		109-52-4	Pentanoic Acid																							
109		3777-69-3	Furan, 2-pentyl																							
110		872-50-4	2-Pyrrolidinone, 1-methyl																							
111		123-91-1	1,4-Dioxane					0.31									0.02									
112		78-40-0	Triethyl phosphate																							
113		142-96-1	n-Butyl ether		1.41	1.21	2.62	1.90	1.66	1.59	1.44	1.35		0.07	0.06	0.13	0.10	0.08	0.08	0.07	0.07	0.10	0.04	0.07		
114		96-29-7	2-Butanone oxime																							
115	Abundant	121-44-8	Triethylamine																							
116		75-21-8	Ethylene oxide																							
117		75-56-9	Propylene oxide																							
118		106-99-0	1,3-Butadiene		26.47	13.88	22.53	16.10	13.98	10.81	10.35	9.82		1.32	0.69	1.13	0.80	0.70	0.54	0.52	0.49	1.11	0.15	0.56		
119		0-00-0	TVOC	19.43	529.44	430.40	523.44	347.96	283.47	236.20	236.58	227.27		25.50	20.55	25.20	16.43	13.20	10.84	10.86	10.39	30.91	0.22	0.89		
A1		78-83-1	1-Propanol, 2-methyl-		35.84	25.08	27.11	16.73	14.20	12.27	12.39	12.95		1.79	1.25	1.36	0.84	0.71	0.61	0.62	0.65					
A2		137-32-6	1-Butanol, 2-methyl-		30.96	26.79	36.93	23.79	20.37	16.07	17.04	14.95		1.55	1.34	1.85	1.19	1.02	0.80	0.85	0.75					
A3		626-93-7	2-Hexanol		34.35	31.09	44.71	28.96	24.45	20.95	21.88	19.45		1.72	1.55	2.24	1.45	1.22	1.05	1.09	0.97					
A4		71-41-0	1-Pentanol		49.96	46.97	67.21	43.74	37.85	30.28	30.99	28.50		2.50	2.35	3.36	2.19	1.89	1.51	1.55	1.43					
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		a	b	R ²		
D1	DNPH	75-07-0	Acetaldehyde								0.9									0.0						
D2		50-00-0	Formaldehyde		1.5									0.1												
D3		123-38-6	Propanal								0.4									0.0						

Note: Levels below the method detection limit are highlighted.

Table A. 28: Concentration & emission factor for WXA_f (exterior automotive care product, liquid wax)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^b with t > 3 h			
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	167.9 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	167.9 h	a	b	R ²			
1	Alcohols	71-36-3	1-Butanol	0.39	0.36	0.78	0.75	0.84	0.90	1.03	0.92	1.06				0.02	0.02	0.02		0.03	0.03	0.03	0.03	0.02	0.02	-0.15	0.85
2		71-23-8	1-Propanol																								
3		104-76-7	Hexanol, 2-ethyl-1-	0.59																							
4		67-63-0	2-Propanol																								
5		64-17-5	Ethanol																								
6		108-95-2	Phenol																								
7	Aldehydes & ketones	78-93-3	Methylethyl ketone		0.53	0.60	0.51	0.33	0.49	0.80	0.55	0.34			0.03	0.03	0.03	0.02	0.02	0.04	0.03	0.02	0.03	0.04	0.04	0.04	0.00
8		67-64-1	Acetone	0.56	3.42	2.33	1.47	1.33	1.78	5.21	1.42	1.44			0.14	0.09	0.05	0.04	0.06	0.23	0.04	0.04	0.06	0.01	0.00		
9		98-86-2	Acetophenone	0.13				0.21	0.77	0.75	0.61	0.35						0.00	0.03	0.03	0.02	0.01	0.00	-0.47	0.15		
10		108-94-1	Cyclohexanone																								
11		108-10-1	Methylisobutyl ketone																								
12		100-52-7	Benzaldehyde	0.52																							
13		123-72-8	Butanal																								
14		112-31-2	Decanal																								
15		3913-81-3	2-Decenal																								
16		98-01-1	Furfural																								
17		111-71-7	Heptanal																								
18		66-25-1	Hexanal																								
19		124-19-6	Nonanal																								
20	18829-56-6	2-Nonenal																									
21	2548-87-0	2-Octenal																									
22	110-62-3	Pentanal																									
23	Aliphatic hydrocarbons	107-83-5	Pentane, 2-methyl-		3.78	5.52	2.31	1.24	0.98	0.87	1.01			0.19	0.28	0.12	0.06	0.05	0.04	0.05		0.35	0.48	0.90			
24		96-14-0	Pentane, 3-methyl-		0.35	0.47	0.20								0.02	0.02	0.01										
25		540-84-1	2,2,4-Trimethylpentane																								
26		108-08-7	2,4-Dimethylpentane																								
27		124-18-5	Decane	347.57	649.05	477.75	299.13	331.46	258.53	266.21	223.29		17.38	32.45	23.89	14.96	16.57	12.93	13.31	11.16	38.87	0.25	0.94				
28		112-40-3	Dodecane	7.57	14.91	11.06	4.89	4.04	2.93	3.15	3.08		0.38	0.75	0.55	0.24	0.20	0.15	0.16	0.15	1.12	0.43	0.95				
29		142-82-5	Heptane	0.46	0.49								0.02	0.02													
30		544-76-3	Hexadecane	0.96	3.14	2.80	2.84	2.34	1.64	1.22	1.06		0.05	0.16	0.14	0.14	0.12	0.08	0.06	0.05	0.24	0.26	0.77				
31		110-54-3	Hexane	5.76	7.44	3.33	1.70	1.38		1.31			0.29	0.37	0.17	0.09	0.07		0.07		0.49	0.49	0.91				
32		111-84-2	Nonane	317.41	609.63	413.65	229.22	247.24	184.76	211.38	114.18		15.87	30.48	20.68	11.46	12.36	9.24	10.57	5.71	41.80	0.35	0.92				
33		111-65-9	Octane	0.32	0.48	0.23							0.02	0.02	0.01												
34		629-62-9	Pentadecane	8.09	25.54	24.06	21.81	17.39	12.06	10.01	7.65		0.40	1.28	1.20	1.09	0.87	0.60	0.50	0.38	2.08	0.29	0.83				
35		629-59-4	Tetradecane	31.04	88.04	78.54	55.14	38.69	25.27	22.57	17.41		1.55	4.40	3.93	2.76	1.93	1.26	1.13	0.87	8.10	0.41	0.94				
36		629-50-5	Tridecane	5.83	14.45	11.19	5.76	3.64	2.62	2.55	2.20		0.29	0.72	0.56	0.29	0.18	0.13	0.13	0.11	1.31	0.50	0.99				
37	1120-21-4	Undecane	78.80	144.36	103.00	54.05	56.03	43.50	44.29	42.71		3.94	7.22	5.15	2.70	2.80	2.18	2.21	2.14	9.04	0.31	0.93					
38	Aromatic hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		0.06	0.09	0.06	0.04							0.00	0.00	0.00	0.00				0.01	0.32	0.92			
39		611-14-3	Toluene, 2-ethyl-		0.30	0.37	0.31	0.25	0.24	0.22	0.19	0.17			0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.18	0.96			
40		620-14-4	Toluene, 3-ethyl-		0.74	1.11	0.76	0.63	0.59	0.46	0.48	0.32			0.04	0.06	0.04	0.03	0.03	0.02	0.02	0.07	0.26	0.92			
41		622-96-8	Toluene, 4-ethyl-		0.31	0.45	0.32	0.23	0.20	0.19	0.17	0.13			0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.03	0.27	0.98			
42		4994-16-5	Cyclohexene, 4-phenyl																								
43		71-43-2	Benzene				0.95	0.96	0.39	6.35	1.02	0.25					0.05	0.05	0.02	0.32	0.05	0.01	0.07	0.13	0.02		
44		526-73-8	Benzene, 1,2,3-trimethyl-		0.21	0.28	0.17	0.13	0.17	0.10		0.13			0.01	0.01	0.01	0.01	0.01	0.00		0.01	0.01	0.18	0.58		
45		95-63-6	Benzene, 1,2,4-trimethyl-		0.89	1.40	1.00	0.82	0.77	0.59	0.53	0.45			0.04	0.07	0.05	0.04	0.04	0.03	0.03	0.02	0.09	0.26	0.95		
46		95-47-6	Benzene, 1,2-dimethyl-				0.28	0.17	0.14	0.17	0.10	0.11					0.01	0.01	0.01	0.01	0.01	0.02	0.28	0.84			
47		108-67-8	Benzene, 1,3,5-trimethyl-		0.77	1.26	0.97	0.80	0.69	0.57	0.55	0.40			0.04	0.06	0.05	0.04	0.03	0.03	0.03	0.02	0.08	0.25	0.95		
48		108-38-3	Benzene, 1,3-dimethyl-						0.39										0.02								
49		98-82-8	Benzene, isopropyl		0.28	0.47	0.43	0.28	0.26	0.23	0.16	0.12			0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.04	0.31	0.92			
50		103-65-1	Benzene, propyl-				0.72	0.40	0.39	0.36	0.24	0.26					0.04	0.02	0.02	0.02	0.01	0.01	0.06	0.31	0.91		
51		100-41-4	Ethylbenzene																								
52		Esters	91-20-3	Naphthalene	0.04	0.20	0.26	0.14	0.12	0.11	0.20	0.09	0.09			0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.26	0.47		
53	99-87-6		p-Cymene			0.19	0.13	0.09								0.01	0.01	0.00				0.01	0.34	0.96			
54	100-42-5		Styrene	0.08	0.40	1.27	0.33	0.26	0.60	1.31	0.97	0.47			0.02	0.06	0.01	0.01	0.03	0.06	0.04	0.02	0.02	-0.03	0.00		
55	108-88-3		Toluene	0.12	2.42	3.69	2.78	1.62	1.20	1.82	0.79	0.84			0.11	0.18	0.13	0.07	0.05	0.08	0.03	0.04	0.27	0.39	0.84		
56	98-83-9		2-Phenylpropene																								
57	95-13-6		Indene																								
58	108-21-4		Acetic acid, 1-methylethyl																								
59	111-15-9		Acetic acid, 2-ethoxyethyl																								
60	123-86-4		Acetic acid, butyl ester																								
61	141-78-6		Acetic acid, ethyl ester																								
62	80-62-6	Methyl methacrylate			0.18											0.01											
63	103-09-3	2-Ethylhexyl acetate																									
64	96-48-0	Butyrolactone																									
65	25265-77-4	Texanol																									
66	6846-50-0	TXIB																									

Table A. 28 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h						
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	167.9 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	167.9 h	a	b	R ²						
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																											
68		110-49-6	2-Methoxyethylacetate																											
69		111-90-0	Diethylene glycol monoeth																											
70		107-98-2	Propanol, 1-methoxy-2-																											
71		111-76-2	Ethanol, 2-butoxy-																											
72		112-34-5	Ethanol, 2-butoxyethoxy-																											
73		110-80-5	Ethanol, 2-ethoxy-																											
74		109-86-4	Ethanol, 2-methoxy-																											
75		75-65-0	Propanol, 2-methyl-2-																											
76			71-55-6	1,1,1-Trichloroethane																										
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																											
78		107-06-2	1,2-Dichloroethane																											
79		78-87-5	1,2-Dichloropropane																											
80		106-46-7	1,4-Dichlorobenzene																											
81		75-27-4	Bromodichloromethane																											
82		56-23-5	Carbon tetrachloride																											
83		67-66-3	Chloroform		0.62	0.18									0.03	0.01														
84		124-48-1	Dibromochloromethane																											
85		75-09-2	Dichloromethane		14.54	20.69	13.12	6.45	4.51	6.84	2.76	2.54		0.73	1.03	0.66	0.32	0.23	0.34	0.14	0.13	1.69	0.49	0.90						
86		127-18-4	Tetrachloroethylene																											
87	Cyclo Alkanes	79-01-6	Trichloroethylene	0.56	3.26	1.42	0.19			4.72				0.13	0.04			0.21												
88		79-34-5	1,1,2,2-Tetrachloroethane																											
89		108-87-2	Methylcyclohexane		0.22	0.26	0.14								0.01	0.01	0.01													
90		110-82-7	Cyclohexane		0.34	0.56	0.28								0.02	0.03	0.01													
91		1678-93-9	Cyclohexane, butyl-		102.84	174.41	108.37	63.89	70.17	56.17	51.21	46.57		5.14	8.72	5.42	3.19	3.51	2.81	2.56	2.33	10.40	0.31	0.93						
92		1678-91-7	Cyclohexane, ethyl-		1.86	3.49	2.17	1.00	0.90	0.64	0.67	0.28		0.09	0.17	0.11	0.05	0.05	0.03	0.03	0.01	0.31	0.54	0.95						
93		1678-92-8	Cyclohexane, propyl-		181.06	340.10	202.75	125.67	110.78	85.46	93.47	52.24		9.05	17.00	10.14	6.28	5.54	4.27	4.67	2.61	23.98	0.40	0.95						
94		91-17-8	Decahydronaphthalene		66.81	112.30	77.35	48.15	48.62	37.04	37.87	32.11		3.34	5.62	3.87	2.41	2.43	1.85	1.89	1.61	7.03	0.30	0.96						
95	Terpenes	80-56-8	alpha-Pinene																											
96		99-86-5	alpha-Terpinene																											
97		127-91-3	beta-Pinene																											
98		99-85-4	gamma-Terpinene																											
99		13466-78-9	3-Carene																											
100		79-92-5	Camphene																											
101	5989-27-5	Limonene																												
102	Acids	64-19-7	Acetic acid			1.55					2.26				0.08				0.11											
103		79-31-2	Isobutyric acid																											
104		107-92-6	Butyric acid																											
105		111-14-8	Heptanoic acid																											
106		149-57-5	2-Ethylhexanoic acid																											
107		142-62-1	Hexanoic acid																											
108	109-52-4	Pentanoic Acid																												
109	Other	3777-69-3	Furan, 2-pentyl																											
110		872-50-4	2-Pyrrolidinone, 1-methyl-																											
111		123-91-1	1,4-Dioxane																											
112		78-40-0	Triethyl phosphate																											
113		142-96-1	n-Butyl ether																											
114		96-29-7	2-Butanone oxime																											
115		121-44-8	Triethylamine																											
116		75-21-8	Ethylene oxide																											
117		75-56-9	Propylene oxide																											
118		106-99-0	1,3-Butadiene																											
119	0-00-0	TVOC	9.3	7065.3	13081	8940.6	5141.0	4984.4	3894.1	3964.1	2807.1		352.8	653.6	446.6	256.6	248.8	194.2	197.7	139.9	890.82	0.35	0.97							
A1	Abundant	6236-88-0	1-Ethyl-4-methylcyclohexa		179.13	391.07	232.84	131.71	125.82	92.91	112.34	52.80		8.96	19.55	11.64	6.59	6.29	4.65	5.62	2.64	28.02	0.42	0.92						
A2		17301-94-9	Nonane, 4-methyl-		177.43	333.69	219.64	128.14	133.17	101.37	108.85	74.12		8.87	16.68	10.98	6.41	6.66	5.07	5.44	3.71	21.66	0.33	0.95						
A3		4316-65-8	1-Hexene, 3,3,5-trimethyl-		229.33	526.08	266.80	152.89	163.74	104.13	110.70	69.50		11.47	26.30	13.34	7.64	8.19	5.21	5.53	3.47	35.77	0.44	0.94						
A4		62338-08-3	3-Hexene, 3-ethyl-2,5-dim		191.52	309.40	232.72	139.07	143.64	107.95	115.02	82.12		9.58	15.47	11.64	6.95	7.18	5.40	5.75	4.11	20.63	0.30	0.96						
A5		17302-28-2	Nonane, 2,6-dimethyl-		167.90	303.58	207.22	124.86	134.19	119.29	108.68	89.48		8.39	15.18	10.36	6.24	6.71	5.96	5.43	4.47	18.16	0.27	0.94						
	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h						
#				0 h	1.4 h	3.4 h	6.4 h	24.5 h	48.4 h	72.4 h	96.4 h		0 h	1.4 h	3.4 h	6.4 h	24.5 h	48.4 h	72.4 h	96.4 h		a	b	R ²						
D1	DNPH	75-07-0	Acetaldehyde	1.1	1.0	1.3	3.8	0.6	1.3	0.3	0.5					0.0	0.1		0.0			0.06	0.41	0.14						
D2		50-00-0	Formaldehyde	0.1	9.7	7.9	4.2	1.3	1.7	1.4	1.5			0.5	0.4	0.2	0.1	0.1	0.1	0.1		0.56	0.52	0.83						
D3		123-38-6	Propanal																											

Note: Levels below the method detection limit are highlighted.

Table A. 29: Concentration & emission factor for WC_f (weed control compound, liquid)

#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)												Emission factor (μg h ⁻¹)												Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168.3 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168.3 h	a	b	R ²						
1	Alcohols	71-36-3	1-Butanol	0.95	0.85	2.18	1.82	1.27	1.02	1.57	1.53	1.68				0.06	0.04	0.02	0.00	0.03	0.03	0.04	0.05	0.21	0.11					
2		71-23-8	1-Propanol																											
3		104-76-7	Hexanol, 2-ethyl-1-	1.01	1.78	6.44	4.77	2.90	2.21	3.53	3.07	3.00		0.04	0.27	0.19	0.09	0.06	0.13	0.10	0.10	0.28	0.25	0.57						
4		67-63-0	2-Propanol																											
5		64-17-5	Ethanol				1.12	1.03	0.62	0.52		4.68				0.06	0.05	0.03	0.03			0.23	0.03	0.23	0.18					
6	Aldehydes & Ketones	108-95-2	Phenol		0.33	0.40	0.57	0.35	0.71	0.58	0.41	0.42		0.02	0.02	0.03	0.02	0.04	0.03	0.02	0.02	0.02	-0.01	0.01						
7		78-93-3	Methylethyl ketone		0.31	0.43	0.33	0.23	0.29	0.31	0.23	0.26		0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.11	0.54						
8		67-64-1	Acetone	0.37	6.38	9.91	8.77	5.31	6.03	6.48	3.98	6.52		0.30	0.48	0.42	0.25	0.28	0.31	0.18	0.31	0.53	0.16	0.54						
9		98-86-2	Acetophenone	0.05	0.28	0.52	0.47	0.27	0.38	0.64	0.29	0.24		0.01	0.02	0.02	0.01	0.02	0.03	0.01	0.01	0.03	0.14	0.26						
10		108-94-1	Cyclohexanone				0.51			0.21						0.03				0.01										
11		108-10-1	Methylisobutyl ketone																											
12		100-52-7	Benzaldehyde	0.50	2.12	4.07	3.32	2.20	2.53	3.11	2.21	2.05		0.08	0.18	0.14	0.08	0.10	0.13	0.09	0.08	0.19	0.17	0.65						
13		123-72-8	Butanal																											
14		112-31-2	Decanal																											
15		3913-81-3	2-Decenal																											
16		98-01-1	Furfural							0.24										0.01										
17		111-71-7	Heptanal				0.72	0.52	0.31							0.04	0.03	0.02				0.05	0.40	1.00						
18		66-25-1	Hexanal			1.18	2.55	2.05	1.08	0.98	1.10	0.76	0.68		0.06	0.13	0.10	0.05	0.05	0.06	0.04	0.03	0.18	0.32	0.95					
19		124-19-6	Nonanal		0.65								0.60		0.03							0.03								
20		18829-56-6	2-Nonenal																											
21		2548-87-0	2-Octenal																											
22		110-62-3	Pentanal			0.21	0.52	0.46	0.39	0.30	0.36	0.21			0.01	0.03	0.02	0.02	0.02	0.02	0.01		0.03	0.20	0.77					
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		1.79	0.83	0.36				0.19				0.09	0.04	0.02			0.01		0.05	0.41	0.86						
24		96-14-0	Pentane, 3-methyl-				0.18										0.01													
25		540-84-1	2,2,4-Trimethylpentane																											
26		108-08-7	2,4-Dimethylpentane																											
27		124-18-5	Decane		1.63	2.09	1.40	0.62	0.46	0.59	0.47	0.37		0.08	0.10	0.07	0.03	0.02	0.03	0.02	0.02	0.15	0.42	0.93						
28		112-40-3	Dodecane		2.12	4.00	3.29	1.71	1.46	2.14	1.98	1.60		0.11	0.20	0.16	0.09	0.07	0.11	0.10	0.08	0.23	0.22	0.71						
29		142-82-5	Heptane																											
30		544-76-3	Hexadecane																											
31		110-54-3	Hexane		1.35	1.88	1.79	1.08	0.87	1.12	1.11	1.69		0.07	0.09	0.09	0.05	0.04	0.06	0.06	0.08	0.09	0.10	0.26						
32		111-84-2	Nonane		0.26	0.28	0.18								0.01	0.01	0.01													
33		111-65-9	Octane																											
34		629-62-9	Pentadecane																											
35		629-59-4	Tetradecane		0.17	0.35	0.43		0.20	0.34					0.01	0.02	0.02		0.01	0.02		0.02	0.13	0.34						
36		629-50-5	Tridecane				0.14										0.01													
37		1120-21-4	Undecane		2.31	4.02	3.28	1.53	1.26	1.65	1.57	1.32		0.12	0.20	0.16	0.08	0.06	0.08	0.08	0.07	0.25	0.28	0.83						
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		0.12	0.18	0.14	0.07	0.05	0.08	0.06	0.05		0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.29	0.85						
39		611-14-3	Toluene, 2-ethyl-		0.16	0.21	0.14	0.07	0.06	0.07	0.06	0.05		0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.35	0.93						
40		620-14-4	Toluene, 3-ethyl-		0.39	0.51	0.33	0.17	0.12	0.16	0.12	0.15		0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.34	0.83						
41		622-96-8	Toluene, 4-ethyl-		0.19	0.22	0.18	0.08	0.07	0.08	0.07	0.08		0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.28	0.81						
42		4994-16-5	Cyclohexene, 4-phenyl																											
43		71-43-2	Benzene			1.28	0.92	0.77	0.70	1.76	0.80	0.94				0.06	0.05	0.04	0.03	0.09	0.04	0.05	0.03	0.02						
44		526-73-8	Benzene, 1,2,3-trimethyl-		0.24	0.33	0.25	0.13	0.11	0.12	0.10	0.09		0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.02	0.32	0.94						
45		95-63-6	Benzene, 1,2,4-trimethyl-		0.83	1.11	0.74	0.39	0.32	0.36	0.29	0.31		0.04	0.06	0.04	0.02	0.02	0.02	0.01	0.02	0.07	0.33	0.91						
46		95-47-6	Benzene, 1,2-dimethyl-		0.13	0.14	0.09	0.05	0.04		0.04	0.11		0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.17	0.24						
47		108-67-8	Benzene, 1,3,5-trimethyl-		0.24	0.30	0.20	0.10	0.08	0.09	0.09	0.06		0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.02	0.37	0.94						
48		108-38-3	Benzene, 1,3-dimethyl-		0.23	0.24	0.16		0.10	0.08	0.07	0.46		0.01	0.01	0.01		0.01	0.00	0.00	0.02	0.01	0.07	0.03						
49		98-82-8	Benzene, isopropyl																											
50		103-65-1	Benzene, propyl-		0.14	0.19	0.12	0.07			0.05				0.01	0.01	0.01	0.00			0.00	0.01	0.39	0.98						
51		100-41-4	Ethylbenzene		0.07	0.08	0.05		0.04	0.03		0.12		0.00	0.00	0.00		0.00	0.00		0.01	0.00	0.01	0.00						
52		91-20-3	Naphthalene	0.08	1.05	1.80	1.50	0.84	0.81	0.93	0.84	0.65		0.05	0.09	0.07	0.04	0.04	0.04	0.04	0.03	0.11	0.25	0.88						
53		99-87-6	p-Cymene		0.33	0.39	0.26	0.13	0.10	0.12	0.09			0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00									
54		100-42-5	Styrene	0.08	0.11	0.50	0.29	0.25	0.27	0.38	0.15	0.23		0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.02	0.24	0.38						
55		108-88-3	Toluene	0.07	0.74	0.79	0.54	0.37	0.65	0.32	0.21	2.44		0.03	0.04	0.02	0.01	0.03	0.01	0.01	0.12	0.02	-0.01	0.00						
56	98-83-9	2-Phenylpropene																												

Table A. 29 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)												Emission factor ($\mu\text{g h}^{-1}$)												Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168.3 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168.3 h	a	b	R ²						
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																											
68		110-49-6	2-Methoxyethylacetate																											
69		111-90-0	Diethylene glycol monoeth																											
70		107-98-2	Propanol, 1-methoxy-2-																											
71		111-76-2	Ethanol, 2-butoxy-																											
72		112-34-5	Ethanol, 2-butoxyethoxy-																											
73		110-80-5	Ethanol, 2-ethoxy-																											
74	Halo Carbons	109-86-4	Ethanol, 2-methoxy-																											
75		75-65-0	Propanol, 2-methyl-2-																											
76		71-55-6	1,1,1-Trichloroethane																											
77		95-50-1	1,2-Dichlorobenzene																											
78		107-06-2	1,2-Dichloroethane																											
79		78-87-5	1,2-Dichloropropane																											
80		106-46-7	1,4-Dichlorobenzene																											
81	Cyclo Alkanes	75-27-4	Bromodichloromethane																											
82		56-23-5	Carbon tetrachloride																											
83		67-66-3	Chloroform		0.26										0.01															
84		124-48-1	Dibromochloromethane																											
85		75-09-2	Dichloromethane		1.33	0.52	0.25		1.59			0.69		0.07	0.03	0.01		0.08			0.03	0.02	-0.24	0.33						
86		127-18-4	Tetrachloroethylene																											
87		79-01-6	Trichloroethylene		2.39	0.83	0.31	0.18	0.76	0.13		1.30		0.12	0.04	0.02	0.01	0.04	0.01		0.07	0.02	-0.03	0.00						
88	Terpenes	79-34-5	1,1,2,2-Tetrachloroethane																											
89		108-87-2	Methylcyclohexane																											
90		110-82-7	Cyclohexane																											
91		1678-93-9	Cyclohexane, butyl-		0.22										0.01															
92		1678-91-7	Cyclohexane, ethyl-																											
93		1678-92-8	Cyclohexane, propyl-		0.13	0.09									0.01	0.00														
94		91-17-8	Decahydronaphthalene			0.12										0.01														
95	Acids	80-56-8	alpha-Pinene		0.53	0.39	0.23								0.03	0.02	0.01													
96		99-86-5	alpha-Terpinene																											
97		127-91-3	beta-Pinene		0.22	0.21	0.12								0.01	0.01	0.01													
98		99-85-4	gamma-Terpinene		0.15	0.18	0.13								0.01	0.01	0.01													
99		13466-78-9	3-Carene																											
100		79-92-5	Camphene		0.17										0.01															
101		5989-27-5	Limonene		23.72	31.25	20.41	8.89	6.78	7.91	6.19	5.15		1.19	1.56	1.02	0.44	0.34	0.40	0.31	0.26	2.24	0.44	0.95						
102	Other	64-19-7	Acetic acid		0.75	4.78	3.56	1.58	2.11	2.60	0.80	0.90		0.04	0.24	0.18	0.08	0.11	0.13	0.04	0.04	0.36	0.38	0.72						
103		79-31-2	Isobutyric acid																											
104		107-92-6	Butyric acid																											
105		111-14-8	Heptanoic acid																											
106		149-57-5	2-Ethylhexanoic acid																											
107		142-62-1	Hexanoic acid																											
108		109-52-4	Pentanoic Acid																											
109	Other	3777-69-3	Furan, 2-pentyl																											
110		872-50-4	2-Pyrrolidinone, 1-methyl																											
111		123-91-1	1,4-Dioxane																											
112		78-40-0	Triethyl phosphate																											
113		142-96-1	n-Butyl ether																											
114		96-29-7	2-Butanone oxime																											
115		121-44-8	Triethylamine																											
116	DNP	75-21-8	Ethylene oxide																											
117		75-56-9	Propylene oxide																											
118		106-99-0	1,3-Butadiene																											
119		0-00-0	TVOC	15.83	85.19	121.16	88.10	44.26	54.99	62.66	50.52	62.86		3.47	5.27	3.61	1.42	1.96	2.34	1.73	2.35	5.12	0.22	0.52						
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)												Emission factor ($\mu\text{g h}^{-1}$)												Coefficient: $E = a t^{-b}$ with $t > 3 \text{ h}$		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		a	b	R ²						
D1	DNP	75-07-0	Acetaldehyde	0.9	3.2	5.2	3.1	2.7	1.6	2.2	1.6			0.1	0.2	0.1	0.1	0.0	0.1	0.0		0.33	0.47	0.83						
D2		50-00-0	Formaldehyde	0.8	0.9	1.3	0.3				0.2			0.0	0.0															
D3		123-38-6	Propanal																											

Note: Levels below the method detection limit are highlighted.

[illegible]

Table A. 30 (continued)

			Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
#	Cla ss	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168.2 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	168.2 h	a	b	R ²	
67	Glycols, glycoethers	57-55-6	1,2-Propanediol																						
68		110-49-6	2-Methoxyethylacetate																						
69		111-90-0	Diethylene glycol monoeth																						
70		107-98-2	Propanol, 1-methoxy-2-																						
71		111-76-2	Ethanol, 2-butoxy-																						
72		112-34-5	Ethanol, 2-butoxyethoxy-																						
73		110-80-5	Ethanol, 2-ethoxy-																						
74		109-86-4	Ethanol, 2-methoxy-																						
75		75-65-0	Propanol, 2-methyl-2-																						
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																						
77		95-50-1	1,2-Dichlorobenzene																						
78		107-06-2	1,2-Dichloroethane																						
79		78-87-5	1,2-Dichloropropane																						
80		106-46-7	1,4-Dichlorobenzene																						
81		75-27-4	Bromodichloromethane																						
82		56-23-5	Carbon tetrachloride																						
83		67-66-3	Chloroform			0.33										0.02									
84		124-48-1	Dibromochloromethane																						
85	Cyclo Alkanes	75-09-2	Dichloromethane		3.71	2.00	1.07	0.46	0.85	0.23		0.86		0.19	0.10	0.05	0.02	0.04	0.01		0.04	0.10	0.30	0.38	
86		127-18-4	Tetrachloroethylene		0.14									0.01											
87		79-01-6	Trichloroethylene	0.38	2.81	0.89	0.28	0.15	0.41		0.15	3.80		0.12	0.03			0.00			0.17	0.01	-0.23	0.04	
88		79-34-5	1,1,2,2-Tetrachloroethane																						
89		108-87-2	Methylcyclohexane		0.53	0.50		0.33	0.21	0.15			0.09		0.03	0.02	0.02	0.01	0.01			0.00	0.04	0.41	0.99
90		110-82-7	Cyclohexane		0.15		0.14							0.01		0.01									
91		1678-93-9	Cyclohexane, butyl-		0.69	0.63	0.49	0.16		0.08	0.06			0.03	0.03	0.02	0.01		0.00	0.00		0.07	0.68	0.99	
92		1678-91-7	Cyclohexane, ethyl-																						
93		1678-92-8	Cyclohexane, propyl-		0.23	0.28	0.15							0.01	0.01	0.01									
94		91-17-8	Decahydronaphthalene		0.33	0.38	0.23							0.02	0.02	0.01									
95	Terpenes	80-56-8	alpha-Pinene																						
96		99-86-5	alpha-Terpinene																						
97		127-91-3	beta-Pinene																						
98		99-85-4	gamma-Terpinene																						
99		13466-78-9	3-Carene																						
100		79-92-5	Camphene																						
101	Acids	5989-27-5	Limonene																						
102		64-19-7	Acetic acid			1.64										0.08									
103		79-31-2	Isobutyric acid																						
104		107-92-6	Butyric acid																						
105		111-14-8	Heptanoic acid																						
106		149-57-5	2-Ethylhexanoic acid																						
107		142-62-1	Hexanoic acid																						
108		109-52-4	Pentanoic Acid																						
109		Other	3777-69-3	Furan, 2-pentyl																					
110	872-50-4		2-Pyrrolidinone, 1-methyl																						
111	123-91-1		1,4-Dioxane																						
112	78-40-0		Triethyl phosphate																						
113	142-96-1		n-Butyl ether		1.06	2.08	2.02	1.71	1.70	1.44	1.27	1.36		0.05	0.10	0.10	0.09	0.08	0.07	0.06	0.07	0.12	0.12	0.89	
114	96-29-7		2-Butanone oxime																						
115	121-44-8		Triethylamine																						
116	75-21-8		Ethylene oxide																						
117	75-56-9		Propylene oxide																						
118	106-99-0		1,3-Butadiene																						
119	0-00-0	TVOC		10.30	77.37	98.37	69.07	49.05	44.22	41.68	27.84	41.36			3.35	4.40	2.94	1.94	1.70	1.57	0.88	1.55	5.49	0.31	0.80
			Chamber concentration (µg m ⁻³)										Emission factor (µg h ⁻¹)										Coefficient: E = a t ^{-b} with t > 3 h		
#	Cla ss	CAS #	Compound	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		a	b	R ²	
D1	DNPH	75-07-0	Acetaldehyde		1.6	0.8	1.1	3.4	1.1	0.6	0.0	0.8					0.1								
D2		50-00-0	Formaldehyde		0.6	1.5	2.2	1.4	0.5	0.7	0.6	0.6			0.0	0.1	0.0		0.0	0.0	0.0		0.84	1.69	0.89
D3		123-38-6	Propanal																						

Note: Levels below the method detection limit are highlighted.

A.4 Chamber concentrations & emission factors for temperature tests

Table A. 31: Concentration & emission factor for GC_4oC (gasoline container tested at 4 °C)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol	1.4																				
2		71-23-8	1-Propanol																					
3		104-76-7	Hexanol, 2-ethyl-1-	1.2																				
4		67-63-0	2-Propanol																					
5		64-17-5	Ethanol		25158.2	21786.3	13553.5	19980.9	14665.5	9939.5	10448.6		1257.9	1089.3	677.7	999.0	733.3	497.0	522.4	1205.33	0.16	0.51		
6		108-95-2	Phenol	0.4																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.5																				
8		67-64-1	Acetone	3.1																				
9		98-86-2	Acetophenone	0.2																				
10		108-94-1	Cyclohexanone	0.3																				
11		108-10-1	Methylisobutyl ketone																					
12		100-52-7	Benzaldehyde	1.1																				
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17		111-71-7	Heptanal																					
18	Aliphatic Hydrocarbons	66-25-1	Hexanal																					
19		124-19-6	Nonanal																					
20		18829-56-6	2-Nonenal																					
21		2548-87-0	2-Octenal																					
22		110-62-3	Pentanal																					
23		107-83-5	Pentane, 2-methyl-		20234	16836	12816	20170	14646	13138	13477		1011.7	841.8	640.8	1008.5	732.3	656.9	673.9	832.49	0.03	0.07		
24		96-14-0	Pentane, 3-methyl-		10858.7	9091.6	6668.2	10930.2	7594.1	7007.4	7376.8		542.9	454.6	333.4	546.5	379.7	350.4	368.8	440.60	0.03	0.06		
25		540-84-1	2,2,4-Trimethylpentane		5907.6	4277.2	2707.5	4189.8	3098.5	2820.2	2968.0		295.4	213.9	135.4	209.5	154.9	141.0	148.4	200.71	0.06	0.20		
26		108-08-7	2,4-Dimethylpentane																					
27		124-18-5	Decane		836.4	441.9	442.3	402.4	337.4	280.9	277.9		41.8	22.1	22.1	20.1	16.9	14.0	13.9	27.78	0.14	0.86		
28	Aromatic Hydrocarbons	112-40-3	Dodecane																					
29		142-82-5	Heptane		14898.8	10444.3	9094.4	14138.5	10670.1	8526.1	9842.7		744.9	522.2	454.7	706.9	533.5	426.3	492.1	532.64	0.01	0.01		
30		544-76-3	Hexadecane																					
31		110-54-3	Hexane		145514	111000	92480	147943	110442	89384	95873		7275.7	5550.0	4624.0	7397.2	5522.1	4469.2	4793.6	5667.9	0.02	0.02		
32		111-84-2	Nonane		1892.8	1061.5	997.3	1463.7	1105.1	928.4	1073.5		94.6	53.1	49.9	73.2	55.3	46.4	53.7	54.81	0.00	0.00		
33		111-65-9	Octane		4593.1	2919.5	2666.3	4023.5	2998.5	2507.4	3023.7		229.7	146.0	133.3	201.2	149.9	125.4	151.2	147.88	0.00	0.00		
34		629-62-9	Pentadecane																					
35		629-59-4	Tetradecane																					
36		629-50-5	Tridecane																					
37		1120-21-4	Undecane		322.9	146.9	158.8	133.7	89.1	82.6	82.8		16.1	7.3	7.9	6.7	4.5	4.1	4.1	10.38	0.20	0.84		
38	Esters	95-93-2	Benzene, 1,2,4,5-tetramet		398.5	185.9	186.3	282.9	213.7	209.2	189.0		19.9	9.3	9.3	14.1	10.7	10.5	9.4	9.55	-0.03	0.06		
39		611-14-3	Toluene, 2-ethyl-		2393.0	1413.8	1454.1	2347.4	1710.3	1521.1	1600.7		119.6	70.7	72.7	117.4	85.5	76.1	80.0	72.83	-0.04	0.09		
40		620-14-4	Toluene, 3-ethyl-		9266.9	5336.6	5940.2	9253.1	6934.3	6023.4	6262.4		463.3	266.8	297.0	462.7	346.7	301.2	313.1	282.89	-0.05	0.11		
41		622-96-8	Toluene, 4-ethyl-		6053.7	3533.5	4068.8	6147.9	4798.8	4196.9	4253.3		302.7	176.7	203.4	307.4	239.9	209.8	212.7	187.33	-0.05	0.16		
42		4994-16-5	Cyclohexene, 4-phenyl																					
43		71-43-2	Benzene	0.6	11153.5	8933.3	7999.4	12809.4	9224.4	7237.9	7793.5		557.6	446.6	399.9	640.4	461.2	361.9	389.6	478.13	0.03	0.03		
44		526-73-8	Benzene, 1,2,3-trimethyl-		2362.4	1355.2	1372.7	2227.1	1623.7	1473.9	1518.1		118.1	67.8	68.6	111.4	81.2	73.7	75.9	69.19	-0.04	0.10		
45		95-63-6	Benzene, 1,2,4-trimethyl-		15407.2	9027.8	9689.5	14982.7	11245.7	10006.6	10296.4		770.4	451.4	484.5	749.1	562.3	500.3	514.8	472.16	-0.04	0.10		
46		95-47-6	Benzene, 1,2-dimethyl-		9272.5	6055.5	6097.9	9802.8	6960.0	5974.5	6776.2		463.6	302.8	304.9	490.1	348.0	298.7	338.8	314.37	-0.03	0.04		
47		108-67-8	Benzene, 1,3,5-trimethyl-		3557.6	2054.1	2084.0	3275.1	2382.9	2119.2	2297.1		177.9	102.7	104.2	163.8	119.1	106.0	114.9	105.87	-0.03	0.06		
48		108-38-3	Benzene, 1,3-dimethyl-	0.1	27681	18028	18969	30200	21838	18152	20633		1384.1	901.4	948.4	1510.0	1091.9	907.6	1031.6	951.95	-0.03	0.05		
49		98-82-8	Benzene, isopropyl		346.7	201.8	205.2	328.3	229.6	199.6	228.8		17.3	10.1	10.3	16.4	11.5	10.0	11.4	10.51	-0.03	0.04		
50		103-65-1	Benzene, propyl-		1953.8	1123.9	1261.4	1969.2	1500.3	1301.7	1345.8		97.7	56.2	63.1	98.5	75.0	65.1	67.3	59.20	-0.05	0.14		
51		100-41-4	Ethylbenzene	0.0	6603.4	4343.8	4571.8	7335.0	5282.1	4368.1	4982.1		330.2	217.2	228.6	366.7	264.1	218.4	249.1	229.54	-0.03	0.05		
52		91-20-3	Naphthalene		709.8	369.8	424.4	612.6	478.3	481.6	411.7		35.5	18.5	21.2	30.6	23.9	24.1	20.6	19.57	-0.05	0.16		
53		99-87-6	p-Cymene		48.9	28.5	32.7	46.3	34.3	31.7	28.1		2.4	1.4	1.6	2.3	1.7	1.6	1.4	1.62	-0.01	0.00		
54		100-42-5	Styrene	0.3																				
55	108-88-3	Toluene	0.7	60182	44293	43813	70310	49389	38691	44598		3009.1	2214.6	2190.6	3515.5	2469.4	1934.5	2229.9	2400.9	0.00	0.00			
56	98-83-9	2-Phenylpropene																						
57	95-13-6	Indene		34.9								1.7												
58	Esters	108-21-4	Acetic acid, 1-methylethyl																					
59		111-15-9	Acetic acid, 2-ethoxyethyl																					
60		123-86-4	Acetic acid, butyl ester																					
61		141-78-6	Acetic acid, ethyl ester																					
62		80-62-6	Methyl methacrylate																					
63		103-09-3	2-Ethylhexyl acetate																					
64		96-48-0	Butyrolactone																					
65		25265-77-4	Texanol																					
66		6846-50-0	TXIB																					

Table A. 31 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R^2
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane		1.5																	
86		127-18-4	Tetrachloroethylene																			
87	Cyclo Alkanes	79-01-6	Trichloroethylene		4.6																	
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		4300.5	3339.6	2382.6	3862.8	2628.9	2531.5	2682.3		215.0	167.0	119.1	193.1	131.4	126.6	134.1	159.93	0.04	0.07
90		110-82-7	Cyclohexane		3185.6	2488.3	1832.9	3081.7	2034.2	1956.7	2075.7		159.3	124.4	91.6	154.1	101.7	97.8	103.8	120.17	0.03	0.04
91		1678-93-9	Cyclohexane, butyl-		74.4	37.3	26.6	34.6	23.0	20.5	20.2		3.7	1.9	1.3	1.7	1.1	1.0	1.0	2.10	0.15	0.64
92		1678-91-7	Cyclohexane, ethyl-		675.0	482.0	349.1	556.9	373.2	345.2	392.2		33.8	24.1	17.5	27.8	18.7	17.3	19.6	23.49	0.04	0.10
93		1678-92-8	Cyclohexane, propyl-		186.5	146.0	87.7	136.3	88.6	83.3	91.4		9.3	7.3	4.4	6.8	4.4	4.2	4.6	7.07	0.10	0.33
94		91-17-8	Decahydronaphthalene		24.5								1.2									
95	Terpenes	80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102	Acids	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109	Other	3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119	A	0-00-0	TVOC	30.9	414488	319611	275406	423891	302872	255735	276064		20723	15979	13769	21193	15142	12785	13802	16712.0	0.03	0.05
A1		78-78-4	Butane, 2-methyl-		20683	17980	13071	21766	14499	13998	13748		1034.1	899.0	653.5	1088.3	725.0	699.9	687.4	883.12	0.04	0.08
A2		109-66-0	Pentane		22886	19412	15520	24745	17625	15582	15230		1144.3	970.6	776.0	1237.2	881.3	779.1	761.5	994.82	0.04	0.07
A3		513-35-9	2-Butene, 2-methyl-		18352	15605	11579	18380	13396	10743	10796		917.6	780.2	579.0	919.0	669.8	537.2	539.8	811.42	0.07	0.19

Table A. 32: Concentration & emission factor for GC_14oC (gasoline container tested at 14 °C)

#	Cla ss	CAS #	Compound	Chamber concentration (μg m ⁻³)									Emission factor (μg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol																					
2		71-23-8	1-Propanol																					
3		104-76-7	Hexanol, 2-ethyl-1-																					
4		67-63-0	2-Propanol																					
5		64-17-5	Ethanol		26967.5	26250.4	18698.8	16190.1	57042.2	18641.1	16657.8		1348.4	1312.5	934.9	809.5	2852.1	932.1	832.9	1154.53	0.00	0.00		
6		108-95-2	Phenol																					
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																					
8		67-64-1	Acetone		0.4																			
9		98-86-2	Acetophenone		0.2																			
10		108-94-1	Cyclohexanone																					
11		108-10-1	Methylisobutyl ketone																					
12		100-52-7	Benzaldehyde		1.3																			
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17		111-71-7	Heptanal																					
18		66-25-1	Hexanal																					
19		124-19-6	Nonanal																					
20		18829-56-6	2-Nonenal																					
21		2548-87-0	2-Octenal																					
22		110-62-3	Pentanal																					
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		27250	31085	25609	21556	34737	21638	24362		1362.5	1554.3	1280.5	1077.8	1736.8	1081.9	1218.1	1499.92	0.04	0.10		
24		96-14-0	Pentane, 3-methyl-		15073	17587	14392	11973	17540	12164	13292		753.7	879.3	719.6	598.6	877.0	608.2	664.6	859.58	0.06	0.23		
25		540-84-1	2,2,4-Trimethylpentane		7979.1	9572.0	7910.4	6470.9	9131.6	6745.2	6806.2		399.0	478.6	395.5	323.5	456.6	337.3	340.3	478.15	0.07	0.34		
26		108-08-7	2,4-Dimethylpentane																					
27		124-18-5	Decane		729.1	757.6	633.3	488.6	652.1	578.7	512.7		36.5	37.9	31.7	24.4	32.6	28.9	25.6	38.03	0.08	0.44		
28		112-40-3	Dodecane			43.1								2.2										
29		142-82-5	Heptane		18660	20430	16605	14422	28443	15340	15958		933.0	1021.5	830.2	721.1	1422.1	767.0	797.9	952.31	0.02	0.01		
30		544-76-3	Hexadecane																					
31		110-54-3	Hexane		181593	195712	156909	139154	336371	148539	163425		9079.6	9785.6	7845.5	6957.7	16818.5	7427.0	8171.3	8738.9	-0.01	0.00		
32		111-84-2	Nonane		2050.6	2444.9	2071.9	1677.5	2257.7	1895.1	1772.7		102.5	122.2	103.6	83.9	112.9	94.8	88.6	121.51	0.06	0.36		
33		111-65-9	Octane		5619.9	6500.8	5427.0	4507.5	6979.0	4938.0	5124.8		281.0	325.0	271.3	225.4	348.9	246.9	256.2	311.05	0.04	0.10		
34		629-62-9	Pentadecane																					
35		629-59-4	Tetradecane																					
36		629-50-5	Tridecane																					
37	1120-21-4	Undecane		193.8	192.6	177.3	119.3	129.8	143.1	104.3		9.7	9.6	8.9	6.0	6.5	7.2	5.2	11.10	0.14	0.75			
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		529.4	546.9	474.0	386.2	445.8	435.0	373.7		26.5	27.3	23.7	19.3	22.3	21.7	18.7	28.24	0.08	0.65		
39		611-14-3	Toluene, 2-ethyl-		2960.2	3250.4	2742.8	2286.6	2824.1	2505.5	2351.1		148.0	162.5	137.1	114.3	141.2	125.3	117.6	162.71	0.07	0.51		
40		620-14-4	Toluene, 3-ethyl-		11075.0	12558.2	10878.4	8987.5	11722.1	10114.4	8886.5		553.7	627.9	543.9	449.4	586.1	505.7	444.3	635.50	0.06	0.39		
41		622-96-8	Toluene, 4-ethyl-		7134.2	8134.0	7123.1	6030.3	8389.9	6861.6	5763.6		356.7	406.7	356.2	301.5	419.5	343.1	288.2	409.70	0.05	0.22		
42		4994-16-5	Cyclohexene, 4-phenyl																					
43		71-43-2	Benzene		13144.7	13489.4	10897.0	9919.3	25219.4	10832.4	11709.3		657.2	674.5	544.9	496.0	1261.0	541.6	585.5	591.21	-0.03	0.01		
44		526-73-8	Benzene, 1,2,3-trimethyl-		3098.4	3256.0	2785.4	2289.4	2819.9	2549.3	2411.8		154.9	162.8	139.3	114.5	141.0	127.5	120.6	162.71	0.06	0.50		
45		95-63-6	Benzene, 1,2,4-trimethyl-		19359.3	20870	18158.5	15126.7	19266.0	16993.2	15507.1		968.0	1043.5	907.9	756.3	963.3	849.7	775.4	1044.57	0.06	0.39		
46		95-47-6	Benzene, 1,2-dimethyl-		10851.4	12311.9	10405.5	8695.3	12565.5	9644.1	9482.9		542.6	615.6	520.3	434.8	628.3	482.2	474.1	597.54	0.04	0.17		
47		108-67-8	Benzene, 1,3,5-trimethyl-		4430.3	4859.3	4133.6	3355.0	4076.9	3719.3	3512.3		221.5	243.0	206.7	167.8	203.8	186.0	175.6	244.71	0.07	0.56		
48		108-38-3	Benzene, 1,3-dimethyl-		31939	36493	30985	25936	41948	29286	28020		1596.9	1824.7	1549.3	1296.8	2097.4	1464.3	1401.0	1756.29	0.03	0.07		
49		98-82-8	Benzene, isopropyl		402.8	469.3	394.5	318.8	388.9	344.6	334.2		20.1	23.5	19.7	15.9	19.4	17.2	16.7	23.72	0.08	0.59		
50		103-65-1	Benzene, propyl-		2309.4	2673.7	2302.9	1947.3	2601.6	2155.3	1851.6		115.5	133.7	115.1	97.4	130.1	107.8	92.6	135.64	0.06	0.34		
51		100-41-4	Ethylbenzene		7722.7	8869.4	7426.1	6252.4	10306.6	7027.6	6669.7		386.1	443.5	371.3	312.6	515.3	351.4	333.5	426.12	0.03	0.07		
52	91-20-3	Naphthalene		799.2	907.3	901.0	804.6	809.9	923.7	681.0		40.0	45.4	45.0	40.2	40.5	46.2	34.1	48.41	0.05	0.34			
53	99-87-6	p-Cymene		72.0	74.1	64.9	47.9	61.4	52.6	48.0		3.6	3.7	3.2	2.4	3.1	2.6	2.4	3.94	0.10	0.65			
54	100-42-5	Styrene		0.2																				
55	108-88-3	Toluene		0	69560	72344	60646	53682	90524	58923	60357		3478	3617	3032	2684	4526	2946	3018	3365.7	0.01	0.01		
56	98-83-9	2-Phenylpropene																						
57	95-13-6	Indene																						
58	Esters	108-21-4	Acetic acid, 1-methylethyl																					
59		111-15-9	Acetic acid, 2-ethoxyethyl																					
60		123-86-4	Acetic acid, butyl ester																					
61		141-78-6	Acetic acid, ethyl ester																					
62		80-62-6	Methyl methacrylate		0.3																			
63		103-09-3	2-Ethylhexyl acetate																					
64		96-48-0	Butyrolactone																					
65		25265-77-4	Texanol																					
66		6846-50-0	TXIB																					

Table A. 32 (continued)

				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h			
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²	
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																				
68		110-49-6	2-Methoxyethylacetate																				
69		111-90-0	Diethylene glycol monoeth																				
70		107-98-2	Propanol, 1-methoxy-2-																				
71		111-76-2	Ethanol, 2-butoxy-																				
72		112-34-5	Ethanol, 2-butoxyethoxy-																				
73		110-80-5	Ethanol, 2-ethoxy-																				
74		109-86-4	Ethanol, 2-methoxy-																				
75		75-65-0	Propanol, 2-methyl-2-																				
76		Halo Carbons	71-55-6	1,1,1-Trichloroethane																			
77	95-50-1		1,2-Dichlorobenzene																				
78	107-06-2		1,2-Dichloroethane																				
79	78-87-5		1,2-Dichloropropane																				
80	106-46-7		1,4-Dichlorobenzene																				
81	75-27-4		Bromodichloromethane																				
82	56-23-5		Carbon tetrachloride																				
83	67-66-3		Chloroform																				
84	124-48-1		Dibromochloromethane																				
85	75-09-2		Dichloromethane																				
86	127-18-4	Tetrachloroethylene																					
87	79-01-6	Trichloroethylene																					
88	79-34-5	1,1,2,2-Tetrachloroethane																					
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		5885.6	7244.6	5876.8	4743.8	5913.1	4756.7	4778.4		294.3	362.2	293.8	237.2	295.7	237.8	238.9	373.17	0.10	0.65	
90		110-82-7	Cyclohexane		4374.6	5229.9	4145.0	3349.0	4448.3	3445.8	3560.3		218.7	261.5	207.3	167.5	222.4	172.3	178.0	261.47	0.09	0.50	
91		1678-93-9	Cyclohexane, butyl-		52.4	66.3	51.9	43.7	53.9	43.7	46.0		2.6	3.3	2.6	2.2	2.7	2.2	2.3	3.30	0.09	0.57	
92		1678-91-7	Cyclohexane, ethyl-		879.9	1107.1	903.4	737.2	888.2	749.9	769.0		44.0	55.4	45.2	36.9	44.4	37.5	38.4	56.24	0.09	0.65	
93		1678-92-8	Cyclohexane, propyl-		212.7	249.0	213.3	182.5	204.5	184.2	191.5		10.6	12.5	10.7	9.1	10.2	9.2	9.6	12.58	0.07	0.68	
94		91-17-8	Decahydronaphthalene																				
95		80-56-8	alpha-Pinene																				
96		99-86-5	alpha-Terpinene																				
97		127-91-3	beta-Pinene																				
98		99-85-4	gamma-Terpinene																				
99	13466-78-9	3-Carene																					
100	Terpenes	79-92-5	Camphene																				
101		5989-27-5	Limonene																				
102	Acids	64-19-7	Acetic acid																				
103		79-31-2	Isobutyric acid																				
104		107-92-6	Butyric acid																				
105		111-14-8	Heptanoic acid																				
106		149-57-5	2-Ethylhexanoic acid																				
107		142-62-1	Hexanoic acid																				
108		109-52-4	Pentanoic Acid																				
109	Other	3777-69-3	Furan, 2-pentyl																				
110		872-50-4	2-Pyrrolidinone, 1-methyl																				
111		123-91-1	1,4-Dioxane																				
112		78-40-0	Triethyl phosphate																				
113		142-96-1	n-Butyl ether																				
114		96-29-7	2-Butanone oxime																				
115		121-44-8	Triethylamine																				
116		75-21-8	Ethylene oxide																				
117		75-56-9	Propylene oxide																				
118		106-99-0	1,3-Butadiene																				
119	0-00-0	TVOC	19	486207	530470	443025	386508	652176	416670	431216		24309	26523	22150	19324	32608	20833	21560	24950	0.02	0.02		
A1	A	78-78-4	Butane, 2-methyl-		25319	26571	23212	20236	23878	20847	21369		1266.0	1328.5	1160.6	1011.8	1193.9	1042.4	1068.4	1324.82	0.05	0.49	
A2		109-66-0	Pentane		27386	25933	22180	20250	39769	21539	23125		1369.3	1296.7	1109.0	1012.5	1988.5	1077.0	1156.3	1185.49	-0.01	0.01	
A3		513-35-9	2-Butene, 2-methyl-		21620	20746	16059	14623	27973	15940	16623		1081.0	1037.3	802.9	731.2	1398.6	797.0	831.2	930.19	0.01	0.00	
				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient:			
#	Class	CAS #	Compound	0 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		0 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		a	b	R ²	
D1	DNPH	75-07-0	Acetaldehyde	1.6	74.5	67.0		51.0	54.3	50.9			3.6	3.3		2.5	2.6	2.5			4.10	0.11	0.94
D2		50-00-0	Formaldehyde	0.6				0.1	0.9								0.0						
D3		123-38-6	Propanal																				

Table A. 33: Concentration & emission factor for GC_30oC (gasoline container tested at 30 °C)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	95.9 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	95.9 h	a	b	R ²	
1	Alcohols	71-36-3	1-Butanol																				
2		71-23-8	1-Propanol																				
3		104-76-7	Hexanol, 2-ethyl-1-																				
4		67-63-0	2-Propanol																				
5		64-17-5	Ethanol		31833	46615	45484	67224	66672	80087	77033		1591.7	2330.7	2274.2	3361.2	3333.6	4004.4	3851.7	1839.92	-0.17	0.92	
6		108-95-2	Phenol																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																				
8		67-64-1	Acetone			50.6	33.5	64.8	98.1	53.4				2.5	1.7	3.2	4.9	2.7		1.73	-0.17	0.36	
9		98-86-2	Acetophenone																				
10		108-94-1	Cyclohexanone																				
11		108-10-1	Methylisobutyl ketone																				
12		100-52-7	Benzaldehyde																				
13		123-72-8	Butanal																				
14		112-31-2	Decanal																				
15		3913-81-3	2-Decenal																				
16		98-01-1	Furfural																				
17		111-71-7	Heptanal																				
18		66-25-1	Hexanal																				
19		124-19-6	Nonanal																				
20		18829-56-6	2-Nonenal																				
21		2548-87-0	2-Octenal																				
22		110-62-3	Pentanal																				
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		42551	68420	75822	74701	67830	70057	70600		2127.5	3421.0	3791.1	3735.0	3391.5	3502.9	3530.0	3636.11	0.01	0.04	
24		96-14-0	Pentane, 3-methyl-		24193	39567	43486	42325	37836	38860	39137		1209.6	1978.4	2174.3	2116.2	1891.8	1943.0	1956.9	2134.52	0.02	0.26	
25		540-84-1	2,2,4-Trimethylpentane		12907	23629	26600	24923	22555	23309	22590		645.3	1181.4	1330.0	1246.1	1127.8	1165.4	1129.5	1302.00	0.03	0.36	
26		108-08-7	2,4-Dimethylpentane																				
27		124-18-5	Decane		1044.3	1615.2	1797.8	2083.5	1910.0	1883.4	1887.7		52.2	80.8	89.9	104.2	95.5	94.2	94.4	81.97	-0.04	0.45	
28		112-40-3	Dodecane		67.6	97.3	118.0	144.8	154.4	127.5	137.2		3.4	4.9	5.9	7.2	7.7	6.4	6.9	4.81	-0.09	0.61	
29		142-82-5	Heptane		24565	37997	44881	43160	41898	41700	43072		1228	1900	2244	2158	2095	2085	2154	2010.20	-0.01	0.13	
30		544-76-3	Hexadecane																				
31		110-54-3	Hexane		230099	347299	397056	401295	369450	395888	400726		11505	17365	19853	20065	18472	19794	20036	17886.0	-0.02	0.31	
32		111-84-2	Nonane		2980.5	4699.9	5654.2	5599.9	5572.5	5134.2	5333.7		149.0	235.0	282.7	280.0	278.6	256.7	266.7	252.07	-0.02	0.12	
33		111-65-9	Octane		7853.6	12219.6	14960.8	13941.4	13695.8	13352.6	13751.5		392.7	611.0	748.0	697.1	684.8	667.6	687.6	662.01	-0.01	0.04	
34		629-62-9	Pentadecane																				
35		629-59-4	Tetradecane																				
36		629-50-5	Tridecane					32.6	45.8							1.6	2.3						
37		1120-21-4	Undecane		264.6	399.6	414.3	517.7	566.6	474.7	485.3		13.2	20.0	20.7	25.9	28.3	23.7	24.3	18.93	-0.07	0.57	
38		95-93-2	Benzene, 1,2,4,5-tetramethyl-		652.1	1050.9	1144.5	1340.9	1316.7	1218.2	1176.5		32.6	52.5	57.2	67.0	65.8	60.9	58.8	53.07	-0.04	0.39	
39		611-14-3	Toluene, 2-ethyl-		4404.5	6841.1	7408.3	7364.2	7009.8	6725.3	6717.4		220.2	342.1	370.4	368.2	350.5	336.3	335.9	365.15	0.01	0.18	
40		620-14-4	Toluene, 3-ethyl-		14355	22206	24519	25040	24385	23095	23282		717.7	1110.3	1225.9	1252.0	1219.2	1154.7	1164.1	1166.00	-0.01	0.03	
41	622-96-8	Toluene, 4-ethyl-		9355	14432	16338	16936	17054	16271	16487		467.7	721.6	816.9	846.8	852.7	813.6	824.3	739.06	-0.03	0.48		
42	4994-16-5	Cyclohexene, 4-phenyl																					
43	Aromatic Hydrocarbons	71-43-2	Benzene	2.8	19521	26723	29034	30545	28301	29815	30289		975.9	1336.0	1451.6	1527.1	1414.9	1490.6	1514.3	1346.03	-0.02	0.48	
44		526-73-8	Benzene, 1,2,3-trimethyl-		4249	6546	7243	7509	7204	6855	6826		212.4	327.3	362.1	375.5	360.2	342.7	341.3	345.03	-0.01	0.02	
45		95-63-6	Benzene, 1,2,4-trimethyl-	2.2	24658	37602	41994	43593	42602	40681	40589		1232.8	1880.0	2099.6	2179.5	2130.0	2033.9	2029.3	1959.60	-0.02	0.17	
46		95-47-6	Benzene, 1,2-dimethyl-		17035	25400	28104	26891	25967	25179	25392		851.7	1270.0	1405.2	1344.6	1298.4	1259.0	1269.6	1360.53	0.01	0.18	
47		108-67-8	Benzene, 1,3,5-trimethyl-	0.3	6275	9967	11015	11059	10624	10076	10116		313.7	498.3	550.7	552.9	531.2	503.8	505.8	531.29	0.00	0.02	
48		108-38-3	Benzene, 1,3-dimethyl-	3.7	45046	66470	75738	73085	72244	70201	71094		2252.1	3323.3	3786.7	3654.1	3612.0	3509.9	3554.5	3513.47	-0.01	0.03	
49		98-82-8	Benzene, isopropyl		678.0	1072.4	1148.1	1068.2	1012.2	966.8	982.5		33.9	53.6	57.4	53.4	50.6	48.3	49.1	58.65	0.04	0.70	
50		103-65-1	Benzene, propyl-		3376.4	5224.7	5736.9	5854.0	5715.9	5467.8	5490.2		168.8	261.2	286.8	292.7	285.8	273.4	274.5	272.73	-0.01	0.06	
51		100-41-4	Ethylbenzene	0.8	11139.2	16380.4	18478.1	17563.2	17389.5	16886.5	17188.9		556.9	819.0	923.9	878.1	869.4	844.3	859.4	867.74	0.00	0.00	
52		91-20-3	Naphthalene	2.1	1155.7	1637.8	1836.5	2510.0	2671.5	2520.7	2402.8		57.7	81.8	91.7	125.4	133.5	125.9	120.0	74.16	-0.13	0.82	
53		99-87-6	p-Cymene		94.0	160.9	169.9	177.5	167.6	158.8	154.5		4.7	8.0	8.5	8.9	8.4	7.9	7.7	8.53	0.01	0.10	
54		100-42-5	Styrene																				
55		108-88-3	Toluene	14.3	82321	93266	106702	100994	100281	100175	100888		4115.3	4662.6	5334.4	5049.0	5013.3	5008.0	5043.7	4901.03	-0.01	0.06	
56		98-83-9	2-Phenylpropene																				
57	95-13-6	Indene		71.4	102.9	105.5	125.9	125.2	122.3	113.5		3.6	5.1	5.3	6.3	6.3	6.1	5.7	4.99	-0.05	0.55		
58	Esters	108-21-4	Acetic acid, 1-methylethyl																				
59		111-15-9	Acetic acid, 2-ethoxyethyl																				
60		123-86-4	Acetic acid, butyl ester																				
61		141-78-6	Acetic acid, ethyl ester																				
62		80-62-6	Methyl methacrylate																				
63		103-09-3	2-Ethylhexyl acetate																				
64		96-48-0	Butyrolactone																				
65		25265-77-4	Texanol																				
66		6846-50-0	TXIB																				

Table A. 33 (continued)

			Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^b with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	95.9 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	95.9 h	a	b	R ²	
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																				
68		110-49-6	2-Methoxyethylacetate																				
69		111-90-0	Diethylene glycol monoeth																				
70		107-98-2	Propanol, 1-methoxy-2-																				
71		111-76-2	Ethanol, 2-butoxy-																				
72		112-34-5	Ethanol, 2-butoxyethoxy-																				
73		110-80-5	Ethanol, 2-ethoxy-																				
74		109-86-4	Ethanol, 2-methoxy-																				
75		75-65-0	Propanol, 2-methyl-2-																				
76		Halo Carbons	71-55-6	1,1,1-Trichloroethane																			
77	95-50-1		1,2-Dichlorobenzene																				
78	107-06-2		1,2-Dichloroethane																				
79	78-87-5		1,2-Dichloropropane																				
80	106-46-7		1,4-Dichlorobenzene																				
81	75-27-4		Bromodichloromethane																				
82	56-23-5		Carbon tetrachloride																				
83	67-66-3		Chloroform																				
84	124-48-1		Dibromochloromethane																				
85	75-09-2		Dichloromethane																				
86	127-18-4	Tetrachloroethylene																					
87	79-01-6	Trichloroethylene																					
88	79-34-5	1,1,2,2-Tetrachloroethane																					
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		9367.1	16230.9	17851.7	16705.6	14969.2	14799.1	14929.5		468.4	811.5	892.6	835.3	748.5	740.0	746.5	904.84	0.04	0.59	
90		110-82-7	Cyclohexane		7902.2	13549.4	14444.3	13503.8	11779.9	11868.7	11920.4		395.1	677.5	722.2	675.2	589.0	593.4	596.0	756.52	0.05	0.73	
91		1678-93-9	Cyclohexane, butyl-		75.6	147.6	154.9	147.6	147.4	168.8	141.6		3.8	7.4	7.7	7.4	7.4	8.4	7.1	7.48	0.00	0.00	
92		1678-91-7	Cyclohexane, ethyl-		1377.8	2349.3	2701.8	2534.1	2289.5	2246.6	2283.6		68.9	117.5	135.1	126.7	114.5	112.3	114.2	131.53	0.03	0.33	
93		1678-92-8	Cyclohexane, propyl-		312.7	502.2	561.5	554.3	523.4	565.2	567.0		15.6	25.1	28.1	27.7	26.2	28.3	28.4	25.61	-0.02	0.31	
94		91-17-8	Decahydronaphthalene		66.6	112.2	131.8	128.0	118.4	117.3	113.2		3.3	5.6	6.6	6.4	5.9	5.9	5.7	6.20	0.01	0.05	
95		Terpenes	80-56-8	alpha-Pinene																			
96	99-86-5		alpha-Terpinene																				
97	127-91-3		beta-Pinene																				
98	99-85-4		gamma-Terpinene																				
99	13466-78-9		3-Carene																				
100	79-92-5		Camphene																				
101	5989-27-5		Limonene																				
102	Acids	64-19-7	Acetic acid																				
103		79-31-2	Isobutyric acid																				
104		107-92-6	Butyric acid																				
105		111-14-8	Heptanoic acid																				
106		149-57-5	2-Ethylhexanoic acid																				
107		142-62-1	Hexanoic acid																				
108		109-52-4	Pentanoic Acid																				
109	Other	3777-69-3	Furan, 2-pentyl																				
110		872-50-4	2-Pyrrolidinone, 1-methyl																				
111		123-91-1	1,4-Dioxane																				
112		78-40-0	Triethyl phosphate																				
113		142-96-1	n-Butyl ether																				
114		96-29-7	2-Butanone oxime																				
115		121-44-8	Triethylamine																				
116		75-21-8	Ethylene oxide																				
117		75-56-9	Propylene oxide																				
118		106-99-0	1,3-Butadiene																				
119		0-00-0	TVOC	96	678376	1042153	1162504	1157354	1092432	1109477	1109746		33914	52103	58120	57863	54617	55469	55482	54598	-0.01	0.04	
A1		78-78-4	Butane, 2-methyl-		36208	55654	60063	58481	53549	55455	54163		1810.4	2782.7	3003.2	2924.0	2677.4	2772.8	2708.2	2966.3	0.02	0.30	
A2		109-66-0	Pentane		30912	45856	51520	51058	49705	56576	54414		1545.6	2292.8	2576.0	2552.9	2485.2	2828.8	2720.7	2266.7	-0.04	0.60	
A3		513-35-9	2-Butene, 2-methyl-		23403	34172	35570	30920	26286	32946	30187		1170.2	1708.6	1778.5	1546.0	1314.3	1647.3	1509.3	1832.3	0.05	0.39	

Table A. 34: Concentration & emission factor for PTR_4oC (paint remover tested at 4 °C)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h					
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²			
1	Alcohols	71-36-3	1-Butanol																						
2		71-23-8	1-Propanol																						
3		104-76-7	Hexanol, 2-ethyl-1-	0.3				1.5		0.6						0.1			0.0						
4		67-63-0	2-Propanol																						
5		64-17-5	Ethanol																						
6		108-95-2	Phenol		0.9			0.6	0.8	0.8	0.5	0.6		0.0			0.0	0.0	0.0	0.0	0.0	0.04	0.03	0.00	0.00
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.1	1.1	0.6	0.8	4.4	0.6	0.7	0.6		0.0	0.0		0.0	0.2	0.0	0.0	0.0	0.04	0.03	0.00	0.00	
8		67-64-1	Acetone	0.3	7.4	4.6	4.6	8.0	3.0	6.3	4.3		0.4	0.2		0.2	0.4	0.1	0.3	0.2	0.23	0.00	0.00	0.00	
9		98-86-2	Acetophenone	0.1	0.4	0.3	0.3	0.6	0.4	0.2	0.3		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.01	0.07	0.04	0.00	
10		108-94-1	Cyclohexanone																						
11		108-10-1	Methylisobutyl ketone																						
12		100-52-7	Benzaldehyde	0.5				4.1	2.9	1.4	1.5					0.2	0.1	0.0	0.0	0.0	5.68	1.07	0.87	0.00	
13		123-72-8	Butanal																						
14		112-31-2	Decanal								1.0									0.1					
15		3913-81-3	2-Decenal																						
16		98-01-1	Furfural																						
17		111-71-7	Heptanal																						
18		66-25-1	Hexanal																						
19		124-19-6	Nonanal					1.8		1.8						0.1		0.1							
20	18829-56-6	2-Nonenal																							
21	2548-87-0	2-Octenal																							
22	110-62-3	Pentanal								0.2								0.0							
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																						
24		96-14-0	Pentane, 3-methyl-																						
25		540-84-1	2,2,4-Trimethylpentane																						
26		108-08-7	2,4-Dimethylpentane																						
27		124-18-5	Decane	0.1	28.3	19.1	16.6	14.9	15.7	16.2	16.8		1.4	1.0		0.8	0.7	0.8	0.8	0.8	0.92	0.04	0.34	0.00	
28		112-40-3	Dodecane		1.2	0.6	0.4	0.4	0.4	0.5	0.5		0.1	0.0		0.0	0.0	0.0	0.0	0.0	0.03	0.04	0.14	0.00	
29		142-82-5	Heptane		0.7					0.7				0.0					0.0						
30		544-76-3	Hexadecane																						
31		110-54-3	Hexane							5.0									0.3						
32		111-84-2	Nonane		9.4	6.7	6.2	5.8	5.9	6.2	6.3		0.5	0.3		0.3	0.3	0.3	0.3	0.3	0.33	0.02	0.25	0.00	
33		111-65-9	Octane		2.2	1.7	2.0	1.8	1.8	1.8	1.8		0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.09	0.00	0.01	0.00	
34		629-62-9	Pentadecane																						
35		629-59-4	Tetradecane																						
36		629-50-5	Tridecane																						
37		1120-21-4	Undecane		15.8	9.5	7.8	7.3	7.9	8.3	8.1		0.8	0.5		0.4	0.4	0.4	0.4	0.4	0.44	0.03	0.19	0.00	
38		95-93-2	Benzene, 1,2,4,5-tetramethyl-	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.01	0.07	0.58	0.00	
39		611-14-3	Toluene, 2-ethyl-	1.0	0.7	0.6	0.5	0.5	0.5	0.5	0.5		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.03	0.07	0.80	0.00	
40		620-14-4	Toluene, 3-ethyl-	1.9	1.4	1.2	1.1	1.0	1.3	1.0			0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.07	0.07	0.45	0.00	
41	622-96-8	Toluene, 4-ethyl-	1.2	0.7	0.7	0.5	0.6	0.7	0.6			0.1	0.0		0.0	0.0	0.0	0.0	0.0	0.03	0.02	0.08	0.00		
42	4994-16-5	Cyclohexene, 4-phenyl																							
43	71-43-2	Benzene	0.5	1.0	1.0	2.7	2.4	4.0	6.3	1.3		0.0	0.0		0.1	0.1	0.2	0.3	0.0	0.04	-0.30	0.23	0.00		
44	526-73-8	Benzene, 1,2,3-trimethyl-		1.9	1.3	1.1	1.0	1.0	1.0	1.0		0.1	0.1		0.1	0.0	0.0	0.0	0.0	0.07	0.08	0.81	0.00		
45	95-63-6	Benzene, 1,2,4-trimethyl-		4.5	3.2	2.8	2.5	2.4	2.8	2.4		0.2	0.2		0.1	0.1	0.1	0.1	0.1	0.16	0.06	0.62	0.00		
46	95-47-6	Benzene, 1,2-dimethyl-		0.8	0.5	0.5	0.5	0.4	1.0	0.4		0.0	0.0		0.0	0.0	0.0	0.1	0.0	0.02	-0.03	0.01	0.00		
47	108-67-8	Benzene, 1,3,5-trimethyl-		1.0	0.8	0.6	0.5	0.6	0.6	0.5		0.1	0.0		0.0	0.0	0.0	0.0	0.0	0.04	0.09	0.70	0.00		
48	108-38-3	Benzene, 1,3-dimethyl-		2.5	1.6	1.5	1.4	1.3	5.2	1.3		0.1	0.1		0.1	0.1	0.1	0.3	0.1	0.06	-0.10	0.07	0.00		
49	98-82-8	Benzene, isopropyl		0.2	0.2	0.1	0.1	0.1	0.1	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.01	0.06	0.70	0.00		
50	103-65-1	Benzene, propyl-	0.0	1.1	0.8	0.7	0.7	0.7	0.8	0.6		0.1	0.0		0.0	0.0	0.0	0.0	0.0	0.04	0.03	0.26	0.00		
51	100-41-4	Ethylbenzene		0.9	0.6	0.6	0.6	0.5	1.4	0.5		0.0	0.0		0.0	0.0	0.0	0.1	0.0	0.03	-0.07	0.07	0.00		
52	91-20-3	Naphthalene	0.2	0.5	0.5	0.4	0.3	0.3	0.3	0.3		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.02	0.20	0.80	0.00		
53	99-87-6	p-Cymene	0.1	0.4	0.3	0.3	0.3	0.2	0.2	0.2		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.01	0.16	0.87	0.00		
54	100-42-5	Styrene	0.1	1.5	0.5	0.4	1.3	0.6	0.6	0.5		0.1	0.0		0.0	0.1	0.0	0.0	0.0	0.02	-0.07	0.05	0.00		
55	108-88-3	Toluene	0.1	340.5	301.0	331.9	300.4	301.5	293.1	293.3		17.0	15.0		16.6	15.0	15.1	14.7	14.7	16.14	0.02	0.37	0.00		
56	98-83-9	2-Phenylpropene																							
57	95-13-6	Indene																							
58	Esters	108-21-4	Acetic acid, 1-methylethyl																						
59		111-15-9	Acetic acid, 2-ethoxyethyl																						
60		123-86-4	Acetic acid, butyl ester																						
61		141-78-6	Acetic acid, ethyl ester				0.3			0.3					0.0			0.0							
62		80-62-6	Methyl methacrylate																						
63		103-09-3	2-Ethylhexyl acetate				0.3								0.0										
64		96-48-0	Butyrolactone																						
65		25265-77-4	Texanol																						
66		6846-50-0	TXIB																						

Table A. 34 (continued)

#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg m ⁻² h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	75-65-0	Propanol, 2-methyl-2-																				
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform			0.6	0.3	0.3	0.3	0.3	0.4	0.3		0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.03	0.08
84	124-48-1	Dibromochloromethane																				
85	75-09-2	Dichloromethane		11073.4	11881.0	12873.0	11994.8	11816.0	7048.9	11644.2		553.7	594.1	643.7	599.7	590.8	352.4	582.2	696.08	0.08	0.23	
86	127-18-4	Tetrachloroethylene																				
87	79-01-6	Trichloroethylene		0.1	4.1	0.6	0.4	2.6	0.3	2.9		0.2	0.0	0.0	0.1	0.0	0.1		0.01	-0.33	0.14	
88	79-34-5	1,1,2,2-Tetrachloroethane																				
89	108-87-2	Methylcyclohexane			0.6	0.4	0.6	0.6	0.5	0.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	-0.02	0.08	
90	110-82-7	Cyclohexane																				
91	1678-93-9	Cyclohexane, butyl-			3.4	2.4	2.2	1.8	2.0	1.6	1.7		0.2	0.1	0.1	0.1	0.1	0.1	0.13	0.10	0.85	
92	1678-91-7	Cyclohexane, ethyl-			1.1	0.9	1.0	1.0	0.9	0.9	0.9		0.1	0.0	0.1	0.0	0.0	0.0	0.05	-0.01	0.02	
93	1678-92-8	Cyclohexane, propyl-			2.4	1.7	1.7	1.5	1.4	1.5	1.6		0.1	0.1	0.1	0.1	0.1	0.1	0.09	0.04	0.49	
94	91-17-8	Decahydronaphthalene			2.0	1.4	1.0	0.9	1.0	1.0	1.0		0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.07	0.08	0.49
95	Terpenes	80-56-8	alpha-Pinene			0.3							0.0									
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		64-19-7	Acetic acid			1.7					1.3			0.1				0.1				
103	79-31-2	Isobutyric acid																				
104	107-92-6	Butyric acid																				
105	111-14-8	Heptanoic acid																				
106	149-57-5	2-Ethylhexanoic acid																				
107	142-62-1	Hexanoic acid																				
108	109-52-4	Pentanoic Acid																				
109	Other	3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117	75-56-9	Propylene oxide																				
118	106-99-0	1,3-Butadiene																				
119	0-00-0	TVOC		23.0	5344.7	5501.6	5407.5	5960.8	6059.9	4640.6	6153.5		266.1	273.9	269.2	296.9	301.8	230.9	306.5	272.98	-0.01	0.01
#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	0 h	1.4 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde		0.8	0.6	0.8	0.4	0.3	0.4	0.3				0.0							
D2		50-00-0	Formaldehyde																			
D3		123-38-6	Propanal																			

Table A. 35: Concentration & emission factor for PTR_14oC (paint remover tested at 14 °C)

				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol																			
6		108-95-2	Phenol																			
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																			
8		67-64-1	Acetone	0.4																		
9		98-86-2	Acetophenone																			
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	0.7																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23		Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																		
24	96-14-0		Pentane, 3-methyl-																			
25	540-84-1		2,2,4-Trimethylpentane																			
26	108-08-7		2,4-Dimethylpentane																			
27	124-18-5		Decane		16.4		19.4	26.6	19.7	21.7			0.8		1.0	1.3	1.0	1.1		1.00	-0.02	0.03
28	112-40-3		Dodecane																			
29	142-82-5		Heptane																			
30	544-76-3		Hexadecane																			
31	110-54-3		Hexane																			
32	111-84-2		Nonane																			
33	111-65-9		Octane																			
34	629-62-9		Pentadecane																			
35	629-59-4		Tetradecane																			
36	629-50-5		Tridecane																			
37	1120-21-4		Undecane																			
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-																			
39		611-14-3	Toluene, 2-ethyl-																			
40		620-14-4	Toluene, 3-ethyl-																			
41		622-96-8	Toluene, 4-ethyl-																			
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene			0.2	2.3	0.9	4.1	34.8	0.5			0.0	0.1	0.0	0.2	1.7	0.0	0.01	-0.66	0.26
44		526-73-8	Benzene, 1,2,3-trimethyl-																			
45		95-63-6	Benzene, 1,2,4-trimethyl-																			
46		95-47-6	Benzene, 1,2-dimethyl-																			
47		108-67-8	Benzene, 1,3,5-trimethyl-																			
48		108-38-3	Benzene, 1,3-dimethyl-					7.7		24.1						0.4		1.2				
49		98-82-8	Benzene, isopropyl																			
50		103-65-1	Benzene, propyl-																			
51		100-41-4	Ethylbenzene							7.1								0.4				
52		91-20-3	Naphthalene				5.4								0.3							
53		99-87-6	p-Cymene																			
54		100-42-5	Styrene	0.1																		
55	108-88-3	Toluene	0.2	336.8	427.8	419.6	466.5	437.8	573.3	356.1		16.8	21.4	21.0	23.3	21.9	28.7	17.8	21.28	-0.01	0.01	
56	98-83-9	2-Phenylpropene																				
57	95-13-6	Indene																				
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 35 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83	Cyclo Alkanes	67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane		26163.3	40531.4	37912.0	43965.0	42300.0	40901.7	42081.8		1308.2	2026.6	1895.6	2198.3	2115.0	2045.1	2104.1	1941.51	-0.02	0.29
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene																			
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane																			
90		110-82-7	Cyclohexane																			
91	Terpenes	1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95		80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99	Acids	13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115	DNP	121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	12.3	16854.8	26140.9	23184.1	28781.4	27320.0	28049.4	26628.4		842.1	1306.4	1158.6	1438.5	1365.4	1401.9	1330.8	1207.29	-0.03	0.33
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	3.4 h	6.3 h	24.4 h	48.4 h	72.4 h	96.4 h		0 h	3.4 h	6.3 h	24.4 h	48.4 h	72.4 h	96.4 h		a	b	R ²
D1	DNP	75-07-0	Acetaldehyde		1.0	1.7	1.9		1.2	0.8			0.0	0.0		0.0				0.08	0.45	0.82
D2		50-00-0	Formaldehyde					1.0	1.1	0.8						0.1	0.1	0.0		0.27	0.41	0.82
D3		123-38-6	Propanal																			

Table A. 36: Concentration & emission factor for PTR_30oC (paint remover tested at 30 °C)

				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h			
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²	
1	Alcohols	71-36-3	1-Butanol																				
2		71-23-8	1-Propanol																				
3		104-76-7	Hexanol, 2-ethyl-1-																				
4		67-63-0	2-Propanol																				
5		64-17-5	Ethanol																				
6		108-95-2	Phenol																				
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																				
8		67-64-1	Acetone																				
9		98-86-2	Acetophenone																				
10		108-94-1	Cyclohexanone																				
11		108-10-1	Methylisobutyl ketone																				
12		100-52-7	Benzaldehyde																				
13		123-72-8	Butanal																				
14		112-31-2	Decanal																				
15		3913-81-3	2-Decenal																				
16		98-01-1	Furfural																				
17		111-71-7	Heptanal																				
18		66-25-1	Hexanal																				
19		124-19-6	Nonanal																				
20		18829-56-6	2-Nonenal																				
21		2548-87-0	2-Octenal																				
22		110-62-3	Pentanal																				
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-																				
24		96-14-0	Pentane, 3-methyl-																				
25		540-84-1	2,2,4-Trimethylpentane																				
26		108-08-7	2,4-Dimethylpentane																				
27		124-18-5	Decane		42.0	80.1	70.8	78.6	78.0	67.4	153.0		2.1	4.0	3.5	3.9	3.9	3.4	7.6	3.19	-0.09	0.17	
28		112-40-3	Dodecane																				
29		142-82-5	Heptane								61.7								3.1				
30		544-76-3	Hexadecane																				
31		110-54-3	Hexane								240.9								12.0				
32		111-84-2	Nonane					36.4			64.0						1.8		3.2				
33		111-65-9	Octane																				
34		629-62-9	Pentadecane																				
35		629-59-4	Tetradecane																				
36		629-50-5	Tridecane																				
37		1120-21-4	Undecane																				
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet																				
39		611-14-3	Toluene, 2-ethyl-								25.1								1.3				
40		620-14-4	Toluene, 3-ethyl-								61.7								3.1				
41		622-96-8	Toluene, 4-ethyl-								38.5								1.9				
42		4994-16-5	Cyclohexene, 4-phenyl																				
43		71-43-2	Benzene			8.4		5.4		3.0	179.7			0.4		0.3		0.1	9.0	0.17	-0.40	0.12	
44		526-73-8	Benzene, 1,2,3-trimethyl-								40.5								2.0				
45		95-63-6	Benzene, 1,2,4-trimethyl-				35.3				201.4				1.8				10.1				
46		95-47-6	Benzene, 1,2-dimethyl-								50.6								2.5				
47		108-67-8	Benzene, 1,3,5-trimethyl-								39.7								2.0				
48		108-38-3	Benzene, 1,3-dimethyl-					18.5			126.0						0.9		6.3				
49		98-82-8	Benzene, isopropyl																				
50		103-65-1	Benzene, propyl-								13.5								0.7				
51		100-41-4	Ethylbenzene								23.5								1.2				
52		91-20-3	Naphthalene								27.6								1.4				
53		99-87-6	p-Cymene																				
54		100-42-5	Styrene																				
55	Esters	108-88-3	Toluene		4.6	813.5	1220.0	1321.3	1327.2	1376.8	1441.5	2118.4		40.4	60.8	65.8	66.1	68.6	71.8	105.7	52.75	-0.10	0.50
56		98-83-9	2-Phenylpropene																				
57		95-13-6	Indene																				
58		108-21-4	Acetic acid, 1-methylethyl																				
59		111-15-9	Acetic acid, 2-ethoxyethyl																				
60		123-86-4	Acetic acid, butyl ester																				
61		141-78-6	Acetic acid, ethyl ester																				
62		80-62-6	Methyl methacrylate																				
63		103-09-3	2-Ethylhexyl acetate																				
64		96-48-0	Butyrolactone																				
65		25265-77-4	Texanol																				
66		6846-50-0	TXIB																				

Table A. 36 (continued)

				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		Halo Carbons	71-55-6	1,1,1-Trichloroethane																		
77	95-50-1		1,2-Dichlorobenzene																			
78	107-06-2		1,2-Dichloroethane																			
79	78-87-5		1,2-Dichloropropane																			
80	106-46-7		1,4-Dichlorobenzene																			
81	75-27-4		Bromodichloromethane																			
82	56-23-5		Carbon tetrachloride																			
83	67-66-3		Chloroform																			
84	124-48-1		Dibromochloromethane																			
85	75-09-2		Dichloromethane		562062	499873	307701	225742	211422	202810	208268		28103	24994	15385	11287	10571	10140	10413	27176.8	0.24	0.87
86	Cyclo Alkanes	127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene																			
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane																			
90		110-82-7	Cyclohexane																			
91		1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-																			
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95		Terpenes	80-56-8	alpha-Pinene																		
96	99-86-5		alpha-Terpinene																			
97	127-91-3		beta-Pinene																			
98	99-85-4		gamma-Terpinene																			
99	13466-78-9		3-Carene																			
100	79-92-5		Camphene																			
101	Acids	5989-27-5	Limonene																			
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117	75-56-9	Propylene oxide																				
118	106-99-0	1,3-Butadiene																				
119	0-00-0	TVOC		230	50693	67392	82934	76012	80651	92934	102041		2523.2	3358.1	4135.2	3789.1	4021.0	4635.2	5090.5	3178.02	-0.08	0.64
				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1.4 h	3.3 h	6.3 h	24.3 h	48.3 h	72.3 h	96.3 h	0 h	1.4 h	3.3 h	6.3 h	24.3 h	48.3 h	72.3 h	96.3 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde		3.3	2.5	4.4	3.6	4.6	3.8	3.4			0.1	0.0	0.1	0.0	0.0	0.0	0.09	0.45	0.40
D2		50-00-0	Formaldehyde		0.9	2.6	2.0	1.5	1.4	1.4	0.8			0.1	0.1	0.0	0.0	0.0	0.0	0.04	0.07	0.05
D3		123-38-6	Propanal																			

Table A. 37: Concentration & emission factor for ADH12_4oC (adhesive tested at 4 °C)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg m ⁻² h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol		56.4	56.5	58.8	43.7	46.5	41.3	42.1		2.8	2.8	2.9	2.2	2.3	2.1	2.1	3.27	0.10	0.85
3		104-76-7	Hexanol, 2-ethyl-1-		0.3								0.0									
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol			46.3								2.3								
6		108-95-2	Phenol	0.3	0.2	0.4		0.3		0.7			0.0	0.0		0.0		0.0		0.00	-0.09	0.01
7	Aldehydes & ketones	78-93-3	Methylethyl ketone		4042.7	4313.4	4047.3	4984.0	4881.5	4741.5	4649.1		202.1	215.7	202.4	249.2	244.1	237.1	232.5	202.13	-0.04	0.52
8		67-64-1	Acetone	2.8	76.9	76.3	75.1	75.2	72.0	69.9	67.5		3.7	3.7	3.6	3.6	3.5	3.4	3.2	3.85	0.03	0.78
9		98-86-2	Acetophenone		0.3	0.2				0.4			0.0	0.0				0.0				
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	1.0	1.5	1.5	0.9	1.3	1.5	2.0	1.1		0.0	0.0		0.0	0.0	0.0	0.0	0.04	0.18	0.09
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural			1.6								0.1								
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal		0.7								0.0									
20	18829-56-6	2-Nonenal																				
21	2548-87-0	2-Octenal																				
22	110-62-3	Pentanal																				
23	Aliphatic hydrocarbons	107-83-5	Pentane, 2-methyl-		5.8	6.3	5.9	5.9	6.8	4.9	5.0		0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.34	0.05	0.30
24		96-14-0	Pentane, 3-methyl-		8.2	10.8	8.3	8.1	8.3	6.9	7.1		0.4	0.5	0.4	0.4	0.4	0.3	0.4	0.56	0.10	0.76
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		1.6	2.0	2.2	1.1	0.6	0.4			0.1	0.1	0.1	0.1	0.0	0.0		0.23	0.53	0.90
28		112-40-3	Dodecane			0.2								0.0								
29		142-82-5	Heptane	1955.4	2001.8	1891.0	2175.5	2144.1	2105.9	2071.3		97.8	100.1	94.5	108.8	107.2	105.3	103.6	95.61	-0.02	0.44	
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane	331.7	348.4	338.1	346.6	326.9	305.7	297.1		16.6	17.4	16.9	17.3	16.3	15.3	14.9	18.45	0.04	0.68	
32		111-84-2	Nonane		1.1	0.8	0.6	0.4					0.1	0.0	0.0	0.0			0.05	0.32	0.97	
33		111-65-9	Octane		85.6	81.9	72.8	75.2	74.7	75.2	73.5		4.3	4.1	3.6	3.8	3.7	3.8	3.7	3.98	0.02	0.32
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane		0.6	1.0	1.2	1.1	0.6				0.0	0.1	0.1	0.1	0.0			0.07	0.17	0.44
38		Aromatic hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet																		
39			611-14-3	Toluene, 2-ethyl-		0.1	0.2	0.1						0.0	0.0	0.0						
40	620-14-4		Toluene, 3-ethyl-		0.2	0.5	0.2						0.0	0.0	0.0							
41	622-96-8		Toluene, 4-ethyl-		0.1	0.3	0.1						0.0	0.0	0.0							
42	4994-16-5		Cyclohexene, 4-phenyl																			
43	71-43-2		Benzene		0.4	6.6	1.1	0.3	0.1	0.9	1.2		0.0	0.3	0.1	0.0	0.0	0.0	0.1	0.23	0.61	0.27
44	526-73-8		Benzene, 1,2,3-trimethyl-		0.2	0.3	0.2						0.0	0.0	0.0							
45	95-63-6		Benzene, 1,2,4-trimethyl-		0.4	0.9	0.4		0.2				0.0	0.0	0.0		0.0			0.07	0.50	0.94
46	95-47-6		Benzene, 1,2-dimethyl-		3.1	3.5	2.4	2.2	2.4	2.2	2.1		0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.17	0.11	0.68
47	108-67-8		Benzene, 1,3,5-trimethyl-		0.1	0.2	0.1						0.0	0.0	0.0							
48	108-38-3		Benzene, 1,3-dimethyl-		14.5	17.7	12.3	11.3	11.6	11.3	11.1		0.7	0.9	0.6	0.6	0.6	0.6	0.6	0.86	0.10	0.66
49	98-82-8		Benzene, isopropyl																			
50	103-65-1		Benzene, propyl-			0.1	0.2	0.1					0.0	0.0	0.0							
51	100-41-4		Ethylbenzene	0.1	4.2	4.9	3.5	3.2	3.3	3.2	3.1		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.23	0.10	0.65
52	91-20-3		Naphthalene	0.0	0.1	0.1	0.1	0.1	0.1	0.1			0.0	0.0	0.0	0.0	0.0			0.01	0.43	0.90
53	99-87-6		p-Cymene																			
54	100-42-5		Styrene	0.5	0.3	0.5	0.6	0.5	0.3	0.6	0.5			0.0	0.0	0.0		0.0	0.0	0.00	-0.31	0.18
55	108-88-3	Toluene	0.5	5.3	27.2	6.6	1.3	2.1	1.4	1.5		0.2	1.3	0.3	0.0	0.1	0.0	0.0	2.01	0.90	0.82	
56	98-83-9	2-Phenylpropene																				
57	95-13-6	Indene																				
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 37 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ³)								Emission factor (µg m ⁻² h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride		0.2								0.0									
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85	Cyclo Alkanes	75-09-2	Dichloromethane		520.9	121.0	138.0		0.8			26.0	6.1	6.9		0.0		96.38	1.94	0.93		
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene		4.6	2.0	1.2					0.2	0.1	0.1								
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		1695.2	1746.2	1623.9	1809.9	1786.2	1756.7	1717.3		84.8	87.3	81.2	90.5	89.3	87.8	85.9	84.26	-0.01	0.14
90		110-82-7	Cyclohexane		376.8	407.8	371.7	368.0	360.4	353.2	340.1		18.8	20.4	18.6	18.4	18.0	17.7	17.0	20.79	0.04	0.85
91		1678-93-9	Cyclohexane, butyl-			0.2								0.0								
92		1678-91-7	Cyclohexane, ethyl-		13.2	13.2	11.4	11.1	11.2	10.7	10.6		0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.66	0.05	0.77
93		1678-92-8	Cyclohexane, propyl-		0.2								0.0									
94	Terpenes	91-17-8	Decahydronaphthalene																			
95		80-56-8	alpha-Pinene		0.1							0.0										
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		Acids	64-19-7	Acetic acid																		
103	79-31-2		Isobutyric acid																			
104	107-92-6		Butyric acid																			
105	111-14-8		Heptanoic acid																			
106	149-57-5		2-Ethylhexanoic acid																			
107	142-62-1		Hexanoic acid																			
108	Other	109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117	A	75-56-9	Propylene oxide													</						

Table A. 38: Concentration & emission factor for ADH12_14oC (adhesive tested at 14 °C)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol																					
2		71-23-8	1-Propanol		57.0	75.7	61.0	68.2	61.0	67.1	65.0		2.9	3.8	3.0	3.4	3.0	3.4	3.2	3.56	0.02	0.17		
3		104-76-7	Hexanol, 2-ethyl-1-	0.3				0.3																
4		67-63-0	2-Propanol		1.1	0.9	0.9	1.1	1.0				0.1	0.0	0.0	0.1	0.0			0.04	-0.04	0.42		
5		64-17-5	Ethanol																					
6		108-95-2	Phenol		1.2	0.4	0.8	0.8					0.1	0.0	0.0	0.0				0.02	-0.29	0.59		
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.3	4397.9	3474.6	5120.1	5359.8	4821.7	5091.9	5000.3		219.9	173.7	256.0	268.0	241.1	254.6	250.0	190.38	-0.07	0.40		
8		67-64-1	Acetone	3.7	81.6	90.8	95.1	106.1	97.1	108.3	108.5		3.9	4.4	4.6	5.1	4.7	5.2	5.2	4.18	-0.05	0.72		
9		98-86-2	Acetophenone	0.2	0.4	0.2	0.4	0.5					0.0	0.0	0.0	0.0				0.00	-1.38	0.67		
10		108-94-1	Cyclohexanone																					
11		108-10-1	Methylisobutyl ketone																					
12		100-52-7	Benzaldehyde	1.6	2.1	0.9	2.1	3.0	1.2	1.5	1.6		0.0		0.0	0.1								
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17		111-71-7	Heptanal																					
18		66-25-1	Hexanal																					
19		124-19-6	Nonanal	1.1																				
20		18829-56-6	2-Nonenal																					
21		2548-87-0	2-Octenal																					
22		110-62-3	Pentanal																					
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		7.1	7.8	8.3	9.1	8.1	10.1	9.6		0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.37	-0.06	0.60		
24		96-14-0	Pentane, 3-methyl-		10.7	11.2	12.0	14.1	11.8	13.8	13.4		0.5	0.6	0.6	0.7	0.6	0.7	0.7	0.55	-0.05	0.46		
25		540-84-1	2,2,4-Trimethylpentane																					
26		108-08-7	2,4-Dimethylpentane																					
27		124-18-5	Decane		0.3								0.0											
28		112-40-3	Dodecane																					
29		142-82-5	Heptane		2060.4	1968.0	2418.1	2528.1	2313.4	2438.6	2348.1		103.0	98.4	120.9	126.4	115.7	121.9	117.4	103.98	-0.04	0.33		
30		544-76-3	Hexadecane																					
31		110-54-3	Hexane		373.9	428.8	437.6	477.3	434.3	506.2	489.4		18.7	21.4	21.9	23.9	21.7	25.3	24.5	20.52	-0.04	0.55		
32		111-84-2	Nonane																					
33		111-65-9	Octane		75.9	83.7	85.7	90.1	85.9	91.0	87.0		3.8	4.2	4.3	4.5	4.3	4.6	4.3	4.17	-0.01	0.40		
34		629-62-9	Pentadecane																					
35		629-59-4	Tetradecane																					
36		629-50-5	Tridecane																					
37		1120-21-4	Undecane																					
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-																					
39		611-14-3	Toluene, 2-ethyl-				0.0								0.0									
40		620-14-4	Toluene, 3-ethyl-		0.3	0.1		0.4					0.0	0.0		0.0								
41		622-96-8	Toluene, 4-ethyl-		0.2	0.0		0.2					0.0	0.0		0.0								
42		4994-16-5	Cyclohexene, 4-phenyl																					
43		71-43-2	Benzene	0.3																				
44		526-73-8	Benzene, 1,2,3-trimethyl-		0.2			0.2					0.0			0.0								
45		95-63-6	Benzene, 1,2,4-trimethyl-		0.9	0.2		1.1					0.0	0.0		0.1								
46		95-47-6	Benzene, 1,2-dimethyl-		2.9	2.9	2.8	3.2	2.8	3.0	2.9		0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.15	0.00	0.00		
47		108-67-8	Benzene, 1,3,5-trimethyl-		0.2	0.0		0.2					0.0	0.0		0.0								
48		108-38-3	Benzene, 1,3-dimethyl-		13.1	14.2	13.6	15.2	13.7	14.6	14.3		0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.70	-0.01	0.07		
49		98-82-8	Benzene, isopropyl																					
50		103-65-1	Benzene, propyl-			0.0		0.2							0.0		0.0							
51		100-41-4	Ethylbenzene		3.6	4.0	3.8	4.2	3.9	4.1	3.9		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	-0.01	0.08		
52		91-20-3	Naphthalene		0.1	0.1		0.2		0.2	0.2		0.0	0.0		0.0		0.0	0.0	0.00	-0.31	0.79		
53	99-87-6	p-Cymene																						
54	100-42-5	Styrene	0.5	0.5	0.3	0.7	1.0	0.5	0.4	0.5		0.0		0.0	0.0	0.0	0.0	0.0	0.08	0.93	0.23			
55	108-88-3	Toluene	0.7	2.1	1.3	1.9	1.9	1.5	1.3	1.3		0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.05	0.06	0.07			
56	98-83-9	2-Phenylpropene																						
57	95-13-6	Indene																						
58	Esters	108-21-4	Acetic acid, 1-methylethyl ester																					
59		111-15-9	Acetic acid, 2-ethoxyethyl ester																					
60		123-86-4	Acetic acid, butyl ester																					
61		141-78-6	Acetic acid, ethyl ester																					
62		80-62-6	Methyl methacrylate																					
63		103-09-3	2-Ethylhexyl acetate																					
64		96-48-0	Butyrolactone																					
65		25265-77-4	Texanol																					
66		6846-50-0	TXIB																					

Table A. 38 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83	Halo Carbons	67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane	12.2					1.1													
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene	2.7	3.8	0.6							0.1									
88	Cyclo Alkanes	79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		1787.1	1726.3	2097.2	2185.2	1997.6	2078.4	2006.5		89.4	86.3	104.9	109.3	99.9	103.9	100.3	91.71	-0.03	0.25
90		110-82-7	Cyclohexane		401.3	462.9	482.6	517.3	473.0	510.6	491.0		20.1	23.1	24.1	25.9	23.7	25.5	24.5	23.23	-0.02	0.29
91		1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-		11.4	12.8	12.6	13.7	12.6	13.2	12.8		0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.64	0.00	0.04
93	Terpenes	1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95		80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98	Terpenes	99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		Acids	64-19-7	Acetic acid																		
103	79-31-2		Isobutyric acid																			
104	107-92-6		Butyric acid																			
105	111-14-8		Heptanoic acid																			
106	149-57-5		2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112	Other	78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117	A	75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	38.4	7845.2	7904.9	9252.1	9658.4	8860.6	9342.6	9025.5		390.3	393.3	460.7	481.0	441.1	465.2	449.4	411.19	-0.03	0.30
A1		591-76-4	Hexane, 2-methyl-		288.3	319.8	347.2	367.9	339.0	358.5	343.5		14.4	16.0	17.4	18.4	17.0	17.9	17.2	16.35	-0.02	0.26
A2		589-34-4	Hexane, 3-methyl-		487.3	521.8	583.9	617.4	568.3	597.2	572.2		24.4	26.1	29.2	30.9	28.4	29.9	28.6	26.96	-0.02	0.27
A3	DMPH	1192-18-3	Cyclopentane, 1,2-dimethyl-		404.9	440.3	490.3	515.5	472.7	492.2	471.7		20.2	22.0	24.5	25.8	23.6	24.6	23.6	22.93	-0.01	0.15
A4		109-60-4	Propyl acetate		657.5	626.7	761.4	795.0	735.3	768.5	742.4		32.9	31.3	38.1	39.7	36.8	38.4	37.1	32.97	-0.04	0.35
#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
	ss			0 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		0 h	3.4 h	6.4 h	24.4 h	48.4 h	72.4 h	96.4 h		a	b	R ²
D1	DMPH	75-07-0	Acetaldehyde	1.5	1.8	1.5	1.1	1.1	1.8	1.0			0.0	0.0			0.0			0.00	-0.65	0.12
D2		50-00-0	Formaldehyde	0.2	0.4	0.0	0.0	1.0	0.7	0.7			0.0			0.0	0.0	0.0		0.26	-0.08	0.01
D3		123-38-6	Propanal																			

Table A. 39: Concentration & emission factor for ADH12_30oC (adhesive tested at 30 °C)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^b with t > 3 h		
				0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol																					
2		71-23-8	1-Propanol		100.89	120.34	122.56			125.40	126.81	105.97		5.04	6.02	6.13		6.27	6.34	5.30	6.22	0.01	0.07	
3		104-76-7	Hexanol, 2-ethyl-1-																					
4		67-63-0	2-Propanol																					
5		64-17-5	Ethanol																					
6		108-95-2	Phenol																					
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		11612.3	16506.2	17335.5	15943.0	14695.9	14730.1	14528.0		580.62	825.31	866.77	797.15	734.79	736.50	726.40	904.21	0.05	0.83		
8		67-64-1	Acetone		101.35	102.44	112.60	113.37	105.66	112.06	110.79		5.07	5.12	5.63	5.67	5.28	5.60	5.54	5.27	-0.01	0.16		
9		98-86-2	Acetophenone																					
10		108-94-1	Cyclohexanone																					
11		108-10-1	Methylisobutyl ketone																					
12		100-52-7	Benzaldehyde																					
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17		111-71-7	Heptanal																					
18		66-25-1	Hexanal																					
19		124-19-6	Nonanal																					
20	18829-56-6	2-Nonenal																						
21	2548-87-0	2-Octenal																						
22	110-62-3	Pentanal																						
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		9.72		6.65						0.49		0.33									
24		96-14-0	Pentane, 3-methyl-		16.38	19.52	17.79	17.77	17.69	18.78	16.27		0.82	0.98	0.89	0.89	0.88	0.94	0.81	0.97	0.03	0.36		
25		540-84-1	2,2,4-Trimethylpentane																					
26		108-08-7	2,4-Dimethylpentane																					
27		124-18-5	Decane																					
28		112-40-3	Dodecane																					
29		142-82-5	Heptane	4659.06	6897.18	7569.07	7210.49	6378.41	6042.03	6251.58		232.95	344.86	378.45	360.52	318.92	302.10	312.58	389.55	0.05	0.58			
30		544-76-3	Hexadecane																					
31		110-54-3	Hexane	876.42	1065.74	1064.15	1032.39	953.38	928.79	941.92		43.82	53.29	53.21	51.62	47.67	46.44	47.10	56.86	0.04	0.88			
32		111-84-2	Nonane																					
33		111-65-9	Octane		171.99	238.52	290.80	264.24	231.21	221.85	237.75		8.60	11.93	14.54	13.21	11.56	11.09	11.89	13.86	0.04	0.28		
34		629-62-9	Pentadecane																					
35		629-59-4	Tetradecane																					
36		629-50-5	Tridecane																					
37		1120-21-4	Undecane																					
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-																				
39			611-14-3	Toluene, 2-ethyl-				9.03		4.96						0.45		0.25						
40			620-14-4	Toluene, 3-ethyl-				12.60		8.15					0.51	0.63		0.41			0.66	0.11	0.55	
41	622-96-8		Toluene, 4-ethyl-			6.74	8.58		6.15					0.34	0.43		0.31			0.41	0.06	0.27		
42	4994-16-5		Cyclohexene, 4-phenyl																					
43	71-43-2		Benzene	1.95	0.03			2.39		16.77						0.02		0.74						
44	526-73-8		Benzene, 1,2,3-trimethyl-			9.26			6.27					0.46			0.31							
45	95-63-6		Benzene, 1,2,4-trimethyl-			44.59	45.05		30.45					2.23	2.25		1.52			2.76	0.15	0.93		
46	95-47-6		Benzene, 1,2-dimethyl-	6.96				13.22	15.80	11.01	10.35		0.35			0.66	0.79	0.55	0.52	1.38	0.20	0.40		
47	108-67-8		Benzene, 1,3,5-trimethyl-			9.39	11.70		7.12					0.47	0.59		0.36			0.62	0.13	0.58		
48	108-38-3		Benzene, 1,3-dimethyl-	31.07	57.01	67.85	50.11	55.54	46.19	45.12		1.55	2.85	3.39	2.51	2.78	2.31	2.26	3.46	0.08	0.61			
49	98-82-8		Benzene, isopropyl																					
50	103-65-1		Benzene, propyl-																					
51	100-41-4		Ethylbenzene	8.70	14.09	17.29	12.35	12.76	12.57	12.76		0.44	0.70	0.86	0.62	0.64	0.63	0.64	0.83	0.06	0.48			
52	Esters	91-20-3	Naphthalene		3.95		24.17	3.68	6.20					0.20		1.21	0.18	0.31		0.25	-0.10	0.03		
53		99-87-6	p-Cymene																					
54		100-42-5	Styrene																					
55		108-88-3	Toluene	5.01	4.08	13.60	17.23	21.29	12.01	60.84	6.02			0.43	0.61	0.81	0.35	2.79	0.05	0.76	0.15	0.03		
56		98-83-9	2-Phenylpropene																					
57		95-13-6	Indene																					
58		108-21-4	Acetic acid, 1-methylethyl																					
59		111-15-9	Acetic acid, 2-ethoxyethyl																					
60		123-86-4	Acetic acid, butyl ester																					
61		141-78-6	Acetic acid, ethyl ester																					
62		80-62-6	Methyl methacrylate																					
63		103-09-3	2-Ethylhexyl acetate																					
64		96-48-0	Butyrolactone																					
65		25265-77-4	Texanol																					
66		6846-50-0	TXIB																					

Table A. 39 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1.1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77	Halo Carbons	95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane					334.66								16.73						
86		127-18-4	Tetrachloroethylene																			
87	Cyclo Alkanes	79-01-6	Trichloroethylene																			
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		3974.6	5841.3	6070.7	6132.7	5471.3	5429.4	5173.5		198.73	292.07	303.53	306.63	273.57	271.47	258.67	317.77	0.04	0.55
90		110-82-7	Cyclohexane		760.6	975.6	973.8	956.1	877.8	855.2	854.9		38.03	48.78	48.69	47.80	43.89	42.76	42.74	52.18	0.04	0.85
91		1678-93-9	Cyclohexane, butyl-																			
92		1678-91-7	Cyclohexane, ethyl-		24.60	36.05	39.93	36.06	36.46	33.25	35.30		1.23	1.80	2.00	1.80	1.82	1.66	1.77	1.96	0.03	0.37
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene																			
95	Terpenes	80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102	Acids	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112	Other	78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	488	18923	27496	29021	28407	25309	24384	24418		921.73	1350.38	1426.64	1395.94	1241.03	1194.81	1196.49	1496.38	0.05	0.65
A1	DNPH	589-34-4	Hexane, 3-methyl-		1060.4	1500.3	1587.6	1604.0	1365.3	1337.6	1278.3		53.02	75.02	79.38	80.20	68.26	66.88	63.92	84.51	0.05	0.57
A2		1192-18-3	Cyclopentane, 1,2-dimethyl-		877.0	1236.3	1253.9	1296.6	1111.7	1105.0	1052.8		43.85	61.81	62.69	64.83	55.58	55.25	52.64	67.75	0.05	0.59
A3		109-60-4	Propyl acetate		1659.7	2272.1	2599.1	2297.5	2125.2	2017.9	2176.1		82.99	113.60	129.95	114.87	106.26	100.90	108.81	128.34	0.04	0.49
#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1.5 h	3.4 h	6.4 h	24.3 h	48.4 h	72.4 h	96.4 h	0 h	1.5 h	3.4 h	6.4 h	24.3 h	48.4 h	72.4 h	96.4 h	a	b	R ²
D1	DNPH	75-07-0	Acetaldehyde	1.9	7.0	4.3	3.7	47.8	46.0	32.0	38.2		0.3	0.1	0.1	2.3	2.2	1.5	1.8	0.03	-0.99	0.79
D2		50-00-0	Formaldehyde	0.9	3.9	4.8	4.7	4.5	3.6	2.4	3.8		0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.27	0.19	0.49
D3		123-38-6	Propanal		10.0	10.4	9.9	10.1	9.8	9.2	8.7		0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.55	0.04	0.66

Table A. 40: Concentration & emission factor for GC_4_14oC (gasoline container tested at 4 and 14 °C for 24 hours at each temperature in two cycles)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)																	
				14 °C					4 °C				14 °C				4 °C				
				0 h	1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h	
1	Alcohols	71-36-3	1-Butanol	0.9																	
2		71-23-8	1-Propanol																		
3		104-76-7	Hexanol, 2-ethyl-1-	0.8																	
4		67-63-0	2-Propanol																		
5		64-17-5	Ethanol		13988.3	18635.1	22441.1	22715.3	26038.3	19332.6	14318.0	10346.0	12878.2	15243.7	20463.2	24129.6	19379.0	20454.3	12992.6	10364.0	
6		108-95-2	Phenol																		
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.2																	
8		67-64-1	Acetone	0.6																	
9		98-86-2	Acetophenone																		
10		108-94-1	Cyclohexanone																		
11		108-10-1	Methylisobutyl ketone																		
12		100-52-7	Benzaldehyde																		
13		123-72-8	Butanal																		
14		112-31-2	Decanal																		
15		3913-81-3	2-Decenal																		
16		98-01-1	Furfural																		
17		111-71-7	Heptanal																		
18		66-25-1	Hexanal																		
19	124-19-6	Nonanal																			
20	18829-56-6	2-Nonenal																			
21	2548-87-0	2-Octenal																			
22	110-62-3	Pentanal																			
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		15087.3	24382.7	33417.1	31362.8	30472.1	21267.5	13939.1	12702.1	15313.5	25844.5	30344.0	32539.9	31030.8	22988.3	16176.6	12756.5	
24		96-14-0	Pentane, 3-methyl-		7995.0	13391.6	18362.1	17045.4	16805.8	11322.7	7623.9	6775.4	8134.8	14177.0	16822.0	17969.5	17253.0	12408.1	8724.9	6796.4	
25		540-84-1	2,2,4-Trimethylpentane		3364.1	6894.9	8165.8	9152.7	8792.3	5578.0	3413.6	2799.0	3542.8	6609.0	8562.5	9778.4	9217.5	6645.9	3389.4	2951.2	
26		108-08-7	2,4-Dimethylpentane																		
27		124-18-5	Decane	0.2	349.2	456.0	593.8	762.5	807.7	545.0	296.8	410.6	349.0	544.0	863.7	1089.3	987.0	692.7	422.2	363.1	
28		112-40-3	Dodecane						76.5						73.6	53.7	48.2	44.5	47.1		
29		142-82-5	Heptane		11126.0	16064.9	20318.4	20707.1	20479.0	14709.9	9806.4	9179.3	10347.1	16211.0	20807.9	22952.2	22164.3	17235.5	10564.2	9561.4	
30		544-76-3	Hexadecane																		
31		110-54-3	Hexane		1.1E+05	1.7E+05	2.1E+05	1.9E+05	2.0E+05	1.5E+05	1.1E+05	9.4E+04	1.1E+05	1.7E+05	2.0E+05	2.1E+05	1.9E+05	1.6E+05	1.2E+05	9.5E+04	
32		111-84-2	Nonane		1121.6	1575.8	2215.7	2333.4	2421.2	1752.8	990.6	1045.1	1056.7	1815.5	2578.6	3012.8	2901.9	2071.8	1316.9	1163.4	
33		111-65-9	Octane		3163.8	4281.9	6037.9	6165.5	6162.1	4399.2	2812.4	2759.1	2895.2	4747.5	6467.4	7300.1	7097.9	5117.5	3264.7	2999.2	
34		629-62-9	Pentadecane																		
35		629-59-4	Tetradecane																		
36		629-50-5	Tridecane																		
37		1120-21-4	Undecane		83.9	110.7	132.1	171.5	248.9	125.3	83.4	92.9	82.2	133.8	197.2	261.5	267.5	174.7	114.2	89.6	
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet	0.2	247.9	350.9	450.7	452.6	562.6	385.2	220.6	219.5	254.8	454.4	625.7	690.1	699.9	500.8	322.0	290.7
39			611-14-3	Toluene, 2-ethyl-	0.4	1930.6	2594.7	3125.8	3082.7	3356.2	2308.1	1462.7	1548.9	1779.2	2849.8	3587.2	3886.8	3820.2	2717.5	1806.9	1762.4
40			620-14-4	Toluene, 3-ethyl-	1.2	7709.9	9936.2	11807.5	11022.4	12916.1	9210.2	5465.1	6191.9	7085.3	11035.7	13562.8	14865.5	14586.8	10569.1	7152.2	7195.6
41			622-96-8	Toluene, 4-ethyl-	1.2	5223.8	6421.1	7538.6	6796.5	8527.7	6199.3	3693.4	4237.2	4739.9	7157.5	8920.0	9687.2	9633.0	7362.6	4858.1	4934.8
42	4994-16-5		Cyclohexene, 4-phenyl																		
43	71-43-2		Benzene		9810.8	12841.8	15411.5	14265.4	15706.1	11675.1	9179.4	8010.6	9281.0	12097.0	14241.5	15840.1	15240.8	13397.7	9461.8	8084.6	
44	526-73-8		Benzene, 1,2,3-trimethyl-	0.7	1823.4	2539.0	3074.6	3205.3	3393.7	2373.8	1491.4	1492.2	1763.6	2853.0	3735.0	4027.5	4029.2	2801.6	1859.3	1741.7	
45	95-63-6		Benzene, 1,2,4-trimethyl-	4.2	12355.4	16311.0	19625.2	19220.0	21659.6	15668.1	9467.6	10117.9	11666.1	18384.0	23555.2	25340.9	24943.4	18309.8	12137.3	11751.2	
46	95-47-6		Benzene, 1,2-dimethyl-	0.5	7826.9	10194.9	12485.7	11833.5	12853.1	9097.5	6154.5	6386.5	7053.0	10885.1	13283.7	14662.8	14511.2	10485.9	7331.6	6950.6	
47	108-67-8		Benzene, 1,3,5-trimethyl-	0.6	2634.4	3772.0	4569.4	4614.1	4885.1	3403.9	2094.7	2170.3	2506.7	4172.0	5313.6	5824.9	5725.9	4028.0	2620.3	2512.5	
48	108-38-3		Benzene, 1,3-dimethyl-	1.0	24133.6	30506.1	36736.0	33863.8	37765.3	27670.5	18731.6	19951.8	21459.4	32214.0	38731.1	43029.0	41595.3	32166.1	22296.1	21631.5	
49	98-82-8		Benzene, isopropyl	0.0	264.3	368.9	462.4	434.7	463.9	309.0	205.5	212.9	244.9	397.6	494.1	536.4	536.4	375.7	254.8	244.2	
50	103-65-1		Benzene, propyl-	0.4	1675.0	2120.3	2530.4	2297.0	2804.9	1989.3	1172.5	1357.7	1516.7	2351.5	2901.5	3185.6	3116.9	2314.3	1550.0	1578.6	
51	100-41-4		Ethylbenzene	0.2	5927.9	7394.5	8924.5	8236.4	9203.8	6665.6	4507.9	4838.4	5217.7	7731.5	9269.8	10429.6	10222.2	7751.0	5306.9	5247.3	
52	91-20-3		Naphthalene	1.4	526.9	616.3	796.1	767.4	1100.1	845.8	491.2	505.5	627.7	882.2	1086.5	1246.7	1345.3	1073.5	751.1	696.9	
53	99-87-6		p-Cymene	0.0	35.4	49.4	75.4	68.4	77.9	48.2	26.8	32.0	33.1	60.8	78.5	87.6	85.0	55.8	36.7	37.2	
54	100-42-5	Styrene	0.1																		
55	108-88-3	Toluene	0.5	54002.1	66067.6	74074.9	74178.5	73852.6	59176.4	45066.7	43870.6	48171.9	64185.1	73277.9	77919.4	61912.4	67993.1	44990.4	44448.5		
56	98-83-9	2-Phenylpropene																			
57	95-13-6	Indene																			
58	Esters	108-21-4	Acetic acid, 1-methylethyl																		
59		111-15-9	Acetic acid, 2-ethoxyethyl																		
60		123-86-4	Acetic acid, butyl ester																		
61		141-78-6	Acetic acid, ethyl ester																		
62		80-62-6	Methyl methacrylate																		
63		103-09-3	2-Ethylhexyl acetate																		
64		96-48-0	Butyrolactone																		
65		25265-77-4	Texanol																		
66		6846-50-0	TXIB				35.5														

Table A. 40 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)																	
				0 h	23 °C					30 °C				23 °C				30 °C			
					1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h	
67	Glycols, Glycol Ethers	57-55-6	1,2-Propanediol																		
68		110-49-6	2-Methoxyethylacetate																		
69		111-90-0	Diethylene glycol monoethyl ether																		
70		107-98-2	Propanol, 1-methoxy-2-methyl-																		
71		111-76-2	Ethanol, 2-butoxy-																		
72		112-34-5	Ethanol, 2-butoxyethoxy-																		
73		110-80-5	Ethanol, 2-ethoxy-																		
74		109-86-4	Ethanol, 2-methoxy-																		
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																		
76		71-55-6	1,1,1-Trichloroethane																		
77		95-50-1	1,2-Dichlorobenzene																		
78		107-06-2	1,2-Dichloroethane																		
79		78-87-5	1,2-Dichloropropane																		
80		106-46-7	1,4-Dichlorobenzene																		
81		75-27-4	Bromodichloromethane																		
82		56-23-5	Carbon tetrachloride																		
83		67-66-3	Chloroform																		
84		124-48-1	Dibromochloromethane																		
85		75-09-2	Dichloromethane																		
86		127-18-4	Tetrachloroethylene																		
87		79-01-6	Trichloroethylene	0.2																	
88		79-34-5	1,1,2,2-Tetrachloroethane																		
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		2919.1	5332.0	6383.8	6823.8	6567.6	4160.0	2715.7	2456.3	2968.9	5303.4	6605.4	7187.3	6949.3	4882.6	2854.6	2494.5	
90		110-82-7	Cyclohexane		2294.4	4077.1	5006.6	4738.3	4921.9	3071.8	2063.5	1872.5	2297.1	4149.0	4918.5	5296.8	5095.3	3455.3	2291.5	1894.8	
91		1678-93-9	Cyclohexane, butyl-		22.9	34.0	47.5	65.6	50.6	39.8	22.6	28.4	25.5	37.9	49.5	71.7	65.2	49.1	30.3	22.1	
92		1678-91-7	Cyclohexane, ethyl-		401.5	720.5	929.2	994.1	970.1	616.4	400.5	365.9	411.2	761.3	987.9	1105.8	1062.8	735.7	418.6	378.8	
93		1678-92-8	Cyclohexane, propyl-		92.1	149.3	188.5	236.2	199.2	151.4	90.6	86.0	90.2	173.1	230.2	251.8	262.0	183.2	104.1	96.1	
94	Terpenes	91-17-8	Decahydronaphthalene			28.0	36.0	33.6	38.1	27.2				21.1	28.9	43.5	38.1	26.4	9.7		
95		80-56-8	alpha-Pinene																		
96		99-86-5	alpha-Terpinene																		
97		127-91-3	beta-Pinene																		
98		99-85-4	gamma-Terpinene																		
99		13466-78-9	3-Carene																		
100		79-92-5	Camphene																		
101	5989-27-5	Limonene																			
102	Acids	64-19-7	Acetic acid																		
103		79-31-2	Isobutyric acid																		
104		107-92-6	Butyric acid																		
105		111-14-8	Heptanoic acid																		
106		149-57-5	2-Ethylhexanoic acid																		
107		142-62-1	Hexanoic acid																		
108	109-52-4	Pentanoic Acid																			
109	Other	3777-69-3	Furan, 2-pentyl																		
110		872-50-4	2-Pyrrolidinone, 1-methyl-																		
111		123-91-1	1,4-Dioxane																		
112		78-40-0	Triethyl phosphate																		
113		142-96-1	n-Butyl ether																		
114		96-29-7	2-Butanone oxime																		
115		121-44-8	Triethylamine																		
116		75-21-8	Ethylene oxide																		
117		75-56-9	Propylene oxide																		
118		106-99-0	1,3-Butadiene																		
119	0-00-0	TVOC		31.7	3.2E+05	4.4E+05	5.5E+05	5.6E+05	5.5E+05	3.9E+05	2.8E+05	2.7E+05	3.1E+05	4.6E+05	5.5E+05	5.9E+05	5.6E+05	4.4E+05	3.0E+05	2.7E+05	
A1	78-78-4	Butane, 2-methyl-		15516.1	23177.6	29175.4	30423.3	27544.0	20170.5	14394.8	13475.2	15187.8	24434.2	28739.7	29391.6	27555.0	21250.1	12291.0	13009.8		
A2	109-66-0	Pentane		18098.8	23931.6	31428.4	32015.4	30334.3	23783.6	17576.4	14909.1	19017.5	23664.9	28662.3	29054.1	25860.9	23544.3	14088.4	15059.9		

Table A. 40 (continued)

#	Class	CAS #	Compound	Emission factor (µg h ⁻¹)																
				14 °C					4 °C				14 °C				4 °C			
				0 h	1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h
1	Alcohols	71-36-3	1-Butanol																	
2		71-23-8	1-Propanol																	
3		104-76-7	Hexanol, 2-ethyl-1-																	
4		67-63-0	2-Propanol																	
5		64-17-5	Ethanol		699.4	931.8	1122.1	1135.8	1301.9	966.6	715.9	517.3	643.9	762.2	1023.2	1206.5	968.9	1022.7	649.6	518.2
6		108-95-2	Phenol																	
7	Aldehydes & ketones	78-93-3	Methylethyl ketone																	
8		67-64-1	Acetone																	
9		98-86-2	Acetophenone																	
10		108-94-1	Cyclohexanone																	
11		108-10-1	Methylisobutyl ketone																	
12		100-52-7	Benzaldehyde																	
13		123-72-8	Butanal																	
14		112-31-2	Decanal																	
15		3913-81-3	2-Decenal																	
16		98-01-1	Furfural																	
17		111-71-7	Heptanal																	
18		66-25-1	Hexanal																	
19	124-19-6	Nonanal																		
20	18829-56-6	2-Nonenal																		
21	2548-87-0	2-Octenal																		
22	110-62-3	Pentanal																		
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		754.4	1219.1	1670.9	1568.1	1523.6	1063.4	697.0	635.1	765.7	1292.2	1517.2	1627.0	1551.5	1149.4	808.8	637.8
24		96-14-0	Pentane, 3-methyl-		399.8	669.6	918.1	852.3	840.3	566.1	381.2	338.8	406.7	708.8	841.1	898.5	862.6	620.4	436.2	339.8
25		540-84-1	2,2,4-Trimethylpentane		168.2	344.7	408.3	457.6	439.6	278.9	170.7	140.0	177.1	330.4	428.1	488.9	460.9	332.3	169.5	147.6
26		108-08-7	2,4-Dimethylpentane																	
27		124-18-5	Decane		17.5	22.8	29.7	38.1	40.4	27.2	14.8	20.5	17.4	27.2	43.2	54.5	49.3	34.6	21.1	18.1
28		112-40-3	Dodecane						3.8						3.7	2.7	2.4	2.2	2.4	
29		142-82-5	Heptane		556.3	803.2	1015.9	1035.4	1024.0	735.5	490.3	459.0	517.4	810.6	1040.4	1147.6	1108.2	861.8	528.2	478.1
30		544-76-3	Hexadecane																	
31		110-54-3	Hexane		5673.0	8323.8	10562.3	9686.3	10193.2	7496.3	5370.6	4677.3	5611.1	8258.0	9871.9	10411.5	9629.4	8109.3	5814.3	4757.8
32		111-84-2	Nonane		56.1	78.8	110.8	116.7	121.1	87.6	49.5	52.3	52.8	90.8	128.9	150.6	145.1	103.6	65.8	58.2
33		111-65-9	Octane		158.2	214.1	301.9	308.3	308.1	220.0	140.6	138.0	144.8	237.4	323.4	365.0	354.9	255.9	163.2	150.0
34		629-62-9	Pentadecane																	
35		629-59-4	Tetradecane																	
36		629-50-5	Tridecane																	
37		1120-21-4	Undecane		4.2	5.5	6.6	8.6	12.4	6.3	4.2	4.6	4.1	6.7	9.9	13.1	13.4	8.7	5.7	4.5
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		12.4	17.5	22.5	22.6	28.1	19.3	11.0	11.0	12.7	22.7	31.3	34.5	35.0	25.0	16.1	14.5
39		611-14-3	Toluene, 2-ethyl-		96.5	129.7	156.3	154.1	167.8	115.4	73.1	77.4	88.9	142.5	179.3	194.3	191.0	135.9	90.3	88.1
40		620-14-4	Toluene, 3-ethyl-		385.4	496.7	590.3	551.1	645.7	460.4	273.2	309.5	354.2	551.7	678.1	743.2	729.3	528.4	357.5	359.7
41		622-96-8	Toluene, 4-ethyl-		261.1	321.0	376.9	339.8	426.3	309.9	184.6	211.8	236.9	357.8	445.9	484.3	481.6	368.1	242.8	246.7
42		4994-16-5	Cyclohexene, 4-phenyl																	
43		71-43-2	Benzene		490.5	642.1	770.6	713.3	785.3	583.8	459.0	400.5	464.0	604.8	712.1	792.0	762.0	669.9	473.1	404.2
44		526-73-8	Benzene, 1,2,3-trimethyl-		91.1	126.9	153.7	160.2	169.6	118.7	74.5	74.6	88.1	142.6	186.7	201.3	201.4	140.0	92.9	87.0
45		95-63-6	Benzene, 1,2,4-trimethyl-		617.6	815.3	981.1	960.8	1082.8	783.2	473.2	505.7	583.1	919.0	1177.6	1266.8	1247.0	915.3	606.7	587.3
46		95-47-6	Benzene, 1,2-dimethyl-		391.3	509.7	624.3	591.7	642.6	454.8	307.7	319.3	352.6	544.2	664.2	733.1	725.5	524.3	366.6	347.5
47		108-67-8	Benzene, 1,3,5-trimethyl-		131.7	188.6	228.4	230.7	244.2	170.2	104.7	108.5	125.3	208.6	265.6	291.2	286.3	201.4	131.0	125.6
48		108-38-3	Benzene, 1,3-dimethyl-		1206.6	1525.3	1836.7	1693.1	1888.2	1383.5	936.5	997.5	1072.9	1610.6	1936.5	2151.4	2079.7	1608.3	1114.8	1081.5
49		98-82-8	Benzene, isopropyl		13.2	18.4	23.1	21.7	23.2	15.4	10.3	10.6	12.2	19.9	24.7	26.8	26.8	18.8	12.7	12.2
50		103-65-1	Benzene, propyl-		83.7	106.0	126.5	114.8	140.2	99.4	58.6	67.9	75.8	117.6	145.1	159.3	155.8	115.7	77.5	78.9
51		100-41-4	Ethylbenzene		296.4	369.7	446.2	411.8	460.2	333.3	225.4	241.9	260.9	386.6	463.5	521.5	511.1	387.5	265.3	262.4
52		91-20-3	Naphthalene		26.3	30.7	39.7	38.3	54.9	42.2	24.5	25.2	31.3	44.0	54.3	62.3	67.2	53.6	37.5	34.8
53		99-87-6	p-Cymene		1.8	2.5	3.8	3.4	3.9	2.4	1.3	1.6	1.7	3.0	3.9	4.4	4.2	2.8	1.8	1.9
54		100-42-5	Styrene																	
55		108-88-3	Toluene		2700.1	3303.4	3703.7	3708.9	3692.6	2958.8	2253.3	2193.5	2408.6	3209.2	3663.9	3895.9	3095.6	3399.6	2249.5	2222.4
56	98-83-9	2-Phenylpropene																		
57	95-13-6	Indene																		
58	Esters	108-21-4	Acetic acid, 1-methylethyl																	
59		111-15-9	Acetic acid, 2-ethoxyethyl																	
60		123-86-4	Acetic acid, butyl ester																	
61		141-78-6	Acetic acid, ethyl ester																	
62		80-62-6	Methyl methacrylate																	
63		103-09-3	2-Ethylhexyl acetate																	
64		96-48-0	Butyrolactone																	
65		25265-77-4	Texanol																	
66		6846-50-0	TXIB				1.8													

Table A. 40 (continued)

#	Class	CAS #	Compound	Emission factor (µg h ⁻¹)																
				0 h	23 °C				30 °C				23 °C				30 °C			
					1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																	
68		110-49-6	2-Methoxyethylacetate																	
69		111-90-0	Diethylene glycol monoeth																	
70		107-98-2	Propanol, 1-methoxy-2-																	
71		111-76-2	Ethanol, 2-butoxy-																	
72		112-34-5	Ethanol, 2-butoxyethoxy-																	
73		110-80-5	Ethanol, 2-ethoxy-																	
74		109-86-4	Ethanol, 2-methoxy-																	
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																	
76		71-55-6	1,1,1-Trichloroethane																	
77		95-50-1	1,2-Dichlorobenzene																	
78		107-06-2	1,2-Dichloroethane																	
79		78-87-5	1,2-Dichloropropane																	
80		106-46-7	1,4-Dichlorobenzene																	
81		75-27-4	Bromodichloromethane																	
82		56-23-5	Carbon tetrachloride																	
83		67-66-3	Chloroform																	
84		124-48-1	Dibromochloromethane																	
85		75-09-2	Dichloromethane																	
86		127-18-4	Tetrachloroethylene																	
87		79-01-6	Trichloroethylene																	
88		79-34-5	1,1,2,2-Tetrachloroethane																	
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		146.0	266.6	319.2	341.2	328.4	208.0	135.8	122.8	148.4	265.2	330.3	359.4	347.5	244.1	142.7	124.7
90		110-82-7	Cyclohexane		114.7	203.9	250.3	236.9	246.1	153.6	103.2	93.6	114.9	207.4	245.9	264.8	254.8	172.8	114.6	94.7
91		1678-93-9	Cyclohexane, butyl-		1.1	1.7	2.4	3.3	2.5	2.0	1.1	1.4	1.3	1.9	2.5	3.6	3.3	2.5	1.5	1.1
92		1678-91-7	Cyclohexane, ethyl-		20.1	36.0	46.5	49.7	48.5	30.8	20.0	18.3	20.6	38.1	49.4	55.3	53.1	36.8	20.9	18.9
93		1678-92-8	Cyclohexane, propyl-		4.6	7.5	9.4	11.8	10.0	7.6	4.5	4.3	4.5	8.7	11.5	12.6	13.1	9.2	5.2	4.8
94	Terpenes	91-17-8	Decahydronaphthalene			1.4	1.8	1.7	1.9	1.4				1.1	1.4	2.2	1.9	1.3	0.5	
95		80-56-8	alpha-Pinene																	
96		99-86-5	alpha-Terpinene																	
97		127-91-3	beta-Pinene																	
98		99-85-4	gamma-Terpinene																	
99		13466-78-9	3-Carene																	
100		79-92-5	Camphene																	
101		5989-27-5	Limonene																	
102	Acids	64-19-7	Acetic acid																	
103		79-31-2	Isobutyric acid																	
104		107-92-6	Butyric acid																	
105		111-14-8	Heptanoic acid																	
106		149-57-5	2-Ethylhexanoic acid																	
107		142-62-1	Hexanoic acid																	
108	Other	109-52-4	Pentanoic Acid																	
109		3777-69-3	Furan, 2-pentyl																	
110		872-50-4	2-Pyrrolidinone, 1-methyl																	
111		123-91-1	1,4-Dioxane																	
112		78-40-0	Triethyl phosphate																	
113		142-96-1	n-Butyl ether																	
114		96-29-7	2-Butanone oxime																	
115		121-44-8	Triethylamine																	
116		75-21-8	Ethylene oxide																	
117		75-56-9	Propylene oxide																	
118		106-99-0	1,3-Butadiene																	
119		0-00-0	TVOC		16073.6	21965.5	27576.0	27839.7	27546.2	19570.8	14053.0	13321.8	15316.4	23075.7	27249.8	29574.2	27825.9	21975.2	15137.2	13742.4
A1		78-78-4	Butane, 2-methyl-		775.8	1158.9	1458.8	1521.2	1377.2	1008.5	719.7	673.8	759.4	1221.7	1437.0	1469.6	1377.7	1062.5	614.6	650.5
A2		109-66-0	Pentane		904.9	1196.6	1571.4	1600.8	1516.7	1189.2	878.8	745.5	950.9	1183.2	1433.1	1452.7	1293.0	1177.2	704.4	753.0

Table A. 41: Concentration & emission factor for GC_23_30oC (gasoline container tested at 23 and 30 °C for 24 hours at each temperature in two cycles)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)																
				23 °C					30 °C				23 °C				30 °C			
				0 h	1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h
1	Alcohols	71-36-3	1-Butanol	1.1																
2		71-23-8	1-Propanol																	
3		104-76-7	Hexanol, 2-ethyl-1-	6.3																
4		67-63-0	2-Propanol																	
5		64-17-5	Ethanol		14434.4	45013.2	33330.2	34243.3	40191.8	43208.5	59338.2	58008.2	50750.4	44473.8	37554.7	35696.5	34722.2	44011.1	42741.7	78410.0
6		108-95-2	Phenol	0.3																
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.9																
8		67-64-1	Acetone	0.8																
9		98-86-2	Acetophenone	0.1																
10		108-94-1	Cyclohexanone																	
11		108-10-1	Methylisobutyl ketone																	
12		100-52-7	Benzaldehyde	0.8																
13		123-72-8	Butanal	0.4																
14		112-31-2	Decanal																	
15		3913-81-3	2-Decenal																	
16		98-01-1	Furfural																	
17		111-71-7	Heptanal																	
18		66-25-1	Hexanal	0.5																
19		124-19-6	Nonanal	0.6																
20		18829-56-6	2-Nonenal																	
21	2548-87-0	2-Octenal																		
22	110-62-3	Pentanal	0.4																	
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		29687.9	47198.7	44316.2	39561.8	39799.0	44760.4	58990.4	54268.4	51657.3	41249.1	34884.7	34133.1	33120.0	41807.3	45380.3	58656.6
24		96-14-0	Pentane, 3-methyl-		16811.4	26552.5	25123.1	22176.6	22092.2	24863.7	33339.9	30092.4	28760.2	22908.5	19457.0	18676.6	18141.7	23069.8	25406.6	31748.9
25		540-84-1	2,2,4-Trimethylpentane		10218.9	17339.4	14973.0	14605.5	14206.1	16300.1	21506.3	20673.7	18798.6	14756.2	11899.0	11367.7	10925.5	13365.0	15341.3	21239.6
26		108-08-7	2,4-Dimethylpentane																	
27		124-18-5	Decane	7.8	947.7	1376.5	1131.8	1400.5	1513.7	1504.5	2278.1	2128.3	2236.3	1628.6	1006.4	1186.3	1178.9	1847.2	1894.0	1952.4
28		112-40-3	Dodecane	3.5	60.7	96.9	77.6	96.9			224.8		248.9	172.5	151.5	98.6	116.2	227.8	217.6	
29		142-82-5	Heptane		19188.4	33706.2	27159.4	28183.2	27889.4	29263.6	40832.4	36864.0	36453.7	27643.9	21961.1	24211.1	22516.6	29259.1	32762.8	42362.1
30		544-76-3	Hexadecane																	
31		110-54-3	Hexane	0.5	1.6E+05	2.8E+05	2.6E+05	2.4E+05	2.5E+05	2.7E+05	3.5E+05	3.3E+05	3.1E+05	2.5E+05	2.1E+05	2.2E+05	2.1E+05	2.6E+05	2.8E+05	3.7E+05
32		111-84-2	Nonane	0.9	2489.1	4191.9	3395.8	3869.5	3893.2	4429.2	6322.8	5512.2	5736.1	4005.4	2935.6	3332.1	3150.9	4724.0	5077.0	5330.1
33		111-65-9	Octane		5974.1	10447.8	8726.2	9114.4	9035.8	9985.9	14091.3	12463.1	12382.7	9083.6	7070.3	7902.8	7535.7	10321.8	11559.6	12599.4
34		629-62-9	Pentadecane																	
35		629-59-4	Tetradecane																	
36		629-50-5	Tridecane																	
37		1120-21-4	Undecane	6.1	244.4	373.3	279.8	394.6	453.1	405.5	775.4	685.3	757.2	558.4	383.4	363.0	364.0	694.1	651.0	534.3
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	0.1	702.5	1001.8	813.0	991.1	1151.6	1105.3	1707.9	1522.2	1703.4	1274.8	926.7	890.1	891.1	1456.6	1398.6	1324.0
39		611-14-3	Toluene, 2-ethyl-	0.0	3894.6	5736.3	4535.5	5055.6	5286.7	5561.8	7992.4	6936.1	7501.6	5640.7	4202.1	4417.2	4321.8	6104.0	6395.5	6680.5
40		620-14-4	Toluene, 3-ethyl-	0.1	13484.2	21383.2	16531.9	18604.5	20004.3	20299.2	29419.9	25769.9	28017.1	21388.0	15651.2	16954.3	16249.0	23712.8	24253.2	24577.7
41		622-96-8	Toluene, 4-ethyl-	0.0	8329.6	13318.4	10215.0	12083.7	13158.7	12986.4	19177.9	16381.4	18236.6	14151.9	10363.3	11092.7	10766.4	15511.2	15832.2	15770.4
42		4994-16-5	Cyclohexene, 4-phenyl																	
43		71-43-2	Benzene	0.6	14047.0	22443.7	19613.9	18823.5	18604.1	19483.9	27009.1	24833.4	24047.1	19319.0	15743.1	16806.0	15495.8	19450.5	21016.5	28511.4
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.1	4155.3	5848.5	4752.0	5409.9	5795.0	5982.1	8777.6	7685.6	8416.5	6336.9	4648.2	4721.6	4697.1	6707.6	6962.2	7296.6
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.2	23365.8	35427.9	28058.5	32578.3	36064.1	36322.2	52727.2	46314.9	50086.0	38137.7	27925.7	29498.8	29198.2	42055.2	43007.5	44283.7
46		95-47-6	Benzene, 1,2-dimethyl-	0.3	13585.6	21543.9	17327.5	18551.6	18898.0	20063.2	28166.6	24722.8	25493.2	19610.7	15125.7	16173.7	15652.9	21037.0	22861.6	24087.5
47		108-67-8	Benzene, 1,3,5-trimethyl-	0.0	5751.8	8471.3	6835.0	7682.0	8089.8	8481.3	12203.0	10631.8	11451.2	8546.1	6596.7	6679.2	6482.5	9191.4	9704.5	10150.1
48		108-38-3	Benzene, 1,3-dimethyl-	0.5	35260.7	59431.1	47904.7	51840.7	54259.2	55411.8	77536.5	68987.8	70780.9	55659.7	42425.0	46783.6	45220.0	60443.9	64906.6	67609.4
49		98-82-8	Benzene, isopropyl-		546.7	834.3	654.5	700.8	696.6	759.1	1069.5	924.1	975.4	732.6	571.8	606.2	573.9	790.1	854.0	886.5
50		103-65-1	Benzene, propyl-		2865.2	4553.0	3512.4	3953.1	4203.6	4232.5	6203.8	5353.9	5865.1	4503.4	3312.4	3592.9	3401.7	4956.4	5110.8	5108.6
51		100-41-4	Ethylbenzene	0.1	9112.5	14985.2	11975.4	12742.3	12878.8	13215.1	18747.5	16530.1	17075.1	13442.7	10279.8	11382.8	10695.0	14385.1	15587.6	16198.8
52		91-20-3	Naphthalene	0.7	970.9	1451.5	1199.5	1487.4	2213.5	1844.8	3189.1	2963.5	3338.9	2732.8	2016.2	1797.1	1813.2	3248.7	2886.8	2442.7
53		99-87-6	p-Cymene		83.2	126.1	106.1	118.3	115.5	120.6	171.2	161.7	185.2	126.0	89.1	101.3	86.7	130.0	134.0	137.0
54		100-42-5	Styrene	0.1																
55		108-88-3	Toluene	0.3	5.1E+04	9.2E+04	8.1E+04	8.3E+04	1.0E+05	1.0E+05	1.4E+05	1.3E+05	1.2E+05	1.0E+05	8.2E+04	8.9E+04	8.7E+04	1.1E+05	1.2E+05	1.4E+05
56	98-83-9	2-Phenylpropene																		
57	95-13-6	Indene		63.6	91.7	76.2	91.4	109.8	99.9	157.8	134.0	152.3	122.4	87.5		84.6	130.6	127.7	116.9	
58	Esters	108-21-4	Acetic acid, 1-methylethyl																	
59		111-15-9	Acetic acid, 2-ethoxyethyl																	
60		123-86-4	Acetic acid, butyl ester																	
61		141-78-6	Acetic acid, ethyl ester																	
62		80-62-6	Methyl methacrylate																	
63		103-09-3	2-Ethylhexyl acetate																	
64		96-48-0	Butyrolactone																	
65		25265-77-4	Texanol	0.7																
66		6846-50-0	TXIB																	

Table A. 41 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)																
				0 h	23 °C				30 °C				23 °C				30 °C			
					1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h
67	Glycols, Glycol ethers	57-55-6	1,2-Propanediol																	
68		110-49-6	2-Methoxyethylacetate																	
69		111-90-0	Diethylene glycol monoethyl ether																	
70		107-98-2	Propanol, 1-methoxy-2-																	
71		111-76-2	Ethanol, 2-butoxy-																	
72		112-34-5	Ethanol, 2-butoxyethoxy-																	
73		110-80-5	Ethanol, 2-ethoxy-																	
74		109-86-4	Ethanol, 2-methoxy-																	
75	75-65-0	Propanol, 2-methyl-2-																		
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																	
77		95-50-1	1,2-Dichlorobenzene																	
78		107-06-2	1,2-Dichloroethane																	
79		78-87-5	1,2-Dichloropropane																	
80		106-46-7	1,4-Dichlorobenzene																	
81		75-27-4	Bromodichloromethane																	
82		56-23-5	Carbon tetrachloride																	
83		67-66-3	Chloroform																	
84	124-48-1	Dibromochloromethane																		
85	75-09-2	Dichloromethane				2343.9			23255.2											
86	127-18-4	Tetrachloroethylene																		
87	79-01-6	Trichloroethylene	0.2																	
88	79-34-5	1,1,2,2-Tetrachloroethane																		
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		7364.8	11796.4	10237.0	9634.8	9492.6	10672.1	14818.0	13248.2	12642.5	9912.9	8362.8	7756.1	7602.4	9589.3	10858.0	13491.0
90		110-82-7	Cyclohexane		5350.9	8857.3	7924.4	6980.7	6752.8	7725.7	10758.7	9386.1	9070.3	7070.8	6089.1	5601.2	5503.6	6931.1	7864.5	9325.9
91		1678-93-9	Cyclohexane, butyl-	1.0	70.7	112.4	90.5	98.8	109.8	118.7	150.9	142.6	144.0	105.4	76.3	91.5	81.3	122.8	115.6	130.4
92		1678-91-7	Cyclohexane, ethyl-		1081.0	1777.3	1615.3	1503.0	1478.7	1684.9	2376.7	2113.0	2037.1	1533.7	1262.7	1215.7	1218.2	1572.5	1822.5	2030.1
93	1678-92-8	Cyclohexane, propyl-	0.4	243.1	416.5	343.7	352.1	379.9	425.6	626.8	495.3	554.3	366.3	289.2	321.6	320.3	421.9	453.2	483.7	
94	91-17-8	Decahydronaphthalene	0.7	43.0	69.2	73.2	73.5	75.8	84.2	103.9	109.0	115.0	76.3	53.6	58.1	56.8	78.6	85.8	83.1	
95	Terpenes	80-56-8	alpha-Pinene																	
96		99-86-5	alpha-Terpinene																	
97		127-91-3	beta-Pinene																	
98		99-85-4	gamma-Terpinene																	
99		13466-78-9	3-Carene																	
100		79-92-5	Camphene																	
101		5989-27-5	Limonene																	
102		64-19-7	Acetic acid																	
103	Acids	79-31-2	Isobutyric acid																	
104		107-92-6	Butyric acid																	
105		111-14-8	Heptanoic acid																	
106		149-57-5	2-Ethylhexanoic acid																	
107	142-62-1	Hexanoic acid																		
108	109-52-4	Pentanoic Acid																		
109	Other	3777-69-3	Furan, 2-pentyl																	
110		872-50-4	2-Pyrrolidinone, 1-methyl-																	
111		123-91-1	1,4-Dioxane																	
112		78-40-0	Triethyl phosphate																	
113		142-96-1	n-Butyl ether											1512.8						
114		96-29-7	2-Butanone oxime	10.9																
115		121-44-8	Triethylamine																	
116		75-21-8	Ethylene oxide																	
117		75-56-9	Propylene oxide																	
118		106-99-0	1,3-Butadiene																	
119	0-00-0	TVOC	99.6	5.2E+05	8.4E+05	7.4E+05	7.2E+05	7.7E+05	8.3E+05	1.1E+06	1.0E+06	9.9E+05	7.8E+05	6.3E+05	6.5E+05	6.4E+05	8.5E+05	8.8E+05	1.1E+06	
A1	78-78-4	Butane, 2-methyl-		26691.0	42002.1	38630.4	34756.9	37346.0	40678.3	50728.6	48812.6	44532.9	37479.4	31579.1	30085.8	30906.4	38992.8	39942.6	52976.3	
A2	109-66-0	Pentane		24370.7	37251.5	34821.7	31995.7	36780.5	38315.8	45606.6	46365.6	42603.6	36384.7	29082.9	30405.0	30702.8	37138.1	36083.1	56624.0	
A3	513-35-9	2-Butene, 2-methyl-		17654.4	33134.1	27906.6	26524.1	30164.7	31654.9	40688.7	40844.2	37350.8	31734.5	26091.2	26245.2	25587.5	31559.5	31156.9	52224.7	

Table A. 41 (continued)

#	Cla ss	CAS #	Compound	Emission factor (µg h ⁻¹)																
				23 °C					30 °C				23 °C				30 °C			
				0 h	1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h
1	Alcohols	71-36-3	1-Butanol																	
2		71-23-8	1-Propanol																	
3		104-76-7	Hexanol, 2-ethyl-1-																	
4		67-63-0	2-Propanol																	
5		64-17-5	Ethanol		721.7	2250.7	1666.5	1712.2	2009.6	2160.4	2966.9	2900.4	2537.5	2223.7	1877.7	1784.8	1736.1	2200.6	2137.1	3920.5
6		108-95-2	Phenol																	
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																	
8		67-64-1	Acetone																	
9		98-86-2	Acetophenone																	
10		108-94-1	Cyclohexanone																	
11		108-10-1	Methylisobutyl ketone																	
12		100-52-7	Benzaldehyde																	
13		123-72-8	Butanal																	
14		112-31-2	Decanal																	
15		3913-81-3	2-Decenal																	
16		98-01-1	Furfural																	
17		111-71-7	Heptanal																	
18		66-25-1	Hexanal																	
19		124-19-6	Nonanal																	
20		18829-56-6	2-Nonenal																	
21		2548-87-0	2-Octenal																	
22		110-62-3	Pentanal																	
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		1484.4	2359.9	2215.8	1978.1	1989.9	2238.0	2949.5	2713.4	2582.9	2062.5	1744.2	1706.7	1656.0	2090.4	2269.0	2932.8
24		96-14-0	Pentane, 3-methyl-		840.6	1327.6	1256.2	1108.8	1104.6	1243.2	1667.0	1504.6	1438.0	1145.4	972.9	933.8	907.1	1153.5	1270.3	1587.4
25		540-84-1	2,2,4-Trimethylpentane		510.9	867.0	748.6	730.3	710.3	815.0	1075.3	1033.7	939.9	737.8	595.0	568.4	546.3	668.2	767.1	1062.0
26		108-08-7	2,4-Dimethylpentane																	
27		124-18-5	Decane		47.0	68.4	56.2	69.6	75.3	74.8	113.5	106.0	111.4	81.0	49.9	58.9	58.6	92.0	94.3	97.2
28		112-40-3	Dodecane		2.9	4.7	3.7	4.7			11.1		12.3	8.5	7.4	4.8	5.6	11.2	10.7	
29		142-82-5	Heptane		959.4	1685.3	1358.0	1409.2	1394.5	1463.2	2041.6	1843.2	1822.7	1382.2	1098.1	1210.6	1125.8	1463.0	1638.1	2118.1
30		544-76-3	Hexadecane																	
31		110-54-3	Hexane		8150.4	14107.8	13088.3	11967.2	12543.2	13397.3	17602.6	16540.2	15661.6	12500.1	10313.0	10913.2	10319.3	12881.8	14055.4	18699.3
32		111-84-2	Nonane		124.4	209.5	169.7	193.4	194.6	221.4	316.1	275.6	286.8	200.2	146.7	166.6	157.5	236.2	253.8	266.5
33		111-65-9	Octane		298.7	522.4	436.3	455.7	451.8	499.3	704.6	623.2	619.1	454.2	353.5	395.1	376.8	516.1	578.0	630.0
34		629-62-9	Pentadecane																	
35		629-59-4	Tetradecane																	
36		629-50-5	Tridecane																	
37		1120-21-4	Undecane		11.9	18.4	13.7	19.4	22.3	20.0	38.5	34.0	37.6	27.6	18.9	17.8	17.9	34.4	32.2	26.4
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramet		35.1	50.1	40.6	49.6	57.6	55.3	85.4	76.1	85.2	63.7	46.3	44.5	44.6	72.8	69.9	66.2
39		611-14-3	Toluene, 2-ethyl-		194.7	286.8	226.8	252.8	264.3	278.1	399.6	346.8	375.1	282.0	210.1	220.9	216.1	305.2	319.8	334.0
40		620-14-4	Toluene, 3-ethyl-		674.2	1069.2	826.6	930.2	1000.2	1015.0	1471.0	1288.5	1400.8	1069.4	782.6	847.7	812.4	1185.6	1212.7	1228.9
41		622-96-8	Toluene, 4-ethyl-		416.5	665.9	510.7	604.2	657.9	649.3	958.9	819.1	911.8	707.6	518.2	554.6	538.3	775.6	791.6	788.5
42		4994-16-5	Cyclohexene, 4-phenyl																	
43		71-43-2	Benzene		702.3	1122.2	980.7	941.1	930.2	974.2	1350.4	1241.6	1202.3	965.9	787.1	840.3	774.8	972.5	1050.8	1425.5
44		526-73-8	Benzene, 1,2,3-trimethyl-		207.8	292.4	237.6	270.5	289.7	299.1	438.9	384.3	420.8	316.8	232.4	236.1	234.8	335.4	348.1	364.8
45		95-63-6	Benzene, 1,2,4-trimethyl-		1168.3	1771.4	1402.9	1628.9	1803.2	1816.1	2636.3	2315.7	2504.3	1906.9	1396.3	1474.9	1459.9	2102.8	2150.4	2214.2
46		95-47-6	Benzene, 1,2-dimethyl-		679.3	1077.2	866.4	927.6	944.9	1003.1	1408.3	1236.1	1274.6	980.5	756.3	808.7	782.6	1051.8	1143.1	1204.4
47		108-67-8	Benzene, 1,3,5-trimethyl-		287.6	423.6	341.7	384.1	404.5	424.1	610.1	531.6	572.6	427.3	329.8	334.0	324.1	459.6	485.2	507.5
48		108-38-3	Benzene, 1,3-dimethyl-		1763.0	2971.5	2395.2	2592.0	2712.9	2770.6	3876.8	3449.4	3539.0	2783.0	2121.2	2339.2	2261.0	3022.2	3245.3	3380.4
49		98-82-8	Benzene, isopropyl		27.3	41.7	32.7	35.0	34.8	38.0	53.5	46.2	48.8	36.6	28.6	30.3	28.7	39.5	42.7	44.3
50		103-65-1	Benzene, propyl-		143.3	227.6	175.6	197.7	210.2	211.6	310.2	267.7	293.3	225.2	165.6	179.6	170.1	247.8	255.5	255.4
51		100-41-4	Ethylbenzene		455.6	749.3	598.8	637.1	643.9	660.8	937.4	826.5	853.8	672.1	514.0	569.1	534.7	719.2	779.4	809.9
52		91-20-3	Naphthalene		48.5	72.5	59.9	74.3	110.6	92.2	159.4	148.1	166.9	136.6	100.8	89.8	90.6	162.4	144.3	122.1
53		99-87-6	p-Cymene		4.2	6.3	5.3	5.9	5.8	6.0	8.6	8.1	9.3	6.3	4.5	5.1	4.3	6.5	6.7	6.8
54		100-42-5	Styrene																	
55		108-88-3	Toluene		2548.4	4609.0	4036.4	4172.3	5111.3	5194.9	6901.8	6431.3	5828.2	5052.2	4105.1	4438.9	4326.4	5411.4	5855.6	7030.8
56		98-83-9	2-Phenylpropene																	
57		95-13-6	Indene		3.2	4.6	3.8	4.6	5.5	5.0	7.9	6.7	7.6	6.1	4.4		4.2	6.5	6.4	5.8
58	Esters	108-21-4	Acetic acid, 1-methylethyl																	
59		111-15-9	Acetic acid, 2-ethoxyethyl																	
60		123-86-4	Acetic acid, butyl ester																	
61		141-78-6	Acetic acid, ethyl ester																	
62		80-62-6	Methyl methacrylate																	
63		103-09-3	2-Ethylhexyl acetate																	
64		96-48-0	Butyrolactone																	
65		25265-77-4	Texanol																	
66		6846-50-0	TXIB																	

Table A. 41 (continued)

#	Class	CAS #	Compound	Emission factor (µg h ⁻¹)																
				23 °C					30 °C				23 °C				30 °C			
				0 h	1 h	3 h	6 h	24 h	25 h	27 h	30 h	48 h	49 h	51 h	54 h	72 h	73 h	75 h	78 h	96 h
67	Glycols, GlycolEthers	57-55-6	1,2-Propanediol																	
68		110-49-6	2-Methoxyethylacetate																	
69		111-90-0	Diethylene glycol monoethyl ether																	
70		107-98-2	Propanol, 1-methoxy-2-																	
71		111-76-2	Ethanol, 2-butoxy-																	
72		112-34-5	Ethanol, 2-butoxyethoxy-																	
73		110-80-5	Ethanol, 2-ethoxy-																	
74		109-86-4	Ethanol, 2-methoxy-																	
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																	
76		71-55-6	1,1,1-Trichloroethane																	
77		95-50-1	1,2-Dichlorobenzene																	
78		107-06-2	1,2-Dichloroethane																	
79		78-87-5	1,2-Dichloropropane																	
80		106-46-7	1,4-Dichlorobenzene																	
81		75-27-4	Bromodichloromethane																	
82		56-23-5	Carbon tetrachloride																	
83	Cyclo Alkanes	67-66-3	Chloroform																	
84		124-48-1	Dibromochloromethane																	
85		75-09-2	Dichloromethane				117.2			1162.8										
86		127-18-4	Tetrachloroethylene																	
87		79-01-6	Trichloroethylene																	
88		79-34-5	1,1,2,2-Tetrachloroethane																	
89		108-87-2	Methylcyclohexane		368.2	589.8	511.9	481.7	474.6	533.6	740.9	662.4	632.1	495.6	418.1	387.8	380.1	479.5	542.9	674.5
90		110-82-7	Cyclohexane		267.5	442.9	396.2	349.0	337.6	386.3	537.9	469.3	453.5	353.5	304.5	280.1	275.2	346.6	393.2	466.3
91	Terpenes	1678-93-9	Cyclohexane, butyl-		3.5	5.6	4.5	4.9	5.4	5.9	7.5	7.1	7.2	5.2	3.8	4.5	4.0	6.1	5.7	6.5
92		1678-91-7	Cyclohexane, ethyl-		54.1	88.9	80.8	75.2	73.9	84.2	118.8	105.6	101.9	76.7	63.1	60.8	60.9	78.6	91.1	101.5
93		1678-92-8	Cyclohexane, propyl-		12.1	20.8	17.2	17.6	19.0	21.3	31.3	24.7	27.7	18.3	14.4	16.1	16.0	21.1	22.6	24.2
94		91-17-8	Decahydronaphthalene		2.1	3.4	3.6	3.6	3.8	4.2	5.2	5.4	5.7	3.8	2.6	2.9	2.8	3.9	4.3	4.1
95		80-56-8	alpha-Pinene																	
96		99-86-5	alpha-Terpinene																	
97		127-91-3	beta-Pinene																	
98		99-85-4	gamma-Terpinene																	
99	Acids	13466-78-9	3-Carene																	
100		79-92-5	Camphene																	
101		5989-27-5	Limonene																	
102		64-19-7	Acetic acid																	
103		79-31-2	Isobutyric acid																	
104		107-92-6	Butyric acid																	
105		111-14-8	Heptanoic acid																	
106		149-57-5	2-Ethylhexanoic acid																	
107	Other	142-62-1	Hexanoic acid																	
108		109-52-4	Pentanoic Acid																	
109		3777-69-3	Furan, 2-pentyl																	
110		872-50-4	2-Pyrrolidinone, 1-methyl-																	
111		123-91-1	1,4-Dioxane																	
112		78-40-0	Triethyl phosphate																	
113		142-96-1	n-Butyl ether											75.6						
114		96-29-7	2-Butanone oxime																	
115	Other	121-44-8	Triethylamine																	
116		75-21-8	Ethylene oxide																	
117		75-56-9	Propylene oxide																	
118		106-99-0	1,3-Butadiene																	
119		0-00-0	TVOC		26190.4	41908.1	37190.9	36109.4	38266.8	41420.3	55165.8	50384.6	49276.8	39132.2	31624.5	32398.4	31908.5	42342.5	44028.1	53889.3
A1		78-78-4	Butane, 2-methyl-		1334.5	2100.1	1931.5	1737.8	1867.3	2033.9	2536.4	2440.6	2226.6	1874.0	1579.0	1504.3	1545.3	1949.6	1997.1	2648.8
A2		109-66-0	Pentane		1218.5	1862.6	1741.1	1599.8	1839.0	1915.8	2280.3	2318.3	2130.2	1819.2	1454.1	1520.2	1535.1	1856.9	1804.2	2831.2
A3		513-35-9	2-Butene, 2-methyl-		882.7	1656.7	1395.3	1326.2	1508.2	1582.7	2034.4	2042.2	1867.5	1586.7	1304.6	1312.3	1279.4	1578.0	1557.8	2611.2

A.5 Chamber concentrations & emission factors for cap/cover tightness

Table A. 42: Concentration & emission factor for MO2_0.5t (2-stroke motor oil opened by half turn)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)									Emission factor (µg h ⁻¹)									Coefficient: E = a t ^{-b} with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²		
1	Alcohols	71-36-3	1-Butanol	0.9			0.5																	
2		71-23-8	1-Propanol																					
3		104-76-7	Hexanol, 2-ethyl-1-	0.5																				
4		67-63-0	2-Propanol																					
5		64-17-5	Ethanol	15.4																				
6		108-95-2	Phenol																					
7	Aldehydes & ketones	78-93-3	Methylethyl ketone	1.2						1.1	1.0													
8		67-64-1	Acetone	8.1	4.7	1.3	0.9	2.7	1.1	19.3	0.7							0.6						
9		98-86-2	Acetophenone																					
10		108-94-1	Cyclohexanone																					
11		108-10-1	Methylisobutyl ketone																					
12		100-52-7	Benzaldehyde	0.6																				
13		123-72-8	Butanal																					
14		112-31-2	Decanal																					
15		3913-81-3	2-Decenal																					
16		98-01-1	Furfural																					
17	Aliphatic Hydrocarbons	111-71-7	Heptanal																					
18		66-25-1	Hexanal							1.1								0.1						
19		124-19-6	Nonanal																					
20		18829-56-6	2-Nonenal																					
21		2548-87-0	2-Octenal																					
22		110-62-3	Pentanal																					
23		107-83-5	Pentane, 2-methyl-																					
24		96-14-0	Pentane, 3-methyl-																					
25		540-84-1	2,2,4-Trimethylpentane																					
26		108-08-7	2,4-Dimethylpentane																					
27	Aliphatic Hydrocarbons	124-18-5	Decane	0.2	80.0	113.4	97.4	80.5	77.9	72.6	73.2		4.0	5.7	4.9	4.0	3.9	3.6	3.6	6.26	0.13	0.96		
28		112-40-3	Dodecane		142.2	227.2	232.1	269.4	272.8	262.5	262.5		7.1	11.4	11.6	13.5	13.6	13.1	13.1	10.86	-0.05	0.77		
29		142-82-5	Heptane	0.4						1.0								0.0						
30		544-76-3	Hexadecane																					
31		110-54-3	Hexane	3.4						7.0								0.2						
32		111-84-2	Nonane				0.3								0.0									
33		111-65-9	Octane																					
34		629-62-9	Pentadecane																					
35		629-59-4	Tetradecane																					
36		629-50-5	Tridecane		3.0	4.1	4.6	5.6	6.5	6.5	6.4		0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.18	-0.14	0.96		
37	Aromatic Hydrocarbons	1120-21-4	Undecane	0.3	548.7	822.4	700.7	751.1	735.8	705.1	718.3		27.4	41.1	35.0	37.5	36.8	35.2	35.9	39.84	0.02	0.34		
38		95-93-2	Benzene, 1,2,4,5-tetramet		22.7	34.9	34.8	30.4	29.6	27.7	27.7		1.1	1.7	1.7	1.5	1.5	1.4	1.4	1.93	0.07	0.96		
39		611-14-3	Toluene, 2-ethyl-		0.1	0.1	0.1			0.1			0.0	0.0	0.0			0.0		0.01	0.08	0.84		
40		620-14-4	Toluene, 3-ethyl-		1.2	1.7	1.4	1.2	1.0	1.1	0.9		0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.10	0.17	0.90		
41		622-96-8	Toluene, 4-ethyl-		0.8	1.1	0.9	0.7	0.7	0.7	0.6		0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.06	0.14	0.85		
42		4994-16-5	Cyclohexene, 4-phenyl																					
43		71-43-2	Benzene	1.5	0.3	0.3			1.4	6.6	0.0							0.3						
44		526-73-8	Benzene, 1,2,3-trimethyl-		7.0	9.6	8.2	6.8	6.6	6.0	6.1		0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.54	0.13	0.97		
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.1	2.0	2.7	2.3	1.9	1.8	1.9	1.6		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.15	0.13	0.90		
46		95-47-6	Benzene, 1,2-dimethyl-	0.2	0.9	1.0	0.7	0.7	0.6	0.7	0.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.21	0.71		
47	Aromatic Hydrocarbons	108-67-8	Benzene, 1,3,5-trimethyl-		0.1	0.1	0.1	0.0					0.0	0.0	0.0	0.0				0.01	0.45	0.99		
48		108-38-3	Benzene, 1,3-dimethyl-	0.9	3.0	3.6	2.7	2.6	2.4	2.9	2.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.14	0.16	0.57		
49		98-82-8	Benzene, isopropyl																					
50		103-65-1	Benzene, propyl-		0.2	0.3	0.2	0.2	0.1	0.2	0.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.13	0.59		
51		100-41-4	Ethylbenzene	0.3	0.7	0.9	0.6	0.6	0.5	0.7	0.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03	0.19	0.37		
52		91-20-3	Naphthalene	0.1	51.1	84.1	91.4	96.0	97.5	93.4	95.3		2.6	4.2	4.6	4.8	4.9	4.7	4.8	4.21	-0.03	0.65		
53		99-87-6	p-Cymene		3.5	4.8	4.0	3.2	3.1	2.8	2.8		0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.27	0.15	0.97		
54		100-42-5	Styrene	0.7	0.4	0.5	0.5	0.4	0.6	0.6	0.2													
55		108-88-3	Toluene	4.7	1.1	0.7	0.5	1.0	0.6	3.8	0.5													
56		98-83-9	2-Phenylpropene																					
57	Esters	95-13-6	Indene																					
58		108-21-4	Acetic acid, 1-methylethyl																					
59		111-15-9	Acetic acid, 2-ethoxyethyl																					
60		123-86-4	Acetic acid, butyl ester																					
61		141-78-6	Acetic acid, ethyl ester	0.6																				
62		80-62-6	Methyl methacrylate																					
63		103-09-3	2-Ethylhexyl acetate																					
64		96-48-0	Butyrolactone																					
65		25265-77-4	Texanol																					
66		6846-50-0	TXIB																					

Table A. 42 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycoethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74	Halo Carbons	109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane	0.9																		
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene	0.1																		
81	Halo Alkanes	75-27-4	Bromodichloromethane	0.5																		
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform	0.8																		
84		124-48-1	Dibromochloromethane	0.3																		
85		75-09-2	Dichloromethane	5.9	1.4		2.2	4.3	2.2	5.0	14.8								0.4			
86		127-18-4	Tetrachloroethylene	0.3																		
87		79-01-6	Trichloroethylene	5.7	4.2	0.8		2.3		24.0								0.9				
88	Cyclo Alkanes	79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane	0.2		0.5								0.0								
90		110-82-7	Cyclohexane							0.5								0.0				
91		1678-93-9	Cyclohexane, butyl-		44.5	59.6	46.0	36.3	33.5	31.3	30.6		2.2	3.0	2.3	1.8	1.7	1.6	1.5	3.41	0.18	0.96
92		1678-91-7	Cyclohexane, ethyl-		0.2		0.2						0.0		0.0							
93		1678-92-8	Cyclohexane, propyl-			0.2								0.0								
94		91-17-8	Decahydronaphthalene		39.5	53.0	44.4	30.4	27.4	24.9	24.6		2.0	2.7	2.2	1.5	1.4	1.2	1.2	3.34	0.23	0.99
95	Terpenes	80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102	Acids	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109	Other	3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116	A	75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	59.2	4951.6	7302.4	6715.1	5762.9	5479.4	5143.3	5055.8		244.6	362.2	332.8	285.2	271.0	254.2	249.8	405.19	0.11	1.00
A1	A	109-60-4	Propyl acetate		103.6	137.5	108.4	75.3	69.8	64.7	63.8		5.2	6.9	5.4	3.8	3.5	3.2	3.2	8.30	0.22	0.97
A2		589-34-4	Hexane, 3-methyl-		153.9	241.1	242.2	222.7	217.1	202.6	203.9		7.7	12.1	12.1	11.1	10.9	10.1	10.2	13.08	0.05	0.93

Table A. 43: Concentration & emission factor for MO2_1t (2-stroke motor oil opened by one turn)

#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-	0.4																		
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol																			
6		108-95-2	Phenol																			
7	Aldehydes & ketones	78-93-3	Methylethyl ketone		1.2			16.7					0.1			0.8						
8		67-64-1	Acetone	1.0	7.6	3.4	1.6	7.9	1.7	1.6	1.2		0.3	0.1	0.0	0.3	0.0	0.0	0.0	0.17	0.38	0.21
9		98-86-2	Acetophenone	0.2																		
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	1.2																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-			1.9								0.1								
24		96-14-0	Pentane, 3-methyl-			1.1								0.1								
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane	0.2	134.1	140.0	123.4	83.8	77.7	81.4	54.0		6.7	7.0	6.2	4.2	3.9	4.1	2.7	9.17	0.23	0.89
28		112-40-3	Dodecane	1.3	191.9	293.5	315.6	314.9	296.4	284.4	204.9		9.5	14.6	15.7	15.7	14.8	14.2	10.2	17.21	0.07	0.32
29		142-82-5	Heptane																			
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane			7.4									0.4							
32		111-84-2	Nonane		0.9	0.6							0.0	0.0								
33		111-65-9	Octane																			
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane		3.1	4.3	5.6	5.9	6.1	6.0	4.3		0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.24	-0.03	0.06
37		1120-21-4	Undecane	3.8	873.1	1079.9	1115.6	866.2	798.8	790.5	580.8		43.5	53.8	55.6	43.1	39.8	39.3	28.9	69.03	0.16	0.83
38		Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	0.1	36.1	45.9	44.9	36.2	32.1	29.1	20.4		1.8	2.3	2.2	1.8	1.6	1.4	1.0	3.09	0.20
39	611-14-3		Toluene, 2-ethyl-	0.1	0.1	0.4	0.1	0.3					0.0	0.0	0.0	0.0				0.00	-0.13	0.01
40	620-14-4		Toluene, 3-ethyl-	0.1	2.1	2.3	1.6	1.3	1.0	1.0	0.6		0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.16	0.33	0.87
41	622-96-8		Toluene, 4-ethyl-	0.0	1.1	1.4	0.9	0.8	0.7	0.8	0.5		0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.08	0.23	0.78
42	4994-16-5		Cyclohexene, 4-phenyl																			
43	71-43-2		Benzene	0.1	0.8	1.5	1.4	0.6			0.5		0.0	0.1	0.1	0.0			0.0	0.12	0.43	0.93
44	526-73-8		Benzene, 1,2,3-trimethyl-		11.5	12.5	10.6	7.3	6.7	6.7	4.8		0.6	0.6	0.5	0.4	0.3	0.3	0.2	0.81	0.24	0.94
45	95-63-6		Benzene, 1,2,4-trimethyl-	0.3	3.1	4.6	2.7	2.9	2.0	1.9	1.3		0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.28	0.32	0.81
46	95-47-6		Benzene, 1,2-dimethyl-		1.6	1.7	1.0	0.9	0.8	0.7	0.4		0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.10	0.29	0.81
47	108-67-8		Benzene, 1,3,5-trimethyl-	0.0		0.4		0.1						0.0		0.0						
48	108-38-3		Benzene, 1,3-dimethyl-	0.2	4.9	4.9	3.4	3.0	2.6	2.8	1.6		0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.29	0.25	0.75
49	98-82-8		Benzene, isopropyl																			
50	103-65-1		Benzene, propyl-		0.3	0.4	0.2	0.3	0.2	0.2			0.0	0.0	0.0	0.0	0.0	0.0		0.02	0.15	0.57
51	100-41-4		Ethylbenzene	0.0	1.2	1.2	0.8	0.8	0.6	0.7	0.4		0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.07	0.22	0.75
52	91-20-3		Naphthalene	0.5	61.3	89.5	100.1	96.2	94.6	94.5	68.2		3.0	4.5	5.0	4.8	4.7	4.7	3.4	5.13	0.04	0.20
53	99-87-6		p-Cymene		6.1	6.2	5.4	3.4	3.1	3.4	2.2		0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.41	0.26	0.90
54	100-42-5	Styrene	0.4	2.0	0.7	1.0	0.8	0.5	0.8	1.1		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.05	0.01	
55	108-88-3	Toluene	0.3	2.3	3.2	1.1	1.8	1.1	0.8	0.8		0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.17	0.40	0.66	
56	98-83-9	2-Phenylpropene																				
57	95-13-6	Indene																				
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol	0.9																		
66		6846-50-0	TXIB							5.3								0.3				

Table A. 43 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoethyl ether																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		Halo Carbons	71-55-6	1,1,1-Trichloroethane																		
77	95-50-1		1,2-Dichlorobenzene																			
78	107-06-2		1,2-Dichloroethane																			
79	78-87-5		1,2-Dichloropropane																			
80	106-46-7		1,4-Dichlorobenzene																			
81	75-27-4		Bromodichloromethane																			
82	56-23-5		Carbon tetrachloride																			
83	67-66-3		Chloroform																			
84	124-48-1		Dibromochloromethane																			
85	75-09-2		Dichloromethane				3.6	10.4	1.4					0.2	0.5	0.1			0.63	0.60	0.40	
86	Cyclo Alkanes	127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene			5.3	1.9		4.6				0.3	0.1		0.2						
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane			1.1	0.8							0.1	0.0							
90		110-82-7	Cyclohexane																			
91		1678-93-9	Cyclohexane, butyl-		96.8	81.3	72.4	44.2	35.1	37.2	25.7		4.8	4.1	3.6	2.2	1.8	1.9	1.3	5.97	0.31	0.95
92		1678-91-7	Cyclohexane, ethyl-		0.6									0.0								
93		1678-92-8	Cyclohexane, propyl-																			
94		91-17-8	Decahydronaphthalene		90.9	89.7	75.3	37.4	31.8	31.7	22.0		4.5	4.5	3.8	1.9	1.6	1.6	1.1	7.02	0.38	0.97
95		Terpenes	80-56-8	alpha-Pinene																		
96	99-86-5		alpha-Terpinene																			
97	127-91-3		beta-Pinene																			
98	99-85-4		gamma-Terpinene																			
99	13466-78-9		3-Carene																			
100	79-92-5		Camphene																			
101	5989-27-5		Limonene																			
102	64-19-7		Acetic acid																			
103	79-31-2		Isobutyric acid																			
104	107-92-6		Butyric acid																			
105	Acids	111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110	Other	872-50-4	2-Pyrrolidinone, 1-methyl-																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	27.3	9687.2	11160.1	10443.8	7050.3	6018.5	5861.7	4093.1		483.0	556.6	520.8	351.2	299.6	291.7	203.3	792.43	0.26	0.93
A1	A	17302-28-2	Nonane, 2,6-dimethyl-		233.2	218.7	178.9	93.1	78.6	82.1	56.0		11.7	10.9	8.9	4.7	3.9	4.1	2.8	16.48	0.37	0.96
A2		527-53-7	Benzene, 1,2,3,5-tetramet		249.8	329.9	332.5	255.1	226.3	214.6	156.0		12.5	16.5	16.6	12.8	11.3	10.7	7.8	22.13	0.19	0.86

Table A. 44: Concentration & emission factor for PTH_0.5t (paint thinner opened by half turn)

#	Class	CAS #	Compound	Chamber concentration (μg m ⁻³)								Emission factor (μg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol	0.26																		
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-	0.30																		
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol																			
6		108-95-2	Phenol																			
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																			
8		67-64-1	Acetone																			
9		98-86-2	Acetophenone	0.19																		
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	0.87																		
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20	Aliphatic Hydrocarbons	18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23		107-83-5	Pentane, 2-methyl-		17.95	14.15	6.82	6.13	19.65	20.65	19.87		0.90	0.71	0.34	0.31	0.98	1.03	0.99	0.33	-0.21	0.29
24		96-14-0	Pentane, 3-methyl-		17.98	11.75	7.21	5.91	14.22	17.97	14.96		0.90	0.59	0.36	0.30	0.71	0.90	0.75	0.34	-0.16	0.27
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		10459.9	14559.7	12879.6	4907.06	1937.82	1766.11	1309.00		523.00	727.99	643.98	245.35	96.89	88.31	65.45	2012.88	0.74	0.97
28		112-40-3	Dodecane		391.27	683.30	965.61	1185.32	487.53	380.34	243.89		19.56	34.16	48.28	59.27	24.38	19.02	12.19	70.60	0.29	0.47
29		142-82-5	Heptane		352.04	256.34	128.76	89.71	83.35	91.27	71.48		17.60	12.82	6.44	4.49	4.17	4.56	3.57	13.95	0.30	0.84
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane		155.26	123.18	62.69	59.91	109.67	145.32	124.28		7.76	6.16	3.13	3.00	5.48	7.27	6.21	3.60	-0.10	0.14
32		111-84-2	Nonane		7987.69	8857.80	5589.11	1902.72	918.07	877.82	674.13		399.38	442.89	279.46	95.14	45.90	43.89	33.71	1040.61	0.76	0.99
33		111-65-9	Octane		1811.29	1609.26	807.18	370.88	220.16	230.03	178.21		90.56	80.46	40.36	18.54	11.01	11.50	8.91	136.52	0.61	0.98
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane		4390.39	6913.95	8757.01	5550.10	1983.52	1659.66	1189.10		219.52	345.70	437.85	277.51	99.18	82.98	59.45	925.80	0.55	0.84
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		214.69	341.95	393.49	209.47	73.55	61.39	44.99		10.73	17.10	19.67	10.47	3.68	3.07	2.25	48.48	0.63	0.90
39		611-14-3	Toluene, 2-ethyl-		1392.89	1710.55	1181.05	394.10	182.22	165.40	127.52		69.64	85.53	59.05	19.71	9.11	8.27	6.38	216.15	0.78	0.99
40		620-14-4	Toluene, 3-ethyl-		2939.45	3672.36	2377.20	803.48	418.72	395.04	309.28		146.97	183.62	118.86	40.17	20.94	19.75	15.46	416.91	0.73	0.99
41		622-96-8	Toluene, 4-ethyl-		1027.29	1332.70	875.60	326.52	186.02	175.21	143.43		51.36	66.63	43.78	16.33	9.30	8.76	7.17	137.07	0.66	0.99
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene	2.41	4.42	3.04	2.22	1.21	2.92	3.00	4.01		0.10	0.03			0.03	0.03	0.08	0.02	-0.12	0.13
44		526-73-8	Benzene, 1,2,3-trimethyl-		2302.99	3149.05	2531.14	868.96	369.01	327.60	256.37		115.15	157.45	126.56	43.45	18.45	16.38	12.82	427.12	0.77	0.98
45		95-63-6	Benzene, 1,2,4-trimethyl-		5340.06	7100.75	5243.71	1864.15	915.90	852.25	651.23		267.00	355.04	262.19	93.21	45.79	42.61	32.56	848.09	0.71	0.99
46		95-47-6	Benzene, 1,2-dimethyl-		994.38	1014.72	532.02	222.58	131.27	134.84	103.83		49.72	50.74	26.60	11.13	6.56	6.74	5.19	91.40	0.64	0.98
47		108-67-8	Benzene, 1,3,5-trimethyl-		1488.40	1865.78	1340.62	447.90	200.74	182.03	137.12		74.42	93.29	67.03	22.39	10.04	9.10	6.86	243.32	0.78	0.99
48		108-38-3	Benzene, 1,3-dimethyl-		1953.31	1980.65	986.64	458.18	301.55	307.96	243.59		97.67	99.03	49.33	22.91	15.08	15.40	12.18	158.57	0.58	0.97
49		98-82-8	Benzene, isopropyl		328.45	346.85	201.50	71.40	34.55	32.76	25.72		16.42	17.34	10.08	3.57	1.73	1.64	1.29	39.32	0.76	0.99
50		103-65-1	Benzene, propyl-		959.01	1170.49	709.29	255.19	137.25	127.99	100.90		47.95	58.52	35.46	12.76	6.86	6.40	5.05	126.20	0.72	0.99
51		100-41-4	Ethylbenzene		660.36	647.05	312.94	145.34	98.00	100.77	83.47		33.02	32.35	15.65	7.27	4.90	5.04	4.17	49.98	0.57	0.96
52		91-20-3	Naphthalene		126.98	246.90	289.28	193.89	92.23	87.65	67.18		6.35	12.34	14.46	9.69	4.61	4.38	3.36	25.04	0.41	0.86
53		99-87-6	p-Cymene		301.13	421.24	345.07	117.89	45.96	40.02	30.24		15.06	21.06	17.25	5.89	2.30	2.00	1.51	61.44	0.80	0.98
54	100-42-5	Styrene	0.19																			
55	108-88-3	Toluene	0.15	471.93	374.51	198.55	143.48	127.03	145.39	117.71		23.59	18.72	9.92	7.17	6.34	7.26	5.88	20.20	0.28	0.83	
56	98-83-9	2-Phenylpropene																				
57	95-13-6	Indene																				
58	Esters	108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate	0.45																		
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB	0.46																		

Table A. 44 (continued)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, Glycol Ethers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	Halo Carbons	75-65-0	Propanol, 2-methyl-2-																			
76		71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83	Cyclo Alkanes	67-66-3	Chloroform																			
84		124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane	1.12	6.48								0.27									
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene																			
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		658.18	481.97	233.88	148.99	142.25	153.80	132.45		32.91	24.10	11.69	7.45	7.11	7.69	6.62	26.06	0.32	0.82
90		110-82-7	Cyclohexane		41.00	31.89	15.99	12.40	18.85	23.81	20.12		2.05	1.59	0.80	0.62	0.94	1.19	1.01	1.15	0.05	0.05
91	Terpenes	1678-93-9	Cyclohexane, butyl-	1243.06	1623.62	1621.71	591.02	176.25	145.70	122.35		62.15	81.18	81.09	29.55	8.81	7.29	6.12	276.49	0.83	0.95	
92		1678-91-7	Cyclohexane, ethyl-	882.23	753.96	423.82	163.13	92.19	85.04	71.58		44.11	37.70	21.19	8.16	4.61	4.25	3.58	74.85	0.68	0.99	
93		1678-92-8	Cyclohexane, propyl-	1983.45	2122.17	1444.31	496.22	196.30	170.89	139.47		99.17	106.11	72.22	24.81	9.81	8.54	6.97	289.39	0.82	0.99	
94		91-17-8	Decahydronaphthalene	823.46	1122.65	1043.00	396.37	119.07	95.19	68.09		41.17	56.13	52.15	19.82	5.95	4.76	3.40	196.64	0.86	0.95	
95		80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99	Acids	13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101		5989-27-5	Limonene																			
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107	Other	142-62-1	Hexanoic acid																			
108		109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115	TVOC	121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119		0-00-0	TVOC	14.2	146841	186500	161614	68188	22690	18653	13609		7341.3	9324.3	8080.0	3408.7	1133.8	931.9	679.8	28646.6	0.79	0.96

Table A. 45: Concentration & emission factor for PTH_1t (paint thinner opened by one turn)

				Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^{-b} with t > 3 h		
#	Class	CAS #	Compound	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol																			
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-																			
4		67-63-0	2-Propanol																			
5		64-17-5	Ethanol																			
6		108-95-2	Phenol																			
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone																			
8		67-64-1	Acetone		0.41																	
9		98-86-2	Acetophenone																			
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde		0.62																	
13		123-72-8	Butanal																			
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal																			
18		66-25-1	Hexanal																			
19		124-19-6	Nonanal																			
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22		110-62-3	Pentanal																			
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-		85.94	110.35	116.10	99.98	103.07	100.66	91.85		4.30	5.52	5.81	5.00	5.15	5.03	4.59	6.04	0.05	0.73
24		96-14-0	Pentane, 3-methyl-		72.83	89.60	89.13	76.62	77.40	78.90	70.21		3.64	4.48	4.46	3.83	3.87	3.95	3.51	4.85	0.06	0.83
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane		3377.22	3259.81	2909.36	2129.54	1738.68	1798.98	1932.31		168.86	162.99	145.47	106.48	86.93	89.95	96.62	195.26	0.18	0.92
28		112-40-3	Dodecane		294.98	288.44	277.88	245.44	184.47	240.77	246.06		14.75	14.42	13.89	12.27	9.22	12.04	12.30	15.41	0.07	0.43
29		142-82-5	Heptane		293.18	368.94	392.20	325.42	323.37	323.83	310.06		14.66	18.45	19.61	16.27	16.17	16.19	15.50	20.44	0.06	0.82
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane		505.70	622.55	595.62	532.74	544.99	571.11	522.28		25.29	31.13	29.78	26.64	27.25	28.56	26.11	31.99	0.04	0.69
32		111-84-2	Nonane		2265.81	2333.70	2157.67	1600.01	1415.20	1434.15	1520.66		113.29	116.68	107.88	80.00	70.76	71.71	76.03	135.75	0.15	0.91
33		111-65-9	Octane		715.18	771.28	769.41	636.21	565.69	598.27	601.79		35.76	38.56	38.47	31.81	28.28	29.91	30.09	43.18	0.09	0.88
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane		2075.52	2056.16	1849.89	1504.52	1151.67	1285.61	1414.05		103.78	102.81	92.49	75.23	57.58	64.28	70.70	117.25	0.14	0.80
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		80.82	88.54	82.74	66.72	52.16	50.24	51.76		4.04	4.43	4.14	3.34	2.61	2.51	2.59	5.52	0.18	0.96
39		611-14-3	Toluene, 2-ethyl-		397.23	403.94	381.76	286.82	248.98	248.86	255.68		19.86	20.20	19.09	14.34	12.45	12.44	12.78	24.09	0.15	0.95
40		620-14-4	Toluene, 3-ethyl-		858.81	879.97	830.18	635.71	556.47	576.73	620.82		42.94	44.00	41.51	31.79	27.82	28.84	31.04	50.24	0.13	0.87
41		622-96-8	Toluene, 4-ethyl-		341.18	347.69	292.30	257.66	216.50	226.40	244.14		17.06	17.38	14.62	12.88	10.82	11.32	12.21	18.68	0.12	0.84
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene		12.56	15.16	15.34	12.28	12.35	13.34	15.51		0.63	0.76	0.77	0.61	0.62	0.67	0.78	0.76	0.03	0.14
44		526-73-8	Benzene, 1,2,3-trimethyl-		697.29	681.22	660.16	493.54	422.60	422.54	423.91		34.86	34.06	33.01	24.68	21.13	21.13	21.20	41.50	0.16	0.96
45		95-63-6	Benzene, 1,2,4-trimethyl-		1689.49	1684.50	1568.04	1232.61	1057.49	1081.03	1128.68		84.47	84.22	78.40	61.63	52.87	54.05	56.43	97.48	0.14	0.93
46		95-47-6	Benzene, 1,2-dimethyl-		352.58	370.52	366.24	291.94	258.03	263.41	271.90		17.63	18.53	18.31	14.60	12.90	13.17	13.59	21.29	0.11	0.91
47		108-67-8	Benzene, 1,3,5-trimethyl-		424.52	443.54	413.07	304.01	267.93	267.33	280.06		21.23	22.18	20.65	15.20	13.40	13.37	14.00	26.26	0.16	0.94
48		108-38-3	Benzene, 1,3-dimethyl-		747.43	819.53	785.78	655.13	576.34	593.20	636.22		37.37	40.98	39.29	32.76	28.82	29.66	31.81	45.41	0.10	0.86
49		98-82-8	Benzene, isopropyl		93.70	97.07	95.56	71.07	65.08	65.35	64.85		4.69	4.85	4.78	3.55	3.25	3.27	3.24	5.73	0.13	0.94
50		103-65-1	Benzene, propyl-		290.00	299.57	275.39	219.26	186.96	200.57	210.55		14.50	14.98	13.77	10.96	9.35	10.03	10.53	16.84	0.12	0.87
51		100-41-4	Ethylbenzene		259.52	284.84	282.20	236.63	203.88	219.76	227.38		12.98	14.24	14.11	11.83	10.19	10.99	11.37	15.84	0.09	0.82
52		91-20-3	Naphthalene		69.36	73.56	79.05	78.59	61.18	74.48	70.09		3.47	3.68	3.95	3.93	3.06	3.72	3.50	3.97	0.03	0.18
53		99-87-6	p-Cymene		84.68	80.49	74.34	55.03	47.10	47.42	48.13		4.23	4.02	3.72	2.75	2.35	2.37	2.41	4.85	0.17	0.96
54		100-42-5	Styrene		0.13																	
55		108-88-3	Toluene		0.25	377.92	461.81	461.47	407.94	389.78	399.83	422.83		18.88	23.08	23.06	20.38	19.48	19.98	21.13	24.18	0.04
56	Esters	98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58		108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol																			
66		6846-50-0	TXIB																			

Table A. 45 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75		75-65-0	Propanol, 2-methyl-2-																			
76		Halo Carbons	71-55-6	1,1,1-Trichloroethane																		
77	95-50-1		1,2-Dichlorobenzene																			
78	107-06-2		1,2-Dichloroethane																			
79	78-87-5		1,2-Dichloropropane																			
80	106-46-7		1,4-Dichlorobenzene																			
81	75-27-4		Bromodichloromethane																			
82	56-23-5		Carbon tetrachloride																			
83	67-66-3		Chloroform																			
84	124-48-1		Dibromochloromethane																			
85	75-09-2		Dichloromethane								167.48								8.37			
86	127-18-4	Tetrachloroethylene																				
87	79-01-6	Trichloroethylene																				
88	79-34-5	1,1,2,2-Tetrachloroethane																				
89	Cyclo Alkanes	108-87-2	Methylcyclohexane		580.34	719.97	757.76	654.95	659.63	639.99	601.72		29.02	36.00	37.89	32.75	32.98	32.00	30.09	39.68	0.05	0.82
90		110-82-7	Cyclohexane		79.72	99.17	103.19	85.32	90.18	85.65	79.12		3.99	4.96	5.16	4.27	4.51	4.28	3.96	5.49	0.06	0.79
91		1678-93-9	Cyclohexane, butyl-		374.58	382.15	299.98	245.42	188.08	192.10	170.63		18.73	19.11	15.00	12.27	9.40	9.60	8.53	23.53	0.22	0.97
92		1678-91-7	Cyclohexane, ethyl-		319.56	349.97	359.47	288.18	279.12	275.46	267.69		15.98	17.50	17.97	14.41	13.96	13.77	13.38	19.87	0.09	0.93
93		1678-92-8	Cyclohexane, propyl-		533.11	526.20	547.91	394.48	331.90	337.98	335.53		26.66	26.31	27.40	19.72	16.59	16.90	16.78	33.12	0.16	0.92
94	91-17-8	Decahydronaphthalene		253.04	237.59	223.71	147.06	130.19	113.90	109.21			12.65	11.88	11.19	7.35	6.51	5.69	5.46	16.10	0.24	0.99
95	Terpenes	80-56-8	alpha-Pinene																			
96		99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100		79-92-5	Camphene																			
101	5989-27-5	Limonene																				
102	Acids	64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104		107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108	109-52-4	Pentanoic Acid																				
109	Other	3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime																			
115		121-44-8	Triethylamine																			
116		75-21-8	Ethylene oxide																			
117		75-56-9	Propylene oxide																			
118		106-99-0	1,3-Butadiene																			
119	0-00-0	TVOC		6.3	48659.1	46023.1	42240.4	31758.8	28485.8	28251.8	27063.3		2432.64	2300.84	2111.70	1587.63	1423.98	1412.28	1352.85	2745.05	0.16	0.98

Table A. 46: Concentration & emission factor for PTO_0.4mm (oil-based paint/primer opened with a gap by inserting a 0.4 mm metal piece)

#	Class	CAS #	Compound	Chamber concentration ($\mu\text{g m}^{-3}$)								Emission factor ($\mu\text{g h}^{-1}$)								Coefficient: $E = a t^b$ with $t > 3 \text{ h}$		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
1	Alcohols	71-36-3	1-Butanol	0.4																		
2		71-23-8	1-Propanol																			
3		104-76-7	Hexanol, 2-ethyl-1-	5.9																		
4		67-63-0	2-Propanol		11.6	16.2	24.3			10.8			0.6	0.8	1.2			0.5		1.25	0.18	0.56
5		64-17-5	Ethanol		51.0	56.6	82.0	37.2	28.2	27.0			2.6	2.8	4.1	1.9	1.4	1.4		5.11	0.31	0.80
6		108-95-2	Phenol																			
7	Aldehydes & ketones	78-93-3	Methylethyl ketone	0.7	7567.4	9507.0	9118.5	6900.7	6272.7	6276.6	5837.5		378.3	475.3	455.9	345.0	313.6	313.8	291.8	568.43	0.15	0.98
8		67-64-1	Acetone	0.6	14.5		30.9	18.2		14.2	14.7		0.7		1.5	0.9		0.7	0.7	2.41	0.29	0.95
9		98-86-2	Acetophenone	0.1																		
10		108-94-1	Cyclohexanone																			
11		108-10-1	Methylisobutyl ketone																			
12		100-52-7	Benzaldehyde	0.6																		
13		123-72-8	Butanal	0.6																		
14		112-31-2	Decanal																			
15		3913-81-3	2-Decenal																			
16		98-01-1	Furfural																			
17		111-71-7	Heptanal	0.7																		
18		66-25-1	Hexanal	0.7																		
19		124-19-6	Nonanal	1.3																		
20		18829-56-6	2-Nonenal																			
21		2548-87-0	2-Octenal																			
22	Aliphatic Hydrocarbons	110-62-3	Pentanal	0.4		32.9	37.5	33.2	24.3	20.8	22.8			1.6	1.9	1.6	1.2	1.0	1.1	2.19	0.15	0.73
23		107-83-5	Pentane, 2-methyl-																			
24		96-14-0	Pentane, 3-methyl-																			
25		540-84-1	2,2,4-Trimethylpentane																			
26		108-08-7	2,4-Dimethylpentane																			
27		124-18-5	Decane	2.9	14798.7	17038.6	13465.1	9788.4	7872.7	7648.9	6072.9		739.8	851.8	673.1	489.3	393.5	382.3	303.5	1135.28	0.27	0.98
28		112-40-3	Dodecane	1.1	925.6	1355.7	884.2	844.8	534.3	453.9	386.2		46.2	67.7	44.2	42.2	26.7	22.6	19.3	93.31	0.33	0.92
29		142-82-5	Heptane		29.4	36.3	39.3	26.5	24.7	26.2			1.5	1.8	2.0	1.3	1.2	1.3		2.25	0.14	0.83
30		544-76-3	Hexadecane																			
31		110-54-3	Hexane																			
32		111-84-2	Nonane	0.4	13214.8	14851.0	12592.0	9043.7	6600.9	5865.4	4496.7		660.7	742.5	629.6	452.2	330.0	293.2	224.8	1122.21	0.32	0.97
33		111-65-9	Octane		1316.0	1555.5	1369.6	866.3	679.8	623.4	516.9		65.8	77.8	68.5	43.3	34.0	31.2	25.8	115.23	0.31	0.99
34		629-62-9	Pentadecane																			
35		629-59-4	Tetradecane																			
36		629-50-5	Tridecane																			
37		1120-21-4	Undecane	2.5	3463.1	4209.7	3200.7	2248.1	1775.0	1699.1	1448.0		173.0	210.4	159.9	112.3	88.6	84.8	72.3	281.50	0.29	0.99
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	0.1																		
39		611-14-3	Toluene, 2-ethyl-	0.0	36.7	45.5	34.5	25.7	19.9	18.5	15.2		1.8	2.3	1.7	1.3	1.0	0.9	0.8	3.08	0.29	0.98
40		620-14-4	Toluene, 3-ethyl-	0.1	116.6	153.9	114.5	92.2	63.1	57.4	48.1		5.8	7.7	5.7	4.6	3.2	2.9	2.4	10.81	0.31	0.97
41		622-96-8	Toluene, 4-ethyl-	0.0	51.7	64.2	42.5	33.6	30.7	24.6	18.2		2.6	3.2	2.1	1.7	1.5	1.2	0.9	4.18	0.30	0.92
42		4994-16-5	Cyclohexene, 4-phenyl																			
43		71-43-2	Benzene	0.7	44.1	50.3	51.7	40.1	36.6	36.2	32.5		2.2	2.5	2.5	2.0	1.8	1.8	1.6	3.02	0.13	0.95
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.1	27.9	37.6	29.1	20.9	18.3	17.1	13.1		1.4	1.9	1.5	1.0	0.9	0.9	0.7	2.46	0.27	0.97
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.2	112.7	156.3	110.6	77.4	60.3	54.8	42.6		5.6	7.8	5.5	3.9	3.0	2.7	2.1	10.96	0.34	0.98
46		95-47-6	Benzene, 1,2-dimethyl-	0.1	3187.1	3848.7	3233.4	2251.3	1643.8	1439.0	1154.6		159.3	192.4	161.7	112.6	82.2	71.9	57.7	292.21	0.33	0.98
47		108-67-8	Benzene, 1,3,5-trimethyl-		51.9	57.2	45.2	29.7	28.6	27.2	22.2		2.6	2.9	2.3	1.5	1.4	1.4	1.1	3.60	0.25	0.96
48		108-38-3	Benzene, 1,3-dimethyl-	0.3	9294.9	11468.2	9387.6	6440.2	4674.6	4157.2	3362.4		464.7	573.4	469.4	322.0	233.7	207.8	168.1	865.87	0.34	0.98
49		98-82-8	Benzene, isopropyl		40.3	48.5	44.3	28.7	23.5	18.2	15.8		2.0	2.4	2.2	1.4	1.2	0.9	0.8	3.75	0.32	0.97
50		103-65-1	Benzene, propyl-		32.3	43.5	36.7	24.1	19.6	15.1	14.5		1.6	2.2	1.8	1.2	1.0	0.8	0.7	3.22	0.32	0.99
51		100-41-4	Ethylbenzene	0.1	2605.3	3179.5	2594.0	1758.9	1302.9	1159.4	950.4		130.3	159.0	129.7	87.9	65.1	58.0	47.5	237.34	0.34	0.99
52		91-20-3	Naphthalene	0.6	7.0	5.9	5.4	9.8	19.2	10.5	7.3		0.3	0.3	0.2	0.5	0.9	0.5	0.3	0.20	-0.22	0.37
53	Esters	99-87-6	p-Cymene																			
54		100-42-5	Styrene	0.1																		
55		108-88-3	Toluene	0.2	574.1	700.1	595.4	394.0	330.5	325.3	275.5		28.7	35.0	29.8	19.7	16.5	16.3	13.8	46.80	0.26	0.99
56		98-83-9	2-Phenylpropene																			
57		95-13-6	Indene																			
58		108-21-4	Acetic acid, 1-methylethyl																			
59		111-15-9	Acetic acid, 2-ethoxyethyl																			
60		123-86-4	Acetic acid, butyl ester																			
61		141-78-6	Acetic acid, ethyl ester																			
62		80-62-6	Methyl methacrylate																			
63		103-09-3	2-Ethylhexyl acetate																			
64		96-48-0	Butyrolactone																			
65		25265-77-4	Texanol	0.8																		
66		6846-50-0	TXIB																			

Table A. 46 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µgh ⁻¹)								Coefficient: E = a t ^b with t > 3 h		
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																			
68		110-49-6	2-Methoxyethylacetate																			
69		111-90-0	Diethylene glycol monoeth																			
70		107-98-2	Propanol, 1-methoxy-2-																			
71		111-76-2	Ethanol, 2-butoxy-																			
72		112-34-5	Ethanol, 2-butoxyethoxy-																			
73		110-80-5	Ethanol, 2-ethoxy-																			
74		109-86-4	Ethanol, 2-methoxy-																			
75	75-65-0	Propanol, 2-methyl-2-		226.2	254.8	284.4	220.5	213.2	201.0	187.7		11.3	12.7	14.2	11.0	10.7	10.0	9.4	15.42	0.10	0.85	
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane																			
77		95-50-1	1,2-Dichlorobenzene																			
78		107-06-2	1,2-Dichloroethane																			
79		78-87-5	1,2-Dichloropropane																			
80		106-46-7	1,4-Dichlorobenzene																			
81		75-27-4	Bromodichloromethane																			
82		56-23-5	Carbon tetrachloride																			
83		67-66-3	Chloroform																			
84	Cyclo Alkanes	124-48-1	Dibromochloromethane																			
85		75-09-2	Dichloromethane							28.6								1.4				
86		127-18-4	Tetrachloroethylene																			
87		79-01-6	Trichloroethylene																			
88		79-34-5	1,1,2,2-Tetrachloroethane																			
89		108-87-2	Methylcyclohexane		219.3	240.6	229.1	165.6	149.9	147.8	127.7		11.0	12.0	11.5	8.3	7.5	7.4	6.4	15.09	0.18	0.97
90		110-82-7	Cyclohexane																			
91		1678-93-9	Cyclohexane, butyl-	0.3	1497.9	1741.8	1492.8	1012.8	907.8	812.7	685.6		74.9	87.1	74.6	50.6	45.4	40.6	34.3	116.66	0.26	0.99
92	Terpenes	1678-91-7	Cyclohexane, ethyl-		793.5	906.4	773.6	498.3	391.0	366.4	299.2		39.7	45.3	38.7	24.9	19.5	18.3	15.0	65.86	0.31	0.99
93		1678-92-8	Cyclohexane, propyl-	0.1	3770.5	3949.4	3569.1	2384.7	2068.4	1606.8	1280.0		188.5	197.5	178.4	119.2	103.4	80.3	64.0	298.31	0.31	0.95
94		91-17-8	Decahydronaphthalene	0.2	918.8	1103.3	947.5	630.3	532.1	486.7	409.3		45.9	55.2	47.4	31.5	26.6	24.3	20.5	76.31	0.28	0.99
95		80-56-8	alpha-Pinene																			
96	Acids	99-86-5	alpha-Terpinene																			
97		127-91-3	beta-Pinene																			
98		99-85-4	gamma-Terpinene																			
99		13466-78-9	3-Carene																			
100	Other	79-92-5	Camphene																			
101		5989-27-5	Limonene	0.4																		
102		64-19-7	Acetic acid																			
103		79-31-2	Isobutyric acid																			
104	Other	107-92-6	Butyric acid																			
105		111-14-8	Heptanoic acid																			
106		149-57-5	2-Ethylhexanoic acid																			
107		142-62-1	Hexanoic acid																			
108	Other	109-52-4	Pentanoic Acid																			
109		3777-69-3	Furan, 2-pentyl																			
110		872-50-4	2-Pyrrolidinone, 1-methyl																			
111		123-91-1	1,4-Dioxane																			
112		78-40-0	Triethyl phosphate																			
113		142-96-1	n-Butyl ether																			
114		96-29-7	2-Butanone oxime	5.4	404.4	645.1	797.4	336.0	186.8	121.3	120.0		20.0	32.0	39.6	16.5	9.1	5.8	5.7	82.66	0.58	0.92
115		121-44-8	Triethylamine																			
116	75-21-8	Ethylene oxide																				
117	75-56-9	Propylene oxide																				
118	106-99-0	1,3-Butadiene																				
119	0-00-0	TVOC		49	193267	220142	181086	126950	96735	88137	70201		9661	11005	9052	6345	4834	4404	3508	15932.4	0.31	0.98

Table A. 47: Concentration & emission factor for PTO_1mm (oil-based paint/primer opened with a gap by inserting a 1 mm metal piece)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h					
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²			
1	Alcohols	71-36-3	1-Butanol																						
2		71-23-8	1-Propanol																						
3		104-76-7	Hexanol, 2-ethyl-1-	2.5																					
4		67-63-0	2-Propanol		26.1	33.2				19.8				1.3	1.7			1.0							
5		64-17-5	Ethanol			156.3									7.8										
6		108-95-2	Phenol	0.5																					
7	Aldehydes & ketones	78-93-3	Methylethyl ketone	0.5	10236.2	10963.3	8710.4	7823.9	9807.2	9377.7	9719.3		511.8	548.1	435.5	391.2	490.3	468.9	485.9	489.15	0.01	0.03			
8		67-64-1	Acetone	1.2		32.7					18.5				1.6					0.9					
9		98-86-2	Acetophenone	0.3																					
10		108-94-1	Cyclohexanone																						
11		108-10-1	Methylisobutyl ketone																						
12		100-52-7	Benzaldehyde	2.1																					
13		123-72-8	Butanal																						
14		112-31-2	Decanal																						
15		3913-81-3	2-Decenal																						
16		98-01-1	Furfural																						
17	Aliphatic hydrocarbons	111-71-7	Heptanal																						
18		66-25-1	Hexanal	0.5																					
19		124-19-6	Nonanal	1.3																					
20		18829-56-6	2-Nonenal																						
21		2548-87-0	2-Octenal																						
22		110-62-3	Pentanal	0.4				28.9									1.4								
23		107-83-5	Pentane, 2-methyl-																						
24		96-14-0	Pentane, 3-methyl-																						
25		540-84-1	2,2,4-Trimethylpentane																						
26		108-08-7	2,4-Dimethylpentane																						
27	Aliphatic hydrocarbons	124-18-5	Decane	2.3	37325.5	22516.8	14872.1	5048.4	5130.0	4443.0	4062.3		1866.2	1125.7	743.5	252.3	256.4	222.0	203.0	1760.78	0.50	0.94			
28		112-40-3	Dodecane	1.3	4177.5	3022.0	1383.9	375.0	192.3	199.0	148.1		208.8	151.0	69.1	18.7	9.5	9.9	7.3	345.23	0.87	0.98			
29		142-82-5	Heptane		48.8	39.7	31.3						2.4	2.0	1.6										
30		544-76-3	Hexadecane																						
31		110-54-3	Hexane																						
32		111-84-2	Nonane	0.2	22766.3	13980.4	9704.6	4714.9	5051.4	4787.9	4538.2		1138.3	699.0	485.2	235.7	252.6	239.4	226.9	877.47	0.32	0.89			
33		111-65-9	Octane		1832.9	1225.7	1048.4	638.8	703.9	732.4	688.3		91.6	61.3	52.4	31.9	35.2	36.6	34.4	68.83	0.17	0.79			
34		629-62-9	Pentadecane																						
35		629-59-4	Tetradecane																						
36		629-50-5	Tridecane																						
37	Aromatic hydrocarbons	1120-21-4	Undecane	2.6	12359.8	7961.4	4444.7	1198.1	1060.1	994.7	939.2		617.9	397.9	222.1	59.8	52.9	49.6	46.8	681.95	0.64	0.94			
38		95-93-2	Benzene, 1,2,4,5-tetramethyl-	0.2																					
39		611-14-3	Toluene, 2-ethyl-	0.1	75.6	45.2	38.7	16.4	15.7	16.7	15.5		3.8	2.3	1.9	0.8	0.8	0.8	0.8	3.15	0.34	0.90			
40		620-14-4	Toluene, 3-ethyl-	0.1	217.8	160.8	103.9	48.5	46.0	38.0	38.9		10.9	8.0	5.2	2.4	2.3	1.9	1.9	11.32	0.42	0.95			
41		622-96-8	Toluene, 4-ethyl-	0.1	88.5	73.6	44.4	13.8	16.1	18.8	15.9		4.4	3.7	2.2	0.7	0.8	0.9	0.8	4.80	0.44	0.80			
42		4994-16-5	Cyclohexene, 4-phenyl																						
43		71-43-2	Benzene	0.6	72.6	69.1	57.1	47.4	55.7	52.1	55.7		3.6	3.4	2.8	2.3	2.8	2.6	2.8	3.30	0.06	0.40			
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.2	70.6	43.1	32.8	13.0	11.8	11.8			3.5	2.1	1.6	0.6	0.6	0.6							
45		95-63-6	Benzene, 1,3-dimethyl-	0.6	234.6	172.1	106.5	39.2	32.8	35.1	31.4		11.7	8.6	5.3	1.9	1.6	1.7	1.5	13.03	0.50	0.93			
46		95-47-6	Benzene, 1,2-dimethyl-	0.1	5052.8	3442.9	2452.6	1315.5	1382.1	1392.0	1344.0		252.6	172.1	122.6	65.8	69.1	69.6	67.2	203.65	0.27	0.86			
47	Aromatic hydrocarbons	108-67-8	Benzene, 1,3,5-trimethyl-	0.1	91.4	62.9	47.9	21.7	18.3	19.1	18.2		4.6	3.1	2.4	1.1	0.9	0.9	0.9	4.50	0.38	0.94			
48		108-38-3	Benzene, 1,3-dimethyl-	0.2	14297.8	9978.5	7157.2	3873.9	4132.4	4301.7	4267.8		714.9	498.9	357.8	193.7	206.6	215.1	213.4	570.03	0.25	0.83			
49		98-82-8	Benzene, isopropyl		72.1	43.3	32.4	17.3	16.2	17.2	13.5		3.6	2.2	1.6	0.9	0.8	0.9	0.7	2.86	0.32	0.94			
50		103-65-1	Benzene, propyl-		66.1	42.4	26.6	12.1	13.1	13.1	10.2		3.3	2.1	1.3	0.6	0.7	0.7	0.5	2.75	0.38	0.90			
51		100-41-4	Ethylbenzene	0.1	3827.1	2670.3	1986.0	1087.4	1175.9	1251.0	1224.4		191.4	133.5	99.3	54.4	58.8	62.5	61.2	150.70	0.23	0.79			
52		91-20-3	Naphthalene	1.8																					
53		99-87-6	p-Cymene																						
54		100-42-5	Styrene	1.0																					
55		108-88-3	Toluene	0.5	791.7	582.9	497.3	350.4	406.9	423.5	409.3		39.6	29.1	24.8	17.5	20.3	21.2	20.4	29.69	0.10	0.58			
56		Esters	98-83-9	2-Phenylpropene																					
57	95-13-6		Indene																						
58	108-21-4		Acetic acid, 1-methylethyl																						
59	111-15-9		Acetic acid, 2-ethoxyethyl																						
60	123-86-4		Acetic acid, butyl ester																						
61	141-78-6		Acetic acid, ethyl ester																						
62	80-62-6		Methyl methacrylate																						
63	103-09-3		2-Ethylhexyl acetate																						
64	96-48-0		Butyrolactone																						
65	25265-77-4		Texanol	0.9																					
66	6846-50-0		TXIB																						

Table A. 47 (continued)

#	Class	CAS #	Compound	Chamber concentration (µg m ⁻³)								Emission factor (µg h ⁻¹)								Coefficient: E = a t ^b with t > 3 h			
				0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	0 h	1 h	3 h	6 h	24 h	48 h	72 h	96 h	a	b	R ²	
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol																				
68		110-49-6	2-Methoxyethylacetate																				
69		111-90-0	Diethylene glycol monoeth																				
70		107-98-2	Propanol, 1-methoxy-2-																				
71		111-76-2	Ethanol, 2-butoxy-																				
72		112-34-5	Ethanol, 2-butoxyethoxy-																				
73		110-80-5	Ethanol, 2-ethoxy-																				
74	Halo Carbons	109-86-4	Ethanol, 2-methoxy-																				
75		75-65-0	Propanol, 2-methyl-2-		307.2	378.6	275.1	243.1	279.3	264.7	256.3		15.4	18.9	13.8	12.2	14.0	13.2	12.8	17.98	0.08	0.52	
76		71-55-6	1,1,1-Trichloroethane																				
77		95-50-1	1,2-Dichlorobenzene																				
78		107-06-2	1,2-Dichloroethane																				
79		78-87-5	1,2-Dichloropropane																				
80		106-46-7	1,4-Dichlorobenzene																				
81	Halo Alkanes	75-27-4	Bromodichloromethane																				
82		56-23-5	Carbon tetrachloride																				
83		67-66-3	Chloroform																				
84		124-48-1	Dibromochloromethane																				
85		75-09-2	Dichloromethane																				
86		127-18-4	Tetrachloroethylene																				
87		79-01-6	Trichloroethylene																				
88	Cyclo Alkanes	79-34-5	1,1,2,2-Tetrachloroethane																				
89		108-87-2	Methylcyclohexane			272.6	244.8	199.1	175.9	174.4	185.4	167.4		13.6	12.2	10.0	8.8	8.7	9.3	8.4	12.44	0.09	0.77
90		110-82-7	Cyclohexane																				
91		1678-93-9	Cyclohexane, butyl-	0.3	4502.4	2695.5	1722.2	620.9	571.1	506.0	430.3		225.1	134.8	86.1	31.0	28.5	25.3	21.5	218.23	0.53	0.96	
92		1678-91-7	Cyclohexane, ethyl-		980.0	727.1	553.0	395.4	395.5	385.3	366.2		49.0	36.4	27.6	19.8	19.8	19.3	18.3	40.66	0.19	0.91	
93		1678-92-8	Cyclohexane, propyl-		6515.8	4125.5	2689.6	1643.6	1432.3	1396.9	1175.2		325.8	206.3	134.5	82.2	71.6	69.8	58.8	267.06	0.34	0.96	
94		91-17-8	Decahydronaphthalene		2768.3	1598.9	1041.8	378.0	342.6	282.8	244.9		138.4	79.9	52.1	18.9	17.1	14.1	12.2	134.53	0.54	0.97	
95	Terpenes	80-56-8	alpha-Pinene																				
96		99-86-5	alpha-Terpinene																				
97		127-91-3	beta-Pinene																				
98		99-85-4	gamma-Terpinene																				
99		13466-78-9	3-Carene																				
100		79-92-5	Camphene																				
101		5989-27-5	Limonene																				
102	Acids	64-19-7	Acetic acid																				
103		79-31-2	Isobutyric acid																				
104		107-92-6	Butyric acid																				
105		111-14-8	Heptanoic acid																				
106		149-57-5	2-Ethylhexanoic acid																				
107		142-62-1	Hexanoic acid																				
108		109-52-4	Pentanoic Acid																				
109	Other	3777-69-3	Furan, 2-pentyl																				
110		872-50-4	2-Pyrrolidinone, 1-methyl																				
111		123-91-1	1,4-Dioxane																				
112		78-40-0	Triethyl phosphate																				
113		142-96-1	n-Butyl ether																				
114		96-29-7	2-Butanone oxime		1333.4	657.6	273.3	66.1	84.5	65.0	66.9		66.7	32.9	13.7	3.3	4.2	3.2	3.3	48.73	0.65	0.87	
115		121-44-8	Triethylamine																				
116	Other	75-21-8	Ethylene oxide																				
117		75-56-9	Propylene oxide																				
118		106-99-0	1,3-Butadiene																				
119		0-00-0	TVOC	49	420075	258007	174506	76521	74536	66507	64968		21001	12898	8723	3824	3724	3323	3246	18083.7	0.41	0.94	

A.6 Summary of emission factors at 24 h and 96 h

Table A. 48: Summary of emission factors ($\mu\text{g h}^{-1}$) at 24 h for large products tested in 2 m^3

#	Class	CAS#	Compound	Large products tested in 2 m^3 after 30 min operation									
				Gas powered equipment									
				SB2	SB3	LM1	LM2	LM3	LM4	TR1	TR2	CS1	CS2
1	Alcohols	71-36-3	1-Butanol										
2		71-23-8	1-Propanol										
3		104-76-7	Hexanol, 2-ethyl-1-										
4		67-63-0	2-Propanol										
5		64-17-5	Ethanol	1968.4	8350.8	4691.5	2258.1	4832.7	7477.5	2822.7	9019.2	3010.8	1642.2
6		108-95-2	Phenol	5.4						2.6	2.5		
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone			180.1	3.0		6.6	1.0	2.1	1.1	0.1
8		67-64-1	Acetone			68.0	6.1	13.3	4.4	2.7	5.4	6.2	3.6
9		98-86-2	Acetophenone	2.4		11.3	15.0	4.4	12.9	2.2			
10		108-94-1	Cyclohexanone										
11		108-10-1	Methylisobutyl ketone										
12		100-52-7	Benzaldehyde										
13		123-72-8	Butanal										
14		112-31-2	Decanal										
15		3913-81-3	2-Decenal										
16		98-01-1	Furfural										
17		111-71-7	Heptanal										
18		66-25-1	Hexanal										
19		124-19-6	Nonanal					5.2					
20	Aliphatic Hydrocarbons	18829-56-6	2-Nonenal										
21		2548-87-0	2-Octenal										
22		110-62-3	Pentanal										
23		107-83-5	Pentane, 2-methyl-	5260.1	3193.0	808.6	464.0	879.5	1633.6	314.2	1605.5	935.7	575.1
24		96-14-0	Pentane, 3-methyl-	2121.3	2034.7	481.5	289.8	543.7	1031.1	175.6	902.6	575.3	349.3
25		540-84-1	2,2,4-Trimethylpentane	116.2	1432.1	453.8	391.0	609.3	1539.6	113.7	663.9	401.1	225.0
26		108-08-7	2,4-Dimethylpentane							12.5			
27		124-18-5	Decane	16.3	122.1	59.8	7.7	14.5	95.6	10.3	26.4	26.0	21.1
28		112-40-3	Dodecane	7.6	29.4	16.8	85.2	3.7	9.6	15.1	9.4	32.8	13.4
29		142-82-5	Heptane	128.9	1364.7	423.6	243.3	393.4	1682.2	126.1	603.3	347.3	182.3
30		544-76-3	Hexadecane					5.9		2.3		1.3	
31		110-54-3	Hexane		3103.1	4040.6	2587.2	4894.3	12579.8	949.8	4476.0	2465.7	1401.5
32		111-84-2	Nonane	28.7	272.9	93.3	21.1	40.5	241.5	20.6	63.6	57.4	37.0
33		111-65-9	Octane	55.2	565.8	136.9	63.8	104.7	541.6	43.9	174.8	127.7	67.7
34	Aromatic Hydrocarbons	629-62-9	Pentadecane					8.6	1.6	2.5	2.4	2.5	
35		629-59-4	Tetradecane	2.0			28.0	5.1	1.4	3.6	1.9	6.0	
36		629-50-5	Tridecane	2.9		4.3	118.0	2.1	2.9	5.6	3.3	14.6	2.9
37		1120-21-4	Undecane	10.3	56.1	34.1	9.7	6.0	30.0	8.1	13.9	16.4	19.1
38		95-93-2	Benzene, 1,2,4,5-tetramethyl-	12.7	103.2	47.9	10.9	7.1	78.5	8.9	41.0	18.6	28.5
39		611-14-3	Toluene, 2-ethyl-	42.6	462.9	141.7	18.3	38.5	378.1	32.7	171.6	77.0	80.6
40		620-14-4	Toluene, 3-ethyl-	86.5	1596.0	259.3	56.6	129.1	1261.5	99.2	501.4	237.3	226.0
41		622-96-8	Toluene, 4-ethyl-	56.7	722.7	156.9	33.7	72.1	784.5	66.9	312.9	167.4	146.3
42		4994-16-5	Cyclohexene, 4-phenyl										
43		71-43-2	Benzene	21.3	1250.6	239.5	144.0	259.3	1278.3	138.9	553.3	217.8	137.1
44		526-73-8	Benzene, 1,2,3-trimethyl-	44.2	519.6	187.5	22.1	33.8	386.9	33.5	189.9	75.3	92.3
45		95-63-6	Benzene, 1,2,4-trimethyl-	205.6	2468.0	805.2	98.7	195.3	2155.8	180.5	914.3	417.3	439.0
46		95-47-6	Benzene, 1,2-dimethyl-	109.1	2585.0	198.9	65.3	127.8	1475.4	102.6	667.9	242.5	215.3
47		108-67-8	Benzene, 1,3,5-trimethyl-	60.1	611.2	197.6	26.5	55.1	516.1	43.6	218.3	106.7	103.6
48		108-38-3	Benzene, 1,3-dimethyl-	247.9	6692.2	468.0	171.6	329.8	3561.0	266.2	1670.0	620.0	510.6
49		98-82-8	Benzene, isopropyl	10.2	91.8					7.5	44.6	19.9	19.5
50		103-65-1	Benzene, propyl-	46.3	381.2					38.6	206.3	100.2	96.0
51		100-41-4	Ethylbenzene	62.6	1703.0	110.4	46.7	90.6	967.5	70.3	446.9	162.7	135.6
52		91-20-3	Naphthalene	20.9	107.6					42.7	134.6	68.8	90.8
53		99-87-6	p-Cymene	1.9	7.6					1.3	6.0	3.4	3.7
54		100-42-5	Styrene		9.3								
55		108-88-3	Toluene	292.1	14060.8	562.7	517.6	898.4	4455.9	705.3	3721.3	1240.5	1100.0
56		98-83-9	2-Phenylpropene										
57		95-13-6	Indene	1.3	7.9					0.9	6.5	2.3	3.3

Note: Pink (EF > 1,000 $\mu\text{g h}^{-1}$); Yellow (100 < EF < 1,000 $\mu\text{g h}^{-1}$)

Table A. 48 (continued)

				Large products tested in 2 m ³ after 30 min operation									
				Gas powered equipment									
#	Class	CAS#	Compound	SB2	SB3	LM1	LM2	LM3	LM4	TR1	TR2	CS1	CS2
58	Esters	108-21-4	Acetic acid, 1-methylethyl ester										
59		111-15-9	Acetic acid, 2-ethoxyethyl ester										
60		123-86-4	Acetic acid, butyl ester										
61		141-78-6	Acetic acid, ethyl ester			5.7							
62		80-62-6	Methyl methacrylate										
63		103-09-3	2-Ethylhexyl acetate										
64		96-48-0	Butyrolactone										
65		25265-77-4	Texanol										
66		6846-50-0	TXIB										
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol										
68		110-49-6	2-Methoxyethylacetate										
69		111-90-0	Diethylene glycol monoethyl ether										
70		107-98-2	Propanol, 1-methoxy-2-										
71		111-76-2	Ethanol, 2-butoxy-										
72		112-34-5	Ethanol, 2-butoxyethoxy-										
73		110-80-5	Ethanol, 2-ethoxy-										
74		109-86-4	Ethanol, 2-methoxy-										
75		75-65-0	Propanol, 2-methyl-2-										
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane										
77		95-50-1	1,2-Dichlorobenzene										
78		107-06-2	1,2-Dichloroethane										
79		78-87-5	1,2-Dichloropropane										
80		106-46-7	1,4-Dichlorobenzene										
81		75-27-4	Bromodichloromethane										
82		56-23-5	Carbon tetrachloride										
83		67-66-3	Chloroform										
84		124-48-1	Dibromochloromethane										
85		75-09-2	Dichloromethane									16.6	
86		127-18-4	Tetrachloroethylene										
87		79-01-6	Trichloroethylene			13.6		31.4					4.7
88		79-34-5	1,1,2,2-Tetrachloroethane										
89	Cyclo Alkanes	108-87-2	Methylcyclohexane	126.1	580.4	135.4	127.5	199.2	632.9	75.7	296.6	249.1	134.8
90		110-82-7	Cyclohexane	107.0	439.5					55.9	269.1	181.3	106.9
91		1678-93-9	Cyclohexane, butyl-										
92		1678-91-7	Cyclohexane, ethyl-	21.9	86.4					11.9	35.0	39.1	23.7
93		1678-92-8	Cyclohexane, propyl-	5.9	21.1					3.4	9.2	10.7	6.8
94		91-17-8	Decahydronaphthalene										
95	Terpenes	80-56-8	alpha-Pinene	1.6		3.9	0.3	1.9	0.7				
96		99-86-5	alpha-Terpinene										
97		127-91-3	beta-Pinene										
98		99-85-4	gamma-Terpinene										
99		13466-78-9	3-Carene										
100		79-92-5	Camphene										
101	Acids	5989-27-5	Limonene				3.1						
102		64-19-7	Acetic acid										
103		79-31-2	Isobutyric acid										
104		107-92-6	Butyric acid	3.9									
105		111-14-8	Heptanoic acid	28.4									
106		149-57-5	2-Ethylhexanoic acid										
107		142-62-1	Hexanoic acid	13.5									
108		109-52-4	Pentanoic Acid	10.3									
109	Other	3777-69-3	Furan, 2-pentyl										
110		872-50-4	2-Pyrrolidinone, 1-methyl-										
111		123-91-1	1,4-Dioxane										
112		78-40-0	Triethyl phosphate										
113		142-96-1	n-Butyl ether										
114		96-29-7	2-Butanone oxime										
115		121-44-8	Triethylamine										
116		75-21-8	Ethylene oxide										
117		75-56-9	Propylene oxide										
118		106-99-0	1,3-Butadiene										
D1	DHPH	75-07-0	Acetaldehyde	19.3	42.3	112.8	6.0		25.7	6.3	14.2	10.9	
D2		50-00-0	Formaldehyde	9.5	5.7	7.6		2.4	2.1		1.2		1.5
D3		123-38-6	Propanal										
		0-00-0	TVOC	6160.4	74317.8	15896.1	10222.0	13266.0	58032.3	5405.9	23245.4	11394.7	8128.1

Table A. 49: Summary of emission factors ($\mu\text{g h}^{-1}$) at 24 h for small products tested in 50 L chamber with cap/cover closed

				Small products testd in 50 L with cap/cover closed											
				Gasoline container	Automotive products		Wax	Lubri cant	Adhesiv es	Degr easer	Paint products				Roof
#	Class	CAS#	Compound	GC	WW	MO2	WXF	LUB	ADH12	DG	PTO	PTR	PTH	PTS	RS
1	Alcohols	71-36-3	1-Butanol		0.0										
2		71-23-8	1-Propanol						5.2						
3		104-76-7	Hexanol, 2-ethyl-1-		0.0										
4		67-63-0	2-Propanol												
5		64-17-5	Ethanol	3479.5											
6		108-95-2	Phenol												
7	Aldehydes & ketones	78-93-3	Methylethyl ketone		0.1				644.6		0.4				0.0
8		67-64-1	Acetone		0.2			0.6	5.6		0.1				15.1
9		98-86-2	Acetophenone		0.0		0.0				0.1				
10		108-94-1	Cyclohexanone												
11		108-10-1	Methylisobutyl ketone												0.2
12		100-52-7	Benzaldehyde		0.1		0.1				0.3				0.0
13		123-72-8	Butanal												
14		112-31-2	Decanal												
15		3913-81-3	2-Decenal												
16		98-01-1	Furfural												
17		111-71-7	Heptanal												
18		66-25-1	Hexanal								0.6				
19	124-19-6	Nonanal													
20	18829-56-6	2-Nonenal													
21	2548-87-0	2-Octenal													
22	110-62-3	Pentanal								0.1					
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	3545.1					0.5	0.1			0.2		
24		96-14-0	Pentane, 3-methyl-	2021.9					0.7	0.1			0.2		
25		540-84-1	2,2,4-Trimethylpentane	1348.8											
26		108-08-7	2,4-Dimethylpentane												
27		124-18-5	Decane	81.2	0.1	3.2	6.7			16.6	11.9	2.7	46.9	0.0	4.8
28		112-40-3	Dodecane	5.5	0.0	13.6	0.1			1.0	1.3		6.0	0.0	0.4
29		142-82-5	Heptane	2003.5					262.6	0.4			1.6		
30		544-76-3	Hexadecane												
31		110-54-3	Hexane	20701.1					37.6	1.1			1.0		
32		111-84-2	Nonane	238.4	0.0		5.2			4.8	6.6	1.1	25.6	0.4	2.5
33		111-65-9	Octane	647.2					9.9	2.2	0.4		6.4	0.2	0.1
34		629-62-9	Pentadecane												
35		629-59-4	Tetradecane				0.0						0.1		
36		629-50-5	Tridecane			0.3							0.1	0.0	
37		1120-21-4	Undecane	19.8	0.3	36.8	1.0			12.2	3.6	1.5	32.5		3.6
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	48.1	0.0	1.4	0.0			0.5			1.4		0.1
39		611-14-3	Toluene, 2-ethyl-	305.0	0.0					0.9	0.0	0.3	4.9	0.0	0.1
40		620-14-4	Toluene, 3-ethyl-	1076.4	0.0	0.0	0.0			1.9	0.1	0.6	10.7	0.1	0.3
41		622-96-8	Toluene, 4-ethyl-	745.8	0.0	0.0	0.0			1.1	0.1	0.4	6.0	0.1	0.2
42		4994-16-5	Cyclohexene, 4-phenyl												
43		71-43-2	Benzene	1522.6					0.1	0.2	0.0	0.1	0.0		
44		526-73-8	Benzene, 1,2,3-trimethyl-	296.1	0.0	0.3				2.7	0.0	0.5	9.2	0.0	0.3
45		95-63-6	Benzene, 1,2,4-trimethyl-	1820.6	0.1		0.0			5.6		1.7	23.5	0.0	0.9
46		95-47-6	Benzene, 1,2-dimethyl-	1175.4	0.0	0.0			0.4	0.9	1.8	0.5	3.7	0.2	0.1
47		108-67-8	Benzene, 1,3,5-trimethyl-	450.8	0.0		0.0			1.0	0.0	0.4	5.4	0.0	0.3
48		108-38-3	Benzene, 1,3-dimethyl-	3425.1	0.1	0.0			1.8	2.5	5.5	1.1	9.0	0.7	0.3
49		98-82-8	Benzene, isopropyl	44.9						0.1	0.0		1.5	0.0	0.0
50		103-65-1	Benzene, propyl-	257.9	0.0					0.6	0.0	0.2	7.0	0.0	0.1
51		100-41-4	Ethylbenzene	818.4	0.0	0.0			0.5	0.9	1.3	0.2	2.9	0.1	0.0
52		91-20-3	Naphthalene	94.5	0.0	2.8				0.4	0.0	0.1	4.7	0.0	0.0
53		99-87-6	p-Cymene	7.0	0.0	0.1				0.2			1.9		0.0
54		100-42-5	Styrene			0.0				0.1	0.1	0.1			
55		108-88-3	Toluene	5274.5	0.9				0.2	124.7	0.2	54.8	3.1	15.4	0.0
56		98-83-9	2-Phenylpropene												
57		95-13-6	Indene												

Note: Pink (EF > 1,000 $\mu\text{g h}^{-1}$); Yellow (100 < EF < 1,000 $\mu\text{g h}^{-1}$)

Table A. 49 (continued)

				Small products testd in 50 L with cap/cover closed												
				Gasoline container	Automotive products		Wax	Lubri cant	Adhesiv es	Degr easer	Paint products				Roof	
#	Class	CAS#	Compound	GC	WW	MO2	WXF	LUB	ADH12	DG	PTO	PTR	PTH	PTS	RS	
58	Esters	108-21-4	Acetic acid, 1-methylethyl ester													
59		111-15-9	Acetic acid, 2-ethoxyethyl ester													
60		123-86-4	Acetic acid, butyl ester													
61		141-78-6	Acetic acid, ethyl ester													
62		80-62-6	Methyl methacrylate													
63		103-09-3	2-Ethylhexyl acetate													
64		96-48-0	Butyrolactone													
65	Glycols, Glycoethers	25265-77-4	Texanol							0.1						
66		6846-50-0	TXIB													
67		57-55-6	1,2-Propanediol												0.6	
68		110-49-6	2-Methoxyethylacetate													
69		111-90-0	Diethylene glycol monoethyl ether													
70		107-98-2	Propanol, 1-methoxy-2-													
71		111-76-2	Ethanol, 2-butoxy-							17.0						
72	Halo Carbons	112-34-5	Ethanol, 2-butoxyethoxy-													
73		110-80-5	Ethanol, 2-ethoxy-													
74		109-86-4	Ethanol, 2-methoxy-													
75		75-65-0	Propanol, 2-methyl-2-													
76		71-55-6	1,1,1-Trichloroethane													
77		95-50-1	1,2-Dichlorobenzene													
78		107-06-2	1,2-Dichloroethane													
79	Halo Carbons	78-87-5	1,2-Dichloropropane													
80		106-46-7	1,4-Dichlorobenzene		0.0											
81		75-27-4	Bromodichloromethane													
82		56-23-5	Carbon tetrachloride													
83		67-66-3	Chloroform													
84		124-48-1	Dibromochloromethane													
85		75-09-2	Dichloromethane		0.6					0.2		8067.3				
86	Cyclo Alkanes	127-18-4	Tetrachloroethylene												0.0	
87		79-01-6	Trichloroethylene													
88		79-34-5	1,1,2,2-Tetrachloroethane													
89		108-87-2	Methylcyclohexane	749.0					187.2	0.5	0.0		3.1	0.0		
90		110-82-7	Cyclohexane	602.3					33.5	0.1			0.5			
91		1678-93-9	Cyclohexane, butyl-	5.9	0.0	0.7	1.0			1.1	1.9	0.2	7.0		0.3	
92		1678-91-7	Cyclohexane, ethyl-	111.2					1.3	0.5	0.3		3.3	0.4	0.1	
93	Terpenes	1678-92-8	Cyclohexane, propyl-	26.7			1.9		0.6	2.5		7.5	0.0	0.2		
94		91-17-8	Decahydronaphthalene	5.1		0.5	0.5		0.5	1.0		3.4		0.2		
95		80-56-8	alpha-Pinene													
96		99-86-5	alpha-Terpinene													
97		127-91-3	beta-Pinene													
98		99-85-4	gamma-Terpinene													
99		13466-78-9	3-Carene													
100	Acids	79-92-5	Camphene													
101		5989-27-5	Limonene													
102		64-19-7	Acetic acid													
103		79-31-2	Isobutyric acid													
104		107-92-6	Butyric acid													
105		111-14-8	Heptanoic acid													
106		149-57-5	2-Ethylhexanoic acid													
107	Other	142-62-1	Hexanoic acid													
108		109-52-4	Pentanoic Acid													
109		3777-69-3	Furan, 2-pentyl													
110		872-50-4	2-Pyrrolidinone, 1-methyl-													
111		123-91-1	1,4-Dioxane													
112		78-40-0	Triethyl phosphate													
113		142-96-1	n-Butyl ether													
114	DHPH	96-29-7	2-Butanone oxime							0.1						
115		121-44-8	Triethylamine													
116		75-21-8	Ethylene oxide													
117		75-56-9	Propylene oxide													
118		106-99-0	1,3-Butadiene													
D1		75-07-0	Acetaldehyde													0.2
D2		50-00-0	Formaldehyde													
D3	123-38-6	Propanal														
		0-00-0	TVOC	55038.3	6.5	227.6	71.5		918.3	315.7	122.7	2877.1	619.3	35.3	59.4	

Table A. 50: Summary of emission factors ($\mu\text{g h}^{-1}$) at 24 h for small products tested in 50 L chamber with cap/cover opened

				Small products tested in 50 L with cap/cover opened							
				Automotive products						Lawn	Drive-way
#	Class	CAS#	Compound	AF_f	UC_f	TF_f	SF_f	MO4_f	WXA_f	WC_f	CF_f
1	Alcohols	71-36-3	1-Butanol	0.11	0.01	7.04	0.03	1.36	0.02	0.02	0.16
2		71-23-8	1-Propanol								
3		104-76-7	Hexanol, 2-ethyl-1-	0.09	0.02	0.22	0.27	6.08		0.09	0.03
4		67-63-0	2-Propanol	5.81				0.05			
5		64-17-5	Ethanol			0.08				0.03	0.05
6		108-95-2	Phenol	0.05		0.06	0.94	0.05		0.02	0.02
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.09		0.02	0.01	0.22	0.02	0.01	0.01
8		67-64-1	Acetone	1.82	0.03	0.22	0.03	0.25	0.04	0.25	0.11
9		98-86-2	Acetophenone	0.03	0.01	0.03	0.02	0.02	0.00	0.01	0.01
10		108-94-1	Cyclohexanone								
11		108-10-1	Methylisobutyl ketone					1.13			
12		100-52-7	Benzaldehyde	0.09	0.03	0.02	0.04	0.05		0.08	0.09
13		123-72-8	Butanal			0.20		0.08			0.02
14		112-31-2	Decanal								
15		3913-81-3	2-Decenal								
16		98-01-1	Furfural			0.04		0.05			
17		111-71-7	Heptanal							0.02	
18		66-25-1	Hexanal			0.04				0.05	
19		124-19-6	Nonanal					0.08			
20		18829-56-6	2-Nonenal								
21	Aliphatic Hydrocarbons	2548-87-0	2-Octenal								
22		110-62-3	Pentanal	0.04				0.12		0.02	
23		107-83-5	Pentane, 2-methyl-				0.02		0.06		
24		96-14-0	Pentane, 3-methyl-				0.02				
25		540-84-1	2,2,4-Trimethylpentane								
26		108-08-7	2,4-Dimethylpentane								
27		124-18-5	Decane	0.06	0.01	0.04	0.03	0.07	14.96	0.03	0.09
28		112-40-3	Dodecane	0.10		0.41	0.04	0.13	0.24	0.09	0.11
29		142-82-5	Heptane				0.04	0.06			0.02
30		544-76-3	Hexadecane						0.14		
31		110-54-3	Hexane		0.04	0.07	0.10	0.26	0.09	0.05	0.06
32		111-84-2	Nonane	0.01		0.01	0.02	0.04	11.46		0.02
33		111-65-9	Octane				0.03	0.03			0.01
34		629-62-9	Pentadecane						1.09		
35	Aromatic Hydrocarbons	629-59-4	Tetradecane			0.02			2.76		
36		629-50-5	Tridecane			0.02			0.29		
37		1120-21-4	Undecane	0.16	0.01	0.69	0.05	0.19	2.70	0.08	0.19
38		95-93-2	Benzene, 1,2,4,5-tetramethyl-	0.01		0.02	0.01	0.01	0.00	0.00	0.01
39		611-14-3	Toluene, 2-ethyl-	0.00		0.00	0.01	0.01	0.01	0.00	0.00
40		620-14-4	Toluene, 3-ethyl-	0.01			0.14	0.02	0.03	0.01	0.01
41		622-96-8	Toluene, 4-ethyl-	0.01			0.08	0.01	0.01	0.00	0.01
42		4994-16-5	Cyclohexene, 4-phenyl								
43		71-43-2	Benzene	0.03	0.05			0.03	0.05	0.04	0.02
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.01		0.01	0.01	0.01	0.01	0.01	0.01
45		95-63-6	Benzene, 1,2,4-trimethyl-	0.03		0.01	0.08	0.03	0.04	0.02	0.03
46		95-47-6	Benzene, 1,2-dimethyl-			0.01	0.06	0.02	0.01	0.00	0.01
47		108-67-8	Benzene, 1,3,5-trimethyl-	0.01		0.00	0.00	0.01	0.04	0.01	0.01
48		108-38-3	Benzene, 1,3-dimethyl-	0.01	0.01	0.03	0.21	0.07			0.02
49		98-82-8	Benzene, isopropyl				0.01	0.00	0.01		
50		103-65-1	Benzene, propyl-	0.01			0.02	0.01	0.02	0.00	0.01
51		100-41-4	Ethylbenzene	0.00	0.01	0.01	0.06	0.02			0.01
52		91-20-3	Naphthalene	0.06	0.00	0.16	0.02	0.05	0.00	0.04	0.04
53		99-87-6	p-Cymene				0.01	0.00	0.00	0.01	0.00
54		100-42-5	Styrene	0.02	0.02	0.01	0.03	0.01	0.01	0.01	0.09
55		108-88-3	Toluene	0.02	0.02	0.03	1.05	0.51	0.07	0.01	0.04
56		98-83-9	2-Phenylpropene								
57		95-13-6	Indene								

Table A. 50 (continued)

#	Class	CAS#	Compound	Small products tested in 50 L with cap/cover opened								Lawn	Drive-way
				AF_f	UC_f	TF_f	SF_f	MO4_f	WXA_f	WC_f	CF_f		
58	Esters	108-21-4	Acetic acid, 1-methylethyl ester										
59		111-15-9	Acetic acid, 2-ethoxyethyl ester										
60		123-86-4	Acetic acid, butyl ester					0.08					
61		141-78-6	Acetic acid, ethyl ester							0.08			
62		80-62-6	Methyl methacrylate			0.24	0.01	0.06					
63		103-09-3	2-Ethylhexyl acetate							0.04			
64		96-48-0	Butyrolactone										
65		25265-77-4	Texanol										
66		6846-50-0	TXIB										
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol										
68		110-49-6	2-Methoxyethylacetate										
69		111-90-0	Diethylene glycol monoethyl ether										
70		107-98-2	Propanol, 1-methoxy-2-										
71		111-76-2	Ethanol, 2-butoxy-										
72		112-34-5	Ethanol, 2-butoxyethoxy-										
73		110-80-5	Ethanol, 2-ethoxy-										
74		109-86-4	Ethanol, 2-methoxy-										
75		75-65-0	Propanol, 2-methyl-2-										
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane										
77		95-50-1	1,2-Dichlorobenzene										
78		107-06-2	1,2-Dichloroethane										
79		78-87-5	1,2-Dichloropropane										
80		106-46-7	1,4-Dichlorobenzene										
81		75-27-4	Bromodichloromethane										
82		56-23-5	Carbon tetrachloride										
83		67-66-3	Chloroform										
84	Halo Carbons	124-48-1	Dibromochloromethane										
85		75-09-2	Dichloromethane			0.11		0.05	0.32			0.02	
86		127-18-4	Tetrachloroethylene										
87		79-01-6	Trichloroethylene			0.08		0.12		0.01			
88		79-34-5	1,1,2,2-Tetrachloroethane										
89		108-87-2	Methylcyclohexane				0.16	0.03				0.01	
90		110-82-7	Cyclohexane										
91		1678-93-9	Cyclohexane, butyl-				0.01	0.01	3.19			0.01	
92	Cyclo Alkanes	1678-91-7	Cyclohexane, ethyl-				0.08		0.05				
93		1678-92-8	Cyclohexane, propyl-				0.03	0.01	6.28				
94		91-17-8	Decahydronaphthalene						2.41				
95		80-56-8	alpha-Pinene										
96		99-86-5	alpha-Terpinene										
97		127-91-3	beta-Pinene										
98		99-85-4	gamma-Terpinene										
99		13466-78-9	3-Carene										
100	Terpenes	79-92-5	Camphene										
101		5989-27-5	Limonene		0.03	0.05				0.44			
102		64-19-7	Acetic acid	0.45		0.22				0.08			
103		79-31-2	Isobutyric acid										
104		107-92-6	Butyric acid										
105		111-14-8	Heptanoic acid										
106		149-57-5	2-Ethylhexanoic acid										
107		142-62-1	Hexanoic acid										
108	Acids	109-52-4	Pentanoic Acid										
109		3777-69-3	Furan, 2-pentyl										
110		872-50-4	2-Pyrrolidinone, 1-methyl-										
111		123-91-1	1,4-Dioxane										
112		78-40-0	Triethyl phosphate					0.02					
113		142-96-1	n-Butyl ether					0.10				0.09	
114		96-29-7	2-Butanone oxime										
115		121-44-8	Triethylamine										
116	Other	75-21-8	Ethylene oxide	0.63									
117		75-56-9	Propylene oxide										
118		106-99-0	1,3-Butadiene			3.31		0.80					
D1		75-07-0	Acetaldehyde	0.16	0.02						0.09		
D2		50-00-0	Formaldehyde						0.06				
D3		123-38-6	Propanal										
		0-00-0	TVOC	28.1	2.3	10.0	6.1	16.4	256.6	1.4	1.9		

Table A. 51: Summary of emission factors ($\mu\text{g h}^{-1}$) at 96 h for large products tested in 2 m^3

#	Class	CAS#	Compound	Large products tested in 2 m^3 after 30 min operation									
				Gas powered equipment									
#	Class	CAS#	Compound	SB2	SB3	LM1	LM2	LM3	LM4	TR1	TR2	CS1	CS2
1	Alcohols	71-36-3	1-Butanol										
2		71-23-8	1-Propanol										
3		104-76-7	Hexanol, 2-ethyl-1-										
4		67-63-0	2-Propanol										
5		64-17-5	Ethanol	1612.8	6594.3	3866.2	2323.8	5882.1	6910.3	306.2	4052.5	775.2	569.7
6		108-95-2	Phenol		29.8					1.6	1.4		
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone			13.0	0.8		4.1				
8		67-64-1	Acetone			6.4	11.9	16.5	5.4	1.5		4.0	
9		98-86-2	Acetophenone	1.3		5.2	7.9	6.9	13.0	0.7			
10		108-94-1	Cyclohexanone										
11		108-10-1	Methylisobutyl ketone										
12		100-52-7	Benzaldehyde										
13		123-72-8	Butanal										
14		112-31-2	Decanal										
15		3913-81-3	2-Decenal										
16		98-01-1	Furfural										
17		111-71-7	Heptanal										
18		66-25-1	Hexanal										
19		124-19-6	Nonanal					6.0					
20		18829-56-6	2-Nonenal										
21		2548-87-0	2-Octenal										
22		110-62-3	Pentanal										
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	4299.0	3941.4	723.5	470.0	988.6	1489.5	182.3	1291.2	516.5	310.2
24		96-14-0	Pentane, 3-methyl-	1840.3	2180.5	438.0	298.2	627.8	942.9	98.6	714.5	313.3	193.0
25		540-84-1	2,2,4-Trimethylpentane	116.5	1433.0	472.1	373.4	835.3	1256.8	62.4	503.4	208.8	
26		108-08-7	2,4-Dimethylpentane							7.2			
27		124-18-5	Decane	10.9	96.0	15.4	4.2	19.4	86.0	2.9	22.5	13.9	11.8
28		112-40-3	Dodecane	6.0	22.6	9.2	24.6	5.5	9.5	3.0	6.0	9.9	7.1
29		142-82-5	Heptane	133.6	1549.6	403.9	232.3	529.0	1591.9	60.5	502.9	167.5	107.1
30		544-76-3	Hexadecane		58.8			4.5				1.7	5.0
31		110-54-3	Hexane		3769.4	3825.2	2552.4	5871.8	12037.6	492.2	3860.1	1222.9	720.8
32		111-84-2	Nonane	23.1	290.6	44.8	16.7	46.9	233.0	7.3	55.0	27.6	22.6
33		111-65-9	Octane	59.0	687.4	111.6	50.5	128.8	541.3	19.2	148.5	58.9	41.9
34		629-62-9	Pentadecane		21.7		2.3	12.1	1.4			2.6	4.8
35		629-59-4	Tetradecane	1.7		4.0	11.3	7.9	1.6	1.9		4.6	3.7
36		629-50-5	Tridecane	2.1		3.6	40.1	2.9	3.2	1.1	1.6	4.4	3.9
37		1120-21-4	Undecane	5.9	50.7	9.4	2.8	9.4	28.0	2.5	10.1	8.1	9.7
38		95-93-2	Benzene, 1,2,4,5-tetramethyl-	7.2	81.8	18.4	4.2	10.1	70.9	2.4	28.1	9.4	13.8
39	Aromatic Hydrocarbons	611-14-3	Toluene, 2-ethyl-	30.3	401.3	44.5	13.9	51.2	329.3	13.7	117.1	39.0	44.2
40		620-14-4	Toluene, 3-ethyl-	64.8	1341.3	88.1	45.5	165.3	1121.0	43.8	345.8	117.0	121.8
41		622-96-8	Toluene, 4-ethyl-	43.4	565.6	55.3	28.1	96.6	771.1	29.8	219.7	79.9	78.4
42		4994-16-5	Cyclohexene, 4-phenyl		12.2								
43		71-43-2	Benzene	97.8	1284.8	236.5	149.8	342.5	1304.0	43.0	367.8	75.4	44.4
44		526-73-8	Benzene, 1,2,3-trimethyl-	29.9	452.3	53.8	13.7	46.1	343.6	13.5	130.6	40.2	49.2
45		95-63-6	Benzene, 1,2,4-trimethyl-	134.6	2272.5	246.1	74.9	262.2	1986.0	80.5	646.3	216.8	236.3
46		95-47-6	Benzene, 1,2-dimethyl-	89.0	1860.7	106.3	56.4	168.2	1234.1	45.4	435.3	104.7	115.1
47		108-67-8	Benzene, 1,3,5-trimethyl-	45.4	553.0	60.7	20.2	72.5	460.4	19.3	152.5	54.8	57.8
48		108-38-3	Benzene, 1,3-dimethyl-	217.6	4451.3	278.0	152.3	417.6	3286.2	117.9	1105.5	255.3	260.8
49		98-82-8	Benzene, isopropyl	8.9	69.4					2.9	29.9	9.2	10.6
50		103-65-1	Benzene, propyl-	37.5	316.0					16.5	140.3	47.4	50.8
51		100-41-4	Ethylbenzene	57.9	1148.5	71.9	41.9	116.2	823.4	30.0	284.2	65.1	67.5
52		91-20-3	Naphthalene	11.3	113.7					10.9	96.5	31.9	53.8
53		99-87-6	p-Cymene	1.1	8.9					0.5	4.0	1.8	1.9
54		100-42-5	Styrene										
55		108-88-3	Toluene	336.1	7513.0	497.1	524.8	1166.8	4250.8	254.5	2500.4	437.5	431.9
56		98-83-9	2-Phenylpropene										
57		95-13-6	Indene	0.5	5.8					0.4	4.0	1.1	1.8

Note: Pink (EF > 1,000 $\mu\text{g h}^{-1}$); Yellow (100 < EF < 1,000 $\mu\text{g h}^{-1}$)

Table A. 51 (continued)

#	Class	CAS#	Compound	Large products tested in 2 m ³ after 30 min operation									
				Gas powered equipment									
				SB2	SB3	LM1	LM2	LM3	LM4	TR1	TR2	CS1	CS2
58	Esters	108-21-4	Acetic acid, 1-methylethyl ester										
59		111-15-9	Acetic acid, 2-ethoxyethyl ester										
60		123-86-4	Acetic acid, butyl ester										
61		141-78-6	Acetic acid, ethyl ester										
62		80-62-6	Methyl methacrylate										
63		103-09-3	2-Ethylhexyl acetate										
64		96-48-0	Butyrolactone										
65		25265-77-4	Texanol										
66		6846-50-0	TXIB		32.0								
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol										
68		110-49-6	2-Methoxyethylacetate										
69		111-90-0	Diethylene glycol monoethyl ether										
70		107-98-2	Propanol, 1-methoxy-2-										
71		111-76-2	Ethanol, 2-butoxy-										
72		112-34-5	Ethanol, 2-butoxyethoxy-										
73		110-80-5	Ethanol, 2-ethoxy-										
74		109-86-4	Ethanol, 2-methoxy-										
75		75-65-0	Propanol, 2-methyl-2-										
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane										
77		95-50-1	1,2-Dichlorobenzene										
78		107-06-2	1,2-Dichloroethane										
79		78-87-5	1,2-Dichloropropane										
80		106-46-7	1,4-Dichlorobenzene										
81		75-27-4	Bromodichloromethane										
82		56-23-5	Carbon tetrachloride										
83		67-66-3	Chloroform										
84		124-48-1	Dibromochloromethane										
85		75-09-2	Dichloromethane										
86		127-18-4	Tetrachloroethylene		9.2								
87		79-01-6	Trichloroethylene				14.3	11.5					
88		79-34-5	1,1,2,2-Tetrachloroethane										
89	Cyclo Alkanes	108-87-2	Methylcyclohexane	120.1	679.6	139.3	123.2	252.3	589.5	35.0	235.9	124.7	83.7
90		110-82-7	Cyclohexane	108.3	478.2					28.4	204.9	90.3	59.9
91		1678-93-9	Cyclohexane, butyl-										
92		1678-91-7	Cyclohexane, ethyl-	23.1	107.3					4.3	29.5	18.6	14.4
93		1678-92-8	Cyclohexane, propyl-	4.7	22.2					1.0	6.9	5.4	4.4
94		91-17-8	Decahydronaphthalene										
95	Terpenes	80-56-8	alpha-Pinene	1.2				0.7					
96		99-86-5	alpha-Terpinene										
97		127-91-3	beta-Pinene										
98		99-85-4	gamma-Terpinene										
99		13466-78-9	3-Carene										
100		79-92-5	Camphene										
101	Acids	5989-27-5	Limonene										
102		64-19-7	Acetic acid										
103		79-31-2	Isobutyric acid										
104		107-92-6	Butyric acid										
105		111-14-8	Heptanoic acid										
106		149-57-5	2-Ethylhexanoic acid										
107		142-62-1	Hexanoic acid										
108		109-52-4	Pentanoic Acid										
109		3777-69-3	Furan, 2-pentyl										
110		872-50-4	2-Pyrrolidinone, 1-methyl-										
111		123-91-1	1,4-Dioxane										
112	Other	78-40-0	Triethyl phosphate										
113		142-96-1	n-Butyl ether										
114		96-29-7	2-Butanone oxime										
115		121-44-8	Triethylamine										
116		75-21-8	Ethylene oxide										
117		75-56-9	Propylene oxide										
118		106-99-0	1,3-Butadiene										
D1	DHPH	75-07-0	Acetaldehyde	12.0	20.3		6.0	48.0	17.1	3.2	0.6		
D2		50-00-0	Formaldehyde	7.9	4.1			0.0	0.9		1.3		
D3		123-38-6	Propanal										
		0-00-0	TVOC	5208.9	66577.2	10026.1	8759.4	15349.4	52345.4	2110.2	16000.0	5539.2	3879.8

Table A. 52: Summary of emission factors ($\mu\text{g h}^{-1}$) at 96 h for small products tested in 50 L chamber with cap/cover closed

				Small products testd in 50 L with cap/cover closed												
				Gasoline container	Automotive products		Wax	Lubri cant	Adhesiv es	Degr easer	Paint products				Roof	
#	Class	CAS#	Compound	GC	WW	MO2	WXF	LUB	ADH12	DG	PTO	PTR	PTH	PTS	RS	
1	Alcohols	71-36-3	1-Butanol													
2		71-23-8	1-Propanol						3.8							
3		104-76-7	Hexanol, 2-ethyl-1-		0.0									0.0		
4		67-63-0	2-Propanol													
5		64-17-5	Ethanol	2902.1			0.4	2.9						0.1		
6		108-95-2	Phenol													
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone		0.1			0.5	537.7		0.3			0.0		
8		67-64-1	Acetone	2.1	0.2		0.1	0.5	4.9		0.1			14.8		
9		98-86-2	Acetophenone					0.0			0.0					
10		108-94-1	Cyclohexanone													
11		108-10-1	Methylisobutyl ketone											0.1		
12		100-52-7	Benzaldehyde		0.1			0.1			0.2			0.1		
13		123-72-8	Butanal													
14		112-31-2	Decanal													
15		3913-81-3	2-Decenal													
16		98-01-1	Furfural													
17		111-71-7	Heptanal													
18		66-25-1	Hexanal								0.4					
19		124-19-6	Nonanal													
20		18829-56-6	2-Nonenal													
21	2548-87-0	2-Octenal														
22	110-62-3	Pentanal								0.1						
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-	2896.2					0.4				0.2			
24		96-14-0	Pentane, 3-methyl-	1623.7					0.6	0.1			0.1			
25		540-84-1	2,2,4-Trimethylpentane	1004.3												
26		108-08-7	2,4-Dimethylpentane													
27		124-18-5	Decane	54.5	0.1	3.3	5.5	1.0		18.2	5.7	3.0	52.2		3.7	
28		112-40-3	Dodecane	3.9	0.0	14.3	0.0	0.0		1.1	0.4		7.1	0.0	0.4	
29		142-82-5	Heptane	1644.2					205.9	0.4			1.4			
30		544-76-3	Hexadecane													
31		110-54-3	Hexane	17107.5						30.9	0.9			0.8		
32		111-84-2	Nonane	189.5	0.0		4.1	0.5		4.9	3.4	1.1	26.2	0.2	1.8	
33		111-65-9	Octane	494.6				0.0	7.1	2.2	0.2		6.1	0.2	0.1	
34		629-62-9	Pentadecane													
35		629-59-4	Tetradecane											0.0		
36		629-50-5	Tridecane			0.3								0.0		
37	1120-21-4	Undecane	12.9	0.3	38.0	0.9	0.4		13.5	1.5	1.5	37.6	0.0	2.9		
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-	35.9	0.0	1.5	0.0			0.5			1.6		0.0	
39		611-14-3	Toluene, 2-ethyl-	235.3	0.0					1.0	0.0	0.2	5.2	0.0	0.1	
40		620-14-4	Toluene, 3-ethyl-	794.9	0.0	0.0				2.1	0.0	0.5	11.4	0.0	0.2	
41		622-96-8	Toluene, 4-ethyl-	537.9	0.0	0.0	0.0			1.1	0.0	0.4	6.5	0.0	0.1	
42		4994-16-5	Cyclohexene, 4-phenyl													
43		71-43-2	Benzene	1241.2				0.1	0.1	0.6			0.2	0.1		
44		526-73-8	Benzene, 1,2,3-trimethyl-	233.4	0.0	0.3	0.0			2.9	0.0	0.4	10.2	0.0	0.2	
45		95-63-6	Benzene, 1,2,4-trimethyl-	1399.5	0.1		0.0	0.0		5.8	0.1	1.7	25.9	0.0	0.7	
46		95-47-6	Benzene, 1,2-dimethyl-	933.4	0.0	0.0	0.0	0.0	0.3	0.9	1.0	0.3	3.7	0.1	0.1	
47		108-67-8	Benzene, 1,3,5-trimethyl-	350.8	0.0		0.0			1.1	0.0	0.4	5.8	0.0	0.2	
48		108-38-3	Benzene, 1,3-dimethyl-	2634.2	0.1	0.0		0.1	1.3	2.5	3.3	0.8	9.0	0.4	0.2	
49		98-82-8	Benzene, isopropyl	35.3						0.1	0.0		1.5		0.0	
50		103-65-1	Benzene, propyl-	185.1	0.0					0.6	0.0		7.5		0.1	
51		100-41-4	Ethylbenzene	620.3	0.0	0.0		0.0	0.4	0.9	0.8	0.2	2.8	0.1	0.0	
52		91-20-3	Naphthalene	71.8	0.1	2.8				0.4			5.5		0.0	
53		99-87-6	p-Cymene	5.0	0.0	0.1				0.3			2.1		0.0	
54		100-42-5	Styrene				0.0	0.0			0.0				0.0	
55		108-88-3	Toluene	4829.0	0.9				0.4	0.1	117.7	0.1	59.7	2.8	11.0	0.0
56		98-83-9	2-Phenylpropene													
57	95-13-6	Indene	3.9													

Note: Pink (EF > 1,000 $\mu\text{g h}^{-1}$); Yellow (100 < EF < 1,000 $\mu\text{g h}^{-1}$)

Table A. 52 (continued)

#	Class	CAS#	Compound	Small products testd in 50 L with cap/cover closed											Roof
				Gasoline container	Automotive products		Wax	Lubri cant	Adhesiv es	Degr easer	Paint products				
#	Class	CAS#	Compound	GC	WW	MO2	WXF	LUB	ADH12	DG	PTO	PTR	PTH	PTS	RS
58	Esters	108-21-4	Acetic acid, 1-methylethyl ester												
59		111-15-9	Acetic acid, 2-ethoxyethyl ester												
60		123-86-4	Acetic acid, butyl ester												
61		141-78-6	Acetic acid, ethyl ester												
62		80-62-6	Methyl methacrylate												
63		103-09-3	2-Ethylhexyl acetate												
64		96-48-0	Butyrolactone												
65	Glycols, GlycoEthers	25265-77-4	Texanol								0.1				
66		6846-50-0	TXIB												
67		57-55-6	1,2-Propanediol												
68		110-49-6	2-Methoxyethylacetate												
69		111-90-0	Diethylene glycol monoethyl ether												
70		107-98-2	Propanol, 1-methoxy-2-												
71		111-76-2	Ethanol, 2-butoxy-								15.8				
72	Halo Carbons	112-34-5	Ethanol, 2-butoxyethoxy-												
73		110-80-5	Ethanol, 2-ethoxy-												
74		109-86-4	Ethanol, 2-methoxy-												
75		75-65-0	Propanol, 2-methyl-2-												
76		71-55-6	1,1,1-Trichloroethane												
77		95-50-1	1,2-Dichlorobenzene												
78		107-06-2	1,2-Dichloroethane												
79	Cyclo Alkanes	78-87-5	1,2-Dichloropropane					0.0							
80		106-46-7	1,4-Dichlorobenzene		0.0										
81		75-27-4	Bromodichloromethane												
82		56-23-5	Carbon tetrachloride												
83		67-66-3	Chloroform												
84		124-48-1	Dibromochloromethane												
85		75-09-2	Dichloromethane		0.7		0.0	0.1			0.1	11515.9			
86	Terpenes	127-18-4	Tetrachloroethylene					0.2							0.0
87		79-01-6	Trichloroethylene												
88		79-34-5	1,1,2,2-Tetrachloroethane												
89		108-87-2	Methylcyclohexane	606.2					169.2	0.5			2.6	0.0	
90		110-82-7	Cyclohexane	485.2					30.2	0.1			0.4		
91		1678-93-9	Cyclohexane, butyl-	4.9		0.8	0.8	0.1		1.2	0.9		7.2		0.2
92		1678-91-7	Cyclohexane, ethyl-	90.1				0.1	1.1	0.5	0.2		3.1	0.1	0.0
93	Acids	1678-92-8	Cyclohexane, propyl-	21.9			1.5	0.2		0.6	1.3	0.3	7.6	0.0	0.2
94		91-17-8	Decahydronaphthalene	3.7		0.5	0.4	0.1		0.6	0.4		3.7		0.1
95		80-56-8	alpha-Pinene												
96		99-86-5	alpha-Terpinene												
97		127-91-3	beta-Pinene												
98		99-85-4	gamma-Terpinene												
99		13466-78-9	3-Carene												
100	Other	79-92-5	Camphene												
101		5989-27-5	Limonene												
102		64-19-7	Acetic acid												
103		79-31-2	Isobutyric acid												
104		107-92-6	Butyric acid												
105		111-14-8	Heptanoic acid												
106		149-57-5	2-Ethylhexanoic acid												
107	DHPH	142-62-1	Hexanoic acid												
108		109-52-4	Pentanoic Acid												
109		3777-69-3	Furan, 2-pentyl												
110		872-50-4	2-Pyrrolidinone, 1-methyl-												
111		123-91-1	1,4-Dioxane												
112		78-40-0	Triethyl phosphate												
113		142-96-1	n-Butyl ether												
114	DHPH	96-29-7	2-Butanone oxime								0.1				
115		121-44-8	Triethylamine												
116		75-21-8	Ethylene oxide												
117		75-56-9	Propylene oxide												
118		106-99-0	1,3-Butadiene												
D1			75-07-0	Acetaldehyde		0.2		0.2	0.2						0.2
D2	DHPH	50-00-0	Formaldehyde		0.0										
D3		123-38-6	Propanal												
		0-00-0	TVOC	43985.0	10.0	234.8	59.1	26.0	764.9	314.5	54.4	4243.8	668.5	19.6	44.0

Table A. 53: Summary of emission factors ($\mu\text{g h}^{-1}$) at 96 h for small products tested in 50 L chamber with cap/cover open

				Small products tested in 50 L with cap/cover opened							
				Automotive products						Lawn	Drive-way
#	Class	CAS#	Compound	AF_f	UC_f	TF_f	SF_f	MO4_f	WXA_f	WC_f	CF_f
1	Alcohols	71-36-3	1-Butanol	0.06		4.73	0.03	0.94	0.03	0.03	0.13
2		71-23-8	1-Propanol								
3		104-76-7	Hexanol, 2-ethyl-1-	0.07	0.01	0.10	0.15	4.34		0.10	0.02
4		67-63-0	2-Propanol	5.78			0.01				
5		64-17-5	Ethanol			0.04					
6		108-95-2	Phenol	0.06		0.01	0.71	0.04		0.02	
7	Aldehydes & Ketones	78-93-3	Methylethyl ketone	0.08		0.01	0.01	0.18	0.03	0.01	0.01
8		67-64-1	Acetone	1.46	0.02	0.01	0.05	0.05	0.04	0.18	0.05
9		98-86-2	Acetophenone	0.03	0.01	0.01	0.02	0.02	0.02	0.01	0.01
10		108-94-1	Cyclohexanone								
11		108-10-1	Methylisobutyl ketone			0.01		0.84			
12		100-52-7	Benzaldehyde	0.06	0.03		0.02	0.04		0.09	0.06
13		123-72-8	Butanal			0.16		0.05			
14		112-31-2	Decanal								
15		3913-81-3	2-Decenal								
16		98-01-1	Furfural								
17		111-71-7	Heptanal								
18		66-25-1	Hexanal							0.04	
19		124-19-6	Nonanal								
20		18829-56-6	2-Nonenal								
21		2548-87-0	2-Octenal								
22		110-62-3	Pentanal	0.03				0.07		0.01	
23	Aliphatic Hydrocarbons	107-83-5	Pentane, 2-methyl-						0.05		
24		96-14-0	Pentane, 3-methyl-				0.01	0.01			
25		540-84-1	2,2,4-Trimethylpentane								
26		108-08-7	2,4-Dimethylpentane								
27		124-18-5	Decane	0.02	0.00	0.01	0.02	0.04	13.31	0.02	0.04
28		112-40-3	Dodecane	0.04		0.12	0.02	0.04	0.16	0.10	0.05
29		142-82-5	Heptane				0.03	0.04			0.01
30		544-76-3	Hexadecane						0.06		
31		110-54-3	Hexane		0.04		0.07	0.17	0.07	0.06	0.04
32		111-84-2	Nonane				0.02	0.03	10.57		0.01
33		111-65-9	Octane				0.02				0.01
34		629-62-9	Pentadecane						0.50		
35		629-59-4	Tetradecane			0.01			1.13		
36		629-50-5	Tridecane			0.01			0.13		
37		1120-21-4	Undecane	0.06		0.23	0.03	0.06	2.21	0.08	0.07
38	Aromatic Hydrocarbons	95-93-2	Benzene, 1,2,4,5-tetramethyl-		0.00	0.00	0.01	0.00		0.00	0.00
39		611-14-3	Toluene, 2-ethyl-				0.00	0.01	0.01	0.00	0.00
40		620-14-4	Toluene, 3-ethyl-				0.11	0.01	0.02	0.01	0.01
41		622-96-8	Toluene, 4-ethyl-				0.07	0.01	0.01	0.00	0.00
42		4994-16-5	Cyclohexene, 4-phenyl								
43		71-43-2	Benzene		0.13				0.05	0.04	0.04
44		526-73-8	Benzene, 1,2,3-trimethyl-	0.00	0.00		0.01	0.01		0.01	0.01
45		95-63-6	Benzene, 1,2,4-trimethyl-				0.06	0.02	0.03	0.01	0.02
46		95-47-6	Benzene, 1,2-dimethyl-			0.01	0.05	0.01	0.01	0.00	0.01
47		108-67-8	Benzene, 1,3,5-trimethyl-				0.00	0.01	0.03	0.00	0.00
48		108-38-3	Benzene, 1,3-dimethyl-	0.01	0.00	0.02	0.17	0.05		0.00	0.02
49		98-82-8	Benzene, isopropyl				0.01	0.00	0.01		
50		103-65-1	Benzene, propyl-				0.02	0.01	0.01	0.00	0.00
51		100-41-4	Ethylbenzene	0.00	0.00	0.01	0.05	0.01			0.00
52		91-20-3	Naphthalene	0.03	0.00	0.03	0.01	0.01	0.00	0.04	0.01
53		99-87-6	p-Cymene				0.01	0.00		0.00	0.00
54		100-42-5	Styrene	0.02	0.00	0.01	0.01	0.01	0.04	0.00	0.08
55		108-88-3	Toluene	0.02	0.01	0.00	0.80	0.38	0.03	0.01	0.02
56		98-83-9	2-Phenylpropene								
57		95-13-6	Indene								

Table A. 53 (continued)

#	Class	CAS#	Compound	Small products tested in 50 L with cap/cover opened								Lawn	Drive-way
				AF_f	UC_f	TF_f	SF_f	MO4_f	WXA_f	WC_f	CF_f		
58	Esters	108-21-4	Acetic acid, 1-methylethyl ester										
59		111-15-9	Acetic acid, 2-ethoxyethyl ester										
60		123-86-4	Acetic acid, butyl ester					0.06					
61		141-78-6	Acetic acid, ethyl ester							0.06			
62		80-62-6	Methyl methacrylate			0.20	0.01	0.03					
63		103-09-3	2-Ethylhexyl acetate							0.03			
64		96-48-0	Butyrolactone										
65		25265-77-4	Texanol										
66		6846-50-0	TXIB										
67	Glycols, GlycoEthers	57-55-6	1,2-Propanediol										
68		110-49-6	2-Methoxyethylacetate										
69		111-90-0	Diethylene glycol monoethyl ether										
70		107-98-2	Propanol, 1-methoxy-2-										
71		111-76-2	Ethanol, 2-butoxy-										
72		112-34-5	Ethanol, 2-butoxyethoxy-										
73		110-80-5	Ethanol, 2-ethoxy-										
74		109-86-4	Ethanol, 2-methoxy-										
75		75-65-0	Propanol, 2-methyl-2-										
76	Halo Carbons	71-55-6	1,1,1-Trichloroethane										
77		95-50-1	1,2-Dichlorobenzene										
78		107-06-2	1,2-Dichloroethane										
79		78-87-5	1,2-Dichloropropane										
80		106-46-7	1,4-Dichlorobenzene										
81		75-27-4	Bromodichloromethane										
82		56-23-5	Carbon tetrachloride										
83		67-66-3	Chloroform										
84	Halo Carbons	124-48-1	Dibromochloromethane										
85		75-09-2	Dichloromethane			0.02			0.14				
86		127-18-4	Tetrachloroethylene										
87		79-01-6	Trichloroethylene	0.03	0.01		0.02						
88		79-34-5	1,1,2,2-Tetrachloroethane										
89	Cyclo Alkanes	108-87-2	Methylcyclohexane				0.11	0.02					
90		110-82-7	Cyclohexane										
91		1678-93-9	Cyclohexane, butyl-				0.01	0.01	2.56			0.00	
92		1678-91-7	Cyclohexane, ethyl-				0.06		0.03				
93		1678-92-8	Cyclohexane, propyl-				0.02	0.02	4.67				
94		91-17-8	Decahydronaphthalene						1.89				
95	Terpenes	80-56-8	alpha-Pinene										
96		99-86-5	alpha-Terpinene										
97		127-91-3	beta-Pinene										
98		99-85-4	gamma-Terpinene										
99		13466-78-9	3-Carene										
100		79-92-5	Camphene										
101	Acids	5989-27-5	Limonene			0.03				0.31			
102		64-19-7	Acetic acid	0.13					0.11	0.04			
103		79-31-2	Isobutyric acid										
104		107-92-6	Butyric acid										
105		111-14-8	Heptanoic acid										
106		149-57-5	2-Ethylhexanoic acid										
107		142-62-1	Hexanoic acid										
108		109-52-4	Pentanoic Acid										
109	Other	3777-69-3	Furan, 2-pentyl										
110		872-50-4	2-Pyrrolidinone, 1-methyl-										
111		123-91-1	1,4-Dioxane										
112		78-40-0	Triethyl phosphate										
113		142-96-1	n-Butyl ether					0.07				0.06	
114		96-29-7	2-Butanone oxime										
115		121-44-8	Triethylamine										
116		75-21-8	Ethylene oxide	0.42									
117	DHPH	75-56-9	Propylene oxide										
118		106-99-0	1,3-Butadiene			2.15		0.52					
D1	DHPH	75-07-0	Acetaldehyde	0.03	0.02	0.02	0.55	0.04		0.03			
D2		50-00-0	Formaldehyde		0.01				0.07			0.00	
D3		123-38-6	Propanal	0.02			0.07	0.02					
		0-00-0	TVOC	18.6	2.0	4.0	4.0	10.9	197.7	1.7		0.9	