IMPROVEMENT OF SPECIATION PROFILES FOR AEROSOL COATINGS

FINAL REPORT
CONTRACT NO. 98-306

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JUNE 1, 2000

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This report was submitted in partial fulfillment of ARB Contracts Numbers 95-336 and 98-306, *Improvement of Speciation Profiles for Aerosol Coatings*, by the Cal Poly Foundation under sponsorship of the California Air Resources Board.

ABSTRACT

The contractor prepared a plan designed to provide chemical speciation profiles for representative aerosol coating products. Products for testing were selected in accordance with program objectives of the Air Resources Board. Consideration was given to products which were representative of the California marketplace. Included were aerosol samples from waterborne, solvent borne, high solids, and lacquer technologies. Products containing exempt solvents, as well as products complying with Bay Area Air Quality Management District requirements for sale in the Bay Area were evaluated by testing. Supplemental information on chemical composition was obtained for all sampled coatings for comparison purposes. This information included Manufacturer's Safety and Data Sheets (MSDS), and Technical Data Sheets. For many samples, detailed formulation data were provided by the coatings manufacturers. Following a literature review of the status of sampling methods for aerosol products, potential sampling methods were evaluated, consistent with the development of accurate source profiles. Suitable sampling and analysis protocols were proposed and validated. Analyses of the coating materials were performed using high resolution capillary gas chromatography. Detection was by flame ionization detector, and mass selective detector, as deemed necessary for identification and quantitation of the coating components. The analytical methods identified and quantified coating total organic compounds (TOC's). Species profiles were obtained for approximately 90 coating samples, including 2 binary component samples, with identification of over 98% of the total organic compound species. These individual profiles were arranged into group profiles, distinguished by coating type and carrier.

Executive Summary

I. Background

Based on concern for public health and the need to attain federal and state Ambient Air Quality Standards, much attention has been directed to the control of tropospheric ozone in California. In recognition of the significance of the pollutant, the ambient standard for ozone in California is more stringent than the federal standard (0.09 vs. 0.12 PPM, hourly average). In 1997, 12 of the 15 air basins in California reported peak 1 hour ozone concentrations in excess of the California Ambient Air Quality Standard. The California Air Resources Board has developed comprehensive control strategies for ozone. Computer based models are often used to simulate the production of ozone within a given receptor grid. Such models allow the impact of various control strategies to be observed. The success of the model depends on having accurate data for both the total amount of material in a given source category (obtained from the emission inventory), as well as detailed composition information for each hydrocarbon in a given source. These "organic gas species profiles" must be frequently updated to reflect changes, such as evolving hydrocarbon and oxygenate solvent use patterns within the state.

In 1997 emissions of Volatile Organic Compounds (VOC) from aerosol coating products in California amounted to about 21.0 tons per day. The compositions of these coatings may have changed significantly in the last few years, especially after the 1996 regulations designed to reduce the amounts and types of emitted VOCs. Thus, the prior species profiles for this class of substances did not accurately reflect the contemporary aerosol coating formulations in use in California.

This study was designed to update the species profiles for a number of sources within the general categories of aerosol coatings. Data were collected, based on direct laboratory analysis of the coating materials. Meaningful composite species profiles that represent the impact of aerosol coating activities on California's air quality were generated.

II. Methods

The contractor prepared a plan designed to provide chemical speciation profiles for representative aerosol coating products. Products for testing were selected in accordance with program objectives of the Air Resources Board. Consideration was given to products which were representative of the California marketplace. Included were aerosol samples from waterborne, solvent borne, high solids, and lacquer technologies. Care was taken to ensure that representative samples were obtained for the most significant categories of coatings selected. Consideration was given to consumer use patterns, as well as reported VOC emissions for each coatings class. CARB provided an initial list of desired samples, selected to provide adequate coverage of all coating types. This list was modified, following discussion with ARB. During the course of this study, we analyzed these samples by laboratory testing. A second set of samples was added to this initial list, in order to provide sufficient samples within each coating category to generate meaningful composite profiles.

Protocols for sampling and analysis of the various components of the aerosol coating samples were developed and validated. The propellant was collected and analyzed separately from the solvents in the liquid paint. A method for screening volatile components of the aerosol coating was developed, based on Solid Phase Microextraction (SPME). Propellants and solvents were subjected to analysis by gas chromatographic methods, using both mass spectral and flame ionization detection. Results from these experiments were combined to produce individual species profiles. For each coatings group, individual profiles were combined into composite profiles, distinguished by coating type and carrier.

III. Results

The procedures in this study produced highly detailed species profiles, with as many as several hundred individual components being identified. For many of the samples, virtually all organic components were identified, and quantitated, producing what can be described as "total organic compound (TOC) speciation. A number of novel analytical techniques were developed to aid in the characterization of the complex solvent mixtures found on many coating samples. Updated species profiles for various coatings classes were produced. These will be used as input data for the modeling of the effect of coating materials on the California air quality.

IV. Conclusions

In this study, the nature of emissions from aerosol coatings was examined in detail. The procedures in this study produced highly detailed species profiles for selected aerosol coating products. These updated species profiles should give a better picture of the impact of aerosol coatings on California's air quality.

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I. Introduction

A. Statement of the Problem

Based on concern for public health and the need to attain federal and state Ambient Air Quality Standards, much attention has been directed to the control of tropospheric ozone in California. In recognition of the significance of the pollutant, the ambient standard for ozone in California is more stringent than the federal standard (0.09 vs. 0.12 PPM, hourly average). In 1997, 12 of the 15 air basins in California reported peak 1 hour ozone concentrations in excess of the California Ambient Air Quality Standard.[1]. The California Air Resources Board has developed comprehensive control strategies for ozone. Computer based models are often used to simulate the production of ozone within a given receptor grid. The ozone forming potential of a VOC can be quantified by a number of methods[2]. Typically an air quality model is used to calculate the reactivity of specific compounds. The model allows the impact of various control strategies to be observed. The success of the model depends on having accurate data for both the total amount of material in a given source category (obtained from the emission inventory), as well as detailed composition information for each hydrocarbon in a given source. These "organic gas species profiles" must be frequently updated to reflect changes, such as evolving hydrocarbon and oxygenate solvent use patterns within the state.

Emissions of Volatile Organic Compounds (VOC) from aerosol coating products in California amounted to about 21.0 tons per day in 1997[3]. The compositions of these coatings may have changed significantly in the last few years, especially after the 1996 regulations designed to reduce the amounts and types of emitted VOCs. Thus, the prior species profiles for this class of substances do not accurately reflect the contemporary aerosol coating formulations in use in California.

This study was designed to update the species profiles for a number of sources within the general categories of aerosol coatings. Data were collected, based on direct laboratory analysis of the coating materials. Meaningful, composite species profiles that represent the impact of aerosol coating activities on California's air quality were generated.

References

1. California Air Resources Board, 1999 California Almanac of Emissions and Air Quality
2. VOC Reactivity Science Assessment", prepared for Reactivity Research Work Group, March 1999, http://odysseus.owt.com/Narsto/reactinfo.html.
3. California Air Resources Board, Initial Statement of Reasons for the Proposed Amendments to the Regulations for Reducing Volatile Organic Compound Emissions from Aerosol Coatings, Antiperspirants and Deodorants, and Consumer Products, 1998.

B. Project Objectives

The overall objective of the research described in this report may be identified in general terms: to develop improved species profiles for total organic compound (TOC) emissions from aerosol coating products. Pursuant to this overall goal, a number of sub-tasks were performed:

- Review information sources containing chemical composition of aerosol coating materials
- Identify critical source categories, based on extent of use, VOC content, and other significant factors
- Review all information sources concerning the sampling of aerosol coating materials
- Design, test and validate a method for accurately sampling emissions from aerosol paint operations
- Obtain samples representative of the aerosol coating market in California
- Analyze the collected samples for speciated TOC's

II. Sample Selection

Development of the sampling and analysis workplan began with a thorough review of current available information dealing with the composition of aerosol paint and coating materials, and the nature of VOC emissions arising from their use. Information provided by manufacturers of coating materials was used to supplement data from conventional and electronic databases.

We began the sample selection process by studying the composition of the coatings classes, ranking the coating types, based on amounts of organic emissions (see Table 1). The "Other Specialty Coating" class was found to be a significant one, with over 600,000 lbs./year of organic emissions, larger than some "stand-alone" classes. Examination of the coating types comprising this category showed that some of the emissions could be added in to other coating classes. The balance of the "Other" total organic emissions data were taken into account by the creation of three new aerosol coatings categories. These new categories (and associated code types) were:

36: lacquers
37: stone/marble sprays
38: stencil inks

Information in Table 1 was used to guide sample selection, ensuring that representative samples were obtained for the most significant categories of coatings. As shown in this table, the top sixteen coatings-types (omitting "other coatings") are responsible for nearly 96% of the organic emissions. Over 50% of the organic emissions are from a single category -- non-flat paint products -- what most people consider basic "spray paint". Based on a thorough review of available MSDS data, formulations for non-flat coatings, especially among the largest volume products, were seen to be fairly similar. Therefore, it was agreed that it should not be necessary to have up to 50% of the total samples selected representing the non-flat category. In the final sampling matrix, 8 flat aerosol products were selected.

Consistent with the data in this table, CARB provided us with an initial list of desired samples, selected to provide adequate coverage of all coating types. This list was modified, following discussion with ARB. During the course of this study, we analyzed these coatings (approximately 90) and developed 21 composite species profiles. Two of the coatings were binary systems, intended to be used in a 1:1 ratio. Thus, two discrete samples were required to produce the species profile for each of these binary systems, since the two components were analyzed separately, but used to form a composite profile, with each component's contribution to the mixture being weighted equally. A summary of samples by coating code is shown in Table 2.

The trend toward increasing use of water-based aerosol coatings was considered. Such coatings will likely make up 25% of the "do-it-yourself" (DIY) market in gloss, satin and clear products for the near future. These coatings were designed primarily for consumers who would not use traditional aerosols. Water-based products will not likely make significant additional inroads into industrial and specialty aerosol coatings, with the exception of "artist/crafts" sprays, which will also have about 25% of products in water-based formulations. This information was obtained from the National Paint and Coatings Association (NPCA) and the leading DIY aerosol paint and clear coatings manufacturers. Water-based samples were obtained for inclusion in the non-flat and clear categories. Water-based samples in other categories were chosen on the basis of percent water-based coatings in category as reported in 1992 ARB aerosol coating survey summary.

Within each coating type, colors were chosen to reflect those purchased most often, whenever possible. For non-flat products, black, white, and red are the highest volume colors. Based on examination of MSDS data, black paints generally contained higher solvent levels than white paints. Red paints typically had solvent levels comparable to or slightly higher than black paints. Gloss paints generally had slightly higher solvent levels than flat paints. Selecting a larger number of black, white, and red gloss products, and black and white flat paints, was thus indicated. For primers, gray and red oxide paints are most common.

Once samples were identified for testing, all associated information including Manufacturer's Safety and Data Sheets (MSDS), Technical Data Sheets, Formulation Guidelines, and information on total VOC, was obtained.

Samples for analysis were acquired using a combination of methods. Some of the samples were obtained directly from the coating manufacturers. Direct retail purchases were used to complete the coating sample matrix.

This project was conducted in two phases. Phase One consisted of approximately 50 samples, selected as described above. At the end of this phase, ARB requested additional sampling, so that each composite group profile would be based on at least four individual profiles. To fulfill this requirement, approximately 40 additional samples were evaluated in Phase Two of this study.

Table 1 - Aerosol Coating Types

ARB Code	Coating Type	Sales, lb./yr	VOC Emissions, lb./yr (1990 Estimates)
6	Non-Flats	9,600,894	7,375,895
2	Flats	1,604,160	1,213,885
5	Metallic Coatings	797,788	664,491
21	Auto Body Primer	824,067	632,662
36[a], 37[b]	Other Specialty Coatings	798,064	620,248
7	Primers	807,138	579,416
1	Clear Coatings	634,696	537,593
30	Hobby/Model/Craft Clear, Metallic	461,587	409,530
4	Ground Traffic Markings	634,051	368,809
27	High Temperature Coatings	383,326	313,370
3	Fluorescent	258,685	181,959
18	Engine Enamel	178,002	139,931
31	Spatter Coatings	217,348	127,869
28	Hobby/Model/Craft Enamels	131,539	101,820
22	Automotive Bumper and Trim	89,583	64,697
14	Vinyl/Fabric/Polycarbonate	57,042	52,231
20	Industrial	57,044	46,957
29	Hobby/Model/Craft Lacquers	19,171	16,270
26	Glass Coatings	6,778	5,734
	TOTAL	**17,560,963**	**13,453,367**

[a]new category defined to include lacquers

[b]new category defined to include stone/marble sprays

source : *Survey of Emissions from Solvent Use - Volume I: Aerosol Paints*, Final Report to California Air Resources Board, Batelle, September 1994

Table 2 - Summary of Sample Types

ARB Code	Type	Number of Samples	
		Solvent-based	Water-based
1	Clear Coatings	4	4
2	Flat Paint Products	4	4
3	Fluorescent Coatings	4	*
4	Ground Traffic/Marking Coatings	4	4
5	Metallic Coatings	4	0
6	Non-Flat Paint Products	4	4
7	Primer	4	4
18	Exact Match Finishes: Engine Enamel	4	0
19	Exact Match Finishes: Automotive	4	0
21	Auto Body Primer	4	0
25	Floral Spray	4	0
27	High Temperature Coatings	4	0
30	Hobby/Model/Craft Coatings: Clear, Metallic	4	*
31	Spatter Coatings	4	0
34	Wood Touch-Up/Repair/Restoration	5	0
36	Lacquers	4	0
37	Stone/marble Sprays	*	0

* Fewer than four samples analyzed. Group profile not generated.

III. Sampling and Analysis Methods

The sampling and analysis of aerosol coating samples proved to be a complicated process, based on the multi-component nature of the aerosol product. Separate methods for propellant, coating solvents, solids and water were required. Current aerosol methods were reviewed and found to be inadequate to obtain the detailed information needed to generate the species profiles. For example, ASTM methods 5200 (Volatile Content of Solvent-Borne Paints in Aerosol Cans) and 5325 (5200 (Volatile Content of Water-Borne Paints in Aerosol Cans) are actually indirect methods, based on weight of solids left after solvent has evaporated. We viewed direct methods as inherently more accurate and better suited to the determination of complex species profiles.

Consequently, a number of new techniques and protocols for the sampling and analysis of Total Organic Compounds in aerosol coatings were developed during the course of this investigation. The term "Total Organic Compounds" (TOC) will be used to refer to all organic species contained in a coating sample, regardless of whether they meet the regulatory definition of a Volatile Organic Compound (VOC) or not. In particular, exempt solvents (which are not VOCs) are included in the TOC species profiles shown in this report.

A. Sampling and Analysis of Propellant from Aerosol Cans

The obvious factor that makes the determination of species profiles for aerosol cans different from that of pure coating samples is that propellant is expelled during application of the coating material. The coating manufacturer carefully evaluates the choice of propellant. The propellant must be compatible with the coating carrier (water or solvent), and should provide reasonably consistent delivery pressures whether the can is full or near empty. For solvent-borne coatings, the propellant of choice is usually a mixture of propane, butane and isobutane. This is liquifiable at normal temperatures and pressures, and is miscible with the normal hydrocarbon solvents typical of this class of coating materials. For water-borne aerosol coatings, the propellant must be soluble in the water carrier, yet volatile enough to provide the pressure required to expel the can's contents during use. The most common propellant found in contemporary water-borne aerosol coatings is dimethyl ether.

If the propellant could be removed from the aerosol can, the coating sample remaining in the can could be analyzed by methods used in a previous study of bulk coatings (Censullo, et al., Final Report, *Improvement of Species Profiles for Architectural and Industrial Maintenance Coating Operations*, June 1996). The sampling train, shown schematically in Figure 1, was fabricated for this purpose. Prior to sampling, the cap, spray tip and paper label (if present) were removed. The full aerosol paint can was weighed, then cooled overnight to $-10^{\circ}C$. This process allowed the paint pigments to settle to the bottom of the can. A silicone rubber septum was secured to the side of the can by means of a hose clamp. The can was then pierced with a steel punch, through the septum, by means of a sharp tap with a hammer. This procedure produced almost no loss of propellant and provided access to the headspace interior of the inverted can through the septum. A syringe needle attached to Teflon tubing was inserted into the can headspace and the propellant was transferred to a 60-liter gas sampling bag (Cali-5-Bond, Alltech Part # 4194). The rate of propellant transfer was monitored with a control valve and pressure gauge. Residual

propellant in the aerosol can was mobilized by sonicating the aerosol can for about 30 minutes after the major portion of propellant had been transferred. The transfer of propellant was judged to be complete when the pressure gauge remained at atmospheric pressure with the gas sampling bag isolated from the system. The amount of propellant in the can was determined by weighing the aerosol can before and after propellant transfer.

This procedure was initially evaluated with two separate cans of the same aerosol paint, purchased locally. The efficacy of this approach is illustrated in Table 3. Mass balance on both cans was consistent with the reported values. Duplicate analyses of the propellant's composition for major components agreed well with each other. The average composition for the major components in the two cans was strikingly similar. The solids (non-volatile) contents of the coatings were determined in accordance with ASTM Method D2369. The procedure was tested on numerous other types of aerosol coatings, with similar results. Standard Operating Procedures (SOP) for this process may be found in Appendix A.

The integrated propellant collected in the sampling bag was sampled using a 1 mL gas-tight syringe. Immediately following the sampling, a 100 μL fraction was injected into a gas chromatograph, and separation of the propellant

Figure 1 – Schematic of Sampling System for Aerosol Paints

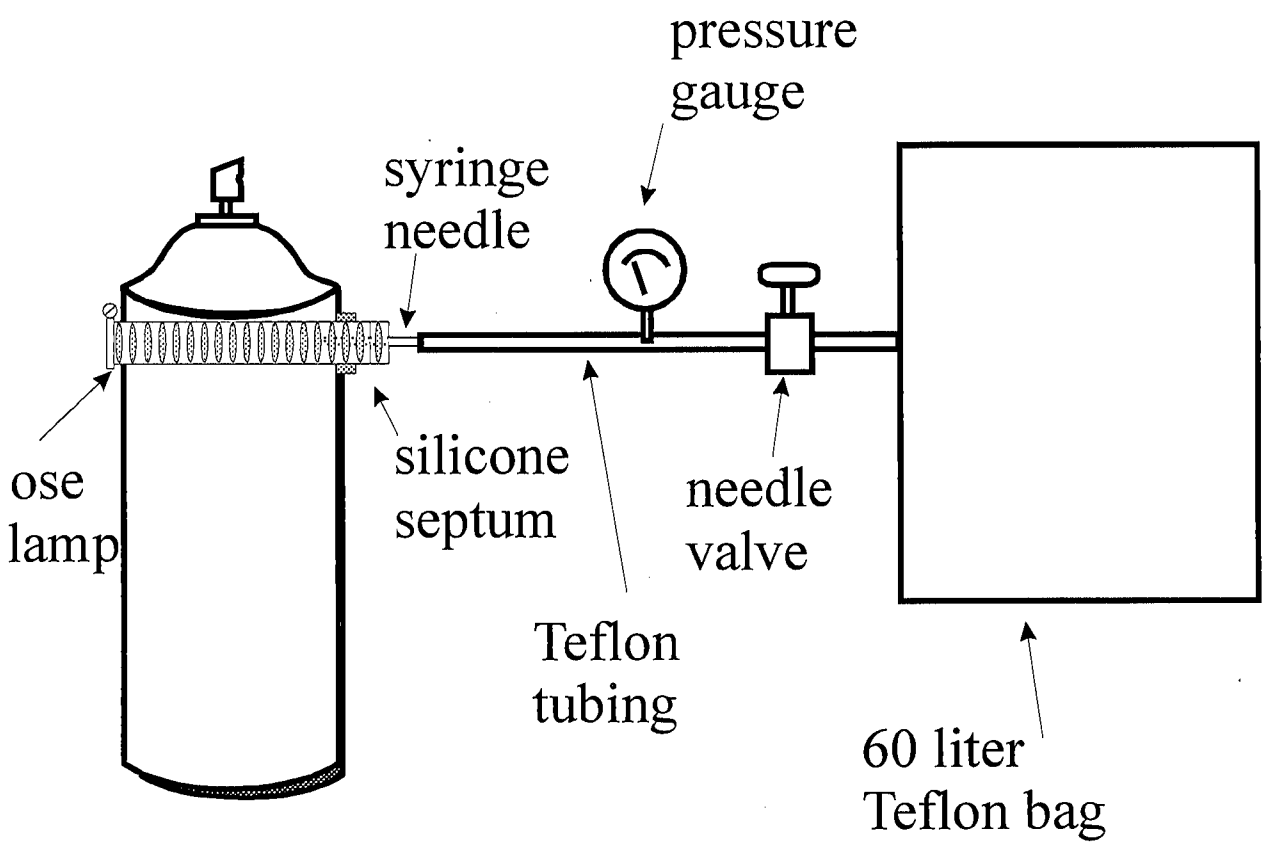


Table 3 – Sampling from Different Cans of Same Type of Aerosol Paint

MASS BALANCE	**Can 1**		**Can 2**	
Propellant, g	74.24		74.26	
Liquid Paint, g	234.6		235.2	
Total, g	309.8		309.5	
Total Reported, g	311.9		311.9	
Non-Volatile Content, %	26.25		26.21	
PROPELLANT ANALYSIS	**trial 1**	**trial 2**	**trial 1**	**trial 2**
Propane %	48.54	48.78	49.34	49.20
Isobutane %	11.34	11.34	11.45	11.48
Butane %	35.00	34.96	34.90	35.12
Acetone %	4.95	4.67	4.09	4.05
Toluene %	0.17	0.26	0.22	0.15

components was effected using a 100 meter x 0.25 mm Petrocol DH column. The SOP for the propellant analysis is located in Appendix A. Relative response factors for the propellant components were determined by preparing solutions of the various gas species in heptane. To perform this procedure, 1 mL of heptane was placed in a septum topped, crimp-cap vial. A gas tight syringe was used to deliver about 6mL of propane and butane, and 10 μL of acetone. The precise amounts of each species were determined by mass, using an analytical balance with a resolution of 0.1 mg. For the gas chromatographic runs, replicate 2 μL portions of this solution were injected onto the column described above. A similar procedure was used to establish the response factors of isobutane, dimethyl ether and pentane. Individual components in these samples were identified by comparison of retention indices with authentic compounds, or alternatively, by GC-MS. A representative chromatogram of propellant is shown in Figure 2.

B. Sampling of Solvent-Based Paints from Aerosol Cans

Once the propellant was removed from the aerosol can, the liquid paint could be removed for analysis and speciation. The aerosol can was first cooled, then placed on a paint shaker to homogenize its contents, and finally opened with a can opener. The liquid paint was transferred to a glass bottle, the empty can rinsed with acetone, then dried and weighed to determine the total mass of liquid paint. This value, when combined with the mass of propellant, was in good agreement with the mass of contents reported on the can label. The solids content from a portion of the liquid paint was determined according to ASTM Method D2369.

As the study proceeded, a convenient method for the screening of volatile components in the liquid paints was desired. The method we chose utilized a solid phase micro-extraction (SPME) device. These are commercially available from Supelco. A schematic diagram of this device is shown in Figure 3. The SPME was originally developed as an alternative to conventional solvent extraction methods, and has been used for a variety of sampling applications, including paints (*Direct VOC Analysis of Water-Based Coatings by Gas Chromatography and Solid-Phase Microextraction*, Censullo, AC, Jones, DR, Wills, MT, "*Journal of Coating Technology*", Volume 69, Number 869, 33-41,June 1997). The SPME consists of a small silica fiber, which is coated with a suitable solid phase adsorbent. In effect, the SPME fiber may be considered to be a capillary GC column "turned inside out". The fiber selected for this procedure was coated with a 65 μm thick layer of Carbowax/divinyl benzene. The fiber is mounted in a holder that allows the user to expose and retract the fiber for sampling the headspace above the liquid, and then transfer the material directly to a GC inlet, where the adsorbed analytes may be thermally desorbed. This technique worked equally well with the GC-FID and the GC-MS systems.

1. Sample Preparation for Solvent-Based Paints

We noted earlier the desire to perform the generation of species profiles using direct methods. The obvious approach was to simply dilute the coating material with suitable solvent, and inject the diluted paint directly into a gas chromatograph. This has the undesirable side effect of transferring some non-volatile (solids) components into the injection port, and possibly onto the analytical columns. These are expensive items, which can become irreversibly contaminated. We demonstrated previously (Censullo, et al. Final Report, *Improvement of Species Profiles for*

Architectural and Industrial Maintenance Coating Operations, June 1996) the utility of separating the solids and solvents by a distillation procedure. Our initial attempts at utilizing this procedure for the aerosol coating samples revealed the need for an additional modification.

It was discovered that some residual propellant invariably remained dissolved in the liquid paint. This residual propellant was expelled (sometimes vigorously) by the vacuum distillation used to prepare the paint solvents for analysis. Removal of this residual propellant prior to vacuum distillation was effected by transferring the liquid paint to a one liter round bottom flask containing a two inch magnetic stir bar, and heating to 60°C with rapid stirring for 20 minutes. A spiral condenser, maintained at 10°C served to keep paint solvents in the flask, but allowed the residual dissolved propellant to be released and added to the sampling bag containing the original propellant. The liquid paint was weighed before and after this operation, to determine the amount of residual dissolved propellant. The de-gassed liquid paint was transferred to a glass bottle for storage, pending analysis.

Figure 2 – Typical Chromatogram of Propellant

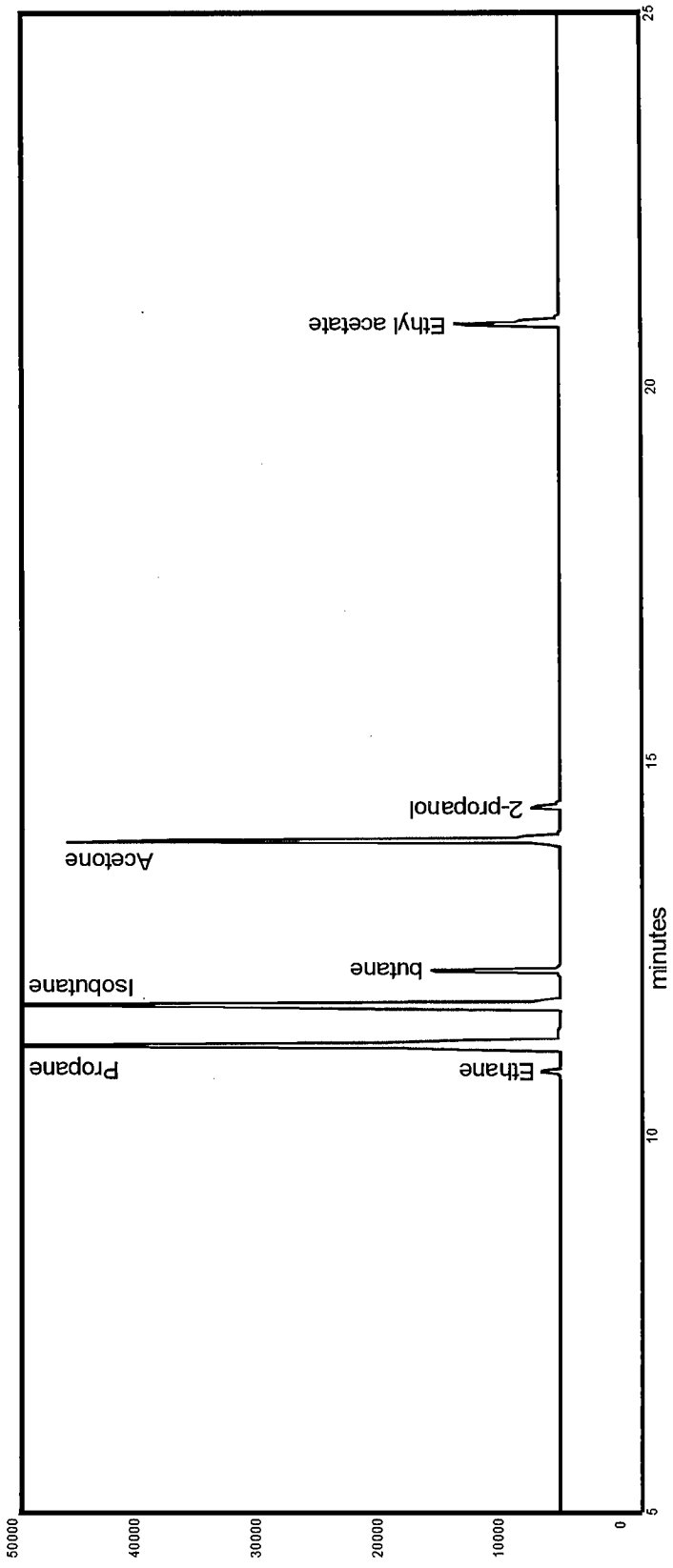
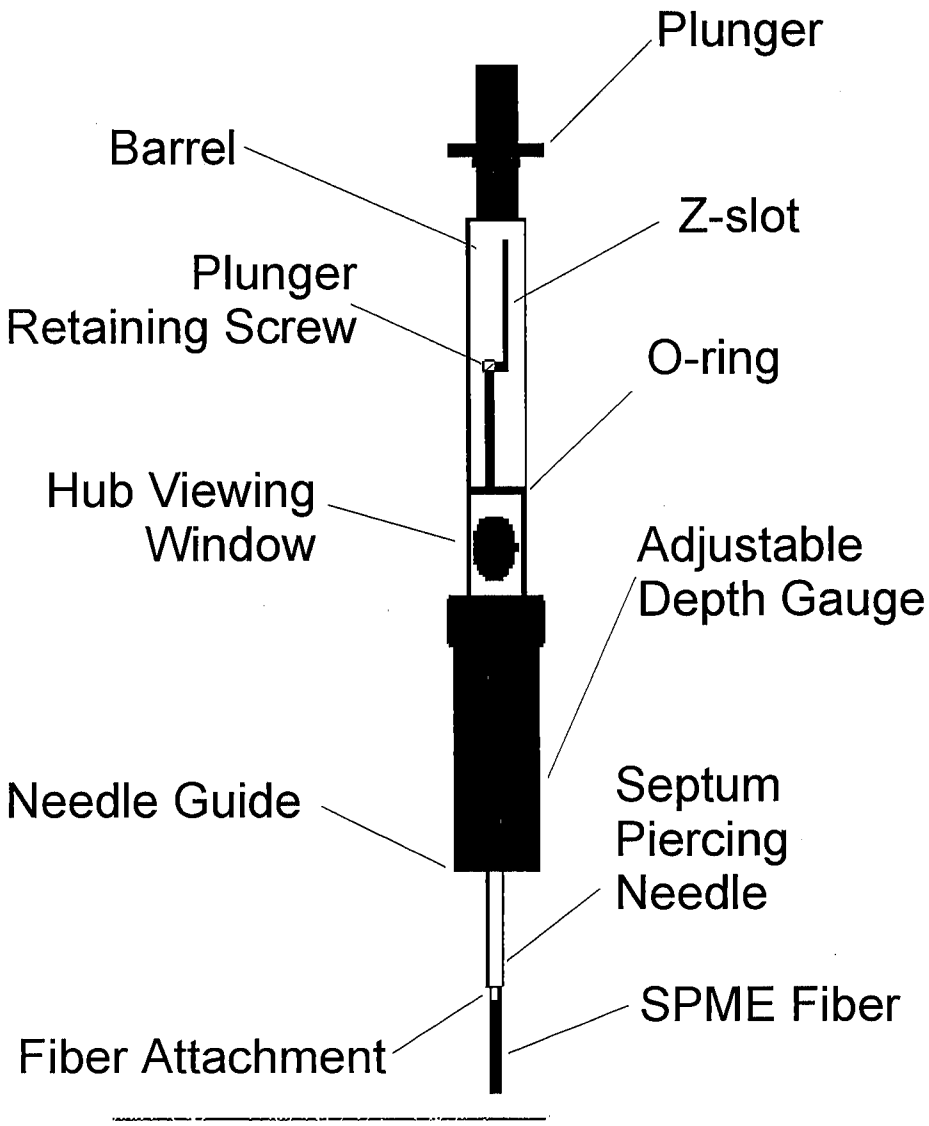


Figure 3 – Diagram of SPME Device



of propellant remaining in the liquid paint could be determined during the GC analysis of the coating, and simply added to the amount indicated by the analysis of the main propellant sample

At this point, the solvents were removed from the liquid paint, using a distillation procedure developed in an earlier ARB study. The liquid paint was agitated thoroughly on a paint shaker. A disposable syringe was used to dispense between 1.0 and 1.5 grams of liquid paint into a 100 mL round bottom flask containing 5.0 grams of dioctyl phthalate dispersant, 2.0 grams of tetradecane chase solvent, and a Teflon-coated stir bag. A schematic of this distillation setup is shown in Figure 4. A vacuum between 0.2 and 0.4 Torr was maintained, and the temperature was gradually increased to 120°C, at which point, the tetradecane chase solvent (the highest boiling component in the flask) began distilling over. The distillate was collected in a receiving tube immersed in liquid nitrogen. The homogenized contents of the receiver were transferred to a screw-capped vial, pending analysis.

2. Sample Preparation for Acetone and Toluene in Solvent-Based Paints by SPME

The use of acetone as a solvent in aerosol paints is likely to increase, following its recent designation as an exempt solvent. While acetone should be sampled effectively by our distillation process, an alternate method of analysis was sought for this important analyte. SPME was found to form the basis of an effective sampling method for acetone, as well as toluene. A diagram of the experimental setup is shown in Figure 5. For this use, a SPME fiber coated with a 100μm film of polydimethylsiloxane was used. The SOP for this method is given in Appendix A. The analysis method uses a deuterated surrogate as an internal standard. For the SPME sampling, about 1.0 gram of paint is added to a 40 mL septum-capped vial, containing 5.0 mL of dioctyl phthalate. A suitable amount of acetone-d6 and toluene-d8 approximately equivalent to the expected amounts of non-deuterated components in the sample, were added, using dedicated 250 μL syringes. The contents were shaken thoroughly, and allowed to stand for 30 minutes. The rate of hydrogen-deuterium exchange at room temperature was found to be negligible over this time period. The head space above this solution was sampled with the SPME fiber for 5 minutes. The fiber was then immediately desorbed in a heated GC inlet onto a 60 meter x 0.25 mm DB Wax column. On this column, the deuterated and non-deuterated acetone were separated with baseline resolution. The amounts of non-deuterated components (acetone and toluene) may be easily calculated from the areas of the resulting chromatographic peaks, and the known amounts of deuterated standards added. Relative response factors for the all species were determined by preparing a synthetic mixture of approximately equal amounts of the four species, and sampling this solution with SPME. It is important to note that quantitation of acetone and toluene by this method could be used to provide values which are completely independent of the values obtained by GC analysis of the distilled solvents. This will be discussed in a later section. (Results section)

C. Sample Preparation for Water-Based Paints from Aerosol Cans

As a simpler (but equally effective) alternative to the distillation method, water-based samples were analyzed by a direct dilution method. This is a procedure developed and reported earlier (Censullo, et al. Final Report, *Improvement of Species Profiles for Architectural and Industrial*

Maintenance Coating Operations, June 1996). Following homogenization of the liquid paint sample on a paint shaker, an aliquot of the sample is diluted with a suitable internal standard/solvent mixture. For paints that did not contain methanol, the dilution mixture was methanol, with 2-ethylhexanol as internal standard. Methanol-containing paints were diluted in dimethylformamide (DMF) with 1-propanol as internal standard. SPME proved to be a convenient method for rapidly screening coating samples for the presence of methanol. Following solvent dilution, the mixture was sonicated for 10 minutes, then centrifuged to facilitate the removal of pigment. In most cases, a nearly clear solution resulted from these operations. For presentation to the GC, a 1 mL aliquot was further diluted with 25 mL of solvent. This procedure minimized the amount of non-volatile material transferred to the chromatography system.

Figure 4 – Schematic of Distillation Process

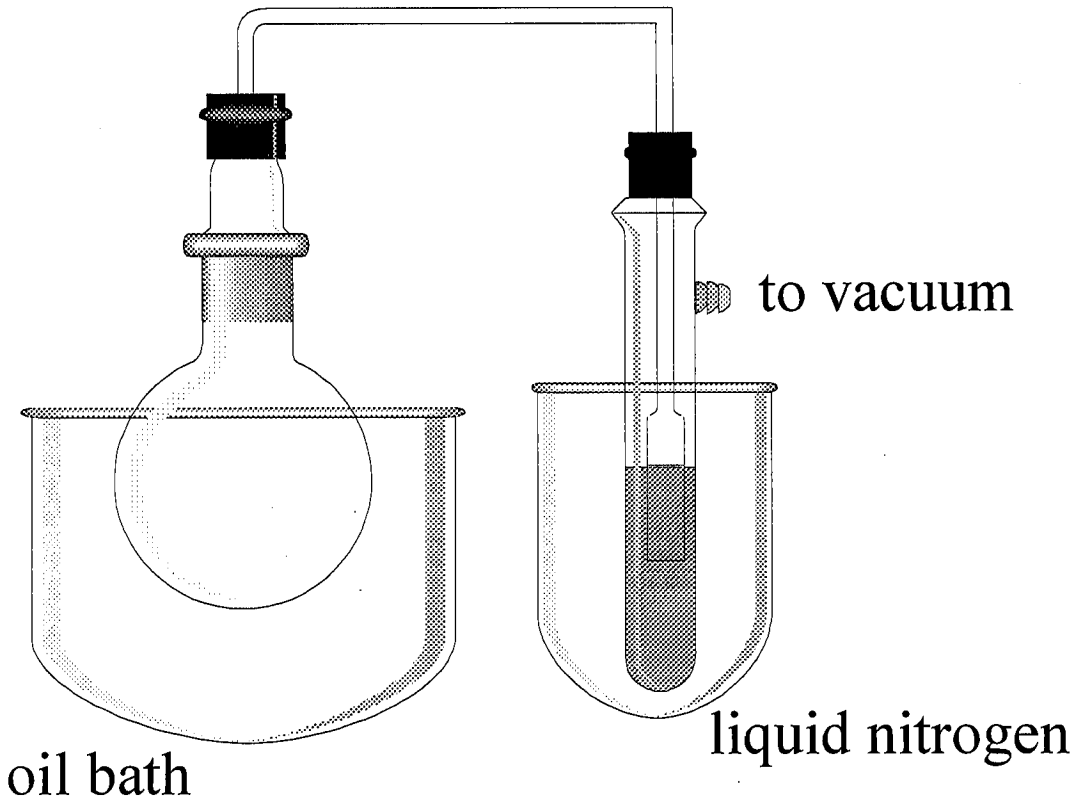
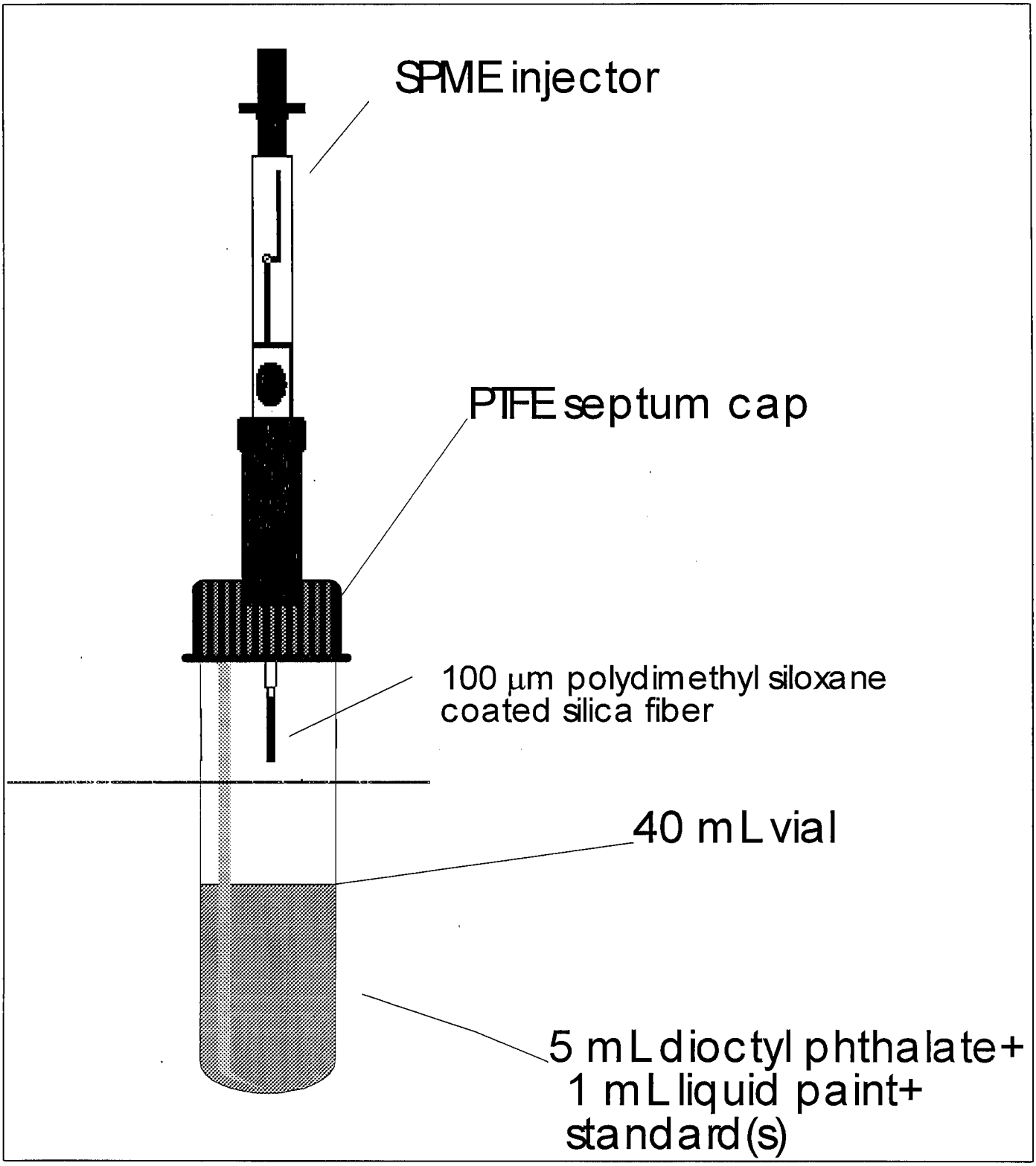


Figure 5 – Sampling for Acetone and Toluene by SPME



D. Analysis of Solvents in Aerosol Paints

The components of the aerosol coating samples were analyzed using a number of chromatographic techniques. Samples were analyzed on a 0.25 mm x 100 meter capillary column (Supelco Petrocol DH), using a flame ionization detector (Hewlett Packard 5890 Series II GC). Identification of major components was based on our library of retention indices. To confirm peak identities, samples were also run on a 30 meter x 0.20 mm column, using a mass selective detector (Hewlett Packard Series II Gas Chromatograph with mass spectral detector G1800). Any unknown peaks were searched against a NIST mass spectral library. As in our previous study using architectural coatings, these procedures produced positive identifications for nearly all sample peaks.

For the sample runs, linear retention indices were assigned using a combination of techniques. Peaks for the linear n-alkanes are easily identified from the chromatograms and retention indices (RI) for these were assigned in the usual manner (retention index = 100 x C_n). Experimental linear retention indices (RI) were then calculated for all peaks in both the GC/FID (100 m) and GC/MS (30 m column) chromatograms, using the equation:

$$RI = 100n + 100\frac{t_r(component) - t_r(C_n)}{t_r(C_{n+1}) - t_r(C_n)}$$

where t_r values are the retention times for the sample component, and the normal hydrocarbons whose retention times bracket the sample peak. A retention index library has been compiled, starting with calibration values supplied by the manufacturer of the 100 meter Petrocol column . A number of known alkane, cycloalkane, aromatic, and oxygenated standard samples have been investigated (some synthesized) to extend this library to common solvents known to occur in paints and coatings. For further information on retention indices, the reader is directed to the literature. Two pertinent references are:

1. Khorasheh, Gray and Selucky, *J. Chromatog.*, 481 (1989) 1-16
2. Hayes and Pitzer, *J. Chromatog.*, 253 (1982) 179-198.

E. Analytical Methodology and Calibration

Samples of the coating materials were screened by a headspace Solid Phase Micro-Extraction (SPME) technique developed in our laboratory. This served to identify the main solvent components, and aid in the selection of an interference-free internal standard.

Water-based aerosol coating samples were screened for VOCs by placing about 1 gram of the propellant-free paint into a 30 mL septum-capped vial, along with 1 to 2 grams of solid sodium chloride. The addition of sodium chloride was found to enhance the partitioning into the gas phase of the VOC components. After mixing the contents, the headspace in the vial was sampled for 5 minutes with an SPME fiber coated with either 65 μm of Carbowax/divinyl benzene or 100 μm of polydimethylsiloxane (Supelco Corp.) The fiber was then withdrawn, and desorbed in the

heated capillary injection port (250°C) of a gas chromatograph. Column type and detection (MS or FID) was determined as needed to obtain optimum qualitative information.

Solvent-based coatings were tested in a similar manner, except that the SPME sampling occurred from a solution of the coating sample in dioctyl phthalate.

The GC-MS runs on the coating samples were used primarily to confirm compound identities. Quantitation on the GC-FID runs was performed by the internal standard technique, using response ratios calculated from authentic sample components or surrogates. Response factors were calculated using the relationship:

$$RF = \frac{C_s \cdot A_x}{C_x \cdot A_s}$$

where C_s= concentration of standard (mg/mL)
A_x= area of analyte peak
C_x= concentration of analyte (mg/mL)
A_s= area of standard peak

A representative GC-FID chromatogram for a coating sample is shown in Figure 6.

IV. Results

A. Acetone and toluene method comparisons

As discussed earlier, two separate methods were developed for the analysis of acetone and toluene. The SPME method used headspace sampling of the liquid coating samples, with quantitation information derived from deuterated internal standards. The other method involved chromatography of the distilled coating samples, with quantitation by previously determined response factors. Many samples were analyzed by both methods. Table 4 shows a comparison of the two methods. As can be seen from these data, agreement between the two methods was excellent, with relative differences averaging 2 to 3% for both analytes. This internal consistency served to validate both methods, since sample handling and analysis approaches were completely independent, yet produced nearly identical results.

B. Species profile generation

The ultimate goal of the project was the production of species profiles for the aerosol coatings investigated. Based on the multi-component nature of these samples, a number of analytical results for each sample had to be combined to generate the total species profile. For example, information from the propellant analysis had to be meshed with the results from the distilled solvent analysis, as well as the water determination (if applicable) for a given coating. The analytical results from each separate scheme were initially expressed on a mass basis, so that the total mass from all analyses could be obtained. These sums were finally converted to the desired fractions. Reported species profiles were obtained from replicate (at least 2) chromatographic

runs. The precision of duplicate chromatograms on a given sample was better than 5% relative. Typical results for duplicate runs on a sample are shown in Table 5.

The reproducibility of the distillation procedure was investigated separately. Two portions of the same coating sample were distilled, and analyzed separately. Results for this series of experiments are shown in Table 6. As can be seen, agreement for these replicates was excellent, with absolute variations in factional composition for all but the two major components showing in the fourth decimal place.

Two of the coating samples were two-component systems. The components of these coatings were intended for separate application of a topcoat over a comparatively fragile undercoat. The reported profile for these coatings weighted each separate component equally, producing "as-applied" profiles. A few of the samples nominally described as "solvent-based" were found to contain water, in amounts ranging from small to considerable.

C. Group species profiles

The individual species profiles were composited into group profiles. A number of the groups initially contained both solvent- and water-based samples. Separate profiles were prepared in these cases, with the water-based groups identified by the letter "w" appended to the group code. The composite profiles were obtained by averaging the profiles for the samples assigned to each group. Each group profile was based on at least four individual profiles. An insufficient number of distinct products in Categories 3w, 30w and 37 were available for testing. For these categories, no group profiles were generated. The group profiles are listed in Appendix B.

IV. Summary and Conclusions

In this study, the nature of emissions from aerosol coatings was examined in detail. Coatings were selected for characterization, based on sales volumes and amounts of VOC emissions. Final sample selection was made through consultation with ARB. A total of approximately 90 samples were analyzed, including two binary component samples, and distinct individual species profiles were generated. Virtually all organic components in these samples were identified, producing what can be described as "total organic compound (TOC) speciation.

To produce these results, a number of sampling and analytical methodologies were developed and validated. The propellant was collected and analyzed separately from the solvents in the liquid paint. A solid phase microextraction (SPME) technique was used to screen coatings for solvents prior to detailed analysis by GC-FID and GC-MS. The distillation procedure reported in a prior study was found to be applicable for the isolation of solvents from the liquid paint, once propellant had been removed from the aerosol paint sample. A novel SPME method for determining acetone and toluene in coating samples, using deuterated surrogates as internal standards, was developed. Results for this method were in excellent agreement with the determinations made by GC on the distilled solvent samples. This method formed the basis for the newly approved (8/10/99) ASTM Method D6438-99, *"Standard Method for the Acetone,*

Methyl Acetate, and Parachlorobenzotrifluoride Content of Paints and Coatings by Solid Phase Microextraction-Gas Chromatography".

The individual species profiles were arranged into 21 composite group profiles, segregated by coating type and carrier.

The procedures in this study produced highly detailed species profiles, with as many as several hundred individual components being identified. For many of the samples, especially the water-based coatings, virtually 100% of the total organic mass was identified and quantitated. In the more complex samples, some small amounts of minor components could not be identified with absolute certainty. In such cases, the components were listed as "OTHER", and assigned a carbon number, based on their retention index.

Figure 6 – Sample Chromatogram of Distilled Solvents

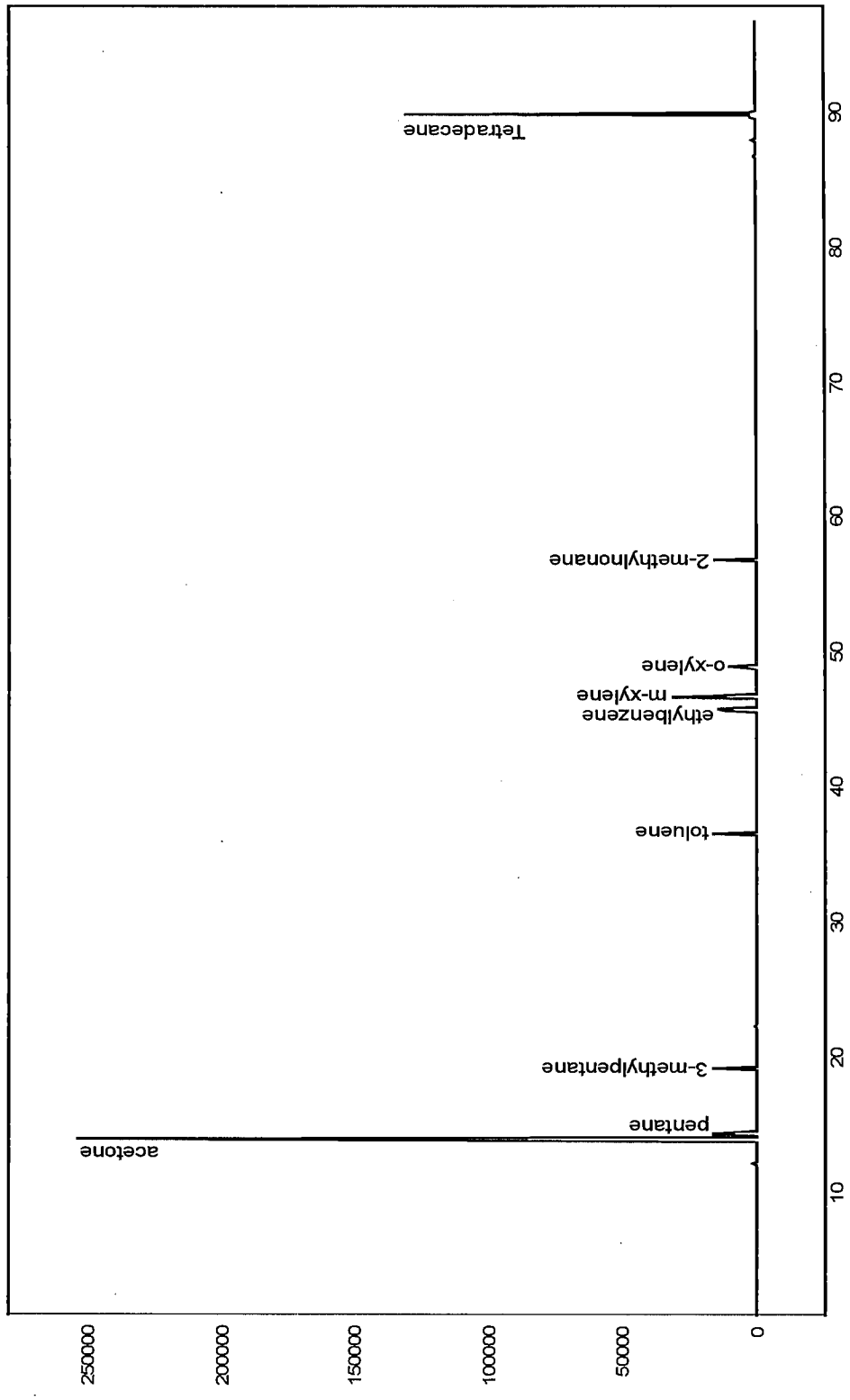


Table 4 - Comparison of SPME and Distillation Results for Acetone and Toluene

	% acetone				% toluene			
	SPME,	Distillation,	Abs. Error	SPME/dist [a]	SPME,	Distillation,	Abs. Error	SPME/dist [a]
	28.53	27.12	-1.41	1.05	34.97	36.43	1.46	0.96
	71.87	72.28	0.41	0.99				
	42.83	41.71	-1.12	1.03	40.49	42.17	1.68	0.96
	51.55	52.39	0.84	0.98				
	11.18	9.60	-1.71	1.16				
					27.75	28.48	0.73	0.97
	38.73	38.84	0.11	1.00				
	55.62	56.00	0.38	0.99				
					34.68	35.47	0.79	0.98
	40.28	39.65	-0.63	1.02				
					11.57	11.96	0.39	0.97
					13.43	13.82	0.40	0.97
	40.68	40.40	-0.28	1.01	29.87	30.41	0.54	0.98
					38.92	38.85	-0.08	1.00
	50.06	49.19	-0.87	1.02				
	37.47	36.28	-1.19	1.03				
	54.24	53.23	-1.01	1.02				
	48.93	49.51	0.58	0.99				
	56.82	54.85	-1.97	1.04				
	40.36	39.27	-1.10	1.03	21.60	21.92	0.32	0.99
	69.33	68.96	-0.37	1.01				
	54.66	56.47	1.80	0.97				
	13.47	13.62	0.15	0.99	67.06	70.66	3.60	0.95
	average		**-0.52**	**1.02**			**1.16**	**0.97**

[a] Ratio of composition as determined by SPME, relative to distillation procedure. This should exactly equal 1.00 if the two methods produced identical results.

Table 5- Duplicate Analyses of a Sample

Compound	Trial 1	Trial 2	Average
Ethane	0.0001	0.0001	0.0001
Propane	0.1228	0.1228	0.1228
Isobutane	0.0213	0.0214	0.0213
Butane	0.1652	0.1656	0.1654
trans-2-Butene	0.0001	0.0001	0.0001
2-Methylbutane	0.0003	0.0003	0.0003
Acetone	0.2112	0.2056	0.2084
Pentane	0.0002	0.0002	0.0002
2-Butanone	0.0559	0.0542	0.0550
1-Butanol	0.0365	0.0345	0.0355
Toluene	0.0165	0.0167	0.0166
Benzene, ethyl	0.0124	0.0125	0.0124
Cyclohexane, 1,2,4-trimethyl, ctt	0.0018	0.0019	0.0019
Benzene, 1,3-dimethyl	0.0314	0.0319	0.0317
Benzene, 1,4-dimethyl	0.0135	0.0137	0.0136
Cyclohexane, 1,2,3-trimethyl, ctc	0.0011	0.0011	0.0011
Cyclohexane, 1,2,4-trimethyl, ctc	0.0009	0.0009	0.0009
Cyclohexane, 1,2,4-trimethyl, ccc	0.0008	0.0008	0.0008
Benzene, 1,2-dimethyl	0.0149	0.0151	0.0150
Cyclohexane, 1-ethyl-3-methyl,	0.0020	0.0021	0.0021
Cyclohexane, 1-ethyl-4-methyl,	0.0011	0.0012	0.0011
Nonane	0.0029	0.0030	0.0029
Cyclohexane, 1,2,3-trimethyl, cct	0.0011	0.0011	0.0011
Cyclohexane, 1-ethyl-2-methyl,	0.0032	0.0033	0.0033
2,2-Dimethyloctane	0.0012	0.0012	0.0012
Other C10	0.0013	0.0014	0.0014
Cyclohexane, isopropyl	0.0008	0.0009	0.0008
Other C10	0.0028	0.0030	0.0029
Cyclohexane, 1-ethyl-2-methyl,	0.0022	0.0023	0.0023
Cyclohexane, propyl	0.0046	0.0049	0.0047
Cyclopentane, butyl	0.0018	0.0019	0.0019
3,3-Dimethyloctane	0.0053	0.0056	0.0055
Cyclohexane, substituted	0.0019	0.0021	0.0020
3-Ethyl-2-methyl heptane	0.0031	0.0033	0.0032
Benzene, propyl	0.0032	0.0034	0.0033
Other C10	0.0013	0.0014	0.0014
Benzene, 1-ethyl-3-methyl	0.0016	0.0018	0.0017
2,3-Dimethyloctane	0.0058	0.0061	0.0060
Benzene, 1,3,5-trimethyl	0.0040	0.0039	0.0039
Cyclooctane, 1,5-dimethyl (?)	0.0073	0.0077	0.0075
2-Methylnonane	0.0062	0.0065	0.0064
3-Ethyloctane	0.0010	0.0011	0.0010
3-Methylnonane	0.0055	0.0059	0.0057
Cyclohexane, 1-isopropyl-3-	0.0028	0.0031	0.0030
Other C10	0.0014	0.0016	0.0015
Cyclohexane, 1-isopropyl-4-	0.0022	0.0025	0.0023
Cyclohexane, 1-methyl-3-propyl,	0.0042	0.0044	0.0043
Cycloalkane, substituted	0.0019	0.0020	0.0020
Cyclohexane, 1-methyl-4-propyl,	0.0036	0.0038	0.0037
Cyclohexane, 1-isopropyl-2-	0.0013	0.0014	0.0013
Cyclohexane, 1-isopropyl-4-	0.0015	0.0016	0.0016
Cyclohexane, 1,3-diethyl, trans	0.0012	0.0012	0.0012
Decane	0.0253	0.0261	0.0257
Cyclohexane, 1-methyl-3-propyl,	0.0015	0.0015	0.0015
Cyclohexane, 1,2-diethyl, cis	0.0022	0.0022	0.0022
Cyclohexane, 1,4-diethyl, trans	0.0012	0.0012	0.0012
Cyclohexane, 1-methyl-2-propyl,	0.0054	0.0054	0.0054
Other C11	0.0015	0.0015	0.0015
Benzene, 1-isopropyl-2-methyl	0.0011	0.0011	0.0011
Cyclohexane, butyl	0.0034	0.0034	0.0034
Other C11	0.0012	0.0011	0.0012
Other C11	0.0014	0.0014	0.0014
Benzene, 1,3-diethyl	0.0013	0.0012	0.0012
Benzene, 1-methyl-3-propyl	0.0009	0.0009	0.0009
Benzene, 1,2-diethyl	0.0024	0.0023	0.0023
Benzene, 1-methyl-2-propyl	0.0029	0.0028	0.0029
trans-Decalin	0.0058	0.0059	0.0059
Other C11	0.0011	0.0010	0.0011
2-Methyldecane	0.0041	0.0041	0.0041
Benzene, 1,4-dimethyl-2-ethyl	0.0012	0.0011	0.0012
Benzene, 1,3-dimethyl-4-ethyl	0.0049	0.0049	0.0049
1-Methylindane	0.0014	0.0014	0.0014
Other C11	0.0012	0.0011	0.0012
Other C11	0.0010	0.0010	0.0010
Benzene, 1,3-dimethyl-2-ethyl	0.0014	0.0014	0.0014
Cyclohexane, substituted	0.0016	0.0016	0.0016
Cyclohexane, substituted	0.0036	0.0036	0.0036
Cyclohexane, substituted	0.0013	0.0019	0.0016
Other C11	0.0018	0.0018	0.0018
Other C11	0.0036	0.0036	0.0036
Benzene, 1,2-dimethyl-3-ethyl	0.0015	0.0015	0.0015
Undecane	0.0308	0.0317	0.0312
Other C12	0.0024	0.0024	0.0024
Other C12	0.0033	0.0034	0.0033
cis-Decalin	0.0029	0.0029	0.0029
Other C12	0.0023	0.0023	0.0023
Benzene, 1,2,4,5-tetramethyl	0.0019	0.0018	0.0018
Benzene, 1,2,3,5-tetramethyl	0.0023	0.0022	0.0022
Other C12	0.0015	0.0014	0.0015
Other C12	0.0014	0.0014	0.0014
2,6-Dimethyldecane	0.0060	0.0060	0.0060
C12	0.0012	0.0012	0.0012
C12	0.0034	0.0034	0.0034
Decahydro-2-methylnaphthalene	0.0043	0.0044	0.0043
C12	0.0012	0.0007	0.0010
Pentylcyclohexane	0.0043	0.0044	0.0043
Cyclic hydrocarbon	0.0038	0.0039	0.0039
Other C12	0.0021	0.0021	0.0021
Benzene, 1,2,3,4-tetramethyl	0.0011	0.0011	0.0011
Benzene, 1,2-diethyl-4-methyl	0.0016	0.0016	0.0016
Tetralin	0.0027	0.0028	0.0028
Benzene, 1,3-diethyl-4-methyl	0.0024	0.0024	0.0024
Benzene, 1,4-diethyl-2-methyl	0.0038	0.0038	0.0038
Benzene, 1,4-diisopropyl	0.0052	0.0053	0.0052
3-Methylundecane	0.0039	0.0040	0.0039
Other C12	0.0026	0.0027	0.0027
Dodecane	0.0132	0.0136	0.0134
2,5-Dimethylundecane	0.0030	0.0031	0.0030
TOTAL	1.0000	1.0000	1.0000

Table 6- Species Profiles for Duplicate Distillations of a Sample

				duplicate distillations	
peak	r.t. (min.)	compound	RI	Trial 1	Trial 2
1	11.24	Propane	377.7	0.0022	0.0023
2	11.78	Isobutane	396.6	0.0008	0.0005
3	12.24	Butane	412.6	0.0036	0.0036
4	13.98	Acetone	473.9	0.4828	0.4909
5	19.17	2-Butanone	577.0	0.1593	0.1601
6	25.41	1-Butanol	642.2	0.0180	0.0177
7	35.87	Toluene	755.9	0.0023	0.0022
8	45.85	PM Acetate	851.3	0.2302	0.2239
9	46.74	Benzene, 1,3-dimethyl	860.4	0.0568	0.0555
10	46.85	Benzene, 1,4-dimethyl	861.5	0.0246	0.0242
11	49.02	Benzene, 1,2-dimethyl	883.2	0.0190	0.0186
12	52.17	Benzene, isopropyl	915.8	0.0005	0.0005
		TOTAL		**1.0000**	**1.0000**

Appendix A -
Standard Operating Procedures for Sampling and Analysis

STANDARD OPERATING PROCEDURE FOR SAMPLING VOC EMISSIONS FROM AEROSOL COATING MATERIALS

1. SCOPE

1.1 This method can be used to sample VOC's emitted from water- and solvent-borne aerosol paint and coatings samples
1.2 The ultimate use of the method involves the determination of VOC species profiles for aerosol paint and coatings samples

2. METHOD SUMMARY

2.1 A rubber septum is attached to the upper portion of the cooled aerosol can by means of a hose clamp
2.2 A transfer line is inserted into the head space of the aerosol can and the propellant is collected in a gas sampling bag
2.3 The collected propellant is sampled with a gas tight syringe and analyzed by gas chromatography
2.4 The solvents are removed from the remaining liquid paint by distillation and analyzed by gas chromatography
2.5 For water-borne aerosol paints, the solvents in the liquid paint are determined directly by dilution with methanol containing an internal standard followed by gas chromatography
2.6 Alternatively, toluene and acetone are determined by solid-phase microextraction
2.7 Solids content of liquid paints is determined by ASTM procedure D 2369 (Test Method for Volatile Content of Coatings)
2.8 Water content of liquid paints is determined by ASTM procedure D 4017 (Test Method for Water in Paints and Paint Materials by Karl Fischer Method)

3. EQUIPMENT

3.1 Rubber septa and hose clamps
3.2 Disposable syringe for dispensing coatings samples, 1mL and 5mL
3.3 Septum capped vials, 40mL with PTFE-Silicone Septa; Crimp cap vials, 1mL
3.4 GC syringe, 1μL and 5μL; Gas-tight syringe, 1mL and 10mL
3.5 Gas Chromatograph, Hewlett Packard Model 5890 with FID detection
3.6 GC columns, 100m x 0.25mm Petrocol DH (Supelco) and 60m x 0.25mm DB-Wax (J&W Scientific)
3.7 Solid phase microextraction syringe and 100μm polydimethylsiloxane coated fiber
3.8 One liter one-neck round-bottom flask, 24 inch coil condenser
3.9 Gas sampling bags, Cali-5-Bond 15L, 60L and 90L

4. PROPELLANT COLLECTION

4.1 The cap, spray tip and paper label (if present) of the full aerosol paint can are removed, the can is weighed and cooled to minus 10°C.

4.2 A silicone rubber septum is attached to the upper portion of the cooled aerosol can by means of a hose clamp and is tightened.

4.3 The can is pierced through the septum with a brass pin and the pin is removed (the can should be leak free after removal of the pin).

4.4 A syringe needle attached to a gas line, consisting of a one foot section 1/16 inch stainless steel tubing, a one foot section of 1/4 inch Teflon tubing, a two foot section of 1/8 inch copper tubing and containing a pressure gauge and needle valve is inserted into the head space of the aerosol can.

4.5 The aerosol can is placed into an ice-water bath and the propellant is collected in a gas sampling bag over a 12 to 16 hour period. The ice in the water bath is allowed to melt and the water is allowed to warm to room temperature in the course of the transfer. The rate of propellant transfer is adjusted such that no visible liquid paint appears in the Teflon section of the transfer line.

4.6 The can is sonicated for 20 minutes at 25 °C to transfer residual propellant to the gas sampling bag.

4.7 The can is weighed to determine propellant mass transferred, is cooled in ice, and opened with a can opener.

4.8 For solvent-borne aerosol paints, the liquid paint is transferred to a one liter round bottom flask containing a 2 inch magnetic stir bar, and is heated to 60°C with rapid stirring for 20 minutes. Residual propellant dissolved in the liquid paint is allowed to pass through a 24 inch spiral condenser cooled to 10°C and is collected in the bag containing the original propellant. The liquid paint is weighed before and after heating to determine additional propellant weight loss. Water-borne and solvent-borne aerosol paints containing water are not subjected to this procedure and are transferred to a storage bottle immediately after sonication.

4.9 The remaining liquid paint is cooled and transferred to a bottle, sealed and stored in a refrigerator.

4.10 The empty aerosol can is rinsed with acetone to remove all of the remaining paint, is allowed to dry, and weighed to determine the amount liquid paint present.

5. ANALYSIS PROCEDURES

5.1 Propellants

5.1.1 Using a 1mL gas-tight syringe, inject 100µL of propellant into the gas chromatograph and integrate peak areas. GC Parameters: Column, 100m x 0.25mm Petrocol DH; Oven, 40°C for 15 minutes then to 200°C at 2.0 C° per minute, hold 15 minutes; Carrier, helium at 1.3mL per minute (20.4 cm per second); Detector, FID at 270°C; Injector, 250°C, split (50:1).

5.1.2 Determine relative response factors for propane, butane, and acetone by dissolving 6mL propane, 6mL butane and 10µL acetone in 1mL heptane in a crimp-cap vial and weighing the amounts added to four places on an analytical balance followed by GC of 2µL portions using the conditions described in 5.1.1. Repeat the procedure for butane, isobutane, dimethyl ether and pentane.

5.1.3 Identify compounds by retention index comparison with known compounds or, alternatively, by GC/MS.

5.2 Sampling for Solvent-Based Liquid Paint (Direct Method - Distillation)

5.2.1 Agitate the bottle containing the liquid paint thoroughly on a paint shaker. Using a disposable syringe, dispense between 1.0 and 1.5 grams of the liquid paint into a rubber septum-stoppered 100mL round bottom flask containing 5.0 grams dioctyl phthalate, 2.0 grams of tetradecane, and a Teflon-coated stirbar. Assemble the apparatus as shown in Figure 1.

5.2.2 Using a disposable syringe, dispense between 1.0 and 1.5 grams of theliquid paint into a rubber septum-stoppered 100mL round bottom flaskcontaining 5.0 grams dioctyl phthalate, 2.0 grams of tetradecane, and aTeflon-coated stirbar. Assemble the apparatus as shown in Figure 1.

5.2.3 Fill the condensing Dewar with liquid nitrogen.

5.2.4 Begin stirring and slowly establish a vacuum between 0.2 and 0.4 torr.

5.2.5 Gradually raise the temperature until it reaches 120^{o}C.

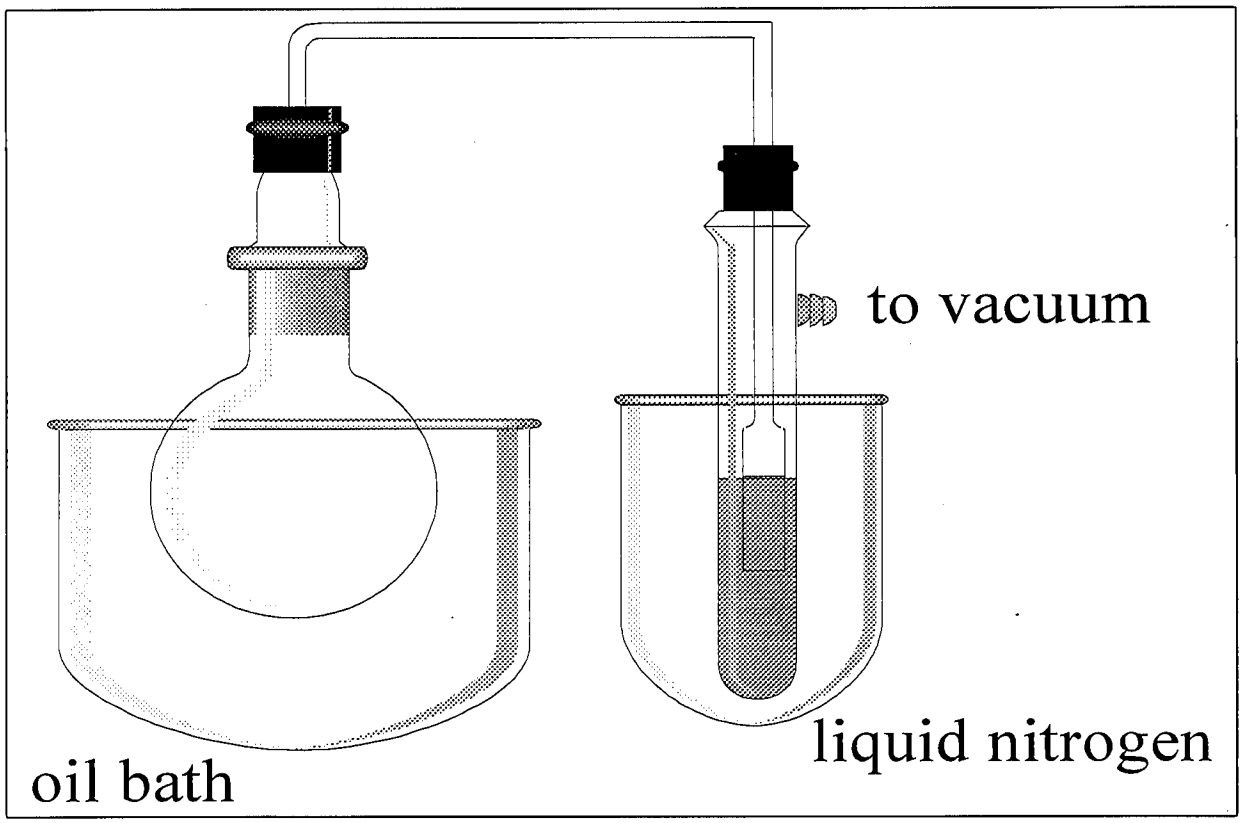
5.2.6 At the end of the distillation, remove the receiving tube from the liquid nitrogen bath, and allow its contents to melt.

5.2.7 Centrifuge the tube, and transfer the homogenized contents to a screw-capped vial.

5.2.8 For solvent-based paints which contain water, add 1.5 grams solid anhydrous sodium sulfate to the vial prior to transfer of the distillate.

5.2.9 Analyze by GC, as in 5.1.1 using an injection volume of 0.1 to 0.2 µL.

Figure 1 - Distillation Apparatus



5.3 Sampling for Water-Based Liquid Paint (Direct Method - Distillation)

5.3.1 Place 6.0 grams stripped hexyl carbitol and 2.0 grams stripped butyl carbitol in a 40mL septum cap vial. Using a disposable syringe, add 1.5 to 2.0 grams liquid paint, weighed to 0.1mg, to the vial. Add 0.2 to 0.3 grams 1-propanol as internal standard, weighed to 0.1mg, to the vial.

5.3.2 Homogenize the vial contents thoroughly by manually shaking the vial and transfer the contents to a 100mL round bottom flask.

5.3.3 Proceed as in 5.2.3.

5.4Sampling for Water-Based Liquid Paint (Direct Method)

5.4.1 Agitate the bottle containing the liquid paint thoroughly on a paint shaker.5.4.2Dispense 10.00 mL of solvent into a clean vial. Use methanol as the solvent, with 2-ethylhexanol as the internal standard. If methanol is present in the formulation, use dimethyl formamide as solvent with 1-propanol as internal standard.

5.4.3 Seal the vial with a septum cap and weigh to the nearest 0.1 mg.

5.4.4 Attach a stub of Teflon tubing to a disposable 5 mL syringe and draw a sample of the liquid paint from the middle of the well mixed paint bottle.

5.4.5 Replace the Teflon tubing with a stainless steel needle and inject approximately 0.5 mL of paint into the vial.

5.4.6 Reweigh the vial containing the paint to determine the mass of paint in the vial to the nearest 0.1 mg.

5.4.7 Mix the vial thoroughly, sonicate for 10 minutes, then centrifuge for 5 minutes at 100 RPM to facilitate settling of pigment.

5.4.8 Remove a 1.00 mL aliquot of the centrifugate from the vial, and dilute it to 25.00 mL with solvent. Seal the diluted solution in a septum capped vial.

5.4.9 For analysis, inject 1 µL aliquot of the diluted sample into a GC for quantitation.

5.4.10 Perform additional dilution(s) if instrumental response is not in the linear region.

5.5 Sampling for Acetone and Toluene in Solvent-Borne Liquid Paints by Solid Phase Microextraction

5.5.1 Place 5.0 mL dioctyl phthalate into a clean 40 mL vial, seal with a PTFE-silicone septum cap, and weigh to the nearest 0.1 mg.

5.5.2 Using a disposable 1 mL syringe, add 0.8 to 1.0 mL well mixed paint and reweigh to the nearest 0.1 mg to determine the mass of the paint.

5.5.3 Using dedicated 250 µL syringes, add either or both, acetone-d6 and toluene-d8 equivalent to the amount expected in the coating sample and determine the mass added to the nearest 0.1 mg.

5.5.4 Mix the contents thoroughly by shaking the vial, and let stand for 30 minutes. Replace the septum cap with a new septum.

5.5.4 Sample the head space for 5 minutes with a solid phase microextraction fiber coated with 100 µm polydimethylsiloxane.

5.5.5 Desorb the fiber at 250^{O}C onto a 60m x 0.25mm DB Wax capillary column. GC Parameters: Oven, 50^{O}C for 8 minutes then to 250^{O}C at 20 C^{O} per minute, hold 10 minutes; Carrier, helium at 2 mL per minute); Detector, FID at 270^{O}C; Injector, 250^{O}C, split (50:1).

5.5.6 Determine response factors for acetone-d6 and toluene-d8 by adding approximately equal quantities of deuterated and undeuterated acetone and toluene, weighed to the nearest 0.1 mg, into a septum-capped vial and proceed as above.

Appendix B -
Group Species Profiles

Group 1 Clear Coatings Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.2964	0.2964	1
Propane	74986	0.1359	0.4324	2
2-Butanone	78933	0.1242	0.5565	3
Butane	106978	0.0776	0.6341	4
Isobutane	75285	0.0453	0.6794	5
Benzene, 1,3-dimethyl	108383	0.0428	0.7222	6
2-Propanol	67630	0.0213	0.7435	7
1-Butanol	71363	0.0194	0.7629	8
4-Methyl-2-pentanone	108101	0.0185	0.7814	9
Benzene, ethyl	100414	0.0176	0.7990	10
Benzene, 1,2-dimethyl	95476	0.0152	0.8142	11
Benzene, 1,4-dimethyl	106423	0.0149	0.8291	12
Decane	124185	0.0110	0.8401	13
Undecane	1120214	0.0095	0.8495	14
3-Methylhexane	589344	0.0081	0.8577	15
Heptane	142825	0.0065	0.8642	16
Hexane, 2-methyl	591764	0.0063	0.8705	17
Other C10	#N/A	0.0059	0.8764	18
Nonane	111842	0.0052	0.8815	19
Toluene	108883	0.0042	0.8858	20
Cyclopentane, isobutyl	3788327	0.0038	0.8896	21
Dodecane	112403	0.0036	0.8932	22
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0029	0.8961	23
3,3-Dimethyloctane	4110445	0.0027	0.8988	24
trans-Decalin	493027	0.0027	0.9014	25
2-Methylnonane	871830	0.0026	0.9040	26
Cyclohexane, propyl	1678928	0.0026	0.9065	27
Other C11	#N/A	0.0025	0.9091	28
Other C12	#N/A	0.0024	0.9114	29
3-Methylnonane	1465084	0.0023	0.9137	30
2,3-Dimethyloctane	7146603	0.0023	0.9160	31
Cyclohexane, methyl	108872	0.0023	0.9183	32
Pentane, 2,3-dimethyl	565593	0.0023	0.9206	33
Cyclohexane, 1-isopropyl-4-methyl	99821	0.0021	0.9227	34
Cyclohexane, 1-methyl-4-propyl, trans	28352423	0.0020	0.9247	35
Cyclohexane, butyl	1678939	0.0020	0.9267	36
Cyclohexane, 1-ethyl-2-methyl, trans	4923788	0.0019	0.9285	37
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0018	0.9304	38
2,6-Dimethyldecane	13150817	0.0018	0.9322	39
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0017	0.9339	40
2-Methyldecane	6975980	0.0017	0.9356	41
Cyclohexane, 1-isopropyl-3-methyl	16580248	0.0014	0.9370	42
4-Methylnonane	17301949	0.0014	0.9383	43
3-Methyloctane	2216333	0.0013	0.9397	44
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0013	0.9410	45

Benzene, 1,4-diisopropyl	100185	0.0013	0.9423	46
Cyclohexane, 1-isopropyl-2-methyl	16580237	0.0013	0.9436	47
Octane	111659	0.0013	0.9448	48
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0012	0.9460	49
3-Ethyloctane	5881174	0.0012	0.9472	50
Cyclohexane, 1,2-diethyl, cis	824431	0.0011	0.9483	51
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0011	0.9494	52
Cyclohexane, pentyl	4292926	0.0011	0.9505	53
Decahydro-2-methylnaphthalene	2958761	0.0011	0.9515	54
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0010	0.9526	55
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0010	0.9536	56
Benzene, 1,3,5-trimethyl	108678	0.0010	0.9546	57
3-Methylundecane	1002433	0.0010	0.9555	58
Benzene, 1,4-diethyl-2-methyl	13632945	0.0010	0.9565	59
Cyclopentane, butyl	2040951	0.0009	0.9574	60
Isobutyl isobutyrate	97858	0.0009	0.9583	61
Cyclohexane, ethyl	1678917	0.0009	0.9592	62
Benzene, propyl	103651	0.0008	0.9600	63
4,5-Dimethyloctane	15869962	0.0008	0.9608	64
Cyclohexane, 1-methyl-3-propyl, cis	42806757	0.0008	0.9616	65
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0008	0.9623	66
3-Ethyl-2-methyl heptane	14676290	0.0008	0.9631	67
2,5-Dimethylundecane	17301223	0.0007	0.9638	68
cis-Decalin	493016	0.0007	0.9645	69
Benzene, 1-methyl-2-propyl	1074175	0.0007	0.9653	70
Cyclohexane, 1-isopropyl-3-methyl, cis	17066658	0.0007	0.9660	71
2,5-Dimethyloctane	15869893	0.0007	0.9667	72
3-Ethylnonane	17302113	0.0007	0.9674	73
Butyl methacrylate	97881	0.0007	0.9681	74
Tetralin	119642	0.0007	0.9687	75
Cyclohexane, isopropyl	696297	0.0007	0.9694	76
3,6-Dimethyloctane	15869940	0.0007	0.9701	77
3-Methyldecane	13151343	0.0006	0.9707	78
2-Methyloctane	3221612	0.0006	0.9713	79
Cyclohexane	110827	0.0006	0.9719	80
3,3-Dimethylpentane	562492	0.0006	0.9725	81
Benzene, 1,3-diethyl-4-methyl	1758856	0.0006	0.9731	82
3,5-Dimethylheptane(+/-)	39056183	0.0006	0.9737	83
Benzene, 1,2-diethyl	135013	0.0006	0.9743	84
Cyclopentane, 1,2-dimethyl, trans	822504	0.0006	0.9749	85
2,2,4-Trimethyloctane	18932144	0.0006	0.9755	86
3,5-Dimethyloctane	15869939	0.0006	0.9760	87
2,7-Dimethylnonane	17302293	0.0006	0.9766	88
Benzene, 1,2,3,5-tetramethyl	527537	0.0006	0.9771	89
2,4-Dimethyloctane	4032944	0.0006	0.9777	90
2-Methylheptane	592278	0.0005	0.9782	91
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0005	0.9788	92
3,7-Dimethylnonane	17302328	0.0005	0.9793	93
3,6-Dimethylnonane	17302317	0.0005	0.9798	94

Other C9	#N/A	0.0005	0.9803	95
Benzene, 1-methyl-3-propyl	1074437	0.0005	0.9808	96
2,2-Dimethyloctane	15869871	0.0005	0.9813	97
Ethane	74840	0.0005	0.9817	98
Cyclohexane, substituted	#N/A	0.0005	0.9822	99
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0005	0.9827	100
Benzene, 1,2,4,5-tetramethyl	95932	0.0005	0.9831	101
4-Ethylnonane	1465115	0.0005	0.9836	102
Methyl methacrylate	80626	0.0005	0.9840	103
Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0005	0.9845	104
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0005	0.9849	105
Cyclohexane, 1,4-dimethyl, cis	624293	0.0004	0.9854	106
2,6-Dimethyloctane	2051301	0.0004	0.9858	107
Cyclopentane, propyl	2040962	0.0004	0.9862	108
Benzene, 1,2-diethyl-4-methyl	13732804	0.0004	0.9866	109
Benzene, 1-ethyl-3-methyl	620144	0.0004	0.9870	110
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0004	0.9874	111
Benzene, 1,3-dimethyl-2-ethyl	354381	0.0004	0.9877	112
1-Methylindane	27133933	0.0004	0.9881	113
Cyclohexane, 1,1,2-trimethyl	7094260	0.0003	0.9884	114
Trimethyloctane	98060527	0.0003	0.9888	115
2,2,4-Trimethylnonane	62184503	0.0003	0.9891	116
Trimethylheptane	79004867	0.0003	0.9895	117
Cyclopentane, ethyl	1640897	0.0003	0.9898	118
3-Methylheptane	589811	0.0003	0.9901	119
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0003	0.9904	120
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0003	0.9907	121
Benzene, 1,3-diethyl	141935	0.0003	0.9910	122
Cyclohexane, 1,3-diethyl, trans	13990948	0.0003	0.9913	123
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0003	0.9916	124
2-Methylbutane	78784	0.0003	0.9919	125
Cyclohexane, 1,2-dimethyl, cis	112134	0.0003	0.9922	126
3,3-Dimethylnonane	17302157	0.0003	0.9925	127
Cyclohexane, 1,3-diethyl, trans	13990948	0.0003	0.9928	128
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0003	0.9931	129
Cyclohexane, 1,4-diethyl, trans	13990937	0.0003	0.9934	130
4,5-Dimethylnonane	17302237	0.0003	0.9937	131
Cyclohexane, 1-methyl-4-propyl, cis	28954429	0.0003	0.9940	132
Benzene, 1-isopropyl-2-methyl	527844	0.0003	0.9943	133
Benzene, 1,2,3,4-tetramethyl	488233	0.0003	0.9945	134
2,6-Dimethylnonane	17302282	0.0003	0.9948	135
Cyclohexane, 1,2,3-trimethyl, ctc	1678815	0.0003	0.9951	136
Nonane, 2,5-dimethyl	17302271	0.0003	0.9953	137
trans-2-Butene	624646	0.0003	0.9956	138
Cyclohexane, 1,3-diethyl, cis	13991430	0.0003	0.9959	139
Nonane, 2,4-dimethyl	17302248	0.0003	0.9961	140
4-Ethyloctane	15869860	0.0003	0.9964	141
Cyclohexane, 1,2-diethyl, trans	13990959	0.0002	0.9966	142
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0002	0.9969	143

2,3-Dimethylheptane	3074713	0.0002	0.9971	144
2,3-Dimethylnonane	359554	0.0002	0.9973	145
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0002	0.9976	146
Cyclohexane, 1,4-diethyl, cis	13990926	0.0002	0.9978	147
Cyclopentane, 1,1-dimethyl	1638262	0.0002	0.9980	148
Pentane, 2,4-dimethyl	108087	0.0002	0.9982	149
2,2,4-Trimethylheptane	14720742	0.0002	0.9984	150
Cyclohexane, 1,3,5-trimethyl, ctc	not in CAS	0.0002	0.9986	151
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0002	0.9988	152
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0002	0.9990	153
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0002	0.9992	154
5-Ethylnonane	17302124	0.0002	0.9994	155
2,5-Dimethylheptane	2216300	0.0002	0.9995	156
2,4-Dimethylhexane	116502444	0.0002	0.9997	157
4-Methylheptane	589537	0.0001	0.9998	158
Benzene, isopropyl	98828	0.0001	1.0000	159
Pentane	109660	0.0000	1.0000	160
Total VOC		1.0000		

Group 2 Flat Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.3186	0.3186	1
Propane	74986	0.1760	0.4946	2
Toluene	108883	0.1518	0.6463	3
Butane	106978	0.1076	0.7540	4
Benzene, 1,3-dimethyl	108383	0.0648	0.8188	5
Isobutane	75285	0.0277	0.8465	6
Benzene, ethyl	100414	0.0275	0.8739	7
Benzene, 1,4-dimethyl	106423	0.0274	0.9013	8
Benzene, 1,2-dimethyl	95476	0.0237	0.9251	9
Octane	111659	0.0056	0.9307	10
Decane	124185	0.0037	0.9344	11
Nonane	111842	0.0029	0.9372	12
2-Methylheptane	592278	0.0024	0.9396	13
Cyclohexane, 1,3-dimethyl, cis	638040	0.0023	0.9419	14
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0021	0.9440	15
Benzene, 1,2,4-trimethyl	95636	0.0021	0.9461	16
Other C11	#N/A	0.0020	0.9481	17
Cyclohexane, ethyl	1678917	0.0017	0.9498	18
Undecane	1120214	0.0016	0.9514	19
3-Methylheptane	589811	0.0016	0.9530	20
2-Butanone	78933	0.0015	0.9545	21
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0014	0.9559	22
1-Butanol	71363	0.0012	0.9571	23
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0011	0.9582	24
3-Methyloctane	2216333	0.0011	0.9593	25
3,5-Dimethylheptane	926829	0.0011	0.9604	26
Cyclohexane, 1,4-dimethyl, cis	624293	0.0010	0.9614	27
Other C12	#N/A	0.0010	0.9624	28
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0009	0.9633	29
Cyclohexane, 1,3,5-trimethyl	1839630	0.0009	0.9642	30
Benzene, 1-ethyl-3-methyl	620144	0.0009	0.9651	31
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0009	0.9660	32
2-Methyloctane	3221612	0.0009	0.9668	33
2-Methylnonane	871830	0.0008	0.9676	34
Cyclopentane, propyl	2040962	0.0008	0.9685	35
Indan	496117	0.0008	0.9692	36
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0008	0.9700	37
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0008	0.9708	38
3,3-Dimethyloctane	4110445	0.0007	0.9715	39
Benzene, 1,3,5-trimethyl	108678	0.0007	0.9723	40
Benzene, 1,2,3,5-tetramethyl	527537	0.0007	0.9730	41
Other C10	#N/A	0.0007	0.9737	42
4-Methylnonane	17301949	0.0007	0.9744	43
4-Methylheptane	589537	0.0007	0.9750	44
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0007	0.9757	45

Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0006	0.9763	46
Cyclohexane, 1,1,2-trimethyl	7094260	0.0006	0.9769	47
3,4-Dimethylheptane	922281	0.0006	0.9775	48
Cyclohexane, propyl	1678928	0.0006	0.9781	49
3,3-Diethylpentane	1067205	0.0006	0.9787	50
2,3-Dimethylheptane	3074713	0.0006	0.9792	51
trans-Decalin	493027	0.0005	0.9798	52
Cyclopentane, butyl	2040951	0.0005	0.9803	53
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0005	0.9808	54
Cyclohexane, 1,2-dimethyl, cis	112134	0.0005	0.9812	55
1H-Indene, octahydro, trans	3296502	0.0005	0.9817	56
Benzene, 1,2,4,5-tetramethyl	95932	0.0005	0.9822	57
Dodecane	112403	0.0005	0.9826	58
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0004	0.9831	59
3-Methylnonane	1465084	0.0004	0.9835	60
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0004	0.9840	61
2,5-Dimethylheptane	2216300	0.0004	0.9844	62
Cyclohexane, methyl	108872	0.0004	0.9848	63
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0004	0.9853	64
Benzene, propyl	103651	0.0004	0.9857	65
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0004	0.9861	66
Cyclohexane, butyl	1678939	0.0004	0.9865	67
Other C9	#N/A	0.0004	0.9869	68
Benzene, 1-ethyl-4-methyl	622968	0.0004	0.9873	69
Benzene, isopropyl	98828	0.0004	0.9876	70
2,3-Dimethylhexane	584941	0.0004	0.9880	71
Cyclohexane, 1,1-dimethyl	590669	0.0003	0.9883	72
2-Methyldecane	6975980	0.0003	0.9887	73
2,3-Dimethyloctane	7146603	0.0003	0.9890	74
Cyclohexane, 1-methyl-4-propyl, trans	28352423	0.0003	0.9893	75
Ethane	74840	0.0003	0.9897	76
Cyclohexane, 1-isopropyl-3-methyl, cis	17066658	0.0003	0.9900	77
Benzene, 1-methyl-2-propyl	1074175	0.0003	0.9903	78
Benzene, 1,2,3-trimethyl	526738	0.0003	0.9906	79
3,6-Dimethyloctane	15869940	0.0003	0.9909	80
Other C9	#N/A	0.0003	0.9912	81
2,5-Dimethyloctane	15869893	0.0003	0.9914	82
Cyclohexane, 1-isopropyl-4-methyl, trans	1678826	0.0003	0.9917	83
2-Methylhexane	591764	0.0003	0.9920	84
5-Ethyl-2-methyloctane	62016186	0.0003	0.9922	85
trans-2-Butene	624646	0.0003	0.9925	86
Benzene, 1-ethyl-2-methyl	611143	0.0003	0.9928	87
3-Ethyl-2-methylheptane	14676290	0.0003	0.9930	88
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0003	0.9933	89
3-Ethylhexane	619998	0.0002	0.9935	90
Benzene, 1-isopropyl-4-methyl	99876	0.0002	0.9938	91
Trimethyloctane	98060527	0.0002	0.9940	92
2-Methylbutane	78784	0.0002	0.9942	93
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0002	0.9945	94

Cyclohexane, isopropyl	696297	0.0002	0.9947	95
Naphthalene, decahydro-2-methyl	2958761	0.0002	0.9949	96
3,3,5-Trimethylheptane	7154805	0.0002	0.9951	97
1H-Indene, octahydro, cis	4551513	0.0002	0.9953	98
2-Methylundecane	7045718	0.0002	0.9955	99
1H-Indene, octahydro-5-methyl	19744640	0.0002	0.9957	100
Cyclohexane, 1-methyl-3-propyl, cis	42806757	0.0002	0.9958	101
3-Ethyl-4-methyl heptane	52896910	0.0002	0.9960	102
Cyclohexane, 1-isopropyl-2-methyl, trans	19489033	0.0001	0.9962	103
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0001	0.9963	104
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0001	0.9964	105
Methanol	67561	0.0001	0.9966	106
4-Methylundecane	2980690	0.0001	0.9967	107
Other C13	#N/A	0.0001	0.9968	108
Benzene, 1-isopropyl-2-methyl	527844	0.0001	0.9970	109
3-Methylpentane	96140	0.0001	0.9971	110
Cyclohexane, 1,3-diethyl, cis	13991430	0.0001	0.9972	111
Cyclohexane, 1,2,3-trimethyl, ctc	1678815	0.0001	0.9974	112
Cyclohexane, 1-methyl-4-propyl, cis	28954429	0.0001	0.9975	113
Cyclohexane, pentyl	4292926	0.0001	0.9976	114
Cyclohexane, 1,1,3,5-tetramethyl	4306654	0.0001	0.9977	115
5-Methylundecane	1632708	0.0001	0.9978	116
Cyclohexane, 1,3-diethyl, trans	13990948	0.0001	0.9979	117
3-Methylundecane	1002433	0.0001	0.9980	118
Cyclohexane, 1,2-diethyl, trans	13990959	0.0001	0.9981	119
2,2-Dimethyloctane	15869871	0.0001	0.9982	120
Benzene, 1-methyl-3-propyl	1074437	0.0001	0.9983	121
2,5-Dimethylnonane	17302271	0.0001	0.9984	122
Cyclopentane, isobutyl	3788327	0.0001	0.9985	123
3-Ethylnonane	17302113	0.0001	0.9986	124
Benzene, 1,2-diethyl	135013	0.0001	0.9987	125
Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0001	0.9988	126
3,7-Dimethylnonane	#N/A	0.0001	0.9989	127
Cyclohexane, 1,4-diethyl, trans	13990937	0.0001	0.9990	128
Tetralin	119642	0.0001	0.9990	129
4-Methyldecane	#N/A	0.0001	0.9991	130
Cyclopentane, 1-methyl-2-propyl	3728572	0.0001	0.9992	131
Cyclohexane, 1,4-diethyl, cis	13990926	0.0001	0.9993	132
3-Ethyloctane	5881174	0.0001	0.9994	133
2,6-Dimethylnonane	17302282	0.0001	0.9994	134
Cyclohexane, 1-isopropyl-4-methyl, cis	6069983	0.0001	0.9995	135
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0001	0.9995	136
3-Ethyl-2-methyl heptane	14676290	0.0001	0.9996	137
cis-Decalin	493016	0.0001	0.9997	138
Benzene, 1,4-diethyl	105055	0.0001	0.9997	139
Trimethylheptane	79004867	0.0001	0.9998	140
Benzene, 1,3-dimethyl-2-ethyl	354381	0.0001	0.9998	141
4-Methyloctane	2216344	0.0000	0.9999	142
2,6-Dimethyldecane	#N/A	0.0000	0.9999	143

Pentane	109660	0.0000	1.0000	144
6-Methylundecane	17302339	0.0000	1.0000	145
Ethanol	64175	0.0000	1.0000	146
Total VOC		1.0000		

Group 3 Fluorescent Coatings Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Propane	74986	0.2274	0.2274	1
Butane	106978	0.1255	0.3529	2
Toluene	108883	0.1169	0.4698	3
Hexane	110543	0.0462	0.5160	4
Acetone	67641	0.0424	0.5584	5
Benzene, 1,3-dimethyl	108383	0.0417	0.6001	6
Isobutane	75285	0.0272	0.6272	7
Benzene, ethyl	100414	0.0198	0.6470	8
Benzene, 1,4-dimethyl	106423	0.0182	0.6652	9
Benzene, 1,2-dimethyl	95476	0.0181	0.6833	10
Cyclohexane, ethyl	1678917	0.0161	0.6994	11
Cyclopentane, methyl	96377	0.0144	0.7138	12
3-Methylpentane	96140	0.0127	0.7265	13
Other C9	#N/A	0.0102	0.7367	14
3,5-Dimethylheptane(+/-)	39056183	0.0098	0.7465	15
Nonane	111842	0.0097	0.7562	16
Octane	111659	0.0093	0.7656	17
Cyclohexane, methyl	108872	0.0092	0.7748	18
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0088	0.7835	19
Pentane, 3-methyl	96140	0.0086	0.7921	20
3-Methyloctane	2216333	0.0084	0.8005	21
2-Methylheptane	592278	0.0083	0.8088	22
2-Methylpentane	107835	0.0079	0.8167	23
Cyclopentane, propyl	2040962	0.0074	0.8241	24
Cyclohexane, 1,4-dimethyl, cis	624293	0.0074	0.8315	25
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0068	0.8382	26
3-Methylheptane	589811	0.0067	0.8449	27
2-Methyloctane	3221612	0.0065	0.8515	28
Butyl acetate	123864	0.0064	0.8579	29
Benzene, 1,2,4-trimethyl	95636	0.0064	0.8643	30
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0063	0.8706	31
Pentane, 2-methyl	107835	0.0054	0.8760	32
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0053	0.8813	33
Heptane	142825	0.0045	0.8859	34
3,3-Dimethylheptane	4032864	0.0041	0.8900	35
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0040	0.8940	36
Cyclohexane, 1,3-dimethyl, cis	638040	0.0039	0.8979	37
Cyclohexane, 1,2-dimethyl, cis	112134	0.0039	0.9017	38
Benzene, 1-ethyl-3-methyl	620144	0.0037	0.9055	39
Cyclopentane, 1,2-dimethyl, trans	822504	0.0036	0.9091	40
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0032	0.9123	41
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0029	0.9152	42
4-Methylheptane	589537	0.0026	0.9178	43
2,5-Dimethylheptane	2216300	0.0025	0.9203	44
Other C8	#N/A	0.0024	0.9228	45

Cyclopentane, 1-ethyl-1-methyl	16747505	0.0024	0.9251	46
3-Ethylpentane	617787	0.0023	0.9275	47
3-Methylhexane	589344	0.0022	0.9297	48
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0021	0.9318	49
4-Methyloctane	2216344	0.0021	0.9338	50
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0020	0.9358	51
Cyclohexane, 1,1,2-trimethyl	7094260	0.0019	0.9377	52
Cyclopentane, 1,2-dimethyl, cis	1192183	0.0019	0.9397	53
Cyclohexane	110827	0.0019	0.9416	54
Benzene, 1,3,5-trimethyl	108678	0.0019	0.9435	55
Cyclopentane	287923	0.0019	0.9453	56
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0019	0.9472	57
Cyclohexane, 1,2,3-trimethyl, ctc	1678815	0.0018	0.9490	58
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0018	0.9508	59
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0017	0.9525	60
Benzene, 1-ethyl-4-methyl	622968	0.0017	0.9542	61
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0017	0.9559	62
Cyclopentane, ethyl	1640897	0.0016	0.9575	63
2,3-Dimethylheptane	3074713	0.0016	0.9591	64
Benzene, 1-ethyl-2-methyl	611143	0.0015	0.9605	65
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0015	0.9620	66
2-Methylhexane	591764	0.0014	0.9634	67
2-Methylbutyl acetate	624419	0.0014	0.9649	68
2,3-Dimethylhexane	584941	0.0013	0.9662	69
2,4-Dimethylhexane	116502444	0.0013	0.9675	70
3-Ethylhexane	619998	0.0012	0.9687	71
2,6-Dimethylheptane	1072055	0.0012	0.9700	72
2,2-Dimethylpentane	590352	0.0011	0.9711	73
Benzene, propyl	103651	0.0011	0.9722	74
Benzene, 1,2,3-trimethyl	526738	0.0010	0.9732	75
Cyclohexane, 1,1-dimethyl	590669	0.0010	0.9742	76
3-Ethylheptane	15869804	0.0010	0.9752	77
2,2-Dimethylhexane	590738	0.0010	0.9762	78
Octahydropentalene	694724	0.0010	0.9772	79
Cyclopentane, 1-ethyl-3-methyl	3726474	0.0009	0.9781	80
Cyclopentane, 1,2,3-trimethyl, ccc	2613696	0.0009	0.9790	81
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0009	0.9800	82
3,4-Dimethylheptane	922281	0.0009	0.9809	83
Cyclohexane, isopropyl	696297	0.0008	0.9817	84
2,5-Dimethylhexane	592132	0.0008	0.9825	85
Benzene, 1-isopropyl-3-methyl	535773	0.0008	0.9833	86
Cyclohexane, 1,1,4-trimethyl	7094271	0.0008	0.9840	87
3,4-Dimethylhexane	583482	0.0007	0.9848	88
2,4-Dimethylpentane	108087	0.0007	0.9855	89
Isobutyl acetate	110190	0.0007	0.9862	90
Benzene, isopropyl	98828	0.0007	0.9868	91
Ethane	74840	0.0006	0.9875	92
2,4-Dimethylheptane	2213232	0.0006	0.9881	93
2,2,5-Trimethylhexane	3522949	0.0006	0.9886	94

Cyclopentane, isopropyl	3875512	0.0006	0.9892	95
Cyclopentane, isobutyl	3788327	0.0005	0.9897	96
Cyclohexane, 1-ethyl-2-methyl, trans	4923788	0.0005	0.9903	97
3-Methylbutyl acetate	123922	0.0005	0.9908	98
Butane, 2,3-dimethyl	79298	0.0005	0.9913	99
2,2-Dimethylbutane	75832	0.0005	0.9918	100
Pentane, 2,4-dimethyl	108087	0.0005	0.9923	101
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0005	0.9928	102
Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0005	0.9933	103
3-Methyl-4-ethyl hexane	3074779	0.0004	0.9937	104
2,2-Dimethylheptane	1071267	0.0004	0.9941	105
Cyclohexane, propyl	1678928	0.0004	0.9945	106
Cyclohexane, 1,1,3-trimethyl	3073663	0.0004	0.9949	107
Cyclopentane, 1,1-dimethyl	1638262	0.0004	0.9953	108
2,3,4-Trimethylpentane	565753	0.0003	0.9956	109
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0003	0.9959	110
2,2,4-Trimethylheptane	14720742	0.0003	0.9962	111
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0003	0.9965	112
Other C10	#N/A	0.0003	0.9968	113
2,5-Dimethyloctane	15869893	0.0003	0.9970	114
Benzene, 1-isopropyl-2-methyl	527844	0.0002	0.9972	115
Trimethylheptane	79004867	0.0002	0.9975	116
2-Butanone	78933	0.0002	0.9977	117
Benzene, 1,3-diethyl	141935	0.0002	0.9979	118
Benzene, 1,4-diethyl	105055	0.0002	0.9981	119
2,2-Dimethyloctane	15869871	0.0002	0.9983	120
2,3-Dimethyl pentane	565593	0.0002	0.9984	121
Pentane	109660	0.0002	0.9986	122
3,3-Dimethylpentane	562492	0.0002	0.9988	123
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0001	0.9989	124
4-Methyl -2-pentanone	108101	0.0001	0.9991	125
Decane	124185	0.0001	0.9992	126
Propane, 2,2-dimethyl	463821	0.0001	0.9993	127
Benzene, 1-methyl-3-propyl	1074437	0.0001	0.9994	128
Butane, 2-methyl	78784	0.0001	0.9995	129
2,2,3-Trimethylbutane	464062	0.0001	0.9996	130
Undecane	1120214	0.0001	0.9996	131
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0001	0.9997	132
Ethyl acetate	141786	0.0001	0.9998	133
2-Methylbutane	78784	0.0000	0.9998	134
3,3-Dimethyloctane	4110445	0.0000	0.9999	135
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0000	0.9999	136
trans-2-Butene	624646	0.0000	0.9999	137
2-Methylnonane	871830	0.0000	1.0000	138
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0000	1.0000	139
Total VOC		1.0000		

Group 4 Ground Traffic Marking Paint Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Propane	74986	0.1708	0.1708	1
Acetone	67641	0.1486	0.3194	2
Toluene	108883	0.1456	0.4650	3
Butane	106978	0.0922	0.5572	4
Benzene, 1,3-dimethyl	108383	0.0728	0.6300	5
Hexane	110543	0.0502	0.6802	6
Cyclohexane, methyl	108872	0.0341	0.7143	7
Benzene, 1,4-dimethyl	106423	0.0311	0.7454	8
Benzene, ethyl	100414	0.0248	0.7701	9
Benzene, 1,2-dimethyl	95476	0.0236	0.7937	10
(2-Methoxy-1-methylethyl) acetate	108656	0.0197	0.8134	11
Isobutane	75285	0.0193	0.8327	12
Heptane	142825	0.0182	0.8509	13
Pentane, 3-methyl	96140	0.0150	0.8659	14
Cyclopentane, methyl	96377	0.0111	0.8770	15
Pentane, 2-methyl	107835	0.0069	0.8839	16
Benzene, 1-ethyl-3-methyl	620144	0.0064	0.8903	17
Cyclopentane, ethyl	1640897	0.0054	0.8957	18
Benzene, 1,2,4-trimethyl	95636	0.0054	0.9011	19
Methanol	67561	0.0047	0.9058	20
3-Methylhexane	589344	0.0045	0.9104	21
4-Methylheptane	589537	0.0045	0.9149	22
Octane	111659	0.0043	0.9192	23
3-Methylheptane	589811	0.0036	0.9228	24
Cyclopentane, 1,2-dimethyl, trans	822504	0.0033	0.9261	25
Hexane, 2-methyl	591764	0.0030	0.9291	26
Benzene, 1,3,5-trimethyl	108678	0.0029	0.9320	27
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0029	0.9349	28
Benzene, 1-ethyl-4-methyl	622968	0.0028	0.9377	29
2,4-Dimethylhexane	116502444	0.0025	0.9402	30
Cyclopentane, 1,2-dimethyl, cis	1192183	0.0025	0.9427	31
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0024	0.9451	32
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0023	0.9473	33
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0022	0.9495	34
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0021	0.9517	35
Benzene, 1-ethyl-2-methyl	611143	0.0021	0.9538	36
Nonane	111842	0.0021	0.9558	37
Benzene, propyl	17312504	0.0018	0.9577	38
Cyclohexane, ethyl	1678917	0.0017	0.9594	39
2-Methylheptane	592278	0.0017	0.9611	40
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0017	0.9628	41
Benzene, 1,2,3-trimethyl	526738	0.0015	0.9643	42
Other C9	#N/A	0.0014	0.9657	43
Other C8	#N/A	0.0014	0.9671	44
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0012	0.9684	45

3,5-Dimethylheptane(+/-)	39056183	0.0012	0.9696	46
3-Methyloctane	2216333	0.0012	0.9707	47
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0011	0.9719	48
Isobutyl methacrylate	97869	0.0011	0.9730	49
Methanol	67561	0.0010	0.9740	50
Cyclopentane, propyl	2040962	0.0010	0.9750	51
Pentane, 2,3-dimethyl	565593	0.0010	0.9760	52
2-Methyloctane	3221612	0.0010	0.9770	53
2,2-Dimethylhexane	590738	0.0010	0.9779	54
Cyclohexane, 1,4-dimethyl, cis	624293	0.0009	0.9789	55
2,3-Dimethylhexane	584941	0.0009	0.9797	56
Benzene, isopropyl	98828	0.0008	0.9806	57
Other C11	#N/A	0.0008	0.9814	58
Cyclopentane	287923	0.0008	0.9822	59
Cyclohexane	110827	0.0008	0.9829	60
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0007	0.9836	61
2,5-Dimethylheptane	2216300	0.0006	0.9842	62
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0006	0.9849	63
3-Ethylhexane	619998	0.0006	0.9855	64
2,3-Dimethylheptane	3074713	0.0006	0.9861	65
Other C8	#N/A	0.0005	0.9866	66
Decane	124185	0.0005	0.9872	67
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0005	0.9877	68
trans-2-Butene	624646	0.0005	0.9882	69
Benzene, 1-methyl-3-propyl	1074437	0.0005	0.9886	70
Ethane	74840	0.0005	0.9891	71
Cyclohexane, 1,2-dimethyl, cis	112134	0.0004	0.9895	72
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0004	0.9900	73
Other C8	#N/A	0.0004	0.9903	74
2,6-Dimethylheptane	1072055	0.0004	0.9907	75
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0004	0.9911	76
4-Methyl-2-pentanone	108101	0.0004	0.9915	77
2,2-Dimethylpentane	590352	0.0004	0.9919	78
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0003	0.9922	79
Indan	496117	0.0003	0.9925	80
Cyclohexane, 1,3-dimethyl, trans	2207036	0.0003	0.9929	81
Other C8	#N/A	0.0003	0.9932	82
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0003	0.9935	83
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0003	0.9938	84
3,4-Dimethylheptane(+/-)	57031648	0.0003	0.9940	85
Undecane	1120214	0.0002	0.9943	86
3,3-Dimethylhexane	563166	0.0002	0.9945	87
2,3-Dimethylhexane	584941	0.0002	0.9948	88
Cyclopentane, 1,1-dimethyl	1638262	0.0002	0.9950	89
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0002	0.9952	90
Cyclohexane, 1,2-diethyl, cis	824431	0.0002	0.9955	91
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0002	0.9957	92
2,4-Dimethylpentane	108087	0.0002	0.9959	93

Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0002	0.9961	94
Trimethyloctane	98060527	0.0002	0.9963	95
2,2,4-Trimethylhexane	16747265	0.0002	0.9965	96
Benzene, 1,4-diethyl	105055	0.0002	0.9967	97
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0002	0.9969	98
2-Butanone	78933	0.0002	0.9971	99
Other C8	#N/A	0.0002	0.9972	100
Other C10	#N/A	0.0002	0.9974	101
Other C8	#N/A	0.0002	0.9976	102
Benzene, 1,3-diethyl	141935	0.0001	0.9977	103
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0001	0.9979	104
Other C8	#N/A	0.0001	0.9980	105
Octahydropentalene	694724	0.0001	0.9981	106
2,2,5-Trimethylhexane	3522949	0.0001	0.9982	107
Cyclohexane, 1,1,2-trimethyl	7094260	0.0001	0.9983	108
Cyclohexane, 1-ethyl-2-methyl, trans	4923788	0.0001	0.9985	109
2,3-Dimethyloctane	7146603	0.0001	0.9986	110
3-Ethylheptane	15869804	0.0001	0.9987	111
3-Methyl-4-ethyl hexane	3074779	0.0001	0.9988	112
Benzene, 1-methyl-2-propyl	1074175	0.0001	0.9989	113
3-Methylpentane	96140	0.0001	0.9990	114
2,3,5-Trimethylhexane	1069530	0.0001	0.9991	115
Cyclopentane, 1,2,3-trimethyl, ccc	2613696	0.0001	0.9992	116
Cyclohexane, propyl	1678928	0.0001	0.9992	117
Trimethylheptane	79004867	0.0001	0.9993	118
Cyclohexane, 1,1,4-trimethyl	7094271	0.0001	0.9994	119
Cyclopentane, isopropyl	3875512	0.0001	0.9995	120
Benzene, 1,2,3,5-tetramethyl	527537	0.0001	0.9996	121
3-Methylbutyl acetate	123922	0.0001	0.9997	122
2-Methylpentane	107835	0.0001	0.9997	123
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0001	0.9998	124
Cyclopentane, 1-ethyl-3-methyl	3726474	0.0001	0.9999	125
3,3-Dimethylheptane	4032864	0.0001	0.9999	126
Cyclohexane, isopropyl	696297	0.0001	1.0000	127
Total VOC		1.0000		

Group 5 Metallic Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Toluene	108883	0.2728	0.2728	1
Acetone	67641	0.2486	0.5214	2
Propane	74986	0.1893	0.7107	3
Butane	106978	0.0751	0.7857	4
Benzene, 1,3-dimethyl	108383	0.0459	0.8317	5
Isobutane	75285	0.0209	0.8526	6
Benzene, 1,4-dimethyl	106423	0.0197	0.8723	7
Benzene, ethyl	100414	0.0186	0.8909	8
Benzene, 1,2-dimethyl	95476	0.0168	0.9077	9
2,2-Dimethylhexane	590738	0.0083	0.9161	10
Other C11	#N/A	0.0044	0.9205	11
Decane	124185	0.0044	0.9249	12
Cyclopentane, 1,2-dimethyl, trans	822504	0.0041	0.9290	13
Heptane	142825	0.0039	0.9329	14
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0030	0.9360	15
3-Ethylpentane	617787	0.0028	0.9388	16
Undecane	1120214	0.0028	0.9415	17
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0026	0.9441	18
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0022	0.9463	19
Other C10	#N/A	0.0021	0.9484	20
Nonane	111842	0.0021	0.9505	21
Other C12	#N/A	0.0020	0.9525	22
Cyclohexane	110827	0.0018	0.9543	23
Cyclopentane, ethyl	1640897	0.0018	0.9561	24
3-Methylhexane	589344	0.0018	0.9579	25
Cyclopentane, 1,2-dimethyl, cis	1192183	0.0017	0.9597	26
Benzene, 1,2,4-trimethyl	95636	0.0016	0.9613	27
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0013	0.9626	28
Cyclohexane, methyl	108872	0.0012	0.9638	29
2-Methylhexane	591764	0.0011	0.9649	30
trans-Decalin	493027	0.0010	0.9658	31
Benzene, 1-ethyl-3-methyl	620144	0.0009	0.9668	32
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0009	0.9677	33
2,3-Dimethylpentane	565593	0.0008	0.9685	34
2-Methylnonane	871830	0.0008	0.9693	35
Benzene, 1,3,5-trimethyl	108678	0.0008	0.9701	36
Butyl methacrylate	97881	0.0008	0.9708	37
Cyclopentane, 1,1-dimethyl	17312504	0.0007	0.9716	38
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0007	0.9723	39
Cyclopentane, methyl	96377	0.0007	0.9729	40
3-Methylnonane	1465084	0.0007	0.9736	41
Cyclohexane, butyl	1678939	0.0007	0.9743	42
3-Methyloctane	2216333	0.0007	0.9749	43
2,3-Dimethyloctane	7146603	0.0006	0.9756	44
Cyclohexane, 1-ethyl-3-methyl,	19489102	0.0006	0.9761	45

cis				
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0006	0.9767	46
Benzene, 1-methyl-2-propyl	1074175	0.0005	0.9772	47
3,5-Dimethylheptane(+/-)	39056183	0.0005	0.9778	48
3-Methylpentane	96140	0.0005	0.9783	49
Benzene, propyl	103651	0.0005	0.9788	50
Benzene, 1-isopropyl-3-methyl	535773	0.0005	0.9792	51
2-Methyloctane	3221612	0.0005	0.9797	52
Cyclohexane, 1-methyl-4-propyl, trans	28352423	0.0005	0.9802	53
Cyclohexane, ethyl	1678917	0.0005	0.9807	54
Cyclohexane, propyl	1678928	0.0005	0.9811	55
Ethane	74840	0.0005	0.9816	56
2-Methylheptane	592278	0.0005	0.9821	57
Methyl methacrylate	80626	0.0005	0.9825	58
Other C9	#N/A	0.0004	0.9830	59
Cyclohexane, 1,2-diethyl, cis	824431	0.0004	0.9834	60
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0004	0.9838	61
2,4-Dimethylhexane	116502444	0.0004	0.9842	62
Trimethyloctane	98060527	0.0004	0.9846	63
Benzene, 1-ethyl-4-methyl	622968	0.0004	0.9850	64
cis-Decalin	493016	0.0004	0.9854	65
Hexane	110543	0.0004	0.9857	66
3-Ethyl-2-methyl heptane	14676290	0.0004	0.9861	67
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0004	0.9865	68
Dodecane	112403	0.0003	0.9868	69
Octane	111659	0.0003	0.9872	70
Benzene, 1-ethyl-2-methyl	611143	0.0003	0.9875	71
Cyclohexane, 1-isopropyl-3-methyl, cis	17066658	0.0003	0.9878	72
2-Methylbutyl acetate	624419	0.0003	0.9881	73
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0003	0.9884	74
2,5-Dimethyloctane	15869893	0.0003	0.9887	75
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0003	0.9890	76
Cyclopentane, propyl	2040962	0.0003	0.9893	77
Benzene, 1,3-diethyl	141935	0.0003	0.9896	78
Benzene, 1-methyl-3-propyl	1074437	0.0003	0.9899	79
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0003	0.9901	80
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0003	0.9904	81
trans-2-Butene	624646	0.0003	0.9907	82
Cyclohexane, 1,3-dimethyl, trans	2207036	0.0003	0.9909	83
Cyclohexane, isopropyl	696297	0.0003	0.9912	84
Cyclohexane, 1-isopropyl-4-methyl, cis	6069983	0.0003	0.9915	85
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0003	0.9917	86
2,3-Dimethylheptane	3074713	0.0003	0.9920	87
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0003	0.9922	88

Benzene, 1-isopropyl-2-methyl	527844	0.0002	0.9925	89
3,4-Dimethylhexane	583482	0.0002	0.9927	90
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0002	0.9930	91
Indan	496117	0.0002	0.9932	92
2,5-Dimethylnonane	17302271	0.0002	0.9935	93
Cyclohexane, 1-methyl-3-propyl, cis	42806757	0.0002	0.9937	94
3-Methylheptane	589811	0.0002	0.9939	95
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0002	0.9941	96
2,4-Dimethylpentane	108087	0.0002	0.9943	97
2-Methylbutane	78784	0.0002	0.9946	98
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0002	0.9948	99
3-Ethyl-2-methylheptane	14676290	0.0002	0.9950	100
Cyclohexane, 1,3-diethyl, trans	13990948	0.0002	0.9951	101
Benzene, 1,4-diisopropyl	100185	0.0002	0.9953	102
Cyclopentane, butyl	2040951	0.0002	0.9955	103
Cyclohexane, isobutyl	1678984	0.0002	0.9957	104
3,3-Dimethyloctane	4110445	0.0002	0.9958	105
2-Methylpentane	107835	0.0002	0.9960	106
Benzene, 1,2-diethyl	135013	0.0002	0.9962	107
Cyclohexane, 1-methyl-4-propyl, cis	28954429	0.0002	0.9963	108
2,6-Dimethylheptane	1072055	0.0002	0.9965	109
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0002	0.9966	110
1-Methylindane	27133933	0.0002	0.9968	111
Tetralin	119642	0.0001	0.9969	112
Benzene, 1,4-diethyl-2-methyl	13632945	0.0001	0.9971	113
Cyclohexane, 1,4-diethyl, cis	13990926	0.0001	0.9972	114
Benzene, 1,2,4,5-tetramethyl	95932	0.0001	0.9973	115
Cyclohexane, 1,3-diethyl, cis	13991430	0.0001	0.9975	116
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0001	0.9976	117
Cyclohexane, 1,4-diethyl, trans	13990937	0.0001	0.9977	118
2,3-Dimethylhexane	584941	0.0001	0.9979	119
2,2-Dimethyloctane	15869871	0.0001	0.9980	120
Trimethylheptane	79004867	0.0001	0.9981	121
Benzene, isopropyl	98828	0.0001	0.9982	122
2,3,4-Trimethylpentane	565753	0.0001	0.9983	123
Cyclohexane, 1,2,3-trimethyl, ctc	1678815	0.0001	0.9985	124
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0001	0.9986	125
2,5-Dimethylheptane	2216300	0.0001	0.9987	126
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0001	0.9988	127
3-Ethyloctane	5881174	0.0001	0.9989	128
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0001	0.9990	129
4-Methylheptane	589537	0.0001	0.9991	130
Benzene, 1,3-dimethyl-2-ethyl	354381	0.0001	0.9992	131
Benzene, 1,3-diethyl-4-methyl	1758856	0.0001	0.9993	132
Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0001	0.9994	133
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0001	0.9995	134
Cyclohexane, 1-ethyl-2-methyl,	4923788	0.0001	0.9995	135

trans				
2,2-Dimethylpentane	590352	0.0001	0.9996	136
Benzene, 1,4-diethyl	105055	0.0001	0.9997	137
Other C8	#N/A	0.0001	0.9998	138
Cyclohexane, 1-isopropyl-2-methyl, cis	19489022	0.0001	0.9998	139
Isobutyl acetate	110190	0.0001	0.9999	140
Cyclohexane, 1-isopropyl-4-methyl, trans	1678826	0.0001	1.0000	141
2,5-Dimethylhexane	592132	0.0000	1.0000	142
2-Butanone	78933	0.0000	1.0000	143
2,3-Dimethylbutane	79298	0.0000	1.0000	144
3,3-Dimethylpentane	562492	0.0000	1.0000	145
Total VOC		1.0000		

Group 6: Non-flat Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.2986	0.2986	1
Propane	74986	0.1680	0.4666	2
Toluene	108883	0.1340	0.6006	3
Butane	106978	0.1060	0.7066	4
Benzene, 1,3-dimethyl	108383	0.0728	0.7794	5
(2-Methoxy-1-methylethyl) acetate	108656	0.0446	0.8240	6
2-Butanone	78933	0.0319	0.8559	7
Benzene, 1,4-dimethyl	106423	0.0311	0.8870	8
Benzene, ethyl	100414	0.0299	0.9169	9
Isobutane	75285	0.0257	0.9426	10
Benzene, 1,2-dimethyl	95476	0.0212	0.9638	11
1-Butanol	71363	0.0036	0.9674	12
Octane	111659	0.0017	0.9691	13
Decane	124185	0.0015	0.9707	14
Cyclohexane, 1,1,3-trimethyl	3073663	0.0015	0.9721	15
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0014	0.9736	16
3,5-Dimethylheptane(+/-)	39056183	0.0013	0.9749	17
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0013	0.9762	18
Cyclopentane, propyl	2040962	0.0009	0.9772	19
Nonane	111842	0.0009	0.9781	20
3-Methyloctane	2216333	0.0009	0.9790	21
Cyclohexane, 1,3-dimethyl, trans	2207036	0.0008	0.9798	22
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0008	0.9807	23
2-Methyloctane	3221612	0.0008	0.9814	24
Other C9	#N/A	0.0007	0.9821	25
Cyclohexane, ethyl	1678917	0.0007	0.9828	26
Benzene, isopropyl	98828	0.0007	0.9835	27
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0006	0.9841	28
2,3-Dimethylheptane	3074713	0.0006	0.9847	29
2-Methylbutyl acetate	624419	0.0006	0.9852	30
Other C11	#N/A	0.0006	0.9858	31
Benzene, 1,2,3,5-tetramethyl	527537	0.0005	0.9863	32
trans-2-Butene	624646	0.0005	0.9869	33
2,6-Dimethylheptane	1072055	0.0005	0.9874	34
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0005	0.9879	35
Other C10	#N/A	0.0005	0.9884	36
2-Methylheptane	592278	0.0005	0.9889	37
Cyclohexane, 1,2,4-trimethyl, ctc	17312504	0.0005	0.9894	38
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0005	0.9898	39
2,5-Dimethylheptane	2216300	0.0004	0.9902	40
2-Methylbutane	78784	0.0004	0.9907	41
Ethane	74840	0.0004	0.9911	42
3-Methylheptane	589811	0.0004	0.9914	43
Undecane	17302113	0.0003	0.9918	44
Cyclohexane, 1,2,3-trimethyl, ctc	1678815	0.0003	0.9921	45

Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0003	0.9924	46
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0003	0.9927	47
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0003	0.9930	48
2-Methylnonane	871830	0.0003	0.9933	49
Benzene, 1,2,4,5-tetramethyl	95932	0.0003	0.9935	50
Cyclohexane, 1-ethyl-2-methyl, trans	4923788	0.0003	0.9938	51
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0003	0.9941	52
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0002	0.9943	53
3-Methylnonane	1465084	0.0002	0.9945	54
2,4-Dimethylheptane	2213232	0.0002	0.9947	55
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0002	0.9949	56
3-Ethyloctane	5881174	0.0002	0.9951	57
Benzene, 1-ethyl-4-methyl	622968	0.0002	0.9953	58
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0002	0.9955	59
Trimethyloctane	98060527	0.0002	0.9957	60
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0002	0.9959	61
Benzene, 1,2,3,4-tetramethyl	488233	0.0002	0.9960	62
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0002	0.9962	63
3,3-Dimethyloctane	4110445	0.0002	0.9963	64
Octahydropentalene	694724	0.0002	0.9965	65
3-Ethylheptane	15869804	0.0001	0.9966	66
4-Methylheptane	589537	0.0001	0.9968	67
Cyclohexane, 1,2-diethyl, trans	13990959	0.0001	0.9969	68
Benzene, 1,2,4-trimethyl	95636	0.0001	0.9971	69
Benzene, 1,3,5-trimethyl	108678	0.0001	0.9972	70
Naphthalene	91203	0.0001	0.9973	71
Benzene, propyl	103651	0.0001	0.9975	72
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0001	0.9976	73
Benzene, 1-ethyl-3-methyl	620144	0.0001	0.9977	74
Benzene, 1-methyl-3-propyl	1074437	0.0001	0.9979	75
Benzene, 1,2,3-trimethyl	526738	0.0001	0.9980	76
Cyclohexane, 1,1,4-trimethyl	7094271	0.0001	0.9981	77
Cyclohexane, propyl	1678928	0.0001	0.9982	78
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0001	0.9983	79
Ethanol	64175	0.0001	0.9984	80
Pentane	109660	0.0001	0.9985	81
Cyclohexane, butyl	1678939	0.0001	0.9986	82
trans-Decalin	493027	0.0001	0.9987	83
Other C12	#N/A	0.0001	0.9988	84
Dodecane	112403	0.0001	0.9989	85
Benzene, isobutyl	538932	0.0001	0.9989	86
Cyclohexane, 1-isopropyl-3-methyl, trans	16580248	0.0001	0.9990	87
Cyclohexane, 1-isopropyl-2-methyl, trans	19489033	0.0001	0.9991	88
Cyclohexane, 1-isopropyl-3-methyl, cis	17066658	0.0001	0.9991	89
Cyclohexane, 1,3-dimethyl, cis	638040	0.0001	0.9992	90
3-Methylpentane	96140	0.0001	0.9993	91
3-Ethyl-5-methyl heptane	52896909	0.0001	0.9993	92
2,3-Dimethylpentane	565593	0.0001	0.9994	93
Cyclohexane, 1,2-diethyl, cis	824431	0.0001	0.9994	94

Cyclohexane, isobutyl	1678984	0.0000	0.9995	95
Cyclohexane, 1-isopropyl-4-methyl, trans	1678826	0.0000	0.9995	96
2,3-Dimethylhexane	584941	0.0000	0.9996	97
Indan	496117	0.0000	0.9996	98
Cyclohexane, 1,4-diethyl, cis	13990926	0.0000	0.9996	99
1H-Indene, octahydro, cis	4551513	0.0000	0.9997	100
Cyclopentane, butyl	2040951	0.0000	0.9997	101
3-Ethyl-2-methylheptane	14676290	0.0000	0.9998	102
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0000	0.9998	103
Cyclohexane, isopropyl	696297	0.0000	0.9998	104
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0000	0.9998	105
Cyclohexane, 1,3-diethyl, trans	13990948	0.0000	0.9999	106
Trimethylheptane	79004867	0.0000	0.9999	107
3-Ethyl-4-methyl heptane	52896910	0.0000	0.9999	108
Cyclohexane, 1-methyl-4-propyl, cis	28954429	0.0000	0.9999	109
2,5-Dimethylnonane	17302271	0.0000	0.9999	110
Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0000	1.0000	111
Cyclohexane, 1,4-diethyl, trans	13990937	0.0000	1.0000	112
Benzene, 1-isopropyl-2-methyl	527844	0.0000	1.0000	113
Cyclohexane, 1,3-diethyl, cis	13991430	0.0000	1.0000	114
Total VOC		1.0000		

Group 7 Primer Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.2890	0.2890	1
Propane	74986	0.1835	0.4725	2
Butane	106978	0.1400	0.6125	3
Benzene, 1,3-dimethyl	108383	0.0827	0.6953	4
Toluene	108883	0.0646	0.7598	5
Benzene, 1,2-dimethyl	95476	0.0323	0.7922	6
Benzene, ethyl	100414	0.0304	0.8225	7
Benzene, 1,4-dimethyl	106423	0.0259	0.8485	8
Isobutane	75285	0.0215	0.8700	9
Cyclohexane, methyl	108872	0.0156	0.8856	10
2-Butanone	78933	0.0150	0.9006	11
Isobutyl acetate	110190	0.0124	0.9129	12
Heptane	142825	0.0091	0.9220	13
Benzene, 1,2,4-trimethyl	95636	0.0059	0.9279	14
Benzene, 1-ethyl-3-methyl	620144	0.0049	0.9328	15
2-Propanol	67630	0.0030	0.9358	16
2-Pentanone	107879	0.0030	0.9388	17
Hexane	110543	0.0028	0.9416	18
2-Methylheptane	592278	0.0024	0.9440	19
Benzene, 1,3,5-trimethyl	108678	0.0024	0.9463	20
Cyclopentane, ethyl	1640897	0.0024	0.9487	21
Benzene, 1-ethyl-4-methyl	622968	0.0021	0.9508	22
Cyclohexane, 1,3-dimethyl, cis	638040	0.0021	0.9529	23
Benzene, 1,2,3-trimethyl	526738	0.0019	0.9549	24
Pentane, 2-methyl	107835	0.0019	0.9568	25
3-Methylhexane	589344	0.0018	0.9586	26
Cyclopentane, methyl	96377	0.0017	0.9603	27
Benzene, 1-ethyl-2-methyl	611143	0.0017	0.9620	28
2,4-Dimethylheptane	2213232	0.0014	0.9633	29
Benzene, propyl	103651	0.0013	0.9646	30
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0013	0.9659	31
3-Methylheptane	589811	0.0013	0.9672	32
2,4-Dimethylhexane	116502444	0.0012	0.9684	33
3,5-Dimethylheptane(+/-)	39056183	0.0012	0.9696	34
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0012	0.9708	35
Hexane, 2-methyl	591764	0.0011	0.9719	36
Cyclohexane, 1,1,3-trimethyl	3073663	0.0011	0.9730	37
Cyclopentane, 1,2-dimethyl, trans	17312504	0.0010	0.9740	38
Cyclopentane, 1,2-dimethyl, cis	1192183	0.0010	0.9750	39
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0010	0.9760	40
Cyclohexane	110827	0.0008	0.9768	41
3-Methyloctane	2216333	0.0008	0.9776	42
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0008	0.9784	43
Cyclohexane, 1,3,5-trimethyl, ccc	17302113	0.0008	0.9791	44
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0007	0.9799	45

2-Methylbutyl acetate	624419	0.0007	0.9806	46
Cyclopentane	287923	0.0007	0.9813	47
Cyclohexane, 1,3-dimethyl, trans	2207036	0.0007	0.9819	48
Benzene, isopropyl	98828	0.0007	0.9826	49
4-Methylheptane	589537	0.0007	0.9833	50
2-Methyloctane	3221612	0.0006	0.9839	51
Octane	111659	0.0006	0.9845	52
Other C8	#N/A	0.0006	0.9851	53
Nonane	111842	0.0006	0.9857	54
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0006	0.9863	55
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0005	0.9869	56
Decane	124185	0.0005	0.9874	57
2,3-Dimethylhexane	584941	0.0005	0.9879	58
4-Methyl -2-pentanone	108101	0.0005	0.9884	59
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0005	0.9888	60
2,3-Dimethylheptane	3074713	0.0004	0.9893	61
2,6-Dimethylheptane	1072055	0.0004	0.9897	62
Cyclohexane, ethyl	1678917	0.0004	0.9901	63
Other C9	#N/A	0.0004	0.9905	64
Ethane	74840	0.0004	0.9909	65
Pentane, 2,3-dimethyl	565593	0.0004	0.9913	66
Cyclohexane, isobutyl	1678984	0.0004	0.9917	67
Benzene, 1,3-diethyl	141935	0.0004	0.9921	68
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0004	0.9924	69
trans-2-Butene	624646	0.0004	0.9928	70
2,5-Dimethylheptane	2216300	0.0003	0.9931	71
2,2-Dimethylhexane	590738	0.0003	0.9934	72
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0003	0.9936	73
Pentane, 2,4-dimethyl	108087	0.0003	0.9939	74
2,2-Dimethylpentane	590352	0.0002	0.9941	75
2-Methylbutane	78784	0.0002	0.9944	76
Benzene, 1,4-diethyl	105055	0.0002	0.9946	77
Undecane	1120214	0.0002	0.9948	78
Benzene, 1-methyl-3-propyl	1074437	0.0002	0.9950	79
3-Ethylhexane	619998	0.0002	0.9952	80
Cyclohexane, 1,2,3-trimethyl, ctc	1678815	0.0002	0.9954	81
Cyclohexane, isopropyl	696297	0.0002	0.9956	82
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0002	0.9957	83
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0002	0.9959	84
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0002	0.9961	85
Cyclohexane, 1,2-dimethyl, cis	112134	0.0002	0.9963	86
Propane, 2,2-dimethyl	463821	0.0002	0.9964	87
Indan	496117	0.0002	0.9966	88
2-Methylpentane	107835	0.0001	0.9967	89
Cyclohexane, 1,1,2-trimethyl	7094260	0.0001	0.9969	90
Pentane, 3-methyl	96140	0.0001	0.9970	91
2,2-Dimethylbutane	75832	0.0001	0.9971	92
3,3-Diethylpentane	1067205	0.0001	0.9973	93
Octahydropentalene	694724	0.0001	0.9974	94

3-Methyl-4-ethyl hexane	3074779	0.0001	0.9975	95
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0001	0.9977	96
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0001	0.9978	97
3-Methylpentane	96140	0.0001	0.9979	98
3,3-Dimethylpentane	562492	0.0001	0.9980	99
Pentane	109660	0.0001	0.9981	100
Butyl acetate	123864	0.0001	0.9982	101
Cyclohexane, 1,1,4-trimethyl	7094271	0.0001	0.9983	102
3-Ethylheptane	15869804	0.0001	0.9984	103
Benzene, 1-methyl-2-propyl	1074175	0.0001	0.9985	104
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0001	0.9986	105
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0001	0.9987	106
cis-Decalin	493016	0.0001	0.9988	107
Butane, 2,3-dimethyl	79298	0.0001	0.9989	108
Cyclopentane, 1,1-dimethyl	1638262	0.0001	0.9990	109
Benzene, isobutyl	538932	0.0001	0.9991	110
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0001	0.9991	111
Other C10	#N/A	0.0001	0.9992	112
Butyl methacrylate	97881	0.0001	0.9993	113
Methyl methacrylate	80626	0.0001	0.9993	114
2-Methyl-1-propanol	78831	0.0001	0.9994	115
Benzene, 1,2,4,5-tetramethyl	95932	0.0001	0.9995	116
Cyclohexane, 1,3-diethyl, trans	13990948	0.0001	0.9995	117
Cyclohexane, 1,4-diethyl, trans	13990937	0.0001	0.9996	118
Benzene, 1,2-diethyl	135013	0.0000	0.9996	119
3-Ethylheptane	15869804	0.0000	0.9997	120
Benzene, 1,2,3,5-tetramethyl	527537	0.0000	0.9997	121
Cyclopentane, butyl	2040951	0.0000	0.9998	122
2-Methylnonane	871830	0.0000	0.9998	123
2-Methylhexane	591764	0.0000	0.9998	124
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0000	0.9999	125
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0000	0.9999	126
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0000	1.0000	127
3-Methylnonane	1465084	0.0000	1.0000	128
Cyclopentane, isopropyl	3875512	0.0000	1.0000	129
Total VOC		1.0000		

Group 18 Exact Match Engine Enamel Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.3369	0.3369	1
Propane	74986	0.1568	0.4937	2
Butane	106978	0.1188	0.6126	3
Toluene	108883	0.1188	0.7314	4
Benzene, 1,3-dimethyl	108383	0.0774	0.8087	5
Benzene, ethyl	100414	0.0306	0.8394	6
Benzene, 1,4-dimethyl	106423	0.0278	0.8672	7
Benzene, 1,2-dimethyl	95476	0.0260	0.8932	8
Isobutane	75285	0.0214	0.9145	9
Ethyl-3-ethoxypropionate	7636699	0.0199	0.9345	10
Ethanol	64175	0.0112	0.9457	11
2-Butanone	78933	0.0073	0.9529	12
2-Propanol	67630	0.0035	0.9564	13
Styrene	100426	0.0034	0.9598	14
Octane	111659	0.0021	0.9619	15
Benzene, 1,2,3,5-tetramethyl	527537	0.0016	0.9636	16
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0015	0.9651	17
Cyclohexane, ethyl	1678917	0.0014	0.9665	18
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0013	0.9678	19
3,5-Dimethylheptane(+/-)	39056183	0.0012	0.9690	20
Hexane	110543	0.0011	0.9701	21
Decane	124185	0.0010	0.9712	22
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0010	0.9722	23
4-Methyl -2-pentanone	108101	0.0010	0.9732	24
Cyclohexane, 1,3-dimethyl, trans	2207036	0.0009	0.9741	25
Cyclopentane, propyl	2040962	0.0009	0.9750	26
Nonane	111842	0.0009	0.9758	27
Benzene, 1,2,4,5-tetramethyl	95932	0.0008	0.9767	28
3-Methyloctane	2216333	0.0008	0.9774	29
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0008	0.9782	30
Benzene, 1,2,4-trimethyl	95636	0.0007	0.9790	31
2-Methyloctane	3221612	0.0007	0.9796	32
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0006	0.9803	33
2,2-Dimethylhexane	590738	0.0006	0.9809	34
2-Methylheptane	592278	0.0006	0.9815	35
Undecane	1120214	0.0006	0.9820	36
Other C9	#N/A	0.0005	0.9826	37
Benzene, 1,4-dimethyl-2-ethyl	17312504	0.0005	0.9831	38
Other C12	#N/A	0.0005	0.9837	39
Cyclohexane, 1,2-dimethyl, cis	112134	0.0005	0.9842	40
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0005	0.9847	41
2,3-Dimethylheptane	3074713	0.0005	0.9852	42
3,4-Dimethylheptane(+/-)	57031648	0.0005	0.9857	43
Benzene, 1,2,3,4-tetramethyl	17302113	0.0005	0.9862	44
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0005	0.9867	45

Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0005	0.9871	46
2-Methylpentane	107835	0.0005	0.9876	47
2-Methyl-1-propanol	78831	0.0004	0.9881	48
3-Methylpentane	96140	0.0004	0.9885	49
Naphthalene	91203	0.0004	0.9889	50
3-Methylheptane	589811	0.0004	0.9894	51
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0004	0.9898	52
2,5-Dimethylheptane	2216300	0.0004	0.9902	53
Cyclopentane, methyl	96377	0.0004	0.9905	54
Propylene glycol propyl ether	1569013	0.0003	0.9909	55
Heptane	142825	0.0003	0.9912	56
Cyclopentane, 1,2-dimethyl, trans	822504	0.0003	0.9915	57
3,3-Diethylpentane	1067205	0.0003	0.9918	58
Benzene, isopropyl	98828	0.0003	0.9921	59
Benzene, 1-methyl-3-propyl	1074437	0.0003	0.9924	60
2-Pentanone	107879	0.0003	0.9927	61
Benzene, 1-ethyl-3-methyl	620144	0.0003	0.9929	62
2-Methylbutane	78784	0.0003	0.9932	63
Indan	496117	0.0003	0.9935	64
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0003	0.9937	65
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0003	0.9940	66
3-Methylhexane	589344	0.0003	0.9942	67
Ethane	74840	0.0003	0.9945	68
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0002	0.9947	69
2-Methylhexane	591764	0.0002	0.9950	70
3,3-Diethylpentane	1067205	0.0002	0.9952	71
Benzene, 1,2,3-trimethyl	526738	0.0002	0.9954	72
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0002	0.9957	73
Benzene, 1-methyl-4-propyl	1074551	0.0002	0.9959	74
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0002	0.9961	75
2,4-Dimethylheptane	2213232	0.0002	0.9963	76
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0002	0.9965	77
Cyclohexane	110827	0.0002	0.9967	78
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0002	0.9969	79
Cyclohexane, 1-ethyl-2-methyl, trans	4923788	0.0002	0.9971	80
Other C10	#N/A	0.0002	0.9972	81
Benzene, 1-isopropyl-3-methyl	535773	0.0002	0.9974	82
trans-Decalin	493027	0.0002	0.9976	83
4-Methylheptane	589537	0.0002	0.9977	84
Octahydropentalene	694724	0.0002	0.9979	85
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0002	0.9981	86
3-Methyl-4-ethyl hexane	3074779	0.0002	0.9982	87
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0002	0.9984	88
Cyclopentane, 1,2,3-trimethyl, ccc	2613696	0.0002	0.9985	89
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0002	0.9987	90
2-Methylnonane	871830	0.0001	0.9988	91
Benzene, 1-ethyl-4-methyl	622968	0.0001	0.9990	92
Benzene, isobutyl	538932	0.0001	0.9991	93
Benzene, 1,3,5-trimethyl	108678	0.0001	0.9993	94

Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0001	0.9994	95
Cyclohexane, 1,1,4-trimethyl	7094271	0.0001	0.9996	96
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0001	0.9997	97
Propane, 2,2-dimethyl	463821	0.0001	0.9998	98
Pentane, 3-methyl	96140	0.0001	0.9999	99
Pentane	109660	0.0001	0.9999	100
trans-2-Butene	624646	0.0000	1.0000	101
Pentane, 2-methyl	107835	0.0000	1.0000	102
Total VOC		1.0000		

Group 19 Exact Match Auto Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.4473	0.4473	1
Propane	74986	0.1048	0.5522	2
2-Butanone	78933	0.0879	0.6401	3
Butane	106978	0.0701	0.7101	4
Ethyl-3-ethoxypropionate	7636699	0.0658	0.7760	5
Toluene	108883	0.0479	0.8238	6
Ethyl acetate	141786	0.0342	0.8581	7
Isobutyl acetate	110190	0.0245	0.8826	8
Isobutane	75285	0.0202	0.9028	9
4-Methyl-2-pentanone	108101	0.0187	0.9215	10
Ethanol	64175	0.0186	0.9401	11
2-Propanol	67630	0.0154	0.9555	12
2,6-Dimethyl-4-heptanone	108838	0.0122	0.9677	13
Benzene, 1,3-dimethyl	108383	0.0079	0.9756	14
Hexyl acetate	142927	0.0036	0.9792	15
Benzene, 1,4-dimethyl	106423	0.0034	0.9826	16
Benzene, 1,2-dimethyl	95476	0.0034	0.9860	17
Benzene, ethyl	100414	0.0031	0.9891	18
Benzene, 1-ethyl-2-methyl	611143	0.0020	0.9911	19
2,6-Dimethyl-4-heptanol	108827	0.0018	0.9930	20
Butyl methacrylate	97881	0.0016	0.9946	21
Benzene, 1-ethyl-4-methyl	622968	0.0013	0.9959	22
2-Methylpentyl acetate	7789993	0.0007	0.9966	23
2-Ethylbutyl acetate	10031875	0.0006	0.9972	24
Benzene, 1,2,4-trimethyl	95636	0.0005	0.9978	25
Isopropyl acetate	108214	0.0004	0.9982	26
Ethane	74840	0.0004	0.9986	27
Other C9	#N/A	0.0003	0.9989	28
Benzene, 1-ethyl-3-methyl	620144	0.0003	0.9992	29
Heptane	142825	0.0002	0.9994	30
1-Butanol	71363	0.0002	0.9995	31
trans-2-Butene	624646	0.0002	0.9997	32
4-Methylheptane	589537	0.0001	0.9998	33
2-Methylbutane	78784	0.0001	0.9999	34
Pentane, 2-methyl	107835	0.0001	1.0000	35
Pentane, 3-methyl	96140	0.0000	1.0000	36
Total VOC		1.0000		

Group 21 Auto Body Primer Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.2868	0.2868	1
Toluene	108883	0.1729	0.4597	2
Propane	74986	0.1656	0.6253	3
Butane	106978	0.1358	0.7610	4
2-Butanone	78933	0.0555	0.8165	5
Benzene, 1,3-dimethyl	108383	0.0362	0.8528	6
Ethyl-3-ethoxypropionate	7636699	0.0346	0.8874	7
Benzene, 1,4-dimethyl	106423	0.0157	0.9031	8
Benzene, ethyl	100414	0.0144	0.9174	9
Benzene, 1,2-dimethyl	95476	0.0140	0.9315	10
Isobutane	75285	0.0114	0.9429	11
Isobutyl acetate	110190	0.0113	0.9542	12
Butyl acetate	123864	0.0108	0.9650	13
2-Propanol	67630	0.0105	0.9755	14
Octane	111659	0.0027	0.9782	15
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0013	0.9795	16
Cyclohexane, ethyl	1678917	0.0013	0.9808	17
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0011	0.9819	18
3,5-Dimethylheptane(+/-)	39056183	0.0009	0.9828	19
2-Methylheptane	592278	0.0008	0.9836	20
Cyclohexane, 1,4-dimethyl, cis	624293	0.0007	0.9843	21
2-Methylbutyl acetate	624419	0.0007	0.9851	22
Cyclopentane, propyl	2040962	0.0007	0.9858	23
Ethane	74840	0.0007	0.9865	24
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0007	0.9872	25
3-Methyloctane	2216333	0.0006	0.9878	26
3-Methylheptane	589811	0.0006	0.9884	27
Other C12	#N/A	0.0006	0.9890	28
2-Methyloctane	3221612	0.0006	0.9896	29
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0005	0.9901	30
Other C9	#N/A	0.0005	0.9906	31
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0005	0.9911	32
Cyclohexane, 1-methyl-4-propyl, trans	28352423	0.0005	0.9916	33
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0005	0.9921	34
2,3-Dimethylheptane	3074713	0.0005	0.9925	35
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0004	0.9930	36
2,6-Dimethylheptane	1072055	0.0004	0.9934	37
Benzene, 1,2,4,5-tetramethyl	17312504	0.0004	0.9938	38
Trimethyloctane	98060527	0.0004	0.9942	39
2,5-Dimethylheptane	2216300	0.0004	0.9945	40
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0004	0.9949	41
Nonane	111842	0.0004	0.9953	42
Other C8	#N/A	0.0003	0.9956	43
2-Methyl-1-propanol	17302113	0.0003	0.9959	44
Naphthalene	91203	0.0002	0.9961	45

4-Methylheptane	589537	0.0002	0.9964	46
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0002	0.9966	47
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0002	0.9968	48
trans-2-Butene	624646	0.0002	0.9970	49
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0002	0.9973	50
Cyclohexane, 1,2-diethyl, cis	824431	0.0002	0.9975	51
2,4-Dimethylheptane	2213232	0.0002	0.9977	52
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0002	0.9979	53
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0002	0.9980	54
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0002	0.9982	55
Propane, 2,2-dimethyl	463821	0.0002	0.9984	56
Benzene, 1-methyl-3-propyl	1074437	0.0002	0.9985	57
Benzene, isopropyl	98828	0.0002	0.9987	58
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0002	0.9988	59
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0001	0.9990	60
3-Methyl-4-ethyl hexane	3074779	0.0001	0.9991	61
Cyclohexane, 1-ethyl-2-methyl, trans	4923788	0.0001	0.9993	62
Cyclohexane, 1,1,4-trimethyl	7094271	0.0001	0.9994	63
Benzene, 1,2,3,4-tetramethyl	488233	0.0001	0.9995	64
Benzene, butyl	104518	0.0001	0.9997	65
Octahydropentalene	694724	0.0001	0.9998	66
2,3-Dimethylhexane	584941	0.0001	0.9999	67
2-Methylbutane	78784	0.0001	1.0000	68
Total VOC		1.0000		

Group 25 Floral Spray Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.5605	0.5605	1
Propane	74986	0.1810	0.7415	2
Isobutyl acetate	110190	0.0707	0.8122	3
Butane	106978	0.0420	0.8541	4
2-Propanol	67630	0.0292	0.8833	5
Benzene, 1,3-dimethyl	108383	0.0290	0.9123	6
2-Butoxyethanol	111762	0.0179	0.9302	7
Ethanol	64175	0.0138	0.9440	8
Benzene, 1,4-dimethyl	106423	0.0125	0.9564	9
Benzene, 1,2-dimethyl	95476	0.0119	0.9683	10
Benzene, ethyl	100414	0.0115	0.9799	11
2-Butanone	78933	0.0069	0.9867	12
Butyl acetate	123864	0.0058	0.9925	13
Isobutane	75285	0.0037	0.9962	14
Toluene	108883	0.0008	0.9970	15
Ethane	74840	0.0006	0.9976	16
(2-Methoxy-1-methylethyl) acetate	108656	0.0006	0.9982	17
Ethyl-3-ethoxypropionate	7636699	0.0006	0.9988	18
3,3-Dimethyloctane	4110445	0.0002	0.9990	19
1-Butanol	71363	0.0002	0.9992	20
Benzene, 1-ethyl-3-methyl	620144	0.0002	0.9994	21
Benzene, 1-methyl-3-propyl	1074437	0.0001	0.9995	22
Benzene, isopropyl	98828	0.0001	0.9996	23
Other C11	#N/A	0.0001	0.9997	24
Propane, 2,2-dimethyl	463821	0.0001	0.9998	25
Butane, 2-methyl	78784	0.0001	0.9999	26
Hexane	110543	0.0001	1.0000	27
trans-2-Butene	624646	0.0000	1.0000	28
Total VOC		1.0000		

Group 27 High Temperature Coatings Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Toluene	108883	0.2941	0.2941	1
Acetone	67641	0.2508	0.5450	2
Propane	74986	0.1645	0.7095	3
Butane	106978	0.1049	0.8144	4
1-Butanol	71363	0.0162	0.8306	5
Benzene, 1,3-dimethyl	108383	0.0144	0.8450	6
Isobutane	75285	0.0122	0.8573	7
Heptane	142825	0.0107	0.8680	8
Cyclohexane, methyl	108872	0.0071	0.8751	9
Benzene, ethyl	100414	0.0070	0.8821	10
Benzene, 1,4-dimethyl	106423	0.0067	0.8888	11
Benzene, 1,2-dimethyl	95476	0.0062	0.8950	12
Decane	124185	0.0058	0.9008	13
Octane	111659	0.0050	0.9058	14
3-Methylhexane	589344	0.0045	0.9103	15
2-Methylheptane	592278	0.0030	0.9134	16
Hexane, 2-methyl	591764	0.0030	0.9163	17
Undecane	1120214	0.0030	0.9193	18
Ethyl-3-ethoxypropionate	7636699	0.0026	0.9219	19
2-Butoxyethanol	111762	0.0025	0.9244	20
3-Methylheptane	589811	0.0025	0.9270	21
Nonane	111842	0.0024	0.9293	22
Cyclohexane, ethyl	1678917	0.0024	0.9317	23
3,5-Dimethylheptane	926829	0.0018	0.9335	24
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0018	0.9353	25
3-Methyloctane	2216333	0.0016	0.9369	26
2-Methyldecane	6975980	0.0015	0.9384	27
2,4-Dimethylhexane	116502444	0.0015	0.9400	28
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0015	0.9414	29
Other C10	#N/A	0.0014	0.9429	30
Cyclohexane, 1,3-dimethyl, cis	638040	0.0014	0.9443	31
2,5-Dimethylhexane	592132	0.0014	0.9457	32
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0014	0.9471	33
Cyclopentane, propyl	2040962	0.0014	0.9484	34
Cyclohexane, 1,4-dimethyl, cis	624293	0.0013	0.9498	35
3,4-Dimethylheptane(+/-)	57031648	0.0013	0.9511	36
Other C8	#N/A	0.0013	0.9524	37
2-Methyloctane	17312504	0.0013	0.9537	38
Cyclohexane	110827	0.0013	0.9550	39
Other C9	#N/A	0.0012	0.9562	40
2-Propanol	67630	0.0012	0.9574	41
4-Methylheptane	589537	0.0011	0.9585	42
Pentane, 2,3-dimethyl	565593	0.0011	0.9596	43
2-Butanone	17302113	0.0011	0.9607	44
Ethanol	64175	0.0011	0.9618	45

Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0011	0.9629	46
Other C11	#N/A	0.0011	0.9640	47
3-Methylnonane	1465084	0.0010	0.9650	48
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0010	0.9659	49
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0010	0.9669	50
2,3-Dimethyloctane	7146603	0.0009	0.9678	51
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0009	0.9687	52
Cyclohexane, 1,2-dimethyl, cis	112134	0.0009	0.9695	53
Cyclohexane, propyl	1678928	0.0008	0.9704	54
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0008	0.9712	55
2-Methylbutyl acetate	624419	0.0008	0.9720	56
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0008	0.9728	57
trans-Decalin	493027	0.0008	0.9735	58
2,5-Dimethylheptane	2216300	0.0008	0.9743	59
2,3-Dimethylhexane	584941	0.0008	0.9751	60
4-Methylnonane	17301949	0.0007	0.9758	61
Cyclopentane, 1,2-dimethyl, trans	822504	0.0007	0.9765	62
Cyclopentane, methyl	96377	0.0007	0.9772	63
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0007	0.9779	64
Benzene, 1,2,4-trimethyl	95636	0.0007	0.9785	65
Benzene, 1,3,5-trimethyl	108678	0.0006	0.9791	66
2,3-Dimethylheptane	3074713	0.0006	0.9797	67
Cyclohexane, butyl	1678939	0.0006	0.9803	68
2-Methyl-1-propanol	78831	0.0006	0.9809	69
Cyclohexane, 1-methyl-4-propyl, trans	28352423	0.0006	0.9814	70
Cyclopentane, butyl	2040951	0.0006	0.9820	71
Cyclohexane, 1-isopropyl-3-methyl	16580248	0.0005	0.9825	72
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0005	0.9830	73
3-Ethylhexane	619998	0.0005	0.9835	74
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0005	0.9840	75
3-Ethylnonane	17302113	0.0005	0.9845	76
2-Methylnonane	871830	0.0005	0.9850	77
Cyclohexane, 1,1,2-trimethyl	7094260	0.0004	0.9854	78
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0004	0.9858	79
Hexane	110543	0.0004	0.9863	80
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0004	0.9867	81
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0004	0.9871	82
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0004	0.9875	83
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0004	0.9879	84
2,3-Dimethylnonane	359554	0.0004	0.9883	85
Ethane	74840	0.0004	0.9887	86
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0004	0.9891	87
5-Methylnonane	15869859	0.0003	0.9894	88
Propylene glycol propyl ether	1569013	0.0003	0.9897	89
Benzene, 1-ethyl-3-methyl	620144	0.0003	0.9900	90
Dodecane	112403	0.0003	0.9903	91
2,2-Dimethylhexane	590738	0.0003	0.9906	92
Other C8	#N/A	0.0003	0.9909	93
Other C8	#N/A	0.0003	0.9911	94

3,6-Dimethyloctane	15869940	0.0003	0.9914	95
4,5-Dimethyloctane	15869962	0.0002	0.9917	96
Other C12	#N/A	0.0002	0.9919	97
3-Ethyl-4-methyl heptane	52896910	0.0002	0.9921	98
3-Ethyl-2-methyl heptane	14676290	0.0002	0.9923	99
2,2-Dimethylheptane	1071267	0.0002	0.9925	100
Cyclohexane, 1,4-diethyl, trans	13990937	0.0002	0.9927	101
Methanol	67561	0.0002	0.9929	102
Cyclohexane, 1-isopropyl-4-methyl, trans	1678826	0.0002	0.9931	103
2,5-Dimethyloctane	15869893	0.0002	0.9933	104
3,3-Dimethylpentane	562492	0.0002	0.9934	105
4,5-Dimethylnonane	17302237	0.0002	0.9936	106
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0002	0.9938	107
3-Methyl-4-ethyl hexane	3074779	0.0002	0.9940	108
Benzene, propyl	103651	0.0002	0.9941	109
Pentane, 2,4-dimethyl	108087	0.0002	0.9943	110
Benzene, 1,2,3-trimethyl	526738	0.0002	0.9945	111
Octahydropentalene	694724	0.0002	0.9946	112
Other C9	#N/A	0.0002	0.9948	113
3,6-Dimethylnonane	17302317	0.0002	0.9949	114
Cyclohexane, 1,2-diethyl, cis	824431	0.0002	0.9951	115
3,5-Dimethyloctane	15869939	0.0002	0.9953	116
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0002	0.9954	117
Cyclopentane, 1,1-dimethyl	1638262	0.0002	0.9956	118
Other C8	#N/A	0.0002	0.9957	119
Cyclopentane, 1,2,3-trimethyl, ccc	2613696	0.0001	0.9959	120
2,2,4-Trimethyloctane	18932144	0.0001	0.9960	121
Benzene, 1-methyl-2-propyl	1074175	0.0001	0.9961	122
3-Methylbutyl acetate	123922	0.0001	0.9963	123
Cyclohexane, 1,1,4-trimethyl	7094271	0.0001	0.9964	124
2,6-Dimethylheptane	1072055	0.0001	0.9965	125
3,3-Dimethyloctane	4110445	0.0001	0.9966	126
Cyclohexane, 1-isopropyl-2-methyl, trans	19489033	0.0001	0.9967	127
Benzene, 1-ethyl-4-methyl	622968	0.0001	0.9968	128
2-Methylbutane	78784	0.0001	0.9970	129
Cyclohexane, 1-methyl-3-propyl, cis	42806757	0.0001	0.9971	130
3-Ethylheptane	15869804	0.0001	0.9972	131
Trimethylheptane	79004867	0.0001	0.9973	132
Cyclopentane, isobutyl	3788327	0.0001	0.9974	133
2,2,5-Trimethylhexane	3522949	0.0001	0.9975	134
Cyclopentane, isopropyl	3875512	0.0001	0.9976	135
Cyclohexane, 1,3-diethyl, trans	13990948	0.0001	0.9976	136
Indan	496117	0.0001	0.9977	137
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0001	0.9978	138
Benzene, 1,3-diethyl	141935	0.0001	0.9979	139
cis-Decalin	493016	0.0001	0.9980	140
Cyclohexane, isobutyl	1678984	0.0001	0.9981	141
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0001	0.9982	142
Trimethyloctane	98060527	0.0001	0.9982	143

Benzene, 1-ethyl-2-methyl	611143	0.0001	0.9983	144
2,6-Dimethylnonane	17302282	0.0001	0.9984	145
2,2-Dimethyloctane	15869871	0.0001	0.9985	146
Propane, 2,2-dimethyl	463821	0.0001	0.9985	147
Cyclohexane, 1-methyl-4-propyl, cis	28954429	0.0001	0.9986	148
Cyclopentane, 1-ethyl-3-methyl	3726474	0.0001	0.9987	149
Cyclohexane, 1-ethyl-2-methyl, trans	4923788	0.0001	0.9988	150
3-Ethyl-5-methyl heptane	52896909	0.0001	0.9988	151
Cyclohexane, 1,3-diethyl, cis	13991430	0.0001	0.9989	152
trans-2-Butene	624646	0.0001	0.9990	153
3-Ethyloctane	5881174	0.0001	0.9990	154
Cyclohexane, 1,4-diethyl, cis	13990926	0.0001	0.9991	155
Isobutyl isobutyrate	97858	0.0001	0.9991	156
4-Methyl -2-pentanone	108101	0.0001	0.9992	157
Cyclohexane, isopropyl	696297	0.0001	0.9993	158
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0001	0.9993	159
3-Ethyl-2-methylheptane	14676290	0.0001	0.9994	160
Cyclohexane, 1,1,3-trimethyl	3073663	0.0001	0.9994	161
Pentane	109660	0.0001	0.9995	162
Benzene, isopropyl	98828	0.0001	0.9995	163
Benzene, 1,3-diethyl-4-methyl	1758856	0.0001	0.9996	164
Benzene, 1,2,3,5-tetramethyl	527537	0.0001	0.9996	165
2,4-Dimethylheptane	2213232	0.0000	0.9997	166
3,3-Dimethylheptane	4032864	0.0000	0.9997	167
Benzene, 1-methyl-3-propyl	1074437	0.0000	0.9998	168
Isobutyl acetate	110190	0.0000	0.9998	169
Benzene, 1,2-diethyl	135013	0.0000	0.9998	170
Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0000	0.9999	171
Benzene, 1-isopropyl-2-methyl	527844	0.0000	0.9999	172
Benzene, 1,4-diisopropyl	100185	0.0000	0.9999	173
3,4-Dimethylhexane	583482	0.0000	1.0000	174
Cyclohexane, 1-isopropyl-2-methyl, cis	19489022	0.0000	1.0000	175
Total VOC		1.0000		

Group 30 HMC Clear/Metallic Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Toluene	108883	0.2569	0.2569	1
Propane	74986	0.1411	0.3979	2
Acetone	67641	0.1390	0.5369	3
Butane	106978	0.1164	0.6534	4
Methylene Chloride	75092	0.0734	0.7267	5
Ethyl acetate	141786	0.0508	0.7775	6
Isobutyl acetate	110190	0.0415	0.8190	7
Benzene, 1,3-dimethyl	108383	0.0316	0.8507	8
Ethyl-3-ethoxypropionate	7636699	0.0156	0.8662	9
Cyclohexane, methyl	108872	0.0144	0.8806	10
Benzene, 1,2-dimethyl	95476	0.0142	0.8948	11
Benzene, 1,4-dimethyl	106423	0.0133	0.9081	12
Isobutane	75285	0.0131	0.9213	13
Benzene, ethyl	100414	0.0122	0.9334	14
2-Butanone	78933	0.0078	0.9413	15
Heptane	142825	0.0072	0.9485	16
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0054	0.9539	17
Cyclopentane, 1,2-dimethyl, trans	822504	0.0049	0.9588	18
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0038	0.9626	19
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0032	0.9658	20
2-Propanol	67630	0.0031	0.9689	21
Cyclopentane, ethyl	1640897	0.0030	0.9719	22
Cyclopentane, 1,2-dimethyl, cis	1192183	0.0027	0.9747	23
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0025	0.9772	24
3-Methylhexane	589344	0.0020	0.9792	25
2,2-Dimethylhexane	590738	0.0018	0.9810	26
Benzene, 1,2,3,5-tetramethyl	527537	0.0017	0.9828	27
Ethanol	64175	0.0014	0.9842	28
2-Methylbutane	78784	0.0014	0.9856	29
2-Methylhexane	591764	0.0010	0.9866	30
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0009	0.9875	31
Other C12	#N/A	0.0009	0.9884	32
Benzene, 1,2,4,5-tetramethyl	95932	0.0008	0.9891	33
2-Methylheptane	592278	0.0007	0.9899	34
2,4-Dimethylhexane	116502444	0.0007	0.9905	35
2,3-Dimethyl pentane	565593	0.0006	0.9911	36
Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0005	0.9917	37
Ethane	17312504	0.0005	0.9922	38
Benzene, 1,2,3,4-tetramethyl	488233	0.0005	0.9927	39
Benzene, 1,3-diisopropyl	99627	0.0005	0.9932	40
Naphthalene	91203	0.0004	0.9936	41
Cyclopentane, 1,1-dimethyl	1638262	0.0004	0.9940	42
Benzene, 1,2,3-trimethyl	526738	0.0004	0.9944	43
Benzene, 1,3-dimethyl-4-ethyl	17302113	0.0004	0.9948	44
3-Methylheptane	589811	0.0004	0.9952	45

Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0003	0.9955	46
Butyl methacrylate	97881	0.0003	0.9958	47
Benzene, pentyl	538681	0.0003	0.9961	48
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0003	0.9964	49
2,3-Dimethylhexane	584941	0.0002	0.9966	50
Benzene, 1-ethyl-3-methyl	620144	0.0002	0.9968	51
Other C8	#N/A	0.0002	0.9970	52
2,3,4-Trimethylpentane	565753	0.0002	0.9972	53
Benzene, isopropyl	98828	0.0002	0.9974	54
Benzene, 1-methyl-3-propyl	1074437	0.0002	0.9976	55
trans-2-Butene	624646	0.0002	0.9978	56
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0002	0.9980	57
Benzene, 1,4-diethyl	105055	0.0002	0.9981	58
Methanol	67561	0.0002	0.9983	59
Cyclohexane	110827	0.0002	0.9984	60
4-Methylheptane	589537	0.0001	0.9986	61
trans-Decalin	493027	0.0001	0.9987	62
Benzene, propyl	103651	0.0001	0.9988	63
Tetralin	119642	0.0001	0.9990	64
Benzene, 1,2-diethyl-3-methyl	13632934	0.0001	0.9991	65
Isopropyl acetate	108214	0.0001	0.9992	66
4-Methyl-2-pentanone	108101	0.0001	0.9993	67
Benzene, 1,2,4-trimethyl-5-ethyl	17851273	0.0001	0.9994	68
2-Methyl-1-propanol	78831	0.0001	0.9994	69
Benzene, 1,3-diethyl	141935	0.0001	0.9995	70
Propane, 2,2-dimethyl	463821	0.0001	0.9996	71
Benzene, 1,4-diethyl-2-methyl	13632945	0.0001	0.9996	72
Benzene, 1,3-dimethyl-2-ethyl	354381	0.0001	0.9997	73
3-Methylpentane	96140	0.0000	0.9997	74
Other C11	#N/A	0.0000	0.9997	75
Octane	111659	0.0000	0.9998	76
Pentane	109660	0.0000	0.9998	77
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0000	0.9998	78
2,5-Dimethylheptane	2216300	0.0000	0.9999	79
2,4-Dimethylheptane	2213232	0.0000	0.9999	80
2,2,5-Trimethylhexane	3522949	0.0000	0.9999	81
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0000	0.9999	82
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0000	0.9999	83
Benzene, 1,3-diethyl-2-methyl	13632956	0.0000	0.9999	84
Cyclohexane, 1,3-dimethyl, trans	2207036	0.0000	1.0000	85
Cyclopentane, isopropyl	3875512	0.0000	1.0000	86
Cyclopentane, 1-ethyl-2-methyl, cis	930892	0.0000	1.0000	87
Cyclohexane, 1,2-dimethyl, cis	112134	0.0000	1.0000	88
3,5-Dimethylheptane(+/-)	39056183	0.0000	1.0000	89
Total VOC		1.0000		

Group 31 Spatter Coatings Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Propane	74986	0.1995	0.1995	1
Butane	106978	0.1372	0.3367	2
Other C11	#N/A	0.0346	0.3713	3
Acetone	67641	0.0334	0.4047	4
Benzene, 1,3-dimethyl	108383	0.0304	0.4351	5
Isobutane	75285	0.0267	0.4618	6
Octane	111659	0.0250	0.4868	7
Other C9	#N/A	0.0233	0.5101	8
Cyclohexane, 1,3-dimethyl, cis	638040	0.0228	0.5329	9
Cyclohexane, ethyl	1678917	0.0208	0.5537	10
Octane, 2,2,4-trimethyl	18932144	0.0197	0.5734	11
3,5-Dimethylheptane(+/-)	39056183	0.0184	0.5919	12
Benzene, ethyl	100414	0.0145	0.6064	13
Nonane, 2,2,8-trimethyl	62184547	0.0131	0.6194	14
Hexane, 2,2,5-trimethyl	3522949	0.0130	0.6325	15
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0128	0.6453	16
Benzene, 1,4-dimethyl	106423	0.0126	0.6579	17
2,2,6-Trimethyloctane	62016288	0.0123	0.6703	18
Pentane, 2,3,3-trimethyl	564023	0.0122	0.6825	19
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0119	0.6944	20
Other C10	#N/A	0.0114	0.7059	21
2-Methylheptane	592278	0.0107	0.7166	22
Benzene, 1,2-dimethyl	95476	0.0105	0.7270	23
Other C12	#N/A	0.0101	0.7372	24
Nonane, 2,2,6-trimethyl	62184525	0.0099	0.7471	25
Cyclopentane, propyl	2040962	0.0098	0.7569	26
Cyclohexane, 1,4-dimethyl, cis	624293	0.0097	0.7665	27
Isobutane	75285	0.0094	0.7760	28
Nonane, 2,2,4-trimethyl	62184503	0.0088	0.7847	29
3-Methyloctane	2216333	0.0084	0.7932	30
Trimethyloctane	98060527	0.0083	0.8014	31
3-Methyldecane	13151343	0.0078	0.8092	32
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0077	0.8169	33
3-Methylheptane	589811	0.0070	0.8239	34
2,2,4-Trimethylhexane	16747265	0.0070	0.8309	35
Other C8	#N/A	0.0069	0.8378	36
2-Methyloctane	3221612	0.0066	0.8444	37
Nonane	17312504	0.0065	0.8509	38
Nonane, 2,2,5-trimethyl	62184514	0.0062	0.8571	39
Nonane, 2,3,8-trimethyl	62184605	0.0062	0.8633	40
2,3-Dimethylheptane	3074713	0.0057	0.8690	41
Cyclohexane, 1,2-dimethyl, cis	112134	0.0057	0.8747	42
Pentane, 2,3,4-trimethyl	565753	0.0052	0.8799	43
2,3,3-Trimethylpentane	17302113	0.0047	0.8846	44
4-Methyloctane	2216344	0.0046	0.8892	45

Trimethylheptane	79004867	0.0045	0.8938	46
2,5-Dimethylheptane	2216300	0.0045	0.8983	47
Cyclopentane, 1-ethyl-1-methyl	16747505	0.0042	0.9025	48
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0042	0.9067	49
Cyclopentane, 1,2,3-trimethyl, ccc	2613696	0.0040	0.9107	50
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0039	0.9146	51
Octane, 2,5,6-trimethyl	62016142	0.0038	0.9184	52
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0033	0.9217	53
3,3-Diethylpentane	1067205	0.0030	0.9247	54
Hexane, 2,3,5-trimethyl	1069530	0.0027	0.9274	55
4-Methylheptane	589537	0.0026	0.9300	56
Cyclohexane, 1,1,2-trimethyl	7094260	0.0026	0.9326	57
Octane, 2,4,6-trimethyl	62016379	0.0026	0.9352	58
Heptane, 2,3,6-trimethyl	4032933	0.0025	0.9377	59
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0025	0.9401	60
Heptane, 3,3,5-trimethyl	7154805	0.0024	0.9425	61
Butane, 2-methyl	78784	0.0023	0.9448	62
2,2,5-Trimethylhexane	3522949	0.0023	0.9471	63
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0022	0.9494	64
Nonane, 2,2,7-trimethyl	62184536	0.0022	0.9516	65
2,3,4-Trimethylpentane	565753	0.0022	0.9537	66
Hexane, 2,3-dimethyl	584941	0.0021	0.9558	67
Octane, 2,5-dimethyl	15869893	0.0021	0.9579	68
2,3-Dimethylhexane	584941	0.0020	0.9599	69
Cyclohexane, methyl	108872	0.0018	0.9617	70
Cyclopentane, isopropyl	3875512	0.0017	0.9634	71
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0017	0.9652	72
Cyclohexane, 1,3,5-trimethyl, cct	1795262	0.0017	0.9669	73
Octane, 2,3,7-trimethyl	62016346	0.0017	0.9685	74
Octane, 2,2,6-trimethyl	62016288	0.0016	0.9701	75
2,3,5-Trimethylhexane	1069530	0.0016	0.9717	76
Cyclohexane, 1,1,4-trimethyl	7094271	0.0015	0.9733	77
2,4-Dimethylheptane	2213232	0.0015	0.9748	78
Ethane	74840	0.0013	0.9761	79
Toluene	108883	0.0013	0.9774	80
2,2-Dimethyloctane	15869871	0.0013	0.9788	81
Cyclopentane, isobutyl	3788327	0.0013	0.9800	82
2,6-Dimethylheptane	1072055	0.0012	0.9812	83
3-Ethylhexane	619998	0.0011	0.9824	84
3-Methyl-4-ethyl hexane	3074779	0.0011	0.9834	85
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0011	0.9845	86
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0010	0.9855	87
3-Ethylheptane	15869804	0.0009	0.9864	88
Heptane, 2,5-dimethyl	2216300	0.0009	0.9873	89
Cyclohexane, 1,2,3-trimethyl, ctc	1678815	0.0008	0.9881	90
Cyclopentane, 1-ethyl-2-methyl, trans	930905	0.0008	0.9889	91
Octane, 2,6,6-trimethyl	54166324	0.0007	0.9896	92
3,4-Dimethylheptane(+/-)	57031648	0.0007	0.9903	93
2,2-Dimethylheptane	1071267	0.0007	0.9910	94

Cyclohexane, 1,1-dimethyl	590669	0.0007	0.9916	95
Cyclopentane, ethyl	1640897	0.0006	0.9923	96
Cyclopentane, 1,2-dimethyl, cis	1192183	0.0006	0.9929	97
Octahydropentalene	694724	0.0006	0.9934	98
Cyclohexane, 1,2,3-trimethyl, ccc	1839889	0.0005	0.9939	99
3,3-Dimethylheptane	4032864	0.0005	0.9944	100
Heptane	142825	0.0005	0.9949	101
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0005	0.9954	102
Ethyl-3-ethoxypropionate	7636699	0.0005	0.9959	103
2,4-Dimethylhexane	116502444	0.0004	0.9963	104
Cyclopentane, 1-ethyl-3-methyl	3726474	0.0004	0.9967	105
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0004	0.9971	106
Cyclohexane, 1,1,3,5-tetramethyl	4306654	0.0004	0.9975	107
Cyclopentane, 1-ethyl-2-methyl	3726463	0.0004	0.9978	108
Cyclohexane, 1-ethyl-2-methyl, cis	4923777	0.0003	0.9981	109
Decane	124185	0.0002	0.9984	110
2,2,4-Trimethylheptane	14720742	0.0002	0.9986	111
3,4-Dimethylhexane	583482	0.0002	0.9988	112
2-Methylbutane	78784	0.0002	0.9989	113
Cyclohexane, 1,2,3-trimethyl	1678973	0.0002	0.9991	114
Undecane	1120214	0.0001	0.9992	115
Heptane, 2,2,4-trimethyl	14720742	0.0001	0.9994	116
Ethane	74840	0.0001	0.9995	117
trans-2-Butene	624646	0.0001	0.9995	118
Propane, 2,2-dimethyl	463821	0.0001	0.9996	119
Benzene, isopropyl	98828	0.0001	0.9997	120
3-Ethylpentane	617787	0.0001	0.9997	121
2,5-Dimethylhexane	592132	0.0001	0.9998	122
Benzene, 1-ethyl-3-methyl	620144	0.0001	0.9999	123
Benzene, 1,2,4-trimethyl	95636	0.0000	0.9999	124
Benzene, 1-ethyl-4-methyl	622968	0.0000	0.9999	125
Benzene, propyl	103651	0.0000	0.9999	126
Benzene, 1,3,5-trimethyl	108678	0.0000	1.0000	127
Pentane	109660	0.0000	1.0000	128
Hexane	110543	0.0000	1.0000	129
Total VOC		1.0000		

Group 34 Wood Touch-up/Repair Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Propane	74986	0.1288	0.1288	1
Ethyl acetate	141786	0.1270	0.2558	2
Ethanol	64175	0.1215	0.3773	3
Acetone	67641	0.1193	0.4966	4
Butyl acetate	123864	0.0958	0.5923	5
Isobutane	75285	0.0932	0.6855	6
1-Butanol	71363	0.0381	0.7237	7
Butane	106978	0.0354	0.7591	8
4-Methyl-2-pentanone	108101	0.0264	0.7854	9
Toluene	108883	0.0222	0.8076	10
2-Propanol	67630	0.0217	0.8293	11
Decane	124185	0.0140	0.8433	12
Isopropyl acetate	108214	0.0126	0.8558	13
Isobutyl isobutyrate	97858	0.0121	0.8680	14
Undecane	1120214	0.0093	0.8772	15
2-Butanone	78933	0.0075	0.8847	16
Pentyl acetate	628637	0.0058	0.8906	17
Other C11	#N/A	0.0057	0.8963	18
Other C12	#N/A	0.0051	0.9014	19
Nonane	111842	0.0051	0.9065	20
Benzene, 1,2,4-trimethyl	95636	0.0033	0.9098	21
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0029	0.9127	22
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0027	0.9154	23
Other C10	#N/A	0.0027	0.9181	24
Benzene, 1,3-dimethyl	108383	0.0026	0.9207	25
n-Propyl acetate	109604	0.0025	0.9233	26
2-Methylnonane	871830	0.0022	0.9255	27
trans-Decalin	493027	0.0022	0.9276	28
2-Methyloctane	3221612	0.0022	0.9298	29
3-Methylnonane	1465084	0.0021	0.9319	30
3-Ethyloctane	5881174	0.0021	0.9340	31
2-Methyldecane	6975980	0.0020	0.9360	32
Benzene, 1-methyl-2-propyl	1074175	0.0017	0.9377	33
Benzene, 1-isopropyl-3-methyl	535773	0.0016	0.9393	34
3,3-Dimethyloctane	4110445	0.0015	0.9409	35
Benzene, ethyl	100414	0.0015	0.9423	36
Cyclohexane, butyl	1678939	0.0015	0.9438	37
Benzene, 1,3-diethyl	17312504	0.0014	0.9453	38
Benzene, 1-ethyl-3-methyl	620144	0.0013	0.9466	39
5-Methyldecane	13151354	0.0013	0.9479	40
Cyclohexane, 1,2-diethyl, cis	824431	0.0013	0.9492	41
Dodecane	112403	0.0013	0.9505	42
Cyclohexane, propyl	1678928	0.0012	0.9517	43
Benzene, 1,4-dimethyl	17302113	0.0012	0.9529	44
Benzene, 1,3,5-trimethyl	108678	0.0012	0.9540	45

2,3-Dimethyloctane	7146603	0.0011	0.9551	46
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0011	0.9562	47
Benzene, 1-ethyl-2-methyl	611143	0.0010	0.9572	48
3,6-Dimethyloctane	15869940	0.0010	0.9583	49
3-Methyloctane	2216333	0.0010	0.9593	50
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0010	0.9602	51
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0010	0.9612	52
Benzene, 1,2-diethyl	135013	0.0009	0.9621	53
Benzene, 1,2-dimethyl	95476	0.0009	0.9630	54
3-Ethylnonane	17302113	0.0008	0.9638	55
Cyclohexane, 1-methyl-4-propyl, trans	28352423	0.0008	0.9647	56
(2-Methoxy-1-methylethyl) acetate	108656	0.0008	0.9655	57
Benzene, 1-ethyl-4-methyl	622968	0.0008	0.9663	58
3-Ethyldecane	17085960	0.0008	0.9671	59
Benzene, 1,4-diethyl	105055	0.0008	0.9679	60
Cyclohexane, 1-methyl-3-propyl, cis	42806757	0.0008	0.9687	61
3,6-Dimethyldecane	17312537	0.0008	0.9695	62
Cyclohexane, 1-methyl-3-propyl, trans	34522195	0.0008	0.9702	63
Cyclohexane, 1,2-diethyl, trans	13990959	0.0008	0.9710	64
1-Methoxy-2-propanol	107982	0.0007	0.9717	65
2,6-Dimethyldecane	13150817	0.0007	0.9724	66
2,6-Dimethylnonane	17302282	0.0007	0.9732	67
2,2,4-Trimethylnonane	62184503	0.0007	0.9739	68
Benzene, 1,2,3,5-tetramethyl	527537	0.0007	0.9745	69
2,6-Dimethyloctane	2051301	0.0007	0.9752	70
Benzene, 1,4-diethyl-2-methyl	13632945	0.0007	0.9759	71
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0007	0.9766	72
4,5-Dimethyldecane	17312468	0.0006	0.9772	73
2,2-Dimethylnonane	17302146	0.0006	0.9779	74
Benzene, 1,2,4,5-tetramethyl	95932	0.0006	0.9785	75
Cyclohexane, isobutyl	1678984	0.0006	0.9791	76
Cyclohexane, 1-isopropyl-3-methyl	16580248	0.0006	0.9797	77
Benzene, propyl	103651	0.0006	0.9803	78
Cyclohexane, 1-isopropyl-2-methyl	16580237	0.0006	0.9809	79
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0006	0.9815	80
Benzene, 1,4-diisopropyl	100185	0.0005	0.9820	81
2,7-Dimethyldecane	17312515	0.0005	0.9825	82
2,7-Dimethylnonane	17302293	0.0005	0.9831	83
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0005	0.9836	84
Cyclohexane, 1-isopropyl-4-methyl	99821	0.0005	0.9841	85
Cyclopentane, butyl	2040951	0.0005	0.9846	86
4-Methyldecane	2847725	0.0005	0.9851	87
Benzyl alcohol	100516	0.0005	0.9855	88
3-Methyldecane	13151343	0.0005	0.9860	89
Cyclohexane, methyl	108872	0.0004	0.9864	90
Cyclohexane, 1,4-diethyl, trans	13990937	0.0004	0.9868	91
Octane	111659	0.0004	0.9873	92
2,7-Dimethyloctane	1072168	0.0004	0.9877	93

2-Methylundecane	7045718	0.0004	0.9881	94
1-Methylindane	27133933	0.0004	0.9885	95
Benzene, 1,2,3,4-tetramethyl	488233	0.0004	0.9889	96
2,5-Dimethylnonane	17302271	0.0004	0.9893	97
Benzene, isopropyl	98828	0.0004	0.9897	98
Cyclohexane, 1,3-diethyl, trans	13990948	0.0004	0.9900	99
2,3-Dimethylheptane	3074713	0.0003	0.9904	100
Benzene, 1-isopropyl-2-methyl	527844	0.0003	0.9907	101
Benzene, 1,3-diethyl-4-methyl	1758856	0.0003	0.9911	102
Other C13	#N/A	0.0003	0.9914	103
Benzene, 1,3-dimethyl-2-ethyl	354381	0.0003	0.9917	104
2,2-Dimethyloctane	15869871	0.0003	0.9920	105
Other C9	#N/A	0.0003	0.9923	106
Cyclohexane, 1-methyl-4-propyl, cis	28954429	0.0003	0.9927	107
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0003	0.9930	108
4,5-Dimethyloctane	15869962	0.0003	0.9933	109
Benzene, 1-isopropyl-4-methyl	99876	0.0003	0.9936	110
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0003	0.9939	111
3,5-Dimethyldecane	17312480	0.0003	0.9942	112
3,5-Dimethylheptane(+/-)	39056183	0.0003	0.9945	113
4-Methylundecane	2980690	0.0003	0.9948	114
2,4-Dimethyloctane	4032944	0.0003	0.9950	115
5-Methylundecane	1632708	0.0003	0.9953	116
2,2-Diethoxy propane	126841	0.0003	0.9956	117
2,2,4-Trimethyloctane	18932144	0.0003	0.9959	118
Benzene, butyl	104518	0.0003	0.9961	119
2,5-Dimethyldecane	17312504	0.0002	0.9964	120
Cyclohexane, isopropyl	696297	0.0002	0.9966	121
Cyclohexane, ethyl	1678917	0.0002	0.9968	122
Cyclopentane, propyl	2040962	0.0002	0.9971	123
2-Methylindan	824635	0.0002	0.9973	124
Benzene, 1,2-diethyl-4-methyl	13732804	0.0002	0.9975	125
Cyclohexane, 1-ethyl-4-methyl, cis	4926787	0.0002	0.9977	126
Cyclohexane, 1,3-diethyl, cis	13991430	0.0002	0.9979	127
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0002	0.9981	128
2,5-Dimethylheptane	2216300	0.0002	0.9983	129
Cyclohexane, 1,1,2-trimethyl	7094260	0.0002	0.9985	130
Ethylene glycol propyl ether	2807309	0.0002	0.9987	131
2,3-Dimethyldecane	17312446	0.0002	0.9989	132
Cyclohexane, 1-isopropyl-4-methyl	99821	0.0002	0.9991	133
cis-Decalin	493016	0.0002	0.9993	134
Ethane	74840	0.0002	0.9995	135
3,5-Dimethyloctane	15869939	0.0002	0.9996	136
2,4-Dimethyldecane	2801845	0.0001	0.9998	137
Cyclohexane, 1,2,3-trimethyl, cct	7667552	0.0001	0.9999	138
Heptane	142825	0.0001	1.0000	139
2-Butanol	14898794	0.0000	1.0000	140
Total VOC		1.0000		

Group 36 Lacquer Solvent Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Acetone	67641	0.3336	0.3336	1
Propane	74986	0.1510	0.4845	2
Butane	106978	0.0790	0.5636	3
Benzene, 1,3-dimethyl	108383	0.0702	0.6338	4
Toluene	108883	0.0651	0.6988	5
2-Butanone	78933	0.0532	0.7520	6
Benzene, ethyl	100414	0.0321	0.7841	7
Ethyl-3-ethoxypropionate	7636699	0.0294	0.8135	8
Benzene, 1,4-dimethyl	106423	0.0292	0.8427	9
4-methyl-2-pentanone	108101	0.0271	0.8698	10
Benzene, 1,2-dimethyl	95476	0.0241	0.8939	11
Isopropyl acetate	108214	0.0151	0.9091	12
Isobutane	75285	0.0109	0.9200	13
2-Butoxyethanol	111762	0.0091	0.9291	14
2-Propanol	67630	0.0089	0.9380	15
Ethanol	64175	0.0072	0.9452	16
Heptane	142825	0.0058	0.9510	17
Butyl acetate	123864	0.0052	0.9562	18
Cyclohexane, methyl	108872	0.0038	0.9600	19
Benzene, 1,2,3,5-tetramethyl	527537	0.0030	0.9630	20
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0029	0.9659	21
3-Methylheptane	589811	0.0027	0.9685	22
2-Methylheptane	592278	0.0021	0.9706	23
Ethyl acetate	141786	0.0019	0.9725	24
Benzene, 1,2,4,5-tetramethyl	95932	0.0016	0.9741	25
2-Methyl-1-propanol	78831	0.0015	0.9756	26
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0012	0.9769	27
2-Methyloctane	3221612	0.0012	0.9780	28
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0012	0.9792	29
Benzene, 1,2,3,4-tetramethyl	488233	0.0010	0.9802	30
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0010	0.9812	31
Pentane, 2,3-dimethyl	565593	0.0007	0.9818	32
Cyclopentane, ethyl	1640897	0.0006	0.9825	33
3-Ethylhexane	619998	0.0006	0.9831	34
Cyclohexane	110827	0.0006	0.9837	35
4-Methylheptane	589537	0.0006	0.9843	36
2,4-Dimethylhexane	116502444	0.0006	0.9849	37
Benzene, isopropyl	17312504	0.0005	0.9854	38
Cyclohexane, 1,4-dimethyl, trans	2207047	0.0005	0.9859	39
Benzene, 1-methyl-3-propyl	1074437	0.0005	0.9864	40
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0005	0.9870	41
Cyclopentane, 1,3-dimethyl, trans	1759586	0.0005	0.9875	42
Benzene, 1-ethyl-3-methyl	620144	0.0005	0.9880	43
Ethane	17302113	0.0005	0.9884	44
Benzene, 1,3-diethyl-2-methyl	13632956	0.0004	0.9888	45
Cyclopentane, 1,2-dimethyl, trans	822504	0.0004	0.9892	46

Cyclopentane, 1,2,4-trimethyl, cct	16883480	0.0004	0.9896	47
4-Methylindan	824226	0.0004	0.9900	48
Naphthalene	91203	0.0004	0.9904	49
Benzene, 1,2-diethyl-4-methyl	13732804	0.0004	0.9907	50
Benzene, 1-methyl-2-propyl	1074175	0.0004	0.9911	51
Cyclohexane, ethyl	1678917	0.0004	0.9914	52
Methanol	67561	0.0003	0.9918	53
Decane	124185	0.0003	0.9921	54
5-Methylindan	874351	0.0003	0.9925	55
Benzene, 1-ethyl-2-methyl	611143	0.0003	0.9928	56
Benzene, 1-methyl-4-propyl	1074551	0.0003	0.9931	57
Cyclohexane, 1-isopropyl-3-methyl, cis	17066658	0.0003	0.9934	58
Nonane	111842	0.0003	0.9937	59
Cyclohexane, 1,2,4-trimethyl, ctt	7667609	0.0003	0.9940	60
Cyclopentane, isobutyl	3788327	0.0003	0.9942	61
Benzene, 1-isopropyl-3-methyl	535773	0.0002	0.9945	62
Undecane	1120214	0.0002	0.9947	63
Hexane	110543	0.0002	0.9950	64
Cyclohexane, 1,1,2-trimethyl	7094260	0.0002	0.9952	65
Cyclopentane, 1,3-dimethyl, cis	2532583	0.0002	0.9954	66
Benzene, 1-ethyl-4-methyl	622968	0.0002	0.9956	67
Benzene, propyl	103651	0.0002	0.9959	68
Cyclohexane, 1,2-dimethyl, trans	6876239	0.0002	0.9961	69
Cyclohexane, 1,4-dimethyl, cis	624293	0.0002	0.9963	70
3-Methylbutyl acetate	123922	0.0002	0.9964	71
Benzene, butyl	104518	0.0002	0.9966	72
Propane, 2,2-dimethyl	463821	0.0002	0.9968	73
3,5-Dimethylheptane(+/-)	39056183	0.0002	0.9969	74
Cyclohexane, 1-methyl-2-propyl, cis	4926710	0.0002	0.9971	75
Cyclopentane, propyl	2040962	0.0002	0.9973	76
Cyclohexane, 1,3,5-trimethyl, ccc	1795273	0.0001	0.9974	77
Cyclopentane, 1,2,4-trimethyl, ctc	18679306	0.0001	0.9976	78
2,3-Dimethylheptane	3074713	0.0001	0.9977	79
Cyclopentane, 1,2,3-trimethyl, ctc	19374460	0.0001	0.9978	80
Cyclopentane, methyl	96377	0.0001	0.9980	81
2-Methylbutane	78784	0.0001	0.9981	82
Cyclohexane, 1-ethyl-3-methyl, cis	19489102	0.0001	0.9982	83
Benzene, 1,3-diethyl	141935	0.0001	0.9983	84
Indan	496117	0.0001	0.9984	85
Other C8	#N/A	0.0001	0.9986	86
1-Butanol	71363	0.0001	0.9987	87
Other C9	#N/A	0.0001	0.9988	88
Cyclohexane, 1,2-dimethyl, cis	112134	0.0001	0.9989	89
2,5-Dimethylheptane	2216300	0.0001	0.9990	90
Benzene, 1,3-dimethyl-2-ethyl	354381	0.0001	0.9991	91
Benzene, 1,3,5-trimethyl	108678	0.0001	0.9992	92
Cyclohexane, 1,2,4-trimethyl, ctc	7667596	0.0001	0.9992	93
Ethane	74840	0.0001	0.9993	94
Cyclohexane, 1,2,4-trimethyl, ccc	1678804	0.0001	0.9994	95

trans-2-Butene	624646	0.0001	0.9994	96
Benzene, 1,2,3-trimethyl	526738	0.0001	0.9995	97
Cyclohexane, 1-ethyl-4-methyl, trans	6236880	0.0001	0.9996	98
2,4-Dimethylheptane	2213232	0.0001	0.9996	99
2,3-Dimethylhexane	584941	0.0001	0.9997	100
3-Methyloctane	2216333	0.0001	0.9997	101
Cyclohexane, 1-ethyl-3-methyl, trans	4926765	0.0000	0.9998	102
Isobutyl acetate	110190	0.0000	0.9998	103
Cyclohexane, 1,1-dimethyl	590669	0.0000	0.9998	104
Cyclopentane, 1-ethyl-3-methyl	3726474	0.0000	0.9999	105
Cyclohexane, 1,1,4-trimethyl	7094271	0.0000	0.9999	106
Cyclohexane, 1,2,4-trimethyl, cct	7667585	0.0000	0.9999	107
2,2,5-Trimethylhexane	3522949	0.0000	0.9999	108
Cyclopentane, isopropyl	3875512	0.0000	1.0000	109
Cyclopentane, 1,2,3-trimethyl, ccc	2613696	0.0000	1.0000	110
3-Methyl-4-ethyl hexane	3074779	0.0000	1.0000	111
Octahydropentalene	694724	0.0000	1.0000	112
Total VOC		1.0000		

Group 1w Clear Coatings Water Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Dimethyl ether	115106	0.5883	0.5883	1
2-Butoxyethanol	111762	0.1748	0.7631	2
2-Propanol	67630	0.1620	0.9251	3
Texanol	2565774	0.0244	0.9495	4
2-Propoxyethanol	2807309	0.0182	0.9677	5
2-Butanol	14898794	0.0082	0.9759	6
Benzene, 1,2,3,5-tetramethyl	527537	0.0021	0.9781	7
Benzene, 1,2,4-trimethyl	95636	0.0018	0.9799	8
Naphthalene	91203	0.0017	0.9816	9
Benzene, 1,2,4,5-tetramethyl	95932	0.0014	0.9830	10
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0011	0.9842	11
Benzene, 1-methyl-4-propyl	1074551	0.0010	0.9852	12
Benzene, 4-ethyl-1,2-dimethyl	934805	0.0010	0.9861	13
Benzene, 1-methyl-3-propyl	1074437	0.0008	0.9870	14
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0008	0.9878	15
Benzene, 1-ethyl-3,5-dimethyl	934747	0.0007	0.9885	16
Toluene	108883	0.0007	0.9891	17
Benzene, 1-isopropyl-3-methyl	535773	0.0006	0.9898	18
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0006	0.9904	19
Butane, 2-methyl	78784	0.0006	0.9909	20
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0006	0.9915	21
Benzene, 5-ethyl-1,2,4-trimethyl	18262856	0.0006	0.9921	22
Benzene, 2-ethenyl-1,4-dimethyl	2039896	0.0005	0.9926	23
Benzene, 1,4-diisopropyl	100185	0.0005	0.9932	24
Indan, 4-methyl	824226	0.0005	0.9937	25
Benzene, 1-ethyl-2,4-dimethyl	874419	0.0005	0.9942	26
Benzene, 1-isopropyl-4-methyl	99876	0.0005	0.9947	27
Benzene, 1-methyl-2-propyl	1074175	0.0005	0.9952	28
Benzene, 2-ethyl-1,4-dimethyl	1758889	0.0005	0.9957	29
Benzene, 1,4-diethyl	105055	0.0005	0.9962	30
Benzene, 1-ethyl-2-methyl	611143	0.0005	0.9966	31
Benzene, 1-methylpropyl	538932	0.0005	0.9971	32
Indan, 5-methyl	874351	0.0004	0.9975	33
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0004	0.9979	34
Benzene, 1,2,3,4-tetramethyl	488233	0.0003	0.9982	35
Benzene, 1-ethyl-3-methyl	620144	0.0003	0.9985	36
Isobutane	75285	0.0002	0.9987	37
2,5-Dimethyldecane	17312504	0.0002	0.9990	38
Benzene, 1-ethyl-2,3-dimethyl	933982	0.0002	0.9992	39
Dodecane	112403	0.0002	0.9994	40
Indan	496117	0.0001	0.9995	41
Propane	74986	0.0001	0.9996	42
Benzene, 1,3-diisopropyl	99627	0.0001	0.9998	43
3-Ethylnonane	17302113	0.0001	0.9999	44
1-Butanol	71363	0.0001	1.0000	45

Butane	106978	0.0000	1.0000	46
Total VOC		1.0000		

Group 2w Flats, Water Based	CAS	Fraction	cum. frac.	# of cmpds.
Dimethyl ether	115106	0.7884	0.7884	1
2-Butoxyethanol	111762	0.1163	0.9047	2
2-Propanol	67630	0.0510	0.9557	3
1-Butanol	71363	0.0229	0.9786	4
Texanol	2565774	0.0069	0.9855	5
Isobutane	75285	0.0016	0.9870	6
Benzene, 4-ethyl-1,2-dimethyl	934805	0.0013	0.9883	7
Benzene, 1,2,3,5-tetramethyl	527537	0.0012	0.9895	8
Benzene, 1-ethyl-3,5-dimethyl	934747	0.0009	0.9904	9
Benzene, 1,2,4,5-tetramethyl	95932	0.0008	0.9912	10
Naphthalene	91203	0.0008	0.9920	11
Benzene, 1-methyl-3-propyl	1074437	0.0007	0.9927	12
Indan, 4-methyl	824226	0.0007	0.9934	13
Benzene, 1-ethyl-2,4-dimethyl	874419	0.0007	0.9941	14
Benzene, 2-ethyl-1,4-dimethyl	1758889	0.0006	0.9947	15
Propane	74986	0.0006	0.9953	16
Benzene, 1-ethyl-2-methyl	611143	0.0006	0.9959	17
Indan, 5-methyl	874351	0.0006	0.9964	18
Benzene, 1-methyl-4-propyl	1074551	0.0005	0.9969	19
Benzene, 1,2,3,4-tetramethyl	488233	0.0004	0.9973	20
Benzene, 1-ethyl-3-methyl	620144	0.0004	0.9977	21
Benzene, 1,3-dimethyl	108383	0.0003	0.9980	22
Benzene, 1-methyl-2-propyl	1074175	0.0003	0.9983	23
Benzene, 1-ethyl-2,3-dimethyl	933982	0.0003	0.9986	24
Butane, 2-methyl	78784	0.0002	0.9988	25
Benzene, 1-isopropyl-3-methyl	535773	0.0002	0.9990	26
Indan	496117	0.0002	0.9992	27
Benzene, 1,3-diisopropyl	99627	0.0002	0.9994	28
Benzene, 1,2-dimethyl	95476	0.0002	0.9995	29
Benzene, 1,4-diisopropyl	100185	0.0001	0.9997	30
Benzene, 1,4-dimethyl	106423	0.0001	0.9998	31
Benzene, ethyl	100414	0.0001	0.9999	32
2-Methylbutane	78784	0.0001	1.0000	33
TOTAL VOC		1.0000		

Group 4w -Ground traffic marking, water-based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Dimethyl ether	115106	0.6734	0.6734	1
2-Propanol	67630	0.1069	0.7802	2
Acetone	67641	0.0649	0.8451	3
2-Butoxyethanol	111762	0.0435	0.8886	4
Hexane	110543	0.0287	0.9173	5
2-Propoxyethanol	2807309	0.0218	0.9391	6
1-Butanol	71363	0.0176	0.9567	7
1-Propanol, 2-methyl	78831	0.0105	0.9672	8
Cyclopentane, methyl	96377	0.0075	0.9747	9
Pentane, 3-methyl	96140	0.0069	0.9817	10
4-Methyl-2-pentanone	108101	0.0058	0.9875	11
Pentane, 2-methyl	107835	0.0033	0.9908	12
Benzene, 1,3-dimethyl	108383	0.0026	0.9934	13
2-Butanone	78933	0.0018	0.9951	14
Benzene, 1,4-dimethyl	106423	0.0011	0.9963	15
Benzene, 1,2-dimethyl	95476	0.0011	0.9973	16
Benzene, ethyl	100414	0.0008	0.9981	17
Butane	106978	0.0004	0.9985	18
Methyl methacrylate	80626	0.0003	0.9988	19
Propane	74986	0.0003	0.9991	20
Isobutane	75285	0.0002	0.9993	21
Butane, 2-methyl	78784	0.0002	0.9995	22
4-Methyl-3-pentene-2-one	141797	0.0002	0.9997	23
Toluene	108883	0.0001	0.9998	24
2-Methyl-2-propanol	75650	0.0001	1.0000	25
Butyl acetate	123864	0.0000	1.0000	26
Total VOC		1.0000		

Group 6w: Non-flat Water Based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Dimethyl ether	115106	0.7443	0.7443	1
2-Butoxyethanol	111762	0.0939	0.8382	2
2-Propanol	67630	0.0682	0.9065	3
1-Propanol, 2-methyl	78831	0.0155	0.9219	4
2-Butanol	14898794	0.0117	0.9336	5
1-Methoxy-2-propyl acetate	108656	0.0112	0.9448	6
1-Methoxy-2-propanol	107982	0.0092	0.9540	7
Texanol	2565774	0.0089	0.9629	8
1-Butanol	71363	0.0086	0.9715	9
1-Propoxy-2-propanol	1569013	0.0076	0.9791	10
2-Butoxyethyl acetate	112072	0.0074	0.9865	11
Benzene, 1,2,3,5-tetramethyl	527537	0.0013	0.9878	12
Benzene, 1,2,4,5-tetramethyl	95932	0.0007	0.9885	13
Benzene, 4-ethyl-1,2-dimethyl	934805	0.0006	0.9892	14
Isobutane	75285	0.0006	0.9898	15
Benzene, 1,2,4-trimethyl	95636	0.0006	0.9904	16
Naphthalene	91203	0.0005	0.9909	17
2-Butanone	78933	0.0005	0.9914	18
Benzene, 1,2-dimethyl-4-ethyl	934805	0.0005	0.9919	19
Benzene, 1-ethyl-3,5-dimethyl	934747	0.0005	0.9924	20
Benzene, 1-methyl-3-propyl	1074437	0.0004	0.9928	21
Benzene, 1,4-diisopropyl	100185	0.0004	0.9932	22
Benzene, 1-ethyl-3-methyl	620144	0.0004	0.9936	23
Propane	74986	0.0004	0.9939	24
Indan, 4-methyl	824226	0.0003	0.9943	25
Benzene, 1-ethyl-2,4-dimethyl	874419	0.0003	0.9946	26
Benzene, 1,2,3,4-tetramethyl	488233	0.0003	0.9950	27
Benzene, 2-ethyl-1,4-dimethyl	1758889	0.0003	0.9953	28
Benzene, 1-ethyl-2-methyl	611143	0.0003	0.9956	29
Indan, 5-methyl	874351	0.0003	0.9959	30
Toluene	108883	0.0003	0.9961	31
Benzene, 1,4-diethyl-2-methyl	13632945	0.0003	0.9964	32
Benzene, 1-methyl-4-propyl	1074551	0.0002	0.9967	33
2-Propoxy-1-propanol	10215302	0.0002	0.9969	34
Butane, 2-methyl	78784	0.0002	0.9971	35
Benzene, 1-methyl-2-propyl	1074175	0.0002	0.9974	36
Benzene, 1,3-dimethyl-4-ethyl	874419	0.0002	0.9976	37
Benzene, 1,3-dimethyl	17312504	0.0002	0.9978	38
Benzene, 5-ethyl-1,2,4-trimethyl	18262856	0.0002	0.9980	39
Benzene, 1,3-dimethyl-5-ethyl	934747	0.0002	0.9982	40
Benzene, 1,4-dimethyl-2-ethyl	1758889	0.0002	0.9983	41
Benzene, 2-ethenyl-1,4-dimethyl	2039896	0.0002	0.9985	42
Benzene, 1,2-dimethyl-3-ethyl	933982	0.0002	0.9987	43
Benzene, 1-isopropyl-3-methyl	17302113	0.0002	0.9989	44
Benzene, 1-ethyl-2,3-dimethyl	933982	0.0001	0.9990	45

Benzene, 1,2-dimethyl	95476	0.0001	0.9991	46
Benzene, 1-isopropyl-4-methyl	99876	0.0001	0.9993	47
Hexane	110543	0.0001	0.9994	48
Benzene, 1,4-diethyl	105055	0.0001	0.9995	49
2,4-Dimethyldecane	2801845	0.0001	0.9996	50
Indan	496117	0.0001	0.9997	51
Benzene, 1,3-diisopropyl	99627	0.0001	0.9998	52
Benzene, 1,4-dimethyl	106423	0.0001	0.9998	53
Benzene, ethyl	100414	0.0001	0.9999	54
Butane	106978	0.0001	1.0000	55
Decane	124185	0.0000	1.0000	56
Propane	74986	0.0000	1.0000	57
Total VOC		1.0000		

Group 7w- Primer, water-based				
Compound	CAS	Fraction	cum. frac.	# of cmpds.
Dimethyl ether	115106	0.7539	0.7539	1
2-Butoxyethanol	111762	0.1156	0.8695	2
Acetone	67641	0.0814	0.9509	3
1-Butanol	71363	0.0216	0.9725	4
2-Propanol	67630	0.0112	0.9837	5
1-Propoxy-2-propanol	1569013	0.0083	0.9920	6
2-Butanone	78933	0.0035	0.9955	7
Toluene	108883	0.0007	0.9962	8
Propane	74986	0.0006	0.9968	9
4-Methyl-4-hydroxy-pentan-2-one	123422	0.0005	0.9973	10
Isobutane	75285	0.0004	0.9977	11
Benzene, 1,3-dimethyl	108383	0.0004	0.9980	12
Butyl acetate	123864	0.0003	0.9984	13
2-Methyl-2-propanol	75650	0.0003	0.9986	14
1-Propanol, 2-methyl	78831	0.0002	0.9989	15
Butane, 2-methyl	78784	0.0002	0.9991	16
Benzene, ethyl	100414	0.0002	0.9993	17
Methyl methacrylate	80626	0.0002	0.9995	18
Benzene, 1,2-dimethyl	95476	0.0002	0.9996	19
Benzene, 1,4-dimethyl	106423	0.0002	0.9998	20
Butyl methacrylate	97881	0.0001	0.9999	21
4-Methyl-3-pentene-2-one	141797	0.0001	0.9999	22
Butane	106978	0.0001	1.0000	23
Total VOC		1.0000		