



DRAFT REPORT: 2002 SURVEY OF AUTOMOTIVE REFINISH COATINGS

**Stationary Source Division
Measures Assessment Branch**

March 2005

**State of California
California Environmental Protection Agency
Air Resources Board**

**2002 Automotive Refinish Coatings Survey
Report**

March 2005

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This report has been reviewed and approved for publication by the Air Resources Board (ARB, Board). Approval does not signify that the contents reflect the views and policies of the ARB, nor does mention of any company constitute endorsement. This report is a direct reflection of the California sales data (for calendar year 2001) submitted by the companies that responded to the “ARB Automotive Coatings Survey” conducted in 2002.

Acknowledgements

The Air Resources Board would like to thank the companies that responded to our survey (see Table 2-1 for a list of survey respondents).

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LIST OF ACRONYMS

APCD	Air Pollution Control District
AQMD	Air Quality Management District
ARB, Board	Air Resources Board
OEM	Original Equipment Manufacturer
PD	Protected Data
RTS	Ready-To-Spray
SB	Solvent-borne
VOC	Volatile Organic Compound
WB	Water-borne

Chapter 1 – Introduction and Background

This report presents results from the 2002 Automotive Refinish Coatings Survey conducted by the California Air Resources Board (ARB or Board) for coatings sold in California during 2001. This survey was conducted by the ARB for the purpose of estimating volatile organic compound (VOC) emissions from automotive refinish coatings and evaluating the feasibility of lowering VOC limits. For purposes of this survey report, automotive coatings will be the term used to describe automotive refinish coatings, which are defined as follows:

“Automotive Refinish Coating: A coating to be applied to all commercial and non-commercial motor vehicles and their parts and components at facilities involved in the non-assembly line production, modification, or refinishing of motor vehicles and mobile equipment. Commercial and non-commercial facilities with coating operations considered within the scope of this survey include, but are not limited to: autobody repair/paint shops, production autobody paint shops, new car dealer repair/paint shops, fleet operator repair/paint shops, custom-made car fabrication facilities, truck body-builders and residences.”

Note: Automotive coatings in this survey report do not include original equipment manufacturer (OEM) coatings.

The information collected in the survey is used by ARB and local air pollution control districts (APCDs) and air quality management districts (AQMDs) to track the volatile organic compound (VOC) emissions from automotive coatings. The survey data may also be used in the development of district rules to reduce the VOC emissions from these products.

The local districts have the primary responsibility for control of air pollution from stationary sources, such as the application of automotive coatings. The local districts develop, adopt, and enforce rules and regulations under their jurisdiction to achieve and maintain the state and federal ambient air quality standards. Twenty-one air districts have rules limiting the VOC content of automotive coatings. These air districts account for approximately 95 percent of the state's population.

The 2002 Automotive Coatings Survey

In June 2002, the ARB mailed survey questionnaires to companies that potentially sold automotive coating products in California in 2001. Some of the companies did not submit data because: they did not manufacture automotive coatings; they did not have any sales of automotive coatings in California during 2001; or their sales were being reported by another company. A total of 17 companies submitted data.

The 2002 Automotive Coatings survey requested 2001 California sales information for 33 product categories. For each of the products in the categories, the survey collected the following information:

- sales in gallons;
- coating technology (solvent-borne or water-borne);
- coating density;
- weight percent of solids, volatile material, water, and exempt compounds;
- volume percent of solids, volatile material, water, and exempt compounds;
- VOC regulatory and VOC actual content; and
- coating ingredients.

In addition, the survey collected the ready-to-spray (RTS) coating information including:

- RTS mixing components;
- RTS mixing ratio of components; and
- RTS mixture VOC regulatory and VOC actual contents.

A copy of the survey questionnaire is available in the Appendix. Manufacturers considered the data provided in the 2002 Automotive Coatings survey to be confidential. To address this concern, but still allow the publishing of survey results, this report contains summarized survey data rather than lists of individual survey responses. In addition, the ARB implemented in chapter 3 the “Three Company Rule” when summarizing the sales data to further protect confidentiality. Under the “Three Company Rule” we have concealed sales data that did not represent at least three companies. However, due to the small number of automotive coatings companies, we could not apply this rule to the rest of the data summarized in this report without concealing too much data. With the exception of sales data, we used the “Three Product Rule” to conceal a value that represents data from two products or less. Throughout this report “PD” (protected data) is used to reflect that compliance with the “Three Company Rule” for sales data or “Three Product Rule” for the rest of the data could not be satisfied and the data were concealed.

The 2002 survey responses represent about 3.7 million gallons of automotive coatings sold in California in 2001, with over 99% of that volume coming from solvent-borne products and less than 1% from water-borne products. Emissions from these coatings are approximately 7,600 tons of VOC per year or about 21 tons per day as an annual average. Solvent-borne products contribute 99.9% of these emissions, while the water-borne products contribute 0.1%.

Information on VOC content was also collected for all coating categories. Values for VOC content summarized in this report were determined by calculating the ready-to-spray (RTS) average and are available in Chapter 4. The VOC content values appear as VOC actual and VOC regulatory. VOC actual, also known as Material VOC, is a ratio of the weight of volatile compounds (minus the weight of water and exempt VOCs) per given volume of coating. VOC actual is the value used to determine emissions.

Usually, automotive refinish products are sold to autobody shops in individual cans, which contain one of the components of the final ready-to-spray (RTS) coating. Before coating application, the components are mixed to prepare the ready-to-spray (RTS) coating, which is sprayed onto the substrate. The current district rules contain VOC limits based on VOC regulatory of RTS coating and not its individual components. In order to summarize the survey

data in the context of current rules, the VOC content in Chapter 4 and information on solids, volatiles etc. in Chapter 6, are derived from data submitted on RTS mixtures. The sales figures in Chapter 3 and VOC emissions in Chapter 5 are calculated using data on individual components of RTS mixtures.

The VOC content limit in automotive coating regulations is commonly known as VOC regulatory, which is a ratio of the weight of VOCs per given volume of coating with water and exempt VOCs subtracted from both the numerator (weight) and denominator (volume). The original rationale behind the VOC regulatory value was to reflect the relationship of coverage to total solids content and to provide an equivalent basis for comparing the polluting portion of solvent-borne and water-borne coatings. Also, based on industry comments, it was believed that the VOC regulatory approach would prohibit coating manufacturers from simply diluting a coating with water in order to meet standards specified in coating regulations.

The 2002 Automotive Coatings Survey also included the collection of ingredient data, which is summarized in Chapter 7.

Chapter 2 – Industry Overview

The 2002 survey was sent to more than 40 companies that potentially sold automotive coating products in California in 2001. Some of the companies did not submit data for the following reasons: they did not manufacture automotive coatings; or they did not have any sales of automotive coatings in California during 2001; or their sales were being reported by another company. A total of 17 companies submitted data.

This chapter includes the following data summaries:

Table 2-1: *Survey Respondents*

Figure 2-1: *Survey Respondents' Annual Gross Earnings (in dollars)*

Figure 2-2: *Survey Respondents' Number of Employees*

Figure 2-3: *Survey Respondents' Marketing Classifications*

Figure 2-4: *Method for Determining California Sales*

Figure 2-5: *Type of Business*

Table 2-1: Survey Respondents

Count	Company Name
1	Akzo Nobel
2	Bondo
3	BASF*
4	Cumberland
5	DuPont
6	Earl Scheib
7	Ellis Paint
8	Fibre Glass - Evercoat
9	Hentzen
10	Jones-Blair
11	Magni
12	Montana Products
13	PPG
14	Sherwin Williams
15	Spies Hecker
16	Standox
17	Valspar

*BASF submitted partial data.

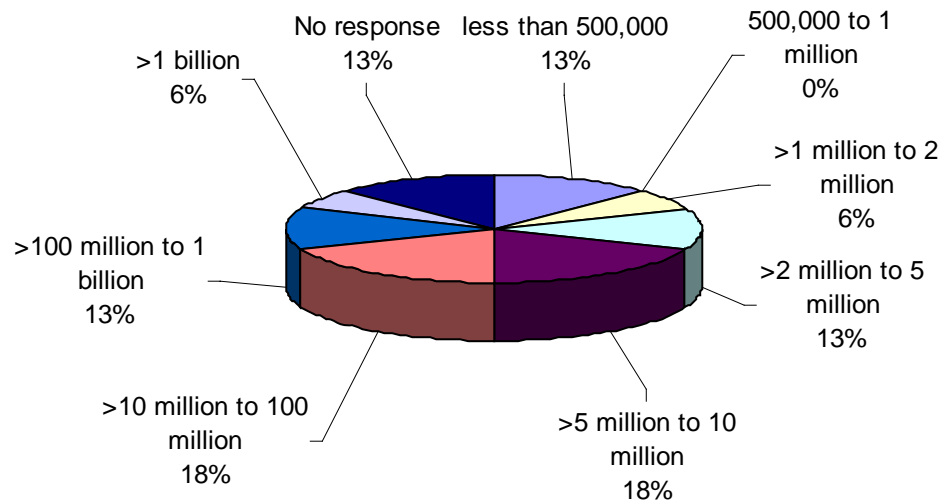
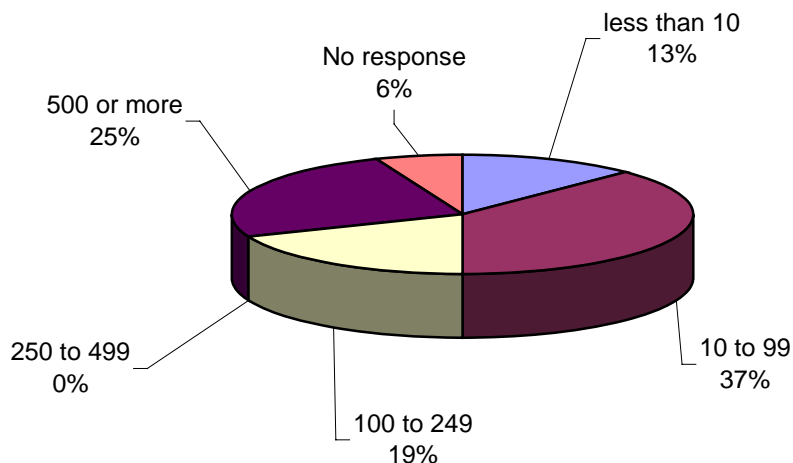
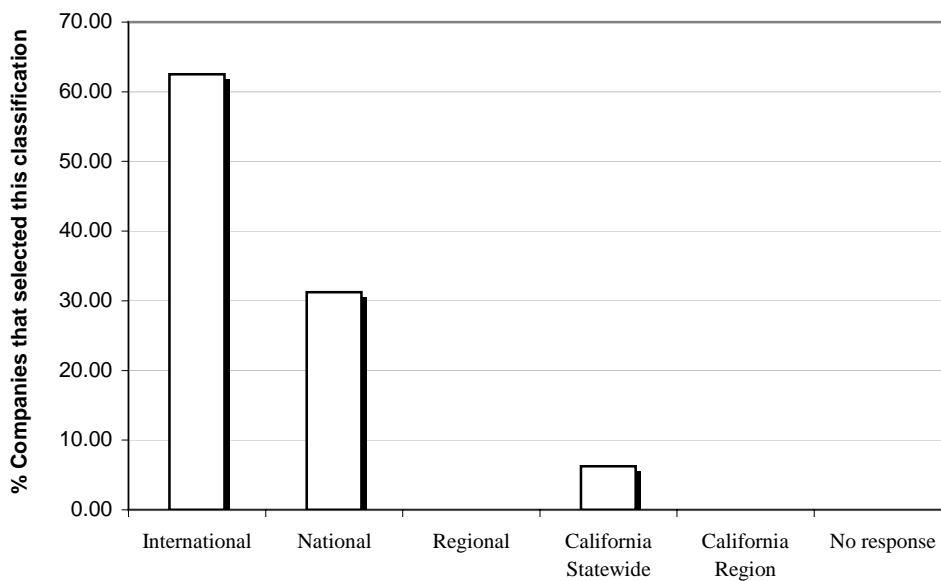
Figure 2-1**Survey Respondents' Gross Annual Earnings (in dollars)**

Figure 2-2

Survey Respondents' Number of Employees

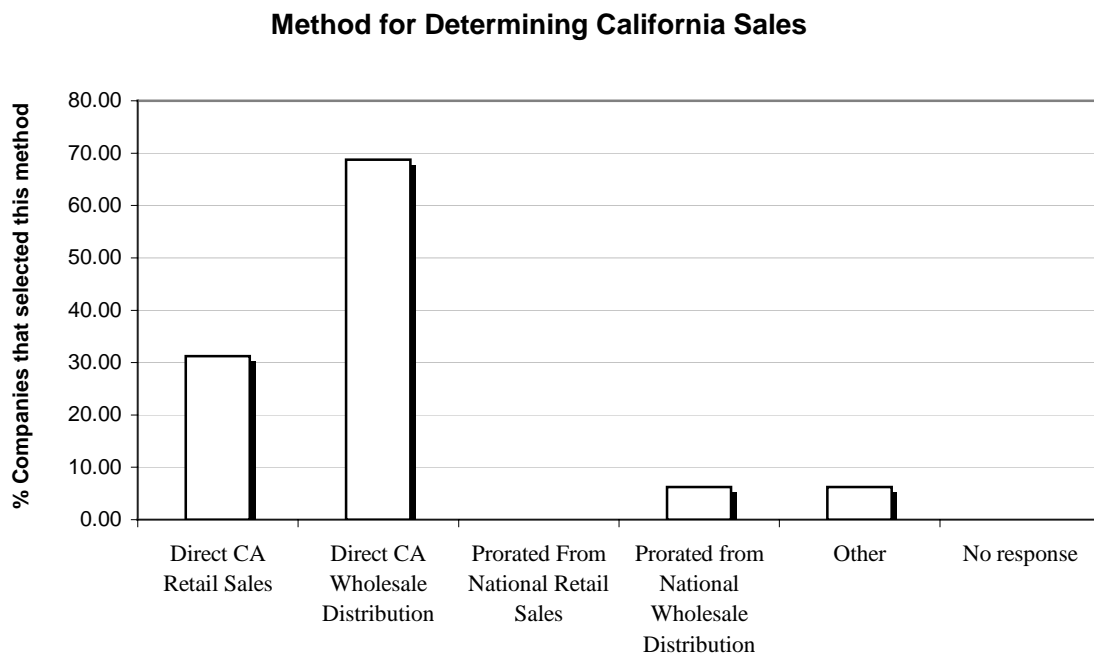
The survey collected data on marketing classification. Although survey respondents were allowed to select multiple classifications (e.g., international and regional), each respondent only chose one type of marketing classification. Figure 2-3 illustrates the percentage of companies that selected a particular marketing classification.

Figure 2-3

Survey Respondents' Marketing Classifications

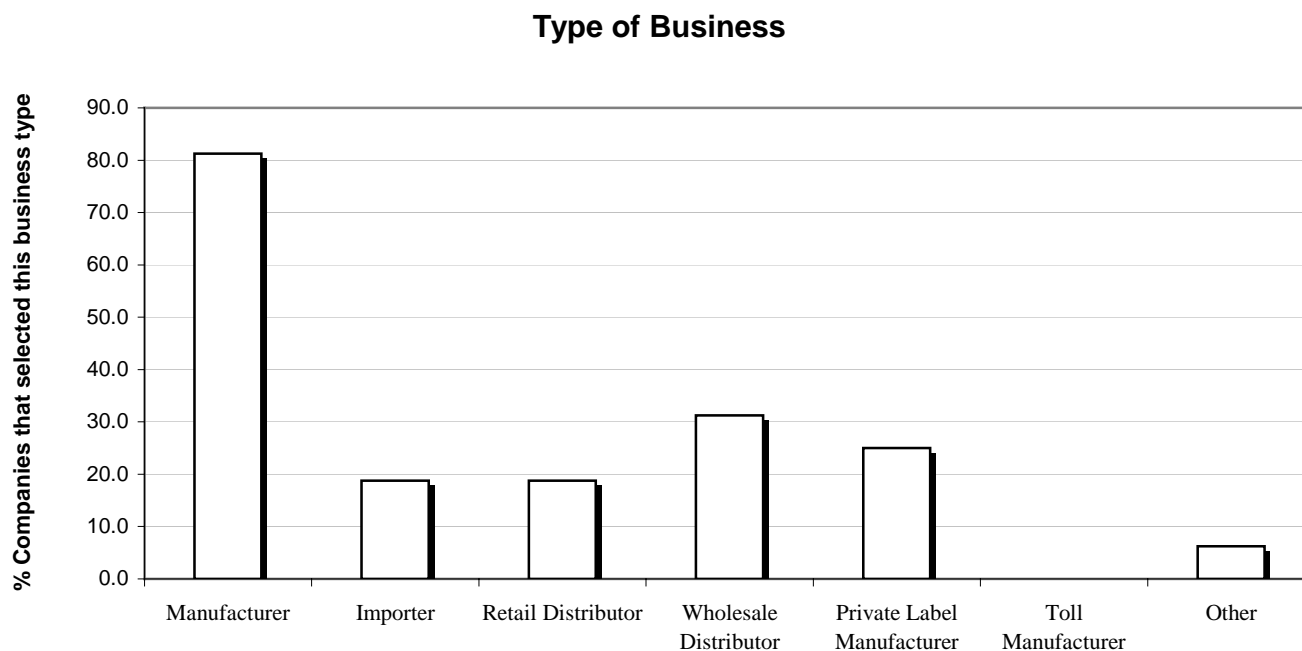
The information on the methods that were used to determine the sales of automotive coatings in California was also collected in the survey. Survey respondents were allowed to select multiple methods (e.g., direct California wholesale and other) and some companies reported more than one method. Figure 2-4 illustrates the percentage of companies that selected a particular method for determining California sales. Please note that the total percentage is greater than 100%, because companies could select multiple methods.

Figure 2-4



The survey gathered data on the type of business (e.g., manufacturer, wholesale distributor). Survey respondents were allowed to select multiple descriptions for their business type and some companies reported more than one type. Figure 2-5 illustrates the percentage of companies that selected a particular business type. Please note that the total percentage is greater than 100%, because companies could select multiple types.

Figure 2-5



Chapter 3 – Sales

The 2002 survey responses represent approximately 3.7 million gallons of automotive coatings sold in California in 2001.

This chapter includes the following data summaries:

Table 3-1: *Sales by Product Category*

Table 3-2: *Sales by Product Category (sorted by volume in descending order)*

Figure 3-1: *Solvent-borne and Water-borne Sales*

Figure 3-2: *Top 10 Coating Sales Categories*

Table 3-1 lists total sales for coating categories, as well as sub-totals for solvent-borne and water-borne sales in each category.

Table 3-1: Sales by Product Category

Product Type	2001 Total Sales (gallons)	Solvent-borne (gallons)	Water-borne (gallons)	%SB	%WB
Accelerator	5313	5313	N/A	100	N/A
Activator	80354	80305	49	100	0
Additive	256124	256124	N/A	100	N/A
Camouflage	24439	23629	810	97	3
Catalyst	38050	38050	N/A	100	N/A
Clear Coat	394364	391990	2373	99	1
Color Coat	135048	134891	157	100	0
Extender	165	165	N/A	100	N/A
Fish Eye Eliminator	6825	6621	204	97	3
Flattener	19169	19169	N/A	100	N/A
Flexible Primer	1608	1608	N/A	100	N/A
Ground Coat	8719	8719	N/A	100	N/A
Hardener	213758	209277	4481	98	2
Metallic/Iridescent	294768	294734	34	100	0
Multistage Color Coat	429980	427118	2861	99	1
Other	17480	17430	50	100	0
Plastisizer	3779	3777	2	100	0
Plastics Primer	2008	1991	17	99	1
Precoat	26919	26835	84	100	0
Pretreatment Wash Primer	24630	24630	N/A	100	N/A
Primer	48866	48307	559	99	1
Primer Sealer	99747	98140	1607	98	2
Primer Surfacer	184820	175585	9236	95	5
Reducer	1097457	1096786	670	100	0
Single Stage Color Coat	263335	263246	89	100	0
Specialty Coating	PD	PD	PD	PD	PD
Temporary Protective Coating	PD	PD	PD	PD	PD
Truck Bed Coating	PD	PD	PD	PD	PD
Underbody Coating	1430	1312	118	92	8
Undercoat	310	310	N/A	100	N/A
Uniform Finish Coating	5206	5206	N/A	100	N/A
Total:	3685499	3661418	24081	99	1

Table 3-2 illustrates the ranking of coating categories based on sales volume.

Table 3-2: Sales by Product Category (sorted by volume in descending order)

Product Type	2001 Sales (gallons)
Reducer	1097457
Multi-stage Color Coat	429980
Clear Coat	394364
Metallic/Iridescent	294768
Single Stage Color Coat	263335
Additive	256124
Hardener	213758
Primer Surfacer	184820
Color Coat	135048
Primer Sealer	99747
Activator	80354
Primer	48866
Catalyst	38050
Precoat	26919
Pretreatment Wash Primer	24630
Camouflage	24439
Flattener	19169
Other	17480
Ground Coat	8719
Fish Eye Eliminator	6825
Accelerator	5313
Uniform Finish Coating	5206
Plastisizer	3779
Plastics Primer	2008
Flexible Primer	1608
Underbody Coating	1430
Temporary Protective Coating	PD
Undercoat	310
Extender	165
Truck Bed Coating	PD
Specialty Coating	PD

The split between solvent-borne and water-borne coatings is illustrated in Figure 3-1, while Figure 3-2 highlights the top ten coating categories based on sales volume.

Figure 3-1

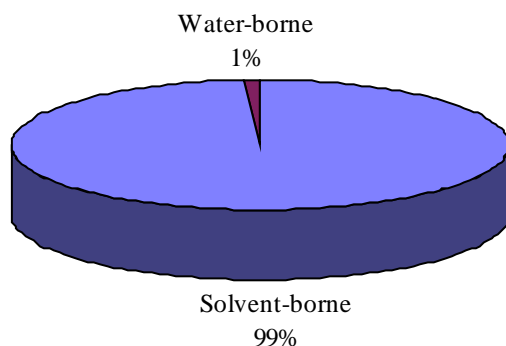
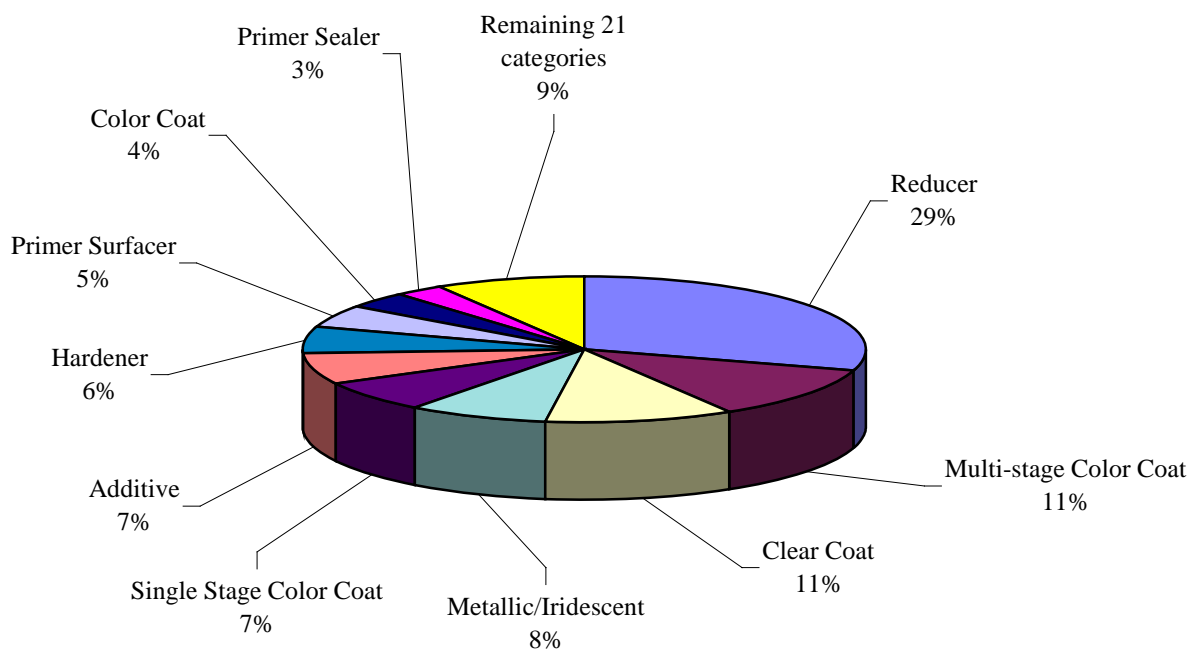
Solvent-borne and Water-borne Sales

Figure 3-2

Top 10 Coating Sales Categories

Chapter 4 – RTS VOC Contents and VOC Distribution Histograms

The 2002 Automotive Coatings Survey collected data on Ready-To-Spray (RTS) VOC regulatory and VOC actual values. This chapter contains data on average VOC regulatory and VOC actual contents that were calculated for each RTS coating category. The VOC could either be based on formulation data or U.S. EPA Method 24 laboratory results. The VOC content could be calculated using the following equations:

$$\text{VOC actual} = \frac{W_{vm} - W_w - W_e}{V_c} \quad \text{VOC regulatory} = \frac{W_{vm} - W_w - W_e}{V_c - V_w - V_e}$$

(Also known as Material VOC) (Also known as Coating VOC)

Where:

- W_{vm} = Total weight of volatile materials (VOC + water + exempt compounds) in the coating, in grams
- W_w = Weight of water in the coating, in grams
- W_e = Weight of exempt compounds in the coating, in grams
- V_c = Total volume of the coating, in liters
- V_w = Volume of water in the coating, in liters
- V_e = Volume of exempt compounds in the coating, in liters

The companies reported the Ready-To-Spray (RTS) information on form 5 of the survey, which included mixing ratios of components in RTS mixtures. The VOC content and density of each component reported on form 3, were used to calculate RTS VOC content and RTS density of these mixtures. Shown below is a formula for calculating RTS VOC actual of a mixture, containing components A, B and C:

$$\text{RTS VOC actual} = \frac{(\text{Part A} \times \text{VOC actual A}) + (\text{Part B} \times \text{VOC actual B}) + (\text{Part C} \times \text{VOC actual C})}{\text{Total Parts}}$$

The equation for calculation of RTS VOC regulatory is slightly different from the equation above. When products are mixed the VOC regulatory of the resulting mixture is not a volume-weighted average of VOC regulatory of the products used to create the mixture. The above equation still applies, however, now the W_{vm} is the result of adding the mass of volatiles from each individual product and W_e is the result of adding the mass of exempt compounds from each individual product, etc. For a three-product RTS mixture containing components A, B and C, the following equation for calculating RTS VOC regulatory applies:

$$\text{RTS VOC regulatory} = \frac{(W_{vmA} + W_{vmB} + W_{vmC}) - (W_{eA} + W_{eB} + W_{eC}) - (W_{wA} + W_{wB} + W_{wC})}{(V_{cA} + V_{cB} + V_{cC}) - (V_{eA} + V_{eB} + V_{eC}) - (V_{wA} + V_{wB} + V_{wC})}$$

The letters A, B and C are used to denote information from three different products.

This chapter includes the following data summaries:

Table 4-1: *Ready-To-Spray (RTS) Average VOC Contents*

Figures 4-1 to 4-19: *VOC Distribution Histograms*

Table 4-1 illustrates the average VOC actual and VOC regulatory values for each RTS coating category. The sales weighted average VOC content for RTS mixtures cannot be calculated because the sales of RTS coatings are not available.

Table 4-1: RTS Average VOC Contents

Coating Type	Average VOC Actual (g/l)*	Average VOC Regulatory (g/l)*	Total Number of Mixtures
Camouflage	383	410	12
Clear Coat	426	464	914
Color Coat	457	463	1792255
Flexible Primer	452	478	61
Ground Coat	499	523	4865
Metallic/Iridescent	521	546	2630
Multi Stage Color Coat	580	609	22143
Multi Stage Multicolor	546	577	26243
Other	569	586	29
Plastics Primer	557	585	106
Precoat	462	499	398
Pretreatment Wash Primer	721	736	57
Primer	354	404	201
Primer Sealer	431	458	2473
Primer Surfacer	485	510	743
Single Stage Color Coat	515	530	23565
Temporary Protective Coating	PD	PD	PD
Truck Bed Coating	PD	PD	PD
Underbody Coating	466	469	6
Undercoat	413	493	4
Uniform Finish Coating	573	584	11

* This is the arithmetic average of VOC content in RTS mixture for each coating category. The average may not represent real RTS coatings.

VOC Distribution Histograms

Percentage of RTS mixtures for each coating category has been summarized based on its VOC regulatory content to illustrate which VOC ranges have the highest percentage of RTS mixtures. Figures 4-1 through 4-19 contain charts of the percentage of RTS mixtures for each category in 50-gram/liter VOC increments.

Figure 4-1

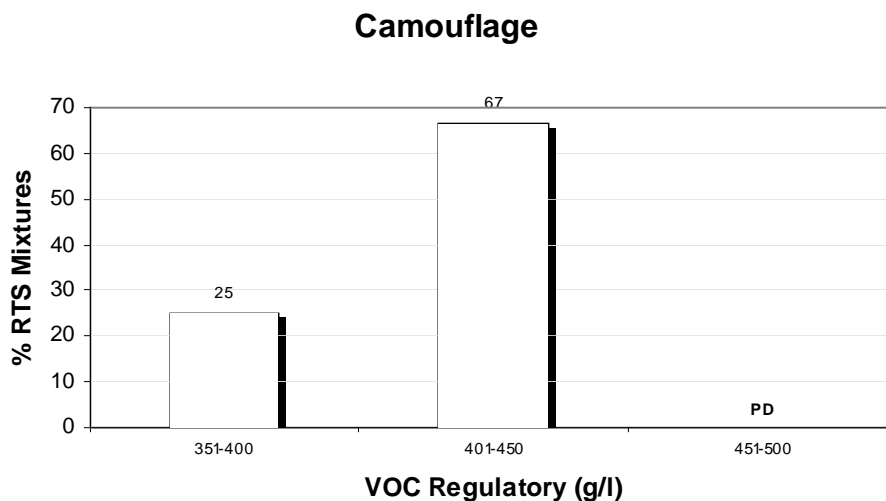


Figure 4-2

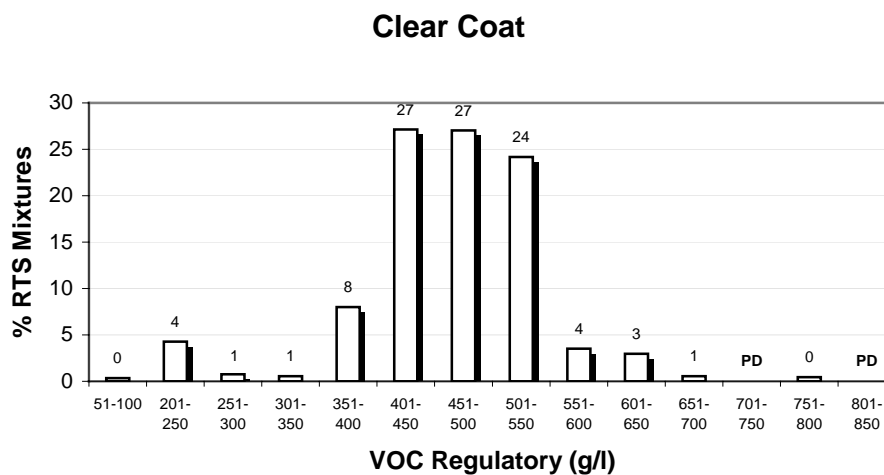


Figure 4-3

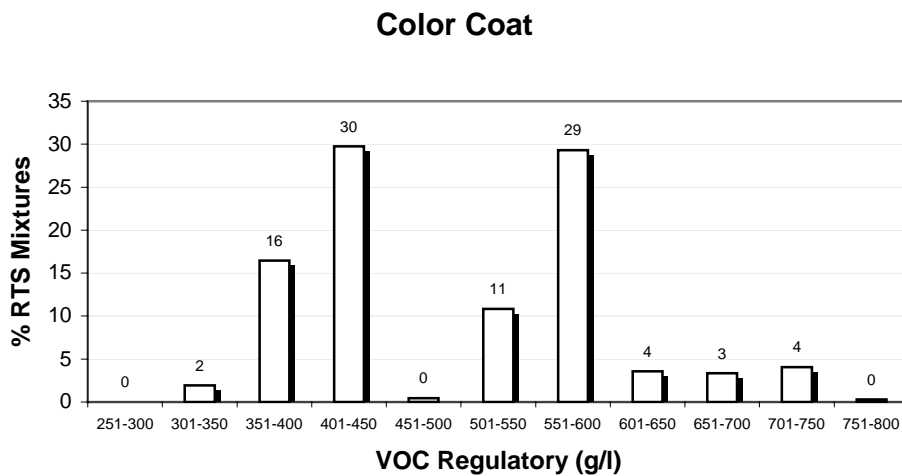


Figure 4-4

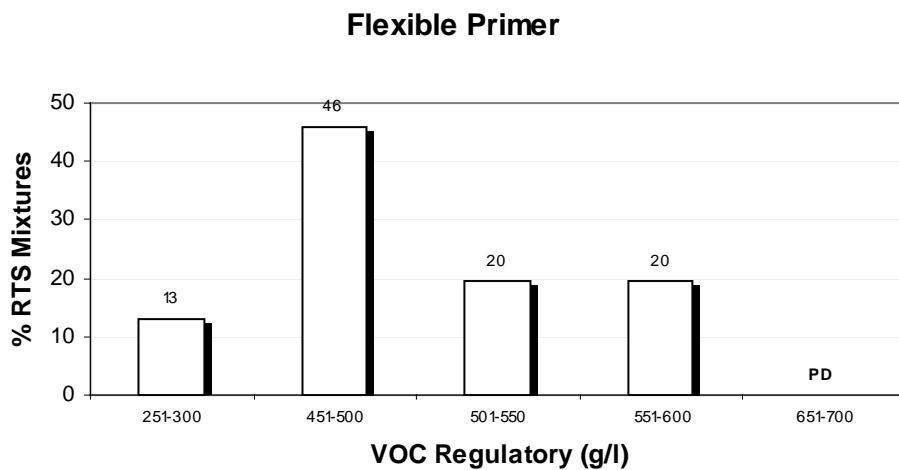


Figure 4-5

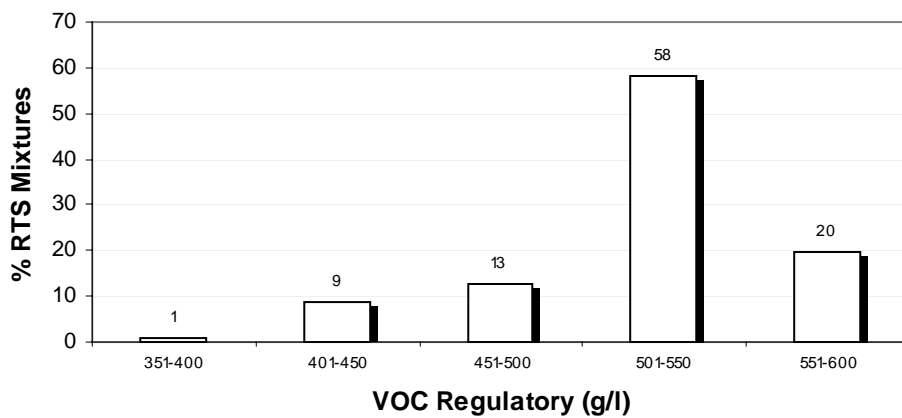
Ground Coat

Figure 4-6

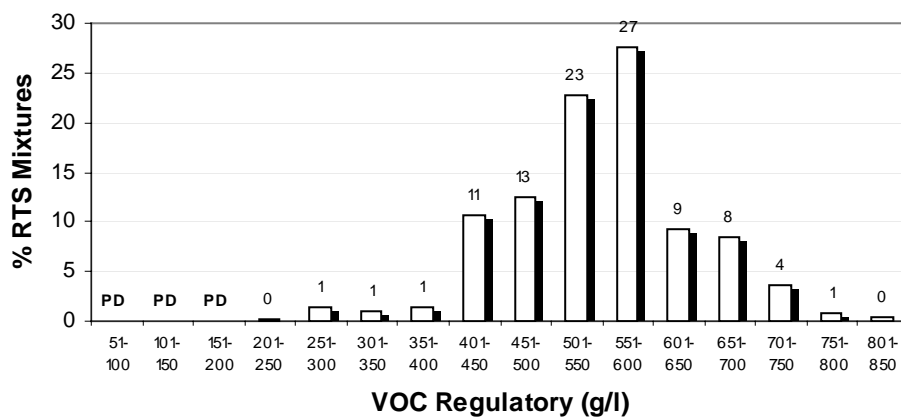
Metallic/Iridescent

Figure 4-7

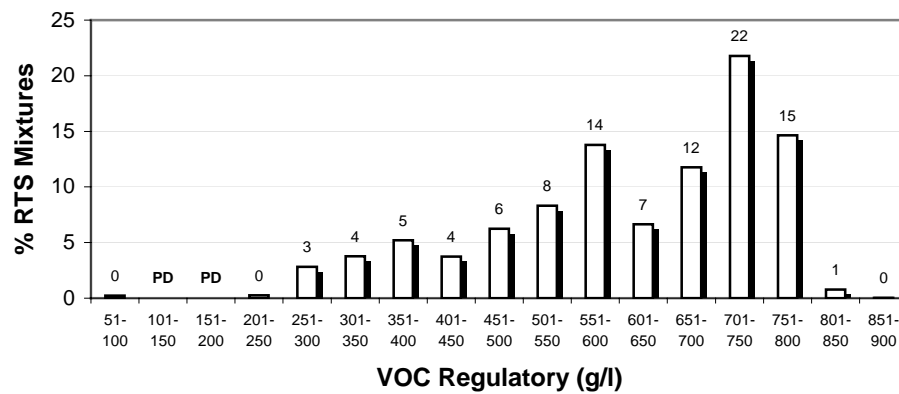
Multi Stage Color Coat

Figure 4-8

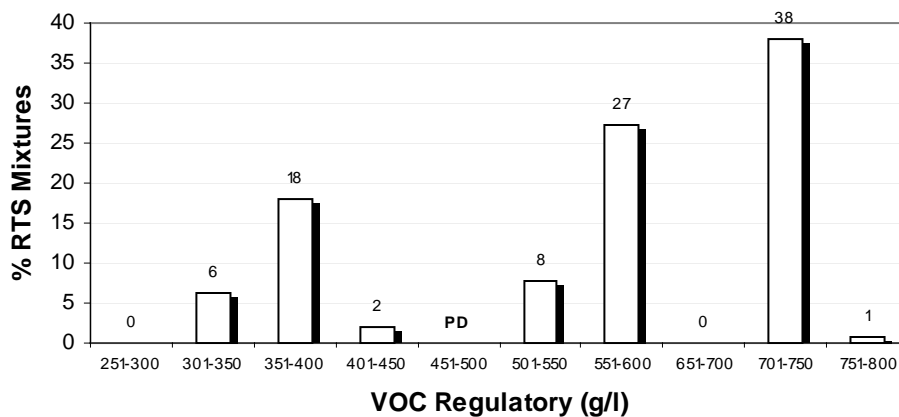
Multi Stage Multicolor

Figure 4-9

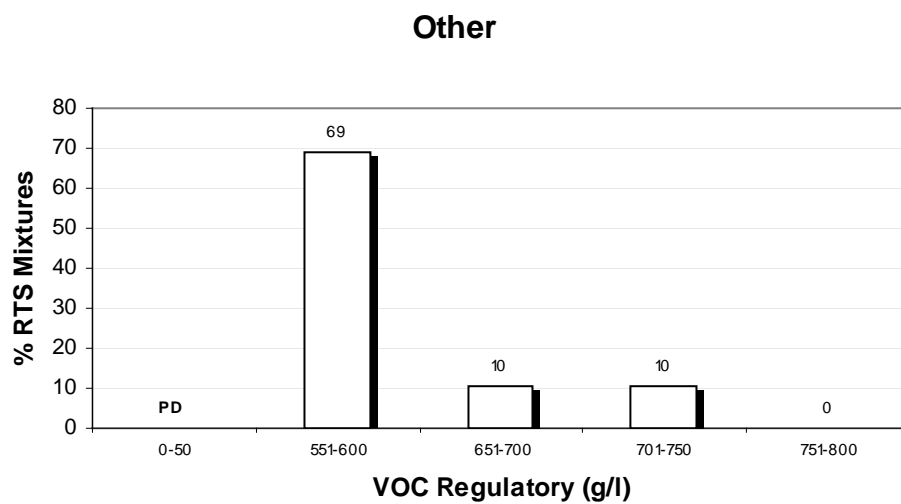


Figure 4-10

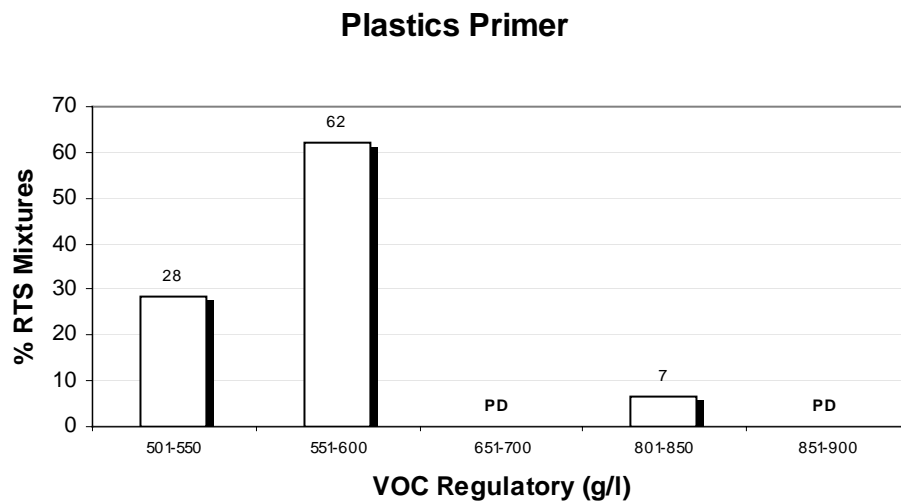


Figure 4-11

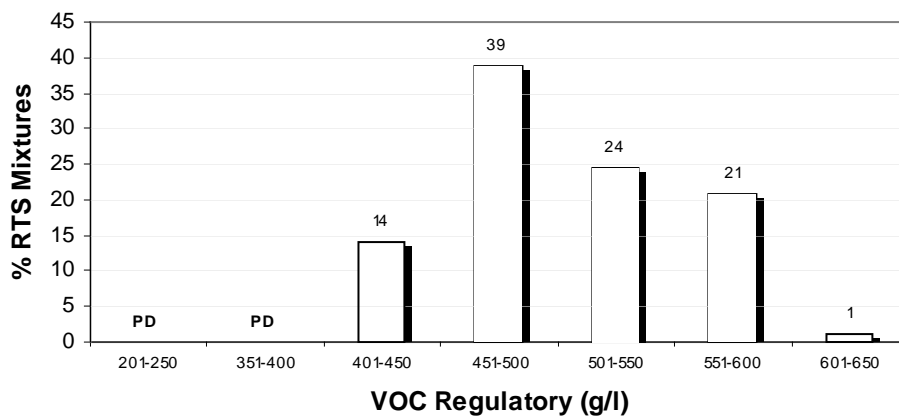
Precoat

Figure 4-12

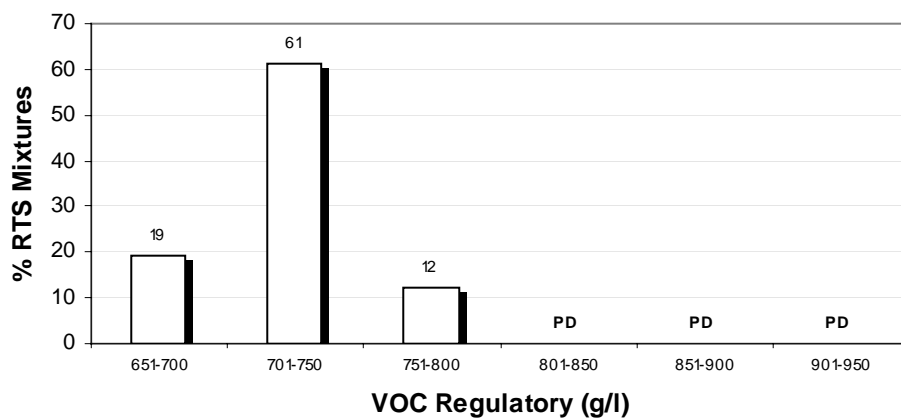
Pretreatment Wash Primer

Figure 4-13

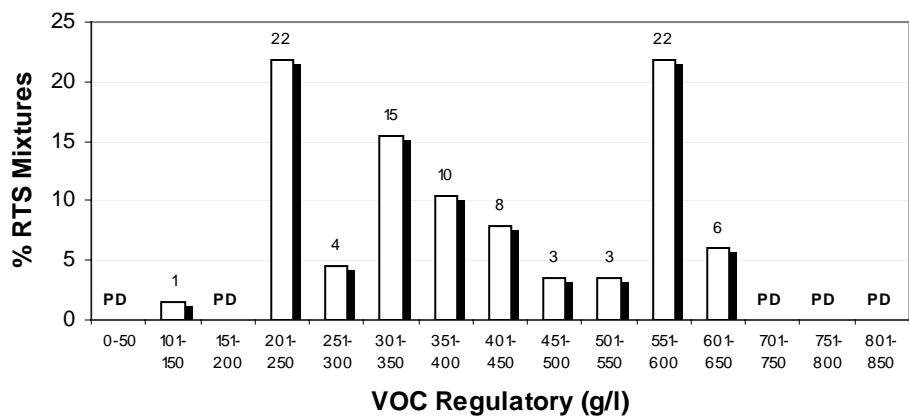
Primer

Figure 4-14

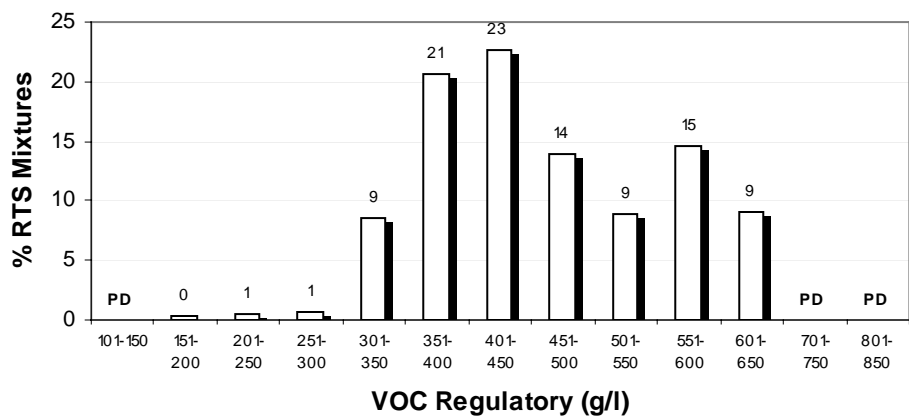
Primer Sealer

Figure 4-15

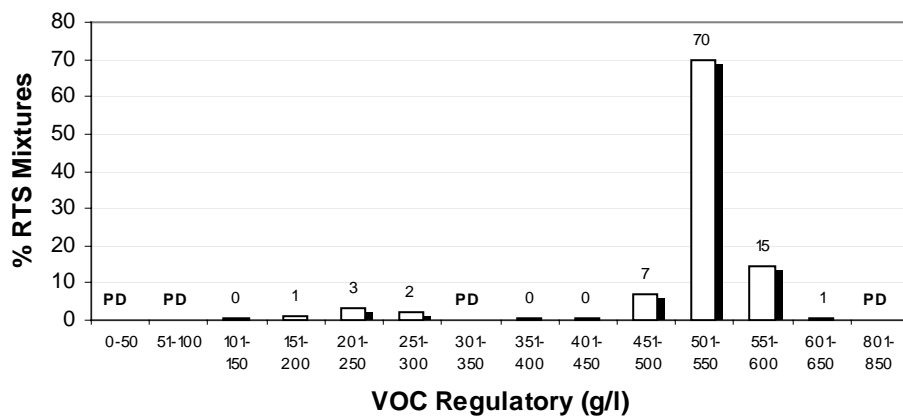
Primer Surfacer

Figure 4-16

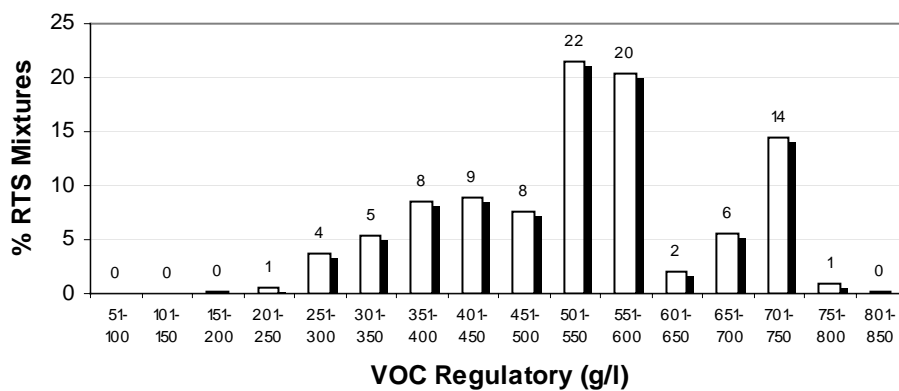
Single Stage Color Coat

Figure 4-17

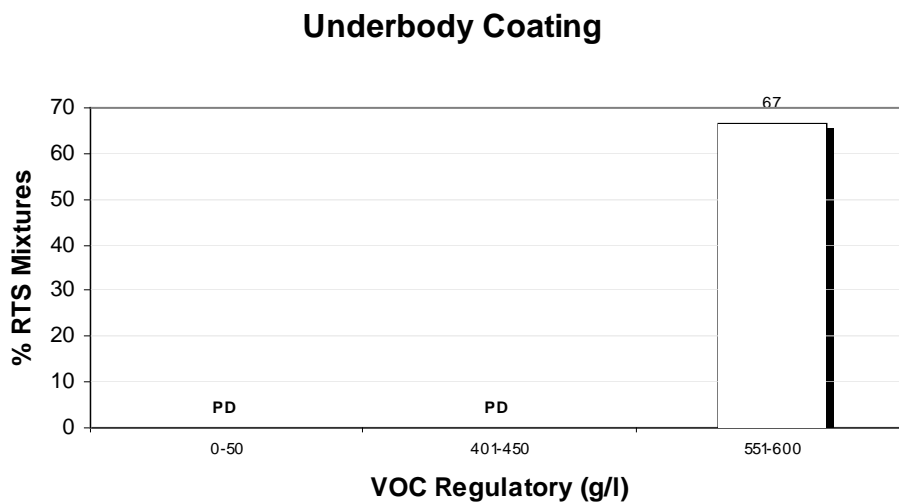


Figure 4-18

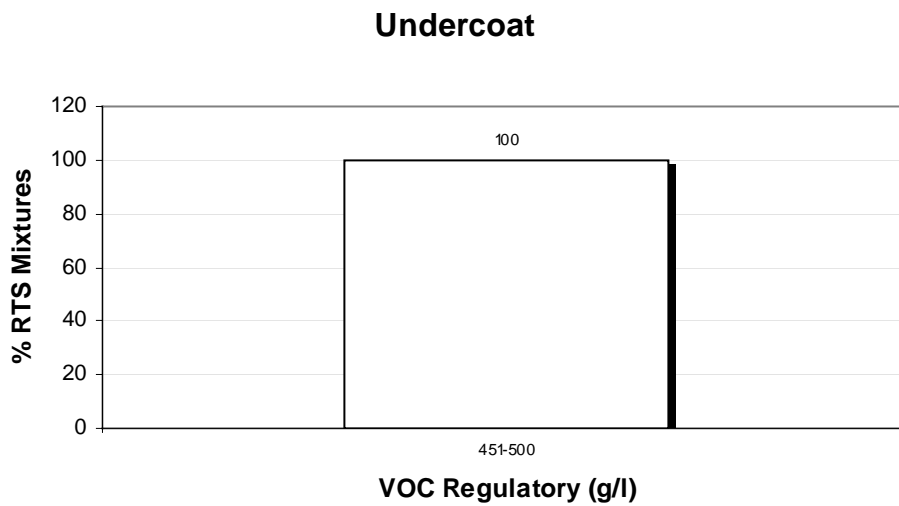
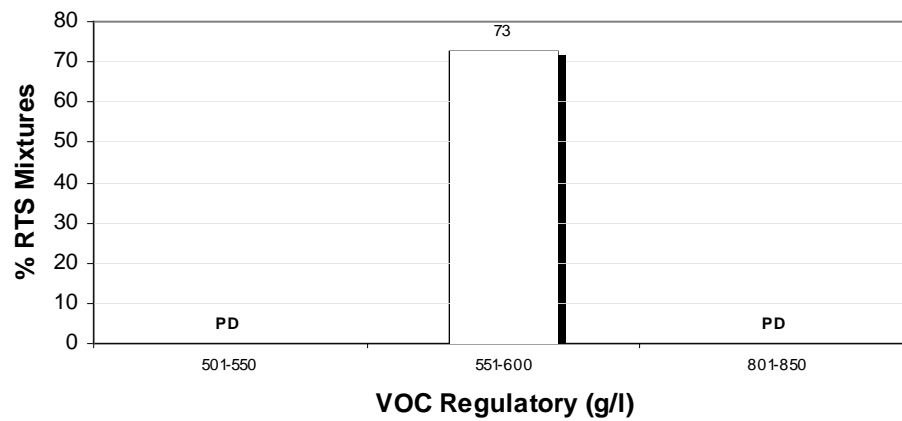


Figure 4-19

Uniform Finish Coating

Chapter 5 – VOC Emissions

The 2002 Automotive Coatings Survey collected data on VOC Actual values, which were then used to estimate VOC emissions from automotive coatings in calendar year 2001. VOC emissions were estimated using the following equations:

$$[VOC\ Emissions,\ tons/year] = [VOC\ Actual,\ g/L] * [2.205 * 10^{-3}\ lbs/g] * \\ [1\ ton/2000\ lbs] * [0.2642\ L/gal] * [Sales,\ gal/year]$$

Estimated emissions from automotive coatings were 7,549 tons per year or approximately 21 tons per day, based on survey data. These quantities do not include emissions from cleanup associated with the use of automotive coatings.

This chapter includes the following data summaries:

Table 5-1: VOC Emissions (*sorted by product category*)

Table 5-2: VOC Emissions (*sorted in descending order of total emissions*)

Figure 5-1: Top 10 Emission Categories

Table 5-1 lists VOC emissions for each product category, as well as subtotals for solvent-borne and water-borne emissions in each category. Table 5-2 provides emissions data, listed in descending order. Figure 5-1 is a chart that highlights the top ten coating categories, based on VOC emissions.

Table 5-1: VOC Emissions (sorted by product category)

Product Type	Solvent-borne	Water-borne	Total Emissions tons/year
Accelerator	19.6	N/A	19.6
Activator	99.7	0.0	99.7
Additive	648.4	0.0	648.4
Camouflage	41.2	0.2	41.4
Catalyst	61.7	N/A	61.7
Clear Coat	560.0	1.1	561.1
Color Coat	302.5	0.0	302.5
Extender	0.6	N/A	0.6
Fish Eye Eliminator	22.0	0.0	22.0
Flattener	51.7	N/A	51.7
Flexible Primer	2.6	N/A	2.6
Ground Coat	16.7	N/A	16.7
Hardener	243.7	0.2	243.9
Metallic/Iridescent	646.3	0.1	646.4
Multi Stage Color Coat	1146.3	1.5	1147.9
Other	25.4	0.0	25.4
Plasticizer	5.3	0.0	5.3
Plastics Primer	6.5	0.0	6.5
Precoat	55.8	0.0	55.8
Pretreatment Wash Primer	67.3	N/A	67.3
Primer	58.8	0.1	58.9
Primer Sealer	167.8	0.5	168.4
Primer Surfacer	163.2	3.1	166.3
Reducer	2602.6	0.1	2602.8
Single Stage Color Coat	508.0	0.2	508.2
Specialty Coating	PD	PD	PD
Temporary Protective Coating	PD	PD	PD
Truck Bed Coating	PD	PD	PD
Underbody Coating	3.0	0.0	3.0
Undercoat	0.6	N/A	0.6
Uniform Finish Coating	13.9	N/A	13.9
Total (tons/year)	7541.4	7.3	7548.7
Total (tons/day)	20.7	0.0	20.7

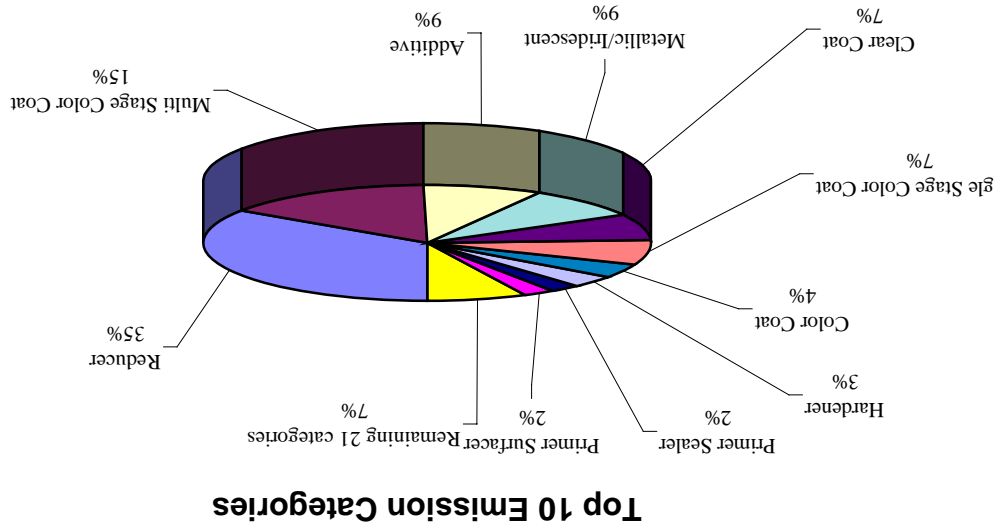
Note: Due to rounding some VOC emissions values in Table 5-1 appear as 0.0. This means that VOC emissions exist, however, in very small amounts.

Table 5-2: VOC Emissions (sorted in descending order of total emissions)

Product Type	Solvent-borne	Water-borne	Total Emissions tons/year
Reducer	2602.7	0.1	2602.8
Multi Stage Color Coat	1146.3	1.5	1147.9
Additive	648.4	N/A	648.4
Metallic/Iridescent	646.4	0.1	646.5
Clear Coat	560.0	1.1	561.1
Single Stage Color Coat	508.3	0.2	508.5
Color Coat	302.5	0.0	302.5
Hardener	243.7	0.2	243.9
Primer Sealer	167.8	0.5	168.4
Primer Surfacer	163.2	3.1	166.3
Activator	99.7	0.0	99.8
Pretreatment Wash Primer	67.3	N/A	67.3
Catalyst	61.7	N/A	61.7
Primer	58.9	0.1	58.9
Precoat	55.8	0.0	55.8
Flattener	51.7	N/A	51.7
Camouflage	41.2	0.2	41.4
Other	25.4	0.0	25.4
Fish Eye Eliminator	22.0	0.0	22.0
Accelerator	19.6	N/A	19.6
Ground Coat	16.7	N/A	16.7
Uniform Finish Coating	13.9	N/A	13.9
Plastics Primer	6.5	0.0	6.5
Plasticizer	5.3	0.0	5.3
Underbody Coating	3.0	0.0	3.0
Flexible Primer	2.6	N/A	2.6
Extender	0.6	N/A	0.6
Undercoat	0.6	N/A	0.6
Truck Bed Coating	PD	PD	PD
Temporary Protective Coating	PD	PD	PD
Specialty Coating	PD	PD	PD
Total (tons/year)	7541.9	7.3	7549.2
Total (tons/day)	20.7	0.0	20.7

Note: Due to rounding some VOC emissions values in Table 5-2 appear as 0.0. This means that VOC emissions exist, however, in very small amounts.

Figure 5-1



Chapter 6 – RTS Weight Percents, Volume Percents, and Densities

The 2002 survey gathered data on the percent by weight and volume of solids and volatiles, and the density of products sold. It includes the following physical parameter data:

- Solids Percent by Weight
- Volatiles Percent by Weight
- Water Percent by Weight
- Exempt Compounds Percent by Weight
- Solids Percent by Volume
- Volatiles Percent by Volume
- Water Percent by Volume
- Exempt Compounds Percent by Volume
- Coating Density

The companies reported these physical parameters for each component in the Ready-To-Spray (RTS) coating. They also reported the RTS information on form 5 of the survey, which included mixing ratios or parts of these components in RTS coatings. The weight percents of solids, volatiles, exempts and water in the RTS coating are calculated using the following equation:

$$RTS\ Coating\ Weight\ \% = \frac{\sum_{i=1}^n (Parts \times Weight\ \% \times \rho)_i}{\sum_{i=1}^n (Parts \times \rho)_i}$$

where,

i = RTS coating component

$Weight\ \%$ = weight % (solids, volatiles, exempts or water) in the RTS coating component

ρ = density of RTS coating component

The volume percents of solids, volatiles, exempts, and water in the RTS coating and the density of the RTS coating are calculated using the following equation:

$$RTS\ Coating\ Volume\ \% = \frac{\sum_{i=1}^n (Parts \times Volume\ \%)_i}{\sum_{i=1}^n Parts_i}$$

where,

i = RTS coating component

$Volume\ \%$ = volume % (solids, volatiles, exempts or water) in the RTS coating component

To calculate the density of the RTS coating, substitute the component density for the component volume % in the above equation.

This chapter includes the following data summaries:

Table 6-1: RTS Average Weight Percents (Solids, Volatiles, Water, Exempts and VOC)

Table 6-2: RTS Average Volume Percents (Solids, Volatiles, Water, Exempts and VOC)

Table 6-3: RTS Average Coatings Densities

Table 6-1 contains the RTS average values for weight percentages in each category. Table 6-2 contains the RTS average volume percentages and Table 6-3 contains the RTS average coating densities.

Table 6-1: RTS Average Weight Percents* (Solids, Volatiles, Water, Exempts and VOC)

Coating Type	Average Weight % Solids	Average Weight % Volatiles	Average Weight % Exempts	Average Weight % Water	Average Weight % VOC
Camouflage	63.2	36.8	0.0	6.1	30.8
Clear Coat	46.3	53.7	10.3	0.0	43.3
Color Coat	54.1	45.9	1.5	0.0	44.5
Flexible Primer	56.8	43.2	5.3	0.0	37.9
Ground Coat	55.9	44.1	3.7	0.0	40.4
Metallic/Iridescent	43.8	56.2	4.1	0.0	52.1
Multi Stage Color Coat	36.0	64.0	3.8	0.4	59.7
Multi Stage Multicolor	37.3	62.7	6.3	0.0	56.4
Other	35.8	64.2	2.1	3.4	58.7
Plastics Primer	47.3	52.7	3.4	0.0	49.3
Precoat	56.1	43.9	6.3	0.1	37.5
Pretreatment Wash Primer	23.1	76.9	1.2	0.6	75.1
Primer	62.4	37.6	9.8	0.2	27.7
Primer Sealer	58.9	41.1	4.9	0.1	36.2
Primer Surfacer	53.3	46.7	4.5	1.0	41.1
Single Stage Color Coat	46.4	53.6	3.2	0.0	50.4
Temporary Protective Coating	PD	PD	PD	PD	PD
Truck Bed Coating	PD	PD	PD	PD	PD
Underbody Coating	39.7	60.3	0.0	7.7	52.7
Undercoat	53.0	47.0	11.1	0.0	35.8
Uniform Finish Coating	36.9	63.1	1.8	0.0	61.3

* These are arithmetic average values. As an example, the average solids weight percent in RTS camouflage coating was obtained by calculating the average of solids weight percent of all RTS products labeled as camouflage coating.

Table 6-2: RTS Average Volume Percents* (Solids, Volatiles, Water, Exempts and VOC)

Coating Type	Average Volume % Solids	Average Volume % Volatiles	Average Volume % Exempts	Average Volume % Water	Average Volume % VOC
Camouflage	47.2	52.8	0.0	7.1	45.8
Clear Coat	41.0	59.0	9.6	0.0	49.4
Color Coat	45.7	54.3	1.4	0.0	53.0
Flexible Primer	40.9	59.1	5.2	0.0	53.8
Ground Coat	37.2	62.8	4.9	0.0	57.9
Metallic/Iridescent	33.2	66.8	4.7	0.0	62.1
Multi Stage Color Coat	27.0	73.0	4.4	0.4	68.2
Multi Stage Multicolor	29.2	70.9	6.8	0.0	64.1
Other	29.5	70.5	2.5	3.4	64.5
Plastics Primer	29.4	70.6	5.0	0.0	65.6
Precoat	38.1	61.9	7.7	0.1	54.0
Pretreatment Wash Primer	11.2	88.8	1.4	0.6	86.8
Primer	43.9	56.1	14.1	0.3	41.7
Primer Sealer	42.7	57.3	6.5	0.1	50.7
Primer Surfacer	36.8	63.2	5.5	1.1	56.6
Single Stage Color Coat	36.9	63.1	3.2	0.0	59.9
Temporary Protective Coating	PD	PD	PD	PD	PD
Truck Bed Coating	PD	PD	PD	PD	PD
Underbody Coating	28.7	71.3	0.0	7.7	63.6
Undercoat	33.5	66.5	16.2	0.0	50.3
Uniform Finish Coating	32.4	67.6	2.1	0.0	65.5

* These are arithmetic average values. As an example, the average solids volume percent in RTS camouflage coating was obtained by calculating the average of solids volume percent of all RTS products labeled as camouflage coating.

Table 6-3: RTS Average Coating Densities*

Coating Type	Average RTS Density (lbs/gal)
Camouflage	10.4
Clear Coat	8.3
Color Coat	8.2
Flexible Primer	10.2
Ground Coat	10.3
Metallic/Iridescent	8.8
Multi Stage Color Coat	9.0
Multi Stage Multicolor	8.2
Other	8.2
Plastics Primer	9.6
Precoat	10.4
Pretreatment Wash Primer	8.0
Primer	11.4
Primer Sealer	10.3
Primer Surfacer	10.2
Single Stage Color Coat	9.1
Temporary Protective Coating	PD
Truck Bed Coating	PD
Underbody Coating	7.9
Undercoat	9.6
Uniform Finish Coating	7.8

* These are arithmetic average values. As an example, the average density in RTS camouflage coating was obtained by calculating the average density of all RTS products labeled as camouflage coating.

Chapter 7 – Ingredients

The 2002 survey gathered speciation data for all ingredients. The ingredient data were collected for all ingredients that amounted to at least 0.1% (by weight) of each coating. It will be used to update ARB's speciation profiles in the emissions inventory for automotive refinish coatings. The quantity of VOC ingredients summarized in this chapter is very close to the quantity of VOC emissions calculated in Chapter 5. This indicates a good correlation between the speciated ingredient data and the data that are used to calculate VOC Actual values.

This chapter includes the following data summaries:

Table 7-1: *VOC Ingredients (sorted by weight)*

Table 7-2: *Exempt Compounds (sorted by weight)*

Table 7-1 lists the quantities of reported ingredients that are classified as VOCs. It identifies ingredients that constitute 95% by weight of the reported VOCs and lumps the remaining VOCs. Table 7-2 identifies the exempt compounds reported.

Table 7-1: VOC Ingredients (sorted by weight)

Ingredient Name	CAS #	Sales Quantity (lbs)
n-Butyl Acetate	123-86-4	3,106,886
Xylene	1330-20-7	1,713,431
Toluene	108-88-3	1,619,395
Methyl n-Amyl Ketone	110-43-0	800,183
Propylene Glycol Monomethyl Ether Acetate	108-65-6	642,594
VM & Painters Naphtha	64742-89-8	635,660
Methyl Ethyl Ketone	78-93-3	609,649
Isopropanol	67-63-0	471,009
Methyl Isobutyl Ketone	108-10-1	434,342
Heptane	142-82-5	327,762
Ethyl Benzene	100-41-4	302,526
Ethyl 3-Ethoxypropionate	763-69-9	254,502
Cellulose Acetate Butyrate	9004-36-8	245,027
VM&P Naphtha	8032-32-4	236,978
Ethyl Acetate	141-78-6	234,550
n-Butanol	71-36-3	228,477
Aromatic 100	64742-95-6	219,170
Styrene	100-42-5	192,624
2-Butoxyethyl Acetate	112-07-2	167,151
Medium Aliphatic Solvent Naphtha	64742-88-7	146,482
Petroleum Ether	8032-32-4	144,768
1,3,4-Trimethylbenzene	95-63-6	108,435
n-Butyl Propionate	590-01-2	101,877
2-Heptanone	110-43-0	96,463
Butyl Acetate	123-86-4	94,303
Isophorone Diisocyanate Polymer	4098-71-9	74,260
Isobutyl Acetate	110-19-0	71,170
Methyl Isoamyl Ketone	110-12-3	68,280
Methanol	67-56-1	65,370
Isophorone Diisocyanate Adduct Soln	CERT. LTR.	61,165
Hydrotreated Heavy Naphtha	64742-48-9	57,340
2-Pentanone	107-87-9	55,862
n-Heptane	142-82-5	52,574
Methylcyclohexane	108-87-2	52,399
Acetic Acid, Hexyl Esters Mixture	88230-35-7	50,844
5-Methyl-3-Heptanone	541-85-5	47,792
1-Methoxy-2-Propanol	107-98-2	42,732
Stoddard Solvent	8052-41-3	42,412
Naphtha, Petroleum, Hydrotreated Light	64742-49-0	32,682
Isobutyl Alcohol	78-83-1	32,185
Isopropyl Alcohol	67-63-0	31,652
Benzoyl Peroxide	94-36-0	29,839

Table 7-1: VOC Ingredients (sorted by weight)

Ingredient Name	CAS #	Sales Quantity (lbs)
2-Butoxyethanol	111-76-2	28,571
2,4-Pentanedione	123-54-6	26,936
1,3 Benzenedicarboxylic Acid	25950-34-9	25,937
Methyl Isobutyl Carbinol	108-11-2	25,753
Acetic Acid, C6-C8 Branched Alkyl Esters	90438-79-2	21,949
Remaining 5% by weight of VOC Ingredients	N/A	749,601
Total VOC Ingredients (lbs)		14,881,551
Total VOC Ingredients (tons/day)		20.4

Table 7-2: Exempt Compounds (sorted by weight)

Ingredient Name	CAS #	Sales Quantity (lbs)
Acetone	67-64-1	3,104,713
Parachlorobenzotrifluoride	98-56-6	1,701,427
Octamethylcyclotetrasiloxane	556-67-2	1,488
Methyl Acetate	79-20-9	912
Decamethylcyclopentasiloxane	541-02-6	752
Total Exempt Compounds		4,809,292

APPENDIX

2002 Automotive Refinish Coatings Survey Package



Winston H. Hickox
Agency Secretary

Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman

1001 I Street • P.O. Box 2815 • Sacramento, California 95812 • www.arb.ca.gov



Gray Davis
Governor

June 26, 2002

Dear Sir or Madam:

We are requesting your participation in a study of automotive refinish coatings sold in California. The purpose of the study is to gather current information on the content and properties of automotive refinish coatings. Automotive refinish coatings are defined as coatings applied to motor vehicles and/or mobile equipment. This survey was developed in consultation with several coating manufacturers, the National Paint and Coatings Association, and local air districts.

Who must complete the survey. If your company manufactures automotive refinish coatings *and* sold or distributed any of these products in California in the year 2001, you are required to complete the survey.

Others who must complete the survey. If your company is not an automotive refinish coating manufacturer, but your company name is listed as "manufactured for" or "distributed by" on the product label, you are responsible for either completing the survey, or ensuring that the manufacturer of your products includes your products in their survey submission. Parent companies and holding companies may need to either complete the survey, or oversee reporting by their subsidiaries. If you are not the correct person to complete the survey for your company, please forward this document to the appropriate individual. If you do not meet any of the criteria listed for completing the survey as described in this paragraph, you need only complete Form 1 and return it to the address on the top of the form.

Legal authority and confidentiality. This request for information is made pursuant to sections 39607, 39701, and 41511 of the California Health and Safety Code, and title 17, California Code of Regulations, section 91100. These sections authorize the Air Resources Board to require the submission of information needed to estimate atmospheric emissions and to carry out its other statutory responsibilities. If you so request, survey data will be treated as confidential information, in accordance with title 17, California Code of Regulations, section 91000 to 91022 and the California Public Records Act (Government Code section 6250 et seq.).

Survey booklet. The enclosed survey package consists of:

- Part A – Survey Forms and Instructions
- Part B – Supplemental Information (Definitions, VOC Calculations, etc.)
- Part C – Example of Completed Survey Forms

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

Sir or Madam

Page 2

The survey package, and information on how to complete the survey electronically, are available on our website at: www.arb.ca.gov/coatings/auto/survey/2002survey.htm.

Uses for survey information. This information is important to improve California's emissions inventory, to assess advances in coatings technology, and to ensure that the automotive refinish coatings industry receives credit for emission reductions already achieved. The information from this survey may also be used to evaluate the feasibility of developing mass-based or reactivity-based control strategies for automotive refinish coatings.

Due date. Please submit the completed survey to the ARB by **September 30, 2002**. The mailing address is at the top of each page of the survey forms. For overnight delivery, please use our street address: **1001 I Street, Sacramento, California 95814**. We appreciate your promptness in completing the survey.

Questions? If you have questions about completing the survey, please contact Mr. David Mehl, Project Lead, at (916) 324-8177, or by e-mail at dmehl@arb.ca.gov. For general questions, please contact Mr. Jose Gomez, Manager, Technical Development Section, at (916) 324-8033, or by e-mail at jgomez@arb.ca.gov.

Sincerely,

Barbara Fry, Chief
Measures Assessment Branch
Stationary Source Division

cc: Mr. Jose Gomez, Manager
Technical Development Section

Mr. David Mehl
Air Resources Engineer
Technical Development Section

Enclosure

2002 Automotive Coatings Survey

(Refinish Coatings Only)

California Environmental Protection Agency

Air Resources Board

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2002 AUTOMOTIVE COATINGS SURVEY

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SUBMITTAL OF FORMS

Please return the completed survey to the following address:

Regular Mail

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
ATTN: SSD / Measures Assessment Branch
Automotive Coatings Survey

Overnight

California EPA Headquarters Building
Air Resources Board (6th Floor)
1001 I Street
Sacramento, CA 95814
ATTN: SSD / Measures Assessment Branch
Automotive Coatings Survey

ELECTRONIC SUBMITTAL OPTIONS

Electronic submittal options are available. Details can be obtained by contacting the ARB or by visiting our web site at “www.arb.ca.gov/coatings/auto/survey/2002survey.htm.” Additional survey packages can also be downloaded from this site.

QUESTIONS

If you have any questions or other requests please contact any of the following staff:

Name	Phone	Email
Jose Gomez, Manager	916-324-8033	jgomez@arb.ca.gov
Dave Mehl, Survey Lead	916-324-8177	dmehl@arb.ca.gov
Gary Mouradian	916-324-8175	gmouradi@arb.ca.gov
Mark Watkins	916-323-9687	mwatkins@arb.ca.gov

2002 Automotive Coatings Survey

PART A

SURVEY FORMS AND INSTRUCTIONS

DUE DATE: SEPTEMBER 30, 2002

2002 California Automotive Coatings Survey		
Air Resources Board, P.O. Box 2815 - Sacramento, CA 95812 - Attention: Stationary Source Division, Measures Assessment Branch		
Phone: 916.324.8023	FAX: 916.324.8026	www.arb.ca.gov/coatings/auto/survey/2002survey.htm

CONFIDENTIAL INFORMATION SUBMITTAL FORM

If you wish to designate any information contained in your survey data as **CONFIDENTIAL INFORMATION**, please provide the data requested below and return it with your completed survey forms.

In accordance with Title 17, California Code of Regulations (CCR), sections 91000 to 91022, and the California Public Records Act (Government Code Section 6250 et seq.), the information that a company provides to the Air Resources Board (ARB) may be released: (1) to the public upon request, except trade secrets which are not emission data or other information which is exempt from disclosure or the disclosure of which is prohibited by law; (2) to the Federal Environmental Protection Agency (EPA), which protects trade secrets as provided in Section 114(c) of the Clean Air Act and amendments thereto (42 USC 7401 et seq.) and in federal regulation; and, (3) to other public agencies provided that those agencies preserve the protections afforded information which is identified as a trade secret, or otherwise exempt from disclosure by law (Section 39660(e)).

Trade secrets as defined in Government Code Section 6254.7 are not public records and therefore will not be released to the public. However, the California Public Records Act provides that air pollution emission data are always public records, even if the data comes within the definition of trade secrets. On the other hand, the information used to calculate air pollution emissions may be withheld from the public if the information is a trade secret.

If any company believes that any of the information it provides is a trade secret or otherwise exempt from disclosure under any other provision of law, **it must identify the confidential information as such at the time of submission to the ARB and must provide the name, address, and telephone number of the individual to be consulted** if the ARB receives a request for disclosure or seeks to disclose the data claimed to be confidential. The ARB may ask the company to provide documentation of its claim of trade secret or exemption at a later date. Data identified as confidential will not be disclosed unless the ARB determines, in accordance with the above referenced regulations, that the data does not qualify for a legal exemption from disclosure. These regulations establish substantial safeguards before any such disclosure.

In accordance with the provisions of Title 17, California Code of Regulations, sections 91000 to 91022, and the California Public Records Act (Government Code Sections 6250 et seq.),

Company Name: _____ declares that only those portions ***specifically identified*** and submitted in response to the California Air Resources Board's information request on the survey are confidential "**trade secret**" information, and requests that it be protected as such from public disclosure. All inquiries pertaining to the confidentiality of this information should be directed to the following person:

Name (please print): _____

Signature: _____

Title: _____

Telephone #: _____

Mailing Address: _____

2002 California Automotive Coatings Survey

Air Resources Board, P.O. Box 2815 - Sacramento, CA 95812 - Attention: Stationary Source Division, Measures Assessment Branch

Phone: 916.324.8023

FAX: 916.324.8026

www.arb.ca.gov/coatings/auto/survey/2002survey.htm

FORM 1**General Information – Reporting Year 2001**

Company Name:		Web Site:	
Division:			
Address:			
City:	State:		Zip:
Contact Person:		Position:	
Phone:	FAX:	e-mail:	

- 1) Did your company manufacture and distribute coatings in 2001 (for use in California) for motor vehicles or mobile equipment, or coatings that you know to be used in those types of applications? **YES NO**
- 2) Did your company distribute coatings in 2001 (for use in California) manufactured by another company, which are for motor vehicles or mobile equipment, or that you know are used in those types of applications? **YES NO**
If yes, please list these companies along with a mailing address and contact person. (Please use a separate sheet of paper labeled as question 2.)
- 3) Did your company manufacture coatings for another company to distribute in 2001 that are for motor vehicles or mobile equipment, or that you know are used in those types of applications? **YES NO**
If yes, please list these companies along with a mailing address and contact person. (Please use a separate sheet of paper labeled as question 3.)
- 4) Is your company a wholly owned subsidiary of another company? **YES NO**
If yes, please list the name of the parent company along with a contact person's name and position, complete mailing address, telephone and facsimile numbers, and an e-mail address for the contact person. (Please use a separate sheet of paper labeled as question 4.)

If you answered "Yes" to question 1, 2 or 3 please complete the remainder of the survey prior to returning it to the ARB. If you answered "No" to all these questions, please return only this form.

CERTIFICATION by Authorized Official

I hereby certify that, to the best of my knowledge and belief, all information entered on Form 1 – General Information, Form 2 – Company Information, Form 3 – Product Information, Form 4 – Ingredient Information, and Form 5 Ready-To-Spray Information is complete and accurate.

Name:	Position:
Signature:	Date:

2002 California Automotive Coatings Survey

Air Resources Board, P.O. Box 2815 - Sacramento, CA 95812 - Attention: Stationary Source Division, Measures Assessment Branch

Phone: 916.324.8023

FAX: 916.324.8026

www.arb.ca.gov/coatings/auto/survey/2002survey.htm

FORM 2

Company Information – Reporting Year 2001

Type of Business (check all that apply) <input type="checkbox"/> Manufacturer <input type="checkbox"/> Importer <input type="checkbox"/> Retail Distributor <input type="checkbox"/> Wholesale Distributor <input type="checkbox"/> Private Label Manufacturer <input type="checkbox"/> Toll Manufacturer <input type="checkbox"/> Other (Specify):	Company Marketing Classification (check one) <input type="checkbox"/> International <input type="checkbox"/> National <input type="checkbox"/> Regional (e.g., western U.S.) list: <input type="checkbox"/> California Statewide <input type="checkbox"/> California Region (e.g. Southern California) list:
Company – Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 500,000 <input type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion	Company – California Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 500,000 <input type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion
Automotive Coatings – Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 500,000 <input type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion	Automotive Coatings – California Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 500,000 <input type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion
Employees for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 10 <input type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more	Employees – California for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 10 <input type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more
Automotive Coatings Employees for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 10 <input type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more	Automotive Coatings Employees – California for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 10 <input type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more
How did you determine California Year 2001 Sales Volume? (check all that apply) <input type="checkbox"/> Direct California retail sales <input type="checkbox"/> Prorated from national retail sales <input type="checkbox"/> Direct California wholesale distribution <input type="checkbox"/> Prorated from national wholesale distribution <input type="checkbox"/> Other (explain):	

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FORM 3**Product Information – Reporting Year 2001**

Entry # : *	
Product Code:	
Product Name:	
Brand and Product Line(s):	

Physical And Other Data

Type Code (10 – 60)	Specify (for codes 10, 20, 40 and 60 only)	Coverage (ft ² /gal)	Recommended Thickness (mil)	Water or Solvent Borne (W or S)	Density (lbs/gal)

Weight Percent				Volume Percent			
Solids	Volatile Material	Water	Exempts	Solids	Volatile Material	Water	Exempts

As Packaged	
VOC Actual (g/l)	VOC Regulatory - Less Water & Exempts (g/l)

2001 California Sales (gallons)

* Note: This entry # must also appear on your corresponding FORM 4.

Page _____ of _____ Enter the current page # out of the total pages submitted.

NOTE: Each FORM 3 must have a corresponding FORM 4.

Photocopy this page as necessary

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FORM 5

Ready-To-Spray (RTS) Information – Reporting Year 2001

Note: RTS mixtures within a single product line may be grouped if the mixing ratios remain constant and all possible combinations are viable products.

For each combination of products listed in Form 3 that requires mixing to be RTS please list the following:

Ready-To-Spray Mixture #				
Mixing Components Entry #: (from Form 3)				
Mixing Ratio:				
Recommended Thickness (mil)				

Production Cost (\$/gal)		
Minimum	Sales Weighted Average	Maximum

If grouping 4 or more RTS mixtures from the top table please complete both of the following tables. If reporting one RTS mixture or grouping 3 or less RTS mixtures, please complete just the appropriate number of columns of the first table.

	low	median	high
VOC regulatory			
Color			
Density			
Coverage			
VOC actual			

	Low	median	high
VOC actual			
Color			
Coverage			
Density			
VOC regulatory			

Page _____ of _____ Enter the current page # out of the total pages submitted.

Photocopy this page as necessary

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Form 1 Instructions

General Information – Reporting Year 2001

The information requested on Form 1 will be used by the California Air Resources Board to determine what companies distribute motor vehicle and mobile equipment coatings (automotive coatings) for sale in California. These companies will be required to complete the survey, based on the coatings sold in calendar year 2001. If your company is not a paint manufacturer, but is listed as “manufactured for” or “distributed by” on the product label, you are responsible for completing the requested information in this survey. You are encouraged to coordinate your responses with the appropriate manufacturer of your product to avoid double reporting of data. Holding companies or subsidiaries may also need to complete this survey.

Company Name: The legal business name of your company. If you are completing this survey for more than one company, please submit different surveys for each company.

Web Site: The company web site address, for example, www.paintcompany.com.

Division: If the company has multiple divisions, please specify which division this survey was completed for.

Address: Enter street address or post office box of your company where mail is received.

City: The city where mail is received.

State: The state where mail is received.

Zip: Enter the postal zip code at which mail is received

Contact Person: Name of the person to be contacted if there are questions about survey responses.

Position: Business position of the contact person.

Phone: Telephone number of the contact person.

Fax: Fax number of the contact person.

e-mail: e-mail address of the contact person.

Please answer questions 1 through 4. List requested information where appropriate.

If you answered yes to question 1, 2 or 3, please also complete Forms 2, 3, 4 and 5. If you answered no to these questions, please return only the completed Form 1 to the ARB at the address listed on page 2.

Certification: Please have a responsible company officer (President, Treasurer, Secretary, or Vice-President of a principle business function) certify that the General Information (Form 1), Company Information (Form 2), Product Information (Form 3), Ingredient Information (Form 4), and Ready-To-Spray Information (Form 5) is complete and accurate. This person is to clearly print or type his name and business position, and sign and date the form where indicated.

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Form 2 Instructions

Company Information – Reporting Year 2001

Type of Business: Check all boxes that describe the types of business conducted by your company.

Manufacturer – A company that produces, packages, or repackages motor vehicle or mobile equipment coatings for sale or distribution in California.

Importer – A company that brings motor vehicle or mobile equipment coatings into the United States for sale or distribution within California.

Retail Distributor – A company who sells or supplies motor vehicle or mobile equipment coatings at the retail level.

Wholesale Distributor – A company who sells or supplies motor vehicle or mobile equipment coatings for the purpose of resale or distribution in commerce at the wholesale level.

Private Label Manufacturer – A company that manufactures motor vehicle or mobile equipment coatings for sale under another company's name.

Toll Manufacturer – A company that manufactures motor vehicle or mobile equipment coatings based on the formula of another company and places that company's name on the product label.

Company Marketing Classification: Check the box that best describes your company's primary marketing classification.

International – Two or more nations. For example, United States, Canada, and Mexico.

National – All of the United States.

Regional – A portion of the United States. For example, California, Oregon, and Arizona.

California Statewide – All of California.

California Local – A portion of California. For example, Southern California or the San Francisco Bay Area.

The information on annual receipts and employees should be provided for both the company and the automotive coatings unit, as appropriate.

Gross Annual Receipts: Check the box which identifies the gross annual receipts generated by your company. This means the total income of the company before expenses are deducted.

Gross Annual Receipts - California: Check the box which identifies the gross annual receipts generated by your company in California.

Employees: Check the box that indicates the total number of full-time equivalent employees of the company.

Employees - California: Check the box that identifies the number of full-time equivalent employees in California.

How did you determine California Year 2001 Sales Volume?: Check the box that best identifies the method used to determine California sales volume for use on Form 3.

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Form 3 Instructions

Product Information – Reporting Year 2001

Entry # : Each Form 3 completed must be numbered sequentially, beginning with “1.” This entry # must also appear on your corresponding Form 4 and will be used in completing Form 5.

Product Code: Enter product code.

Product Name: Enter the product / label name for the product code above.

Product Line(s): Enter the product line(s) which the coating is used in.

Type Code: Enter the code from the Type Code table, on page 11 that best describes the coating.

Specify: If the Type Code entered was 10, 20, 40 or 60, please clarify/specify what type of coating it is.

Coverage: Specify the coverage of the coating when applied at the recommended thickness, in terms of square feet per gallon of coating.

Recommended Thickness: Specify the recommended thickness used in determining the coatings’ coverage, in mils.

Water or Solvent Borne: Note if the coating is solvent (by marking “S”) or water (by marking “W”) borne.

Density: Density of the coating in pounds per gallon (lbs/gal).

Weight Percent of Solids: Solids content of the coating expressed as a percentage of total coating weight.

Weight Percent of Volatile Material: Volatile material (VOC+water+exempts) content expressed as a percentage of total coating weight. See page 22 for the definition of VOC (volatile organic compound) and VOC content.

Weight Percent of Water: Water content as a percentage of total coating weight.

Weight Percent of Exempts: Exempt compounds content expressed as a percentage of total coating weight. See page 18 for definition of exempt compounds.

Volume Percent of Solids: Solids content of the coating expressed as a percentage of total coating volume.

Volume Percent of Volatile Material: Volatile material (VOC+water+exempts) content expressed as a percentage of total coating volume. See page 22 for the definition of VOC (volatile organic compound) and VOC content.

Volume Percent of Water: Water content expressed as a percentage of total coating volume.

Volume Percent of Exempts: Exempt compounds content expressed as a percentage of total coating volume. See page 18 for definition of exempt compounds.

VOC Actual: Also known as Material VOC. VOC content of coating, as supplied, in grams of VOC per liter of coating. This is the weight of all volatile materials less the weight of water and exempt compounds per the entire volume of the coating. This is NOT the same as VOC Regulatory. See “VOC Calculations” page 23.

VOC Regulatory (Less Water & Exempts): Also known as Coating VOC. VOC content of the coating, as supplied, in grams of VOC per liter of coating less water and exempt compounds. This may be determined from the formulation data or previously determined by EPA Method 24, 40 CFR Part 60, as amended in Federal Register Vol. 57, No. 133, July 10, 1992, or ASTM D 3960-92. See “VOC Calculations” page 23.

2001 California Sales: The volume, in gallons, of the coating sold in California in 2001.

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www.arb.ca.gov/coatings/auto/survey/2002survey.htm**Form 3 Instructions, Continued
Type Codes**

Coating Type	Code
Undercoat (specify)	10
primer	11
primer sealer	12
primer surfacer	13
pretreatment wash primer	14
precoat	15
ground coat	16
flexible primer	17
plastics primer	18
Color coat (specify)	20
single-stage	21
single-stage multicolor	22
multi-stage color coat	23
multi-stage multicolor coat	24
camouflage	25
metallic/iridescent	26
Clearcoat	30
Additive (specify)	40
reducer	41
hardener	42
catalyst	43
activator	44
extender	45
flattener	46
plasticizer	47
fish eye eliminator	48
accelerator	49
Truck bed coating	51
Underbody coating	52
Temporary protective coating	53
Uniform finish coating	54
Anti-glare/safety coating	55
Other (specify)	60

Please use the major category code if a coating does not fall within one of the more specific codes. For example, if a coating is an additive (uniform finish blender) which is not one of the specific additives listed, use code 40. "Uniform finish blender" would then be listed under "Specify."

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Form 4 Instructions Ingredient Information – Reporting Year 2001

Form 4 requests product ingredient information. In this table provide all ingredients which are part of the product formulation. Complete one Form 4 for each Form 3 completed.

Entry # From Form 3: Enter the Entry # from corresponding Form 3.

#: Number each ingredient sequentially, beginning with “1.”

Ingredient: Enter the standard (IUPAC) chemical name of the ingredient. Chemical names must be distinguished from trade names, by labeling trade names with an asterisk prior to the name. For example, the desired chemical name of SD 40 Alcohol or ethyl alcohol is ethanol. Only enter the trade name of the ingredient if the chemical name is unknown. If the ingredient is proprietary or a mixture (e.g., petroleum distillates) identify the trade name and manufacturer / primary supplier.

Resin entries should be grouped by resin type instead of listing each specific resin composition. Report only the total weight percentage for each resin group. Please choose from the resin types in the table below. If the resin does not fit within one of these categories, please contact Dave Mehl at (916) 361-0342 or dmehl@arb.ca.gov to help you determine a resin type, for data consistency.

Resin Types		
Acrylic	Epoxy	Silicone, Silane, Siloxane
Acrylic Copolymer	Oleoresin	Styrene-butadiene
Alkyd	Phenolic	Urethane, Polyurethane
Amines, Amides	Polyester (Not Alkyd)	Polyvinyl Chloride (PVC)
Cellulosic	Polyvinyl Acetate (PVA)	Vinyl Toluene
Chlorinated Rubber	Shellac	Vinyl Acrylic Copolymer

NOTE: The volatile portions of resin solutions, colorants or additives must be listed as separate ingredient entries. For example, do not include the volatile portion of a resin solution as a solid.

Bin #: For aliphatic or aromatic hydrocarbon solvents enter the bin number that best represents the nature of the solvent from page 25.

CAS#: Enter the Chemical Abstract Service (CAS) number for the ingredient.

Weight % (of total material): Enter the percent by weight for each ingredient in the final product that is at least 0.1% of the total mass of the product. Toxic air contaminants (e.g., lead and nickel) should be reported to lower than 0.1% if known. If an ingredient is a mixture of known components, list the components separately with their individual weight percentages in the final product. If the components of a mixture cannot be determined, list the ingredient as a single entity. For example, you may not know the weight percentage of individual ingredients of petroleum distillates, resins, or biocides. In cases such as these identify the weight percent of the mixture.

Total of All Ingredients: The sum of all ingredients in the table must equal 100.00 percent by weight. If this value does not sum to 100.00, please recheck the information.

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**Form 5 Instructions
Ready-To-Spray Information – Reporting Year 2001**

Ready-To-Spray Mixture#: Number entries sequentially, beginning with “1.”

Mixing Components: List entry #s from Form 3 for all components to be mixed together to create a Ready-To-Spray (RTS) coating, in the same order as the mixing ratio. RTS mixtures within a single product line may be grouped if the mixing ratios remain constant and all possible combinations are viable products.

Tints from within a product line can be grouped together for reporting ready-to-spray mixtures, instead of reporting for each individual color combination. When grouping tints within a product line, the mixing component listed would be the name of the product line and “tints,” e.g. “Supernova tints.” Please identify the relevant Form 3 entry #s for the “grouped” tints.

Example:

Ready-To-Spray Mixture #	2			
Mixing Components Entry #: (from Form 3)	Supernova tints, 4 – 53 & 56 – 60	92		
Mixing Ratio:	2	1		

Other components of a RTS coating can also be grouped, i.e. reducers, hardeners, or even a main component, such as primers. More than one category can be grouped on one form. For example, if the first column is a clear coat, the second column could be the various hardeners and the third column the reducers, similar to the example below. However, every possible combination represented in the grouping matrix must be an actual marketed RTS product. Please remember that it is only possible to have grouping on this form if the mix ratios are identical for every possible combination.

Example:

Ready-To-Spray Mixture #	3			
Mixing Components Entry #: (from Form 3)	5	10, 11, 12	20, 21, 22	
Mixing Ratio:	4	1	1	

The above table would yield 9 different post-mixing combinations: 5-10-20, 5-10-21, 5-10-22, 5-11-20, 5-11-21, 5-11-22, 5-12-20, 5-12-21, and 5-12-22.

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If not all of the above combinations are actual marketed combinations, then it cannot be grouped as above. For example if 5-11-20 and 5-11-21 are not marketed combinations then at least 2 Form 5s would need to be submitted, such as

Ready-To-Spray Mixture #	3			
Mixing Components Entry #: (from Form 3)	5	10, 11, 12	22	
Mixing Ratio:	4	1	1	

and

Ready-To-Spray Mixture #	4			
Mixing Components Entry #: (from Form 3)	5	10, 12	20, 21	
Mixing Ratio:	4	1	1	

Mixing Ratio: The relative ratio, by volume, of each component to be mixed to create a ready-to-spray coating, in the same order as the mixing components.

Recommended Thickness: Specify the recommended thickness used in determining the RTS coatings' coverage, in mils.

Production Cost, Minimum: Indicate the lowest production cost for a RTS mixture from the form, in dollars per gallon (\$/gal). Production cost includes the cost of materials plus labor.

Production Cost, Sales Weighted Average: Indicate the sales weighted average production cost of the RTS mixtures from the form, in dollars per gallon (\$/gal). Production cost includes the cost of materials plus labor.

Production Cost, Maximum: Indicate the highest production cost for a RTS mixture from the form, in dollars per gallon (\$/gal). Production cost includes the cost of materials plus labor.

For VOC actual and VOC regulatory report your lowest, median, and highest color. For each color reported, report the corresponding information on the coverage, density, and either VOC actual or VOC regulatory as appropriate. If grouping 4 or more RTS mixtures from the first table, complete both of the tables. If reporting one RTS mixture or grouping 3 or less RTS mixtures, complete just the appropriate number of columns of the first table.

Coverage: Specify the coverage of the coating when applied at the recommended thickness, in terms of square feet per gallon of coating.

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Density: Density of the coating in pounds per gallon (lbs/gal).

VOC Actual: Also known as Material VOC. VOC content of coating, as supplied, in grams of VOC per liter of coating. This is the weight of all volatile materials less the weight of water and exempt compounds per the entire volume of the coating. This is NOT the same as VOC Regulatory. See “VOC Calculations” page 23.

VOC Regulatory (Less Water & Exempts): Also known as Coating VOC. VOC content of the coating, as supplied, in grams of VOC per liter of coating less water and exempt compounds. This may be determined from the formulation data or previously determined by EPA Method 24, 40 CFR Part 60, as amended in Federal Register Vol. 57, No. 133, July 10, 1992, or ASTM D 3960-92. See “VOC Calculations” page 23.

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Submitting Survey Forms or Data

Option 1: For each form type, assemble the pages in numerical entry order, beginning with Form 1 and continuing through Form 5.

Option 2: Same as Option 1, except group each Form 4 with its corresponding Form 3.

Option 3: Submit Data Electronically.

Survey data may be submitted electronically. The file formats, in order of preference, are:

1. Microsoft Access
2. Microsoft Excel
3. ASCII tab delimited file

If you wish to submit survey data in any other electronic format, please contact us for additional information.

To obtain information on file formats visit www.arb.ca.gov/coatings/auto/survey/2002survey.htm

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PART B

SUPPLEMENTAL INFORMATION

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DEFINITION OF SURVEY TERMS

Accelerator: a substance that speeds a chemical reaction.

Activator: a necessary component used to provide a chemical reaction to cure paint.

Additive: a chemical substance added to a coating in relatively small amounts to impart or improve desirable properties. Examples include UV screeners, flow agents, defoamers, fish eye eliminators, etc.

Antiglare/Safety Coating: a coating which minimizes light reflection for safety purposes.

Basecoat: a pigmented coating which is the first coating applied as part of a multi-stage topcoat system.

Camouflage Coating: a coating applied on a motor vehicle or mobile equipment to conceal it from detection.

CAS (Chemical Abstracts Service): an organization that indexes information published in Chemical Abstracts by the American Chemical Society and provides index guides by which information about particular substances may be located in the abstracts.

CAS Registration Number: an assigned number used to identify a material. CAS assigns sequential numbers to identify specific chemicals. The CAS numbers have no chemical significance. The CAS number is useful in identifying all abstracts concerning that specific chemical.

Catalyst: a substance that enables a chemical reaction to proceed at a faster rate or under different conditions than otherwise possible.

Clearcoat: a coating which contains no pigments and is the final coating applied as part of a multistage topcoat system.

Coating: a material which is applied to a surface and which forms a film in order to beautify, preserve, repair, or protect such a surface.

Colorant: a concentrated pigment that is dispersed in water, solvent, and/or binder then added to a coating after packaging in sale units to produce the desired color.

Color Coating: an intermediate or final pigmented coating applied over a primer or OEM finish.

Coverage: the area a volume of paint will cover at a certain film thickness. In this survey, coverage will be expressed in terms of square feet per gallon of coating, when applied at the recommended film thickness.

Exempt Compound: the following compounds are considered exempt from being considered a VOC:

- methane;
- methylene chloride (dichloromethane);

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- 1,1,1-trichloroethane (methyl chloroform);
- trichlorofluoromethane (CFC-11);
- dichlorodifluoromethane (CFC-12);
- 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
- 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114);
- chloropentafluoroethane (CFC-115);
- chlorodifluoromethane (HCFC-22);
- 1,1,1-trifluoro-2,2-dichloroethane (HCFC-123);
- 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
- 1,1-dichloro-1-fluoroethane (HCFC-141b);
- 1-chloro-1,1-difluoroethane (HCFC-142b);
- trifluoromethane (HFC-23);
- pentafluoroethane (HFC-125);
- 1,1,2,2-tetrafluoroethane (HFC-134);
- 1,1,1,2-tetrafluoroethane (HFC-134a);
- 1,1,1-trifluoroethane (HFC-143a);
- 1,1-difluoroethane (HFC-152a);
- cyclic, branched, or linear completely methylated siloxanes;
- the following classes of perfluorocarbons:
 - (A) cyclic, branched, or linear, completely fluorinated alkanes;
 - (B) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
 - (C) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
 - (D) sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds only to carbon and fluorine; and
- the following low-reactive organic compounds which have been exempted by the U.S. EPA:
 - acetone;
 - ethane;
 - parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene);
 - perchloroethylene; and
 - methyl acetate.

Exempt compounds content of a coating shall be determined by South Coast Air Quality Management District (SCAQMD) Method 303-91 (Revised August 1996).

Extender: a substance added to a product as a diluent, adulterant, or modifier.

Fish Eye Eliminator: additive used in paint to prevent the occurrence of fish eyes on a fully painted surface.

Flattener: a substance added to a paint to make it lusterless.

Flexible Primer: a primer coating with the ability to withstand dimensional changes.

Groundcoat: an opaque, pigmented coating used under partially transparent finishes to cover a different-hued undercoat and used as part of a four-stage topcoat system.

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Hardener: a substance added to a paint or varnish to harden the film.

Highway: a way or place of whatever nature, publicly maintained and open to the public for purposes of vehicular travel. Highway includes street.

Metallic/Iridescent Topcoat: a topcoat which contains iridescent particles, composed of either metal as metallic particles or silicon as mica particles, in excess of 5 g/L (0.042 lb/gal) as applied, where such particles are visible in the dried film.

Midcoat: a semi-transparent coating which is the middle topcoat applied as part of a three-stage topcoat system.

Mix Ratio: the proportion of ingredients to be blended together to make a ready-to-spray coating. For example, a clearcoat with a mix ratio of 4:1 requires the mixing of 4 parts of clearcoat with 1 part of activator. Mix ratios are normally volumetric.

Mobile Equipment: any equipment that is designed to be physically capable of being driven or drawn upon rails or a roadway, except for motor vehicles, and components for and from such equipment. Examples of mobile equipment include mobile cranes; bulldozers; concrete mixers; tractors, plows; pesticide sprayers; street cleaners; golf carts; hauling equipment used inside and around an airport, dock, depot, and industrial and commercial plants; trains; railcars; truck trailers; implements of husbandry; aircraft ground support equipment; all terrain vehicles; self-propelled wheelchairs, invalid tricycles, and invalid quadricycles.

Motor Vehicle: a vehicle which is self-propelled and which is physically capable of being driven on a highway.

Multi-Color Coating: a coating that is packaged in a single container and that exhibits more than one color when applied in a single coat.

Multi-Stage Color Coating: the basecoat/midcoat portion of a multi-stage topcoat system.

Multi-Stage Multicolor Coating: a multi-stage topcoat system in which the basecoat portion is a multi-colored topcoat.

Multi-Stage Topcoat System: any basecoat/clearcoat topcoat system or any three-stage topcoat system, manufactured as a system, and used as specified by the manufacturer.

Pigment: dry coloring matter, usually an insoluble powder to be mixed with a base, such as oil or water, to make paint and similar products.

Plastics Primer: a primer designed to provide maximum adhesion over plastic parts, both exterior and interior.

Plasticizer: a chemical added to rubbers and resins to impart flexibility, workability, or stretchability.

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Precoat: any coating which is applied to bare metal primarily to deactivate the metal surface prior to application of a subsequent water-based primer surfacer.

Pretreatment Coating: a coating which contains no more than 16 percent solids, by weight, and at least 0.5 percent acid, by weight, (when tested in accordance with ASTM Designation D 1613-96). It is used to provide surface etching, and is applied directly to bare metal surfaces to provide corrosion resistance and promote adhesion for subsequent coatings.

Pretreatment Wash Primer: any coating which contains a minimum of 0.5 percent acid, by weight, is necessary to provide surface etching, and is applied directly to bare metal surfaces to provide corrosion resistance and adhesion.

Primer: a coating labeled and formulated for application to a substrate to provide a firm bond between the substrate and subsequent coats and to provide corrosion resistance.

Primer Sealer: a coating applied prior to the application of a topcoat for the purpose of color uniformity, or to promote the ability of an underlying coating to resist penetration by the topcoat.

Primer Surfacer: a coating applied for the purpose of corrosion resistance or adhesion, and which promotes a uniform surface by filling in surface imperfections.

Ready-To-Spray (RTS): describes a coating that has been properly mixed with all necessary components and is ready to be applied to a substrate.

Reducer: a solvent used to thin (reduce the viscosity of) a coating.

Refinishing: any coating of vehicles, their parts and components, or mobile equipment, including partial body collision repairs, for the purpose of protection or beautification and which is subsequent to the original coating applied at an Original Equipment Manufacturing (OEM) plant coating assembly line.

Sealer: a coating labeled and formulated for application to a substrate for one or more of the following purposes: to prevent subsequent coatings from being absorbed by the substrate, or to prevent harm to subsequent coatings by materials in the substrate.

Single-Stage Coating: a coating that is ready for application as supplied to form an acceptable dry film.

Single-Stage Multicolor Coating: coatings which exhibit more than one color when applied and which are packaged in a single container and applied in a single coat.

Temporary Protective Coating: a coating applied for the purpose of protecting adjacent areas from being painted by overspray. The temporary protective coating is removed after primer or topcoat application.

Topcoat: a color coating applied over any coating, for the purpose of appearance, identification, or protection.

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Truck Bed Coating: any coating applied to a truck bed for the purpose of protecting it from surface abrasion, rust and corrosion.

Underbody Coating: any coating applied to wheel wells, the inside of door panels or fenders, the underside of a trunk or hood, or the underside of the motor vehicle itself for the purpose of sound deadening or protection.

Undercoat: any coating applied prior to the application of a topcoat for the purpose of corrosion resistance and/or adhesion of the topcoat.

Uniform Finish Coating: any coating which is applied for the purpose of blending a paint overspray area of a repaired topcoat to match the appearance of an adjacent existing topcoat.

Vehicle: a device by which any person or property may be propelled, moved, or drawn upon a highway, excepting a device moved exclusively by human power or used exclusively upon stationary rails or tracks.

Volatile Organic Compound (VOC): any volatile compound containing at least one atom of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.

VOC Content: the weight of VOC per volume of coating, calculated according to the procedures specified in "VOC Calculations and Conversions." See "VOC Calculations" page 23.

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VOC CALCULATIONS**VOC Content**

The following equations can be used to calculate entries for Form 3.

$$\text{VOC}_{\text{Actual}} = \frac{W_{vm} - W_w - W_e}{V_c}$$

(Also known as Material VOC)

$$\text{VOC}_{\text{Regulatory}} = \frac{W_{vm} - W_w - W_e}{V_c - V_w - V_e}$$

(Also known as Coating VOC)

Where:

W_{vm} = Total weight of volatile materials (VOC+water+exempt compounds) in the coating, in grams

W_w = Weight of water in the coating, in grams

W_e = Weight of exempt compounds in the coating, in grams

V_c = Total volume of the coating, in liters

V_w = Volume of water in the coating, in liters

V_e = Volume of exempt compounds in the coating, in liters

Note: If you are using BatchMaster, Material VOC and Coating VOC can be found in MSDS / Compliance (Section III – Physical / Chemical Characteristics).

VOC Regulatory After Recommended Thinning

The following equation can be used to calculate VOC Regulatory after the coatings are thinned with VOC containing solvents.

$$\text{VOC}_{\text{Regulatory (After Recommended Thinning)}} = \frac{\text{Volume}_{\text{Coating}} \times \text{VOC}_{\text{Regulatory}} + \text{Volume}_{\text{Thinner}} \times \text{VOC}_{\text{Thinner}}}{\text{Volume}_{\text{Coating}} + \text{Volume}_{\text{Thinner}}}$$

Percent by Volume Solids of Coating

The following are two equations that can be used to calculate the percent volume solids of coating. The choice of equation depends on the type of information that is known about the coating.

- 1) If the weight and density of all of the solid (nonvolatile) materials are known, then the following equation may be used:

$$\% \text{ by Volume Solids of Coating} = \frac{\text{Weight of Solids}}{\text{Density of Solids} \times \text{Volume of Coating Material}} \times 100$$

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- 2) If instead, only the volatile components of a coating (VOC, water and exempt compounds) are known, the percent volume of solids may be estimated by the following equation.

$$\% \text{ by Volume of Solids of Coating} = \left(1 - \frac{W_w}{D_w \times V_c} - \frac{W_{voc}}{D_{voc} \times V_c} - \frac{W_e}{D_e \times V_c} \right) \times 100$$

Where:

W_w = Weight of water in the coating, in grams D_w = Density of water, in grams per liter

W_{voc} = Weight of VOC in the coating, in grams D_{voc} = Density of VOC, in grams per liter

W_e = Weight of exempt compounds in the coating, in grams D_e = Density of exempt compounds, in grams per liter

V_c = Total volume of coating in liters

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REACTIVITY BIN NUMBERS FOR ALIPHATIC AND AROMATIC HYDROCARBON SOLVENTS

(From the Air Resources Board's Aerosol Coating Products Regulation)

Aliphatic Hydrocarbon Solvents

Bin	Average Boiling Point* (degrees F)	Criteria	MIR Value
1	80-205	Alkanes (< 2% Aromatics)	2.08
2	80-205	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	1.59
3	80-205	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	2.52
4	80-205	Alkanes (2 to < 8% Aromatics)	2.24
5	80-205	Alkanes (8 to 22% Aromatics)	2.56
6	>205-340	Alkanes (< 2% Aromatics)	1.41
7	>205-340	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	1.17
8	>205-340	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	1.65
9	>205-340	Alkanes (2 to < 8% Aromatics)	1.62
10	>205-340	Alkanes (8 to 22% Aromatics)	2.03
11	>340-460	Alkanes (< 2% Aromatics)	0.91
12	>340-460	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	0.81
13	>340-460	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	1.01
14	>340-460	Alkanes (2 to < 8% Aromatics)	1.21
15	>340-460	Alkanes (8 to 22% Aromatics)	1.82
16	>460-580	Alkanes (< 2% Aromatics)	0.57
17	>460-580	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	0.51
18	>460-580	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	0.63
19	>460-580	Alkanes (2 to < 8% Aromatics)	0.88
20	>460-580	Alkanes (8 to 22% Aromatics)	1.49

*Average Boiling Point = (Initial Boiling Point + Dry Point) / 2

Aromatic Hydrocarbon Solvents

Bin	Boiling Range (degrees F)	Criteria	MIR Value
21	280-290	Aromatic Content (≥98%)	7.37
22	320-350	Aromatic Content (≥98%)	7.51
23	355-420	Aromatic Content (≥98%)	8.07
24	450-535	Aromatic Content (≥98%)	5.00

Source: Title 17, California Code of Regulations, Article 3, Aerosol Coating Products, Section 94701

Additional details regarding the Aerosol Coating Products Regulation can be found at the following web site:

["www.arb.ca.gov/regact/conspro/aerocoat/aerocoat.htm"](http://www.arb.ca.gov/regact/conspro/aerocoat/aerocoat.htm)

Specific information regarding the table on this page can be found in Chapter VI, Page 57, of the Staff Report which is also available at the web site identified above.

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U.S. RESIDENT POPULATION (As of April 1, 2000)

United States Total = 281,422,000

STATE	RESIDENTS	%	RANK
Alabama	4,447,000	1.6	23
Alaska	627,000	0.2	48
Arizona	5,131,000	1.8	20
Arkansas	2,673,000	0.9	33
California	33,872,000	12.0	1
Colorado	4,301,000	1.5	24
Connecticut	3,406,000	1.2	29
Delaware	784,000	0.3	45
District of Columbia	572,000	0.2	X
Florida	15,982,000	5.7	4
Georgia	8,186,000	2.9	10
Hawaii	1,212,000	0.4	42
Idaho	1,294,000	0.5	39
Illinois	12,419,000	4.4	5
Indiana	6,080,000	2.2	14
Iowa	2,926,000	1.0	30
Kansas	2,688,000	1.0	32
Kentucky	4,042,000	1.4	25
Louisiana	4,469,000	1.6	22
Maine	1,275,000	0.5	40
Maryland	5,296,000	1.9	19
Massachusetts	6,349,000	2.3	13
Michigan	9,938,000	3.5	8
Minnesota	4,919,000	1.7	21
Mississippi	2,845,000	1.0	31
Missouri	5,595,000	2.0	17

STATE	RESIDENTS	%	RANK
Montana	902,000	0.3	44
Nebraska	1,711,000	0.6	38
Nevada	1,998,000	0.7	35
New Hampshire	1,236,000	0.4	41
New Jersey	8,414,000	3.0	9
New Mexico	1,819,000	0.6	36
New York	18,976,000	6.7	3
North Carolina	8,049,000	2.9	11
North Dakota	642,000	0.2	47
Ohio	11,353,000	4.0	7
Oklahoma	3,451,000	1.2	27
Oregon	3,421,000	1.2	28
Pennsylvania	12,281,000	4.4	6
Rhode Island	1,048,000	0.4	43
South Carolina	4,012,000	1.4	26
South Dakota	755,000	0.3	46
Tennessee	5,689,000	2.0	16
Texas	20,852,000	7.4	2
Utah	2,233,000	0.8	34
Vermont	609,000	0.2	49
Virginia	7,079,000	2.5	12
Washington	5,894,000	2.1	15
West Virginia	1,808,000	0.6	37
Wisconsin	5,364,000	1.9	18
Wyoming	494,000	0.2	50

X = Not Applicable

Source: U.S. Census Bureau <http://www.census.gov/statab/ranks/rank01.txt>

2002 Automotive Coatings Survey

PART C

EXAMPLE OF COMPLETED SURVEY FORMS

(The information contained in the following examples is not intended to reflect any actual product(s) ever marketed or any real company.)

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FORM 1**General Information – Reporting Year 2001**

Company Name : DKM, Inc.		Web Site: www.dkminc.com
Division: Coatings		
Address: 8528 Fallen Leaf Rd.		
City: Sacramento	State: CA	Zip: 95826
Contact Person: Kevin McKinsey		Position: Chief Chemist
Phone: 916-555-5555	FAX: 916-555-1212	e-mail: kevinm@dkminc.com

- 1) Did your company manufacture and distribute coatings in 2001 (for use in California) for motor vehicles or mobile equipment, or coatings that you know to be used in those types of applications? **YES** **NO**
- 2) Did your company distribute coatings in 2001 (for use in California) manufactured by another company, which are for motor vehicles or mobile equipment, or that you know are used in those types of applications? **YES** **NO**
If yes, please list these companies along with a mailing address and contact person. (Please use a separate sheet of paper labeled as question 2.)
- 3) Did your company manufacture coatings for another company to distribute in 2001 that are for motor vehicles or mobile equipment, or that you know are used in those types of applications? **YES** **NO**
If yes, please list these companies along with a mailing address and contact person. (Please use a separate sheet of paper labeled as question 3.)
- 4) Is your company a wholly owned subsidiary of another company? **YES** **NO**
If yes, please list the name of the parent company along with a contact person's name and position, complete mailing address, telephone and facsimile numbers, and an e-mail address for the contact person. (Please use a separate sheet of paper labeled as question 4.)

If you answered "Yes" to question 1, 2 or 3 please complete the remainder of the survey prior to returning it to the ARB. If you answered "No" to all these questions, please return this form only.

CERTIFICATION by Authorized Official

I hereby certify that, to the best of my knowledge and belief, all information entered on Form 1 – General Information, Form 2 – Company Information, Form 3 – Product Information, Form 4 – Ingredient Information, and Form 5 Ready-To-Spray Information is complete and accurate.

Name: Daniel K. Mulligen	Position: President & CEO
Signature:	Date: August 3, 2002

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FORM 2

Company Information – Reporting Year 2001

Type of Business (check all that apply) <input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Importer <input type="checkbox"/> Retail Distributor <input type="checkbox"/> Wholesale Distributor <input type="checkbox"/> Private Label Manufacturer <input type="checkbox"/> Toll Manufacturer <input type="checkbox"/> Other (Specify):	Company Marketing Classification (check one) <input type="checkbox"/> International <input checked="" type="checkbox"/> National <input type="checkbox"/> Regional (e.g., western U.S.) list: <input type="checkbox"/> California Statewide <input type="checkbox"/> California Region (e.g. South Coast) list:
Company – Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 500,000 <input type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input checked="" type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion	Company – California Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 500,000 <input checked="" type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion
Automotive Coatings – Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 500,000 <input checked="" type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion	Automotive Coatings – California Gross Annual Receipts (\$) for Calendar Year 2001 (check one) <input checked="" type="checkbox"/> Less than 500,000 <input type="checkbox"/> 500,000 to 1 million <input type="checkbox"/> >1 million to 2 million <input type="checkbox"/> >2 million to 5 million <input type="checkbox"/> >5 million to 10 million <input type="checkbox"/> >10 million to 100 million <input type="checkbox"/> >100 million to 1 billion <input type="checkbox"/> >1 billion
Employees for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 10 <input checked="" type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more	Employees – California for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 10 <input checked="" type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more
Automotive Coatings Employees for Calendar Year 2001 (check one) <input type="checkbox"/> Less than 10 <input checked="" type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more	Automotive Coatings Employees – California for Calendar Year 2001 (check one) <input checked="" type="checkbox"/> Less than 10 <input type="checkbox"/> 10 to 99 <input type="checkbox"/> 100 to 249 <input type="checkbox"/> 250 to 499 <input type="checkbox"/> 500 or more
How did you determine California Year 2001 Sales Volume? (check all that apply) <input type="checkbox"/> Direct California retail sales <input checked="" type="checkbox"/> Direct California wholesale distribution <input type="checkbox"/> Other (explain): <input type="checkbox"/> Prorated from national retail sales <input type="checkbox"/> Prorated from national wholesale distribution	

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FORM 3

Product Information – Reporting Year 2001

Entry # : *	9
Product Code:	K5P3
Product Name:	Goldfinch Yellow Tint
Brand and Product Line(s):	Everwear - Supernova and Quasar

Physical And Other Data

Type Code (10 – 60)	Specify (for codes 10, 20, 40 and 60 only)	Coverage (ft ² /gal)	Recommended Thickness (mil)	Water or Solvent Borne (W or S)	Density (lbs/gal)
23		286	2	S	9.27

Weight Percent				Volume Percent			
Solids	Volatile Material	Water	Exempts	Solids	Volatile Material	Water	Exempts
51.69	48.31	4.1	2.5	35.68	64.32	4.55	3.52

As Packaged

VOC Actual (g/l)	VOC Regulatory - Less Water & Exempts (g/l)
453	492

2001 California Sales (gallons)

1,245

* Note: This entry # must also appear on your corresponding FORM 4.

Page ____3__ of __784____ Enter the current page # out of the total pages submitted.

NOTE: Each FORM 3 must have a corresponding FORM 4.

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FORM 4

Ingredient Information – Reporting Year 2001

Entry # from FORM 3: 9

#	Ingredient	Bin #	CAS #	wt % *
1	acrylic resin			2.73
2	alkyd resin			43.26
3	alkanes	9		19.4
4	methyl ethyl ketone		78-93-3	5.24
5	acetone		67-64-1	2.5
6	iron oxide		1332-37-2	0.26
7	toluene		108-88-3	3.61
8	water			4.1
9	p-xylene		1330-20-7	8.28
10	m-xylene		1330-20-7	2.33
11	o-xylene		1330-20-7	0.56
12	ethyl benzene		100-41-4	1.33
13	titanium dioxide		13463-67-7	5.31
	Aggregated ingredients < 0.1 wt. %	N/A	N/A	1.13
			Total of All Ingredients (Must Equal 100%)	100.0

* Enter the weight percent for each ingredient that is at least 0.1% of the total mass of the product. Toxic air contaminants (e.g., lead and nickel) should be reported to lower than 0.1% if known.

Page ___145___ of ___784___ Enter the current page # out of the total pages submitted.

NOTE: Each FORM 4 must have a corresponding FORM 3.

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FORM 5

Ready-To-Spray (RTS) Information – Reporting Year 2001

Note: RTS mixtures within a single product line may be grouped if the mixing ratios remain constant and all possible combinations are viable products.

For each combination of products listed in Form 3 that requires mixing to be RTS please list the following:

Ready-To-Spray Entry #	4			
Mixing Components Entry #: (from Form 3)	super bright tints (9-72)	75,76,77	92,93,94	
Mixing Ratio:	4	1	1	
Recommended Thickness (mil)	2			

Production Cost (\$/gal)		
Minimum	Sales Weighted Average	Maximum
50.02	66.23	92.81

If grouping 4 or more RTS mixtures from the top table please complete both of the following tables. If reporting one RTS mixture or grouping 3 or less RTS mixtures, please complete just the appropriate number of columns of the first table.

	low	median	high
VOC regulatory	372	384	510
Color	dunn	dolphin gray	rainbow yellow
Coverage	141	130	106
Density	12.01	9.32	9.46
VOC actual	360	384	408

	Low	median	high
VOC actual	324	372	468
Color	vanilla white	aztec yellow	flamingo pink
Coverage	108	122	113
Density	11.15	9.88	9.37
VOC regulatory	336	379	492

Page __692__ of __784__ Enter the current page # out of the total pages submitted.

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Winston H. Hickox
Agency Secretary

Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman

1001 I Street • P.O. Box 2815 • Sacramento, California 95812 • www.arb.ca.gov



Gray Davis
Governor

September 20, 2002

Dear Sir or Madam:

In a letter dated June 26, 2002, the Air Resources Board (ARB) sent you a survey of automotive coatings. In that letter, we requested your response to the survey by September 30, 2002. Recently, the National Paint and Coatings Association requested additional time for its members to complete the survey. In response to this request, we are granting up to 60 additional days for all survey respondents to complete the survey. Therefore, your completed survey is now due on or before November 30, 2002. Please acknowledge receipt of this letter, in writing or via email to jgomez@arb.ca.gov, and indicate when you anticipate submitting your completed survey.

Your participation in this survey of automotive coatings is very important. The ARB has not conducted a comprehensive automotive coatings survey since 1988. This information is important to improve California's emissions inventory, to assess advances in coatings technology, and to ensure that the automotive refinish coatings industry receives credit for emission reductions already achieved. The information from this survey may also be used to evaluate the feasibility of developing mass-based or reactivity-based control strategies for automotive refinish coatings.

Additional information and copies of the survey are available on our web site at www.arb.ca.gov/coatings/autorefin/autorefin.htm. Thank you for your participation in the survey. If you have any questions, please call or e-mail Mr. Jose Gomez, Manager, Technical Development Section at 916-324-8033 (jgomez@arb.ca.gov) or Mr. Dave Mehl, at 916-324-8177 (dmehl@arb.ca.gov).

Sincerely,

Barbara Fry, Chief
Measures Assessment Branch
Stationary Source Division

cc: Mr. Jose Gomez, Manager
Technical Development Section

Mr. Dave Mehl
Technical Development Section

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: <http://www.arb.ca.gov>.

California Environmental Protection Agency