# IMPROVEMENT OF SPECIATION PROFILES FOR AEROSOL COATINGS

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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°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**

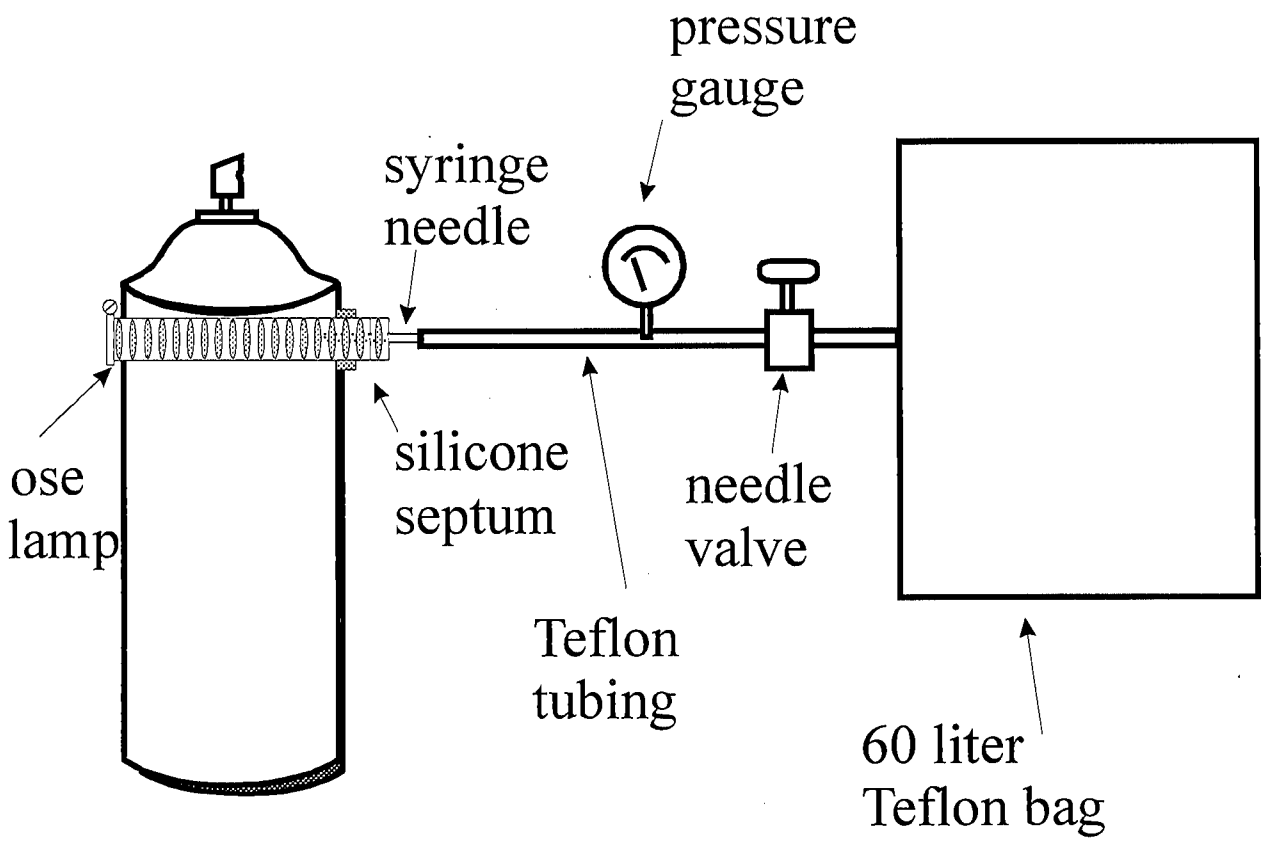


Table 3 – Sampling from Different Cans of Same Type of Aerosol Paint

| **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**

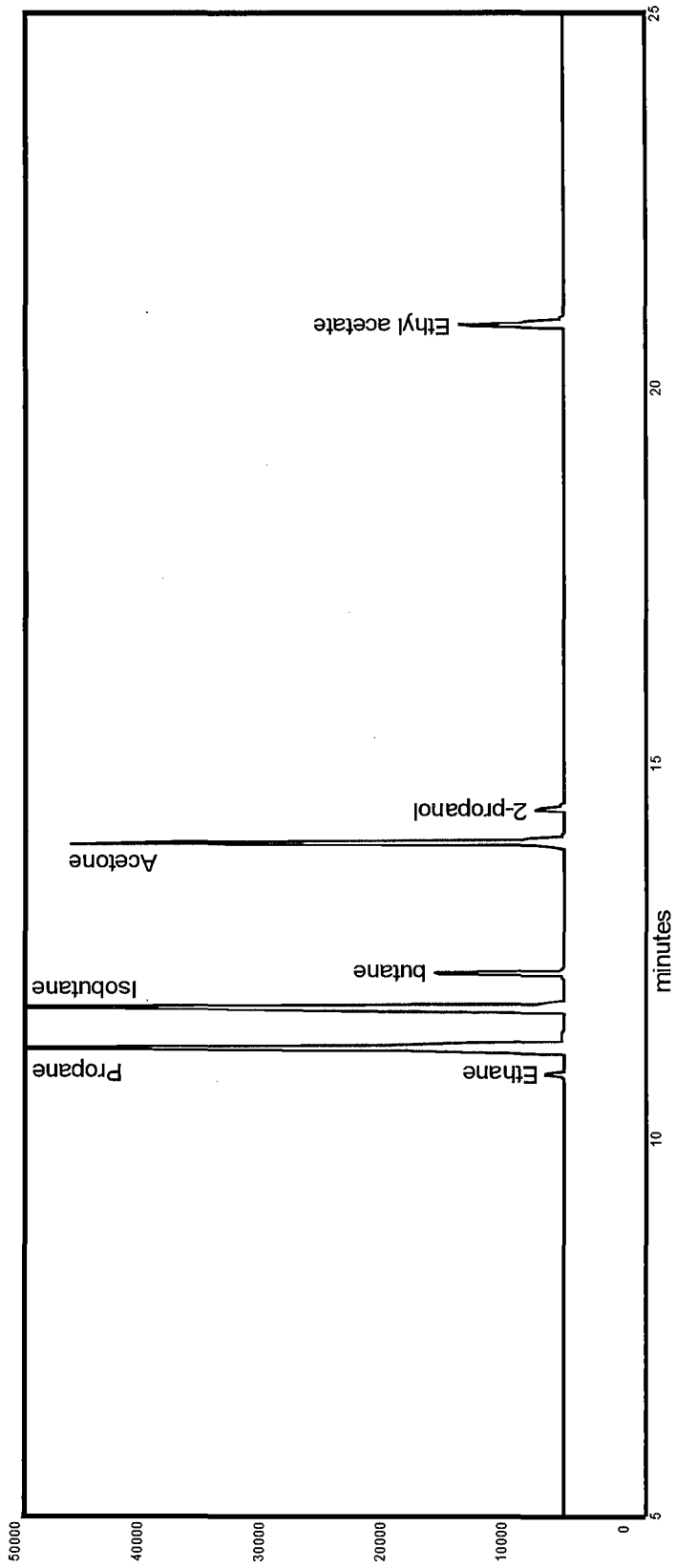
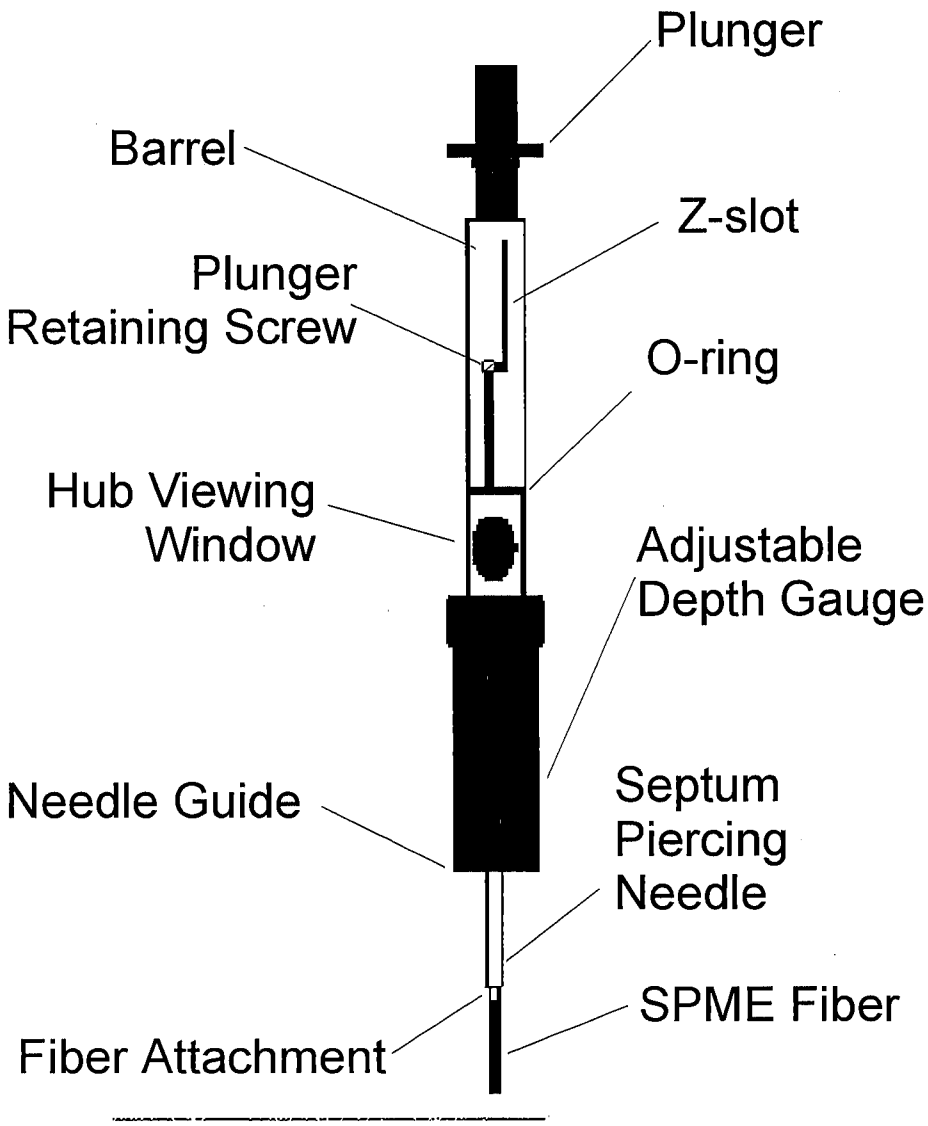


**Figure 3 – Diagram of SPME Device**



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**

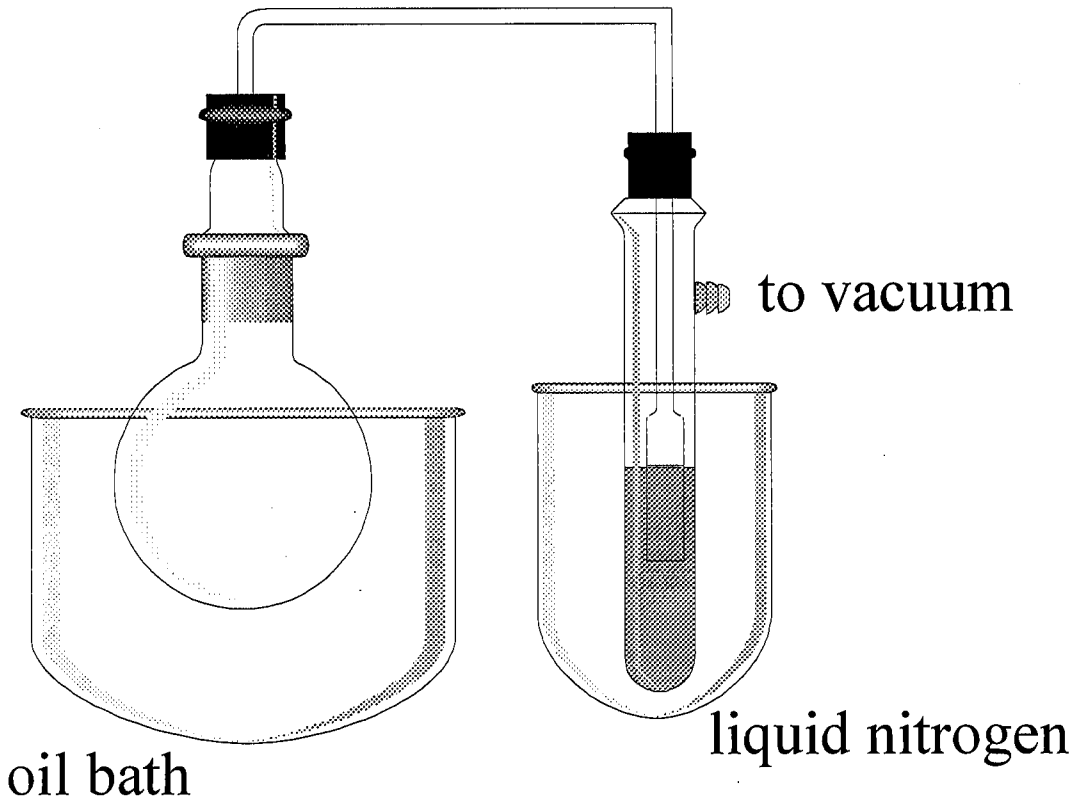
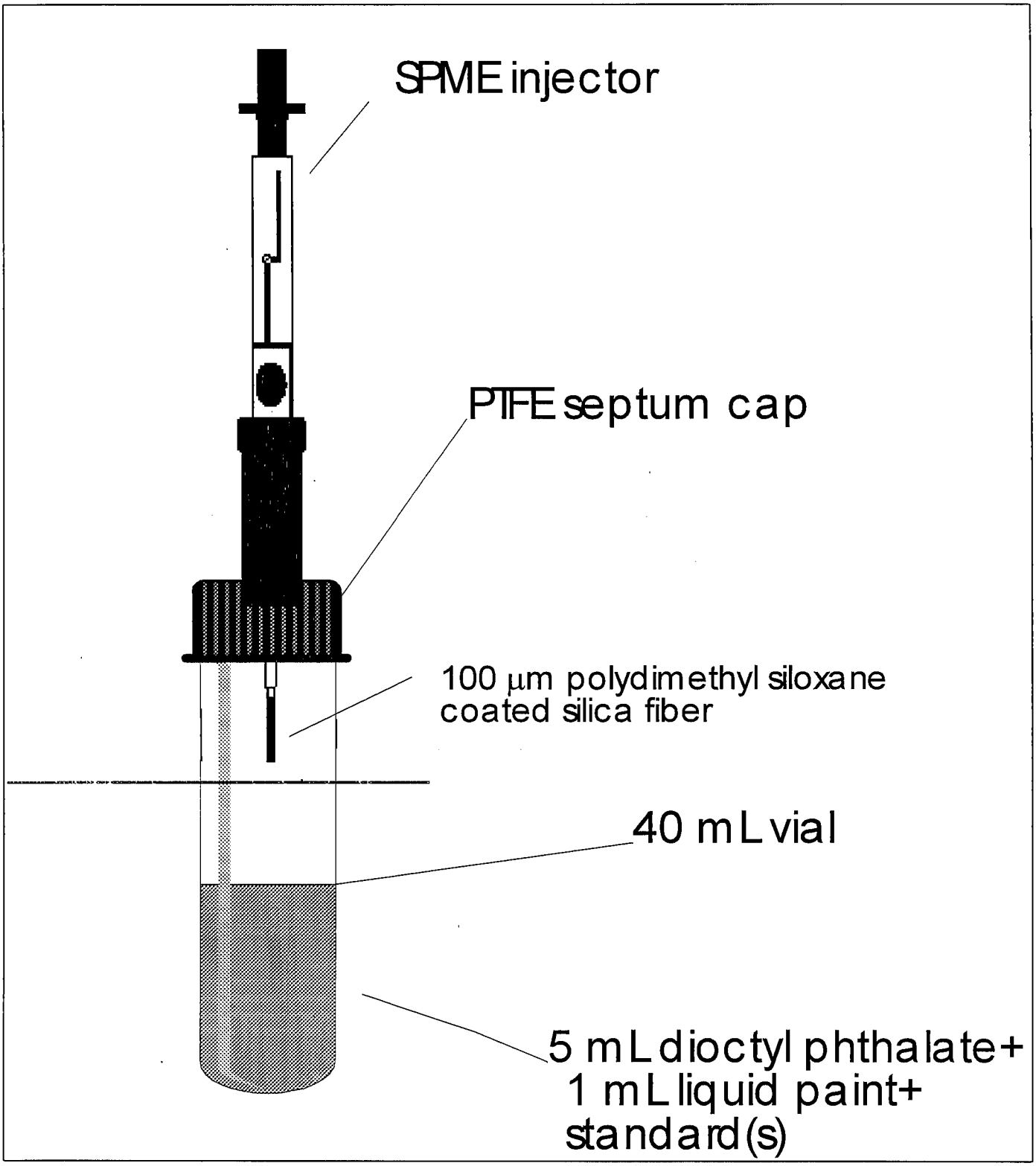


**Figure 5 – Sampling for Acetone and Toluene by SPME**



## 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**

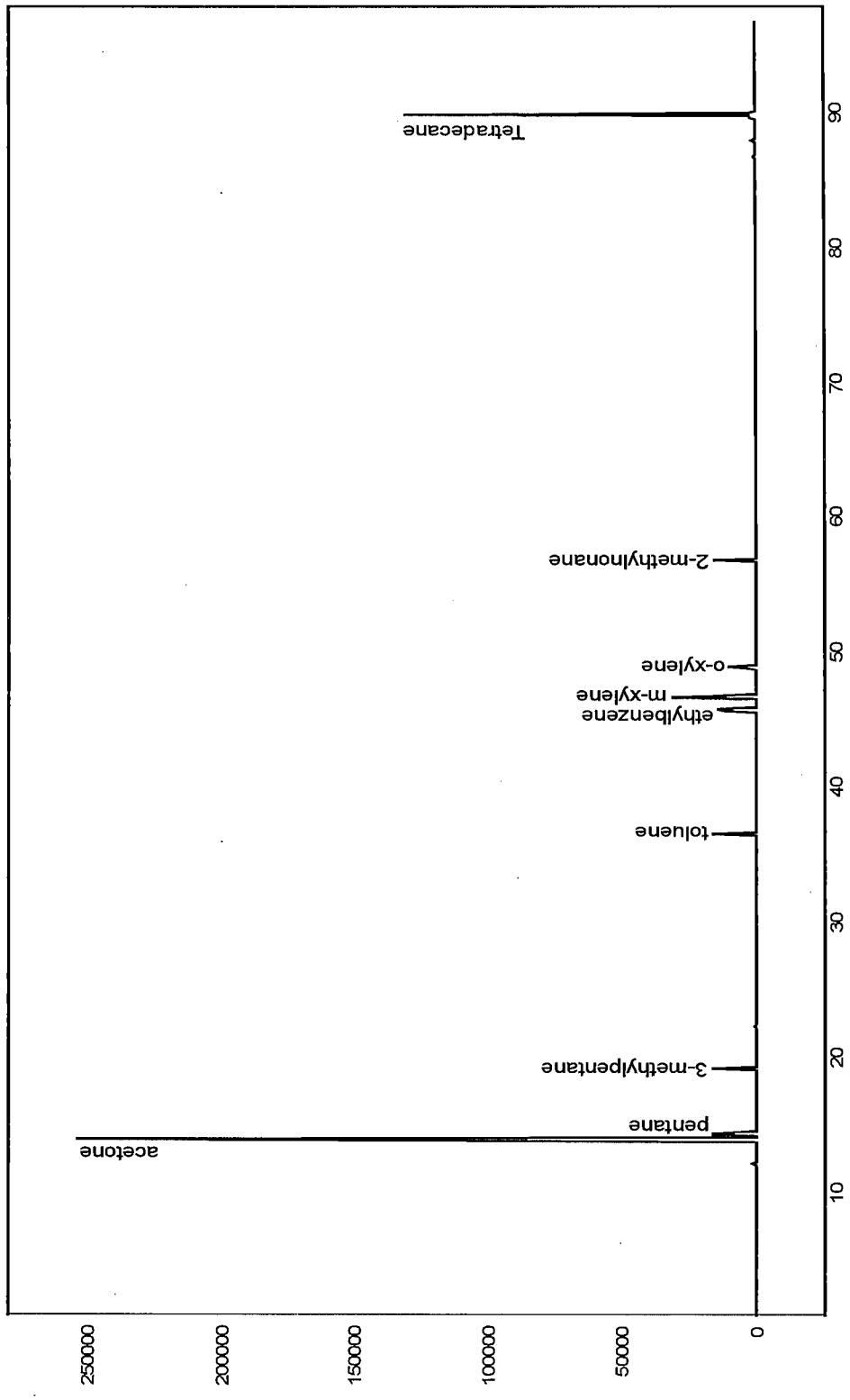


Table 4 - Comparison of SPME and Distillation Results for Acetone and Toluene

| | % 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.

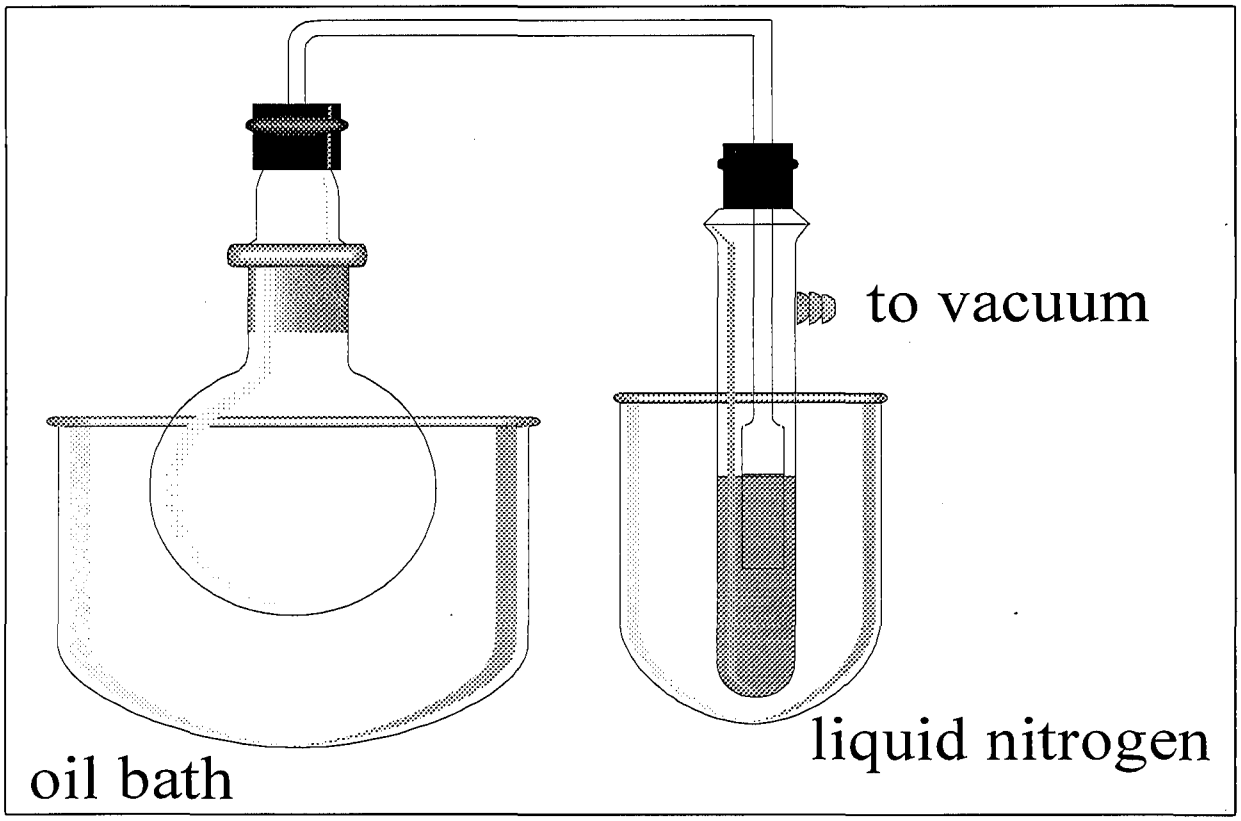
5.2.6 At the end of the distillation, remove the receiving tube from the liquid nitrogen bath, and allow its contents to melt.

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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|
| 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 | | |