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DETERMINATION OF THE NEXT GENERATION OF AUTOMOTIVE REFINISHING COATINGS

Phase I Interim Report

for

California Air Resources Board

July 26, 2000

Contract No. 98-333

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Disclaimer

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EXECUTIVE SUMMARY

The overall objectives of this project are to: (1) gather information on the availability of automotive refinishing ultralow-VOC coatings, (2) determine the usability and performance of these ultralow-VOC coatings, (3) determine the formulations for ultralow- or zero-VOCs, and (4) evaluate the feasibility of reducing the toxic air contaminant (TAC) content. These objectives were intended to apply to coatings that are planned for commercial introduction during the next five years, as well as to coatings now in use.

The focus of the Phase I study is to specify methods that are employed to accomplish the study's objective. AVES' technical approaches include:

- Collect information on availability and properties of coatings (Task 1, Phase I).
- Analyze information (Task 2, Phase I).
- Produce interim report (Task 3, Phase I).

AVES worked with automotive refinishing coating industry to collect information on low-VOC coatings and analyze information for selected automotive refinishing coatings. AVES identified many low-VOC automotive refinishing coatings that contain VOCs at levels lower than the current limits set by air pollution control district automotive refinishing rules. Additionally, these commercially available low-VOC automotive refinishing coatings have potentials for reducing the contents of toxic air contaminant (TAC) according to their materials safety data sheets.

Twelve low-VOC/low-TAC automotive refinishing coatings (three primer surfacer, three primer sealer, three basecoat, and three clearcoat) should be tested side-by-side with eight compliant coatings (two primer surfacer, two primer sealer, two basecoat, and two clearcoat) as control to evaluate the feasibility of reducing the toxic air contaminant (TAC) content to the maximum extent possible.

SECTION 1.0 INTRODUCTION AND BACKGROUND

1.1 Significance

1.1.1 Project Introduction

The California Air Resource Board (ARB) needs to gather information on availability of automotive refinishing coatings (ultra-low-volatile organic compound coatings) that contain VOCs at levels lower than the current limits set by air pollution control district automotive refinishing rules, and to determine the technical feasibility of these ultra-low-VOC coatings by laboratory and/or field testing. The ARB also intends to determine the formulations that can be developed for automotive refinishing coatings that would have ultra-low or zero VOC content. Another objective of this study is to evaluate the feasibility of reducing the toxic air contaminant (TAC) content of these coatings to the maximum extent possible.

To achieve ambient air quality goals in urban areas, further general reduction of emissions of volatile organic compounds is necessary. Current automotive refinishing regulations of air pollution control districts contain limits for VOCs that took effect in 1997-1998. It is expected that, when these rules are fully implemented, the automotive refinishing category will account for approximately one percent of the statewide VOC emissions. An evaluation of the opportunity to further reduce VOC emissions from autobody refinishing operations is needed. The ARB will use the results of this study to develop new VOC limits for automotive refinishing coatings. Then, a revised Reasonably Available Control Technology/ Best Available Retrofit Control Technology (RACT/BACT) determination for automotive refinishing coatings beyond 2000 may be developed and published by the ARB. This revised (RACT/BACT) can then be used by the air pollution control and air quality management districts ("districts"), as appropriate, to revise or develop local regulations for automotive refinishing operations.

This study was conducted in two phases. In the first phase, AVES gathered information to determine the ultra-low-VOC, low-TAC coatings that have been developed or are planned. In the second phase, AVES determined the efficacy, relative cost, emissions reduction benefits, and barriers to the use of these coatings, including any effects on other media.

1.1.2 VOC Regulations

The 1990 Clean Air Act Amendments (CAAA) extend controls to many small shops that generate air pollution. The effect of the requirements on a business depends on local air pollution conditions and the nature and amount of air

pollutants a company emits. The following CAAA programs may apply to some autobody refinishers.

Ground-level ozone or "smog" forms when VOCs react with nitrogen oxides in the presence of sunlight. Automobile exhaust contains nitrogen oxides. One way of reducing ground-level ozone concentrations is to reduce VOC emissions. VOC regulations apply only to sources in ozone nonattainment areas.

With the passage of the Clean Air Act Amendments, and other EPA initiatives, new regulations for the automobile refinishing industry are emerging. Regulations requiring use of low-VOC coatings have forced the industry away from lacquer and enamel coatings and toward urethanes and waterborne. To achieve ambient air quality goals in urban areas, further general reduction of VOC emissions is necessary. Effective in 1998-1999, automotive refinishing regulations of air pollution control districts contain limits for VOCs. Examples of these regulations are listed below.

Hazardous Air Pollutants

Many paints used in body shops—toluene, xylene, methyl ethyl ketone (MEK), and methyl isobutyl ketone (MIBK)—contain significant quantities of HAPs. Shops using these paints could be classified as a "major" source of HAP emissions if they have a potential to emit 10 tons per year of any single HAP, 25 tons per year of a combination of HAPs, or 100 tons per year of VOCs. "Potential to emit" is the amount of emissions an auto shop would release if it operated at maximum capacity 24 hours per day, 365 days per year (8,760 hours per year).

Most body shops will be classified as "area" sources of HAPs (having potential emissions below the major source levels) and therefore will not be subject to permit requirements.

South Coast Air Quality Management District

Rule 1151 Motor Vehicle and Mobile Equipment Non-assembly Line Coating Operations (*Amended December 11, 1998*)

Rule 1151 applies to all commercial and noncommercial coating applications to Group I vehicles and equipment and Group II vehicles and their parts and components at facilities involved in the non-assembly line production, modification, or refinishing of motor vehicles and mobile equipment. For example, a person who (a) applies coatings to Group I vehicles and equipment, or their parts or components, shall not apply a multistage topcoat that has a VOC content of 2.8 lbs./gal, and (b) applies multistage topcoats to Group II vehicles, their parts or components, shall not apply a topcoat that has a VOC content in excess of 3.5 lbs./gal. Group I vehicles and equipment include large-sized

trucks, buses, and mobile equipment; Group II vehicles include passenger cars, small- and medium-sized trucks and vans, motor homes, and motorcycles.

In late 1996, coating manufactures indicated that they had not been and were not expected to be successful in formulating coatings to meet the January 1, 1997 VOC limits for Group I single-stage metallic/iridescent topcoats, Group II single-stage metallic/iridescent topcoats, and Group II primer sealers. In addition, significant concerns were raised regarding productivity, application properties and finish quality of multistage topcoats meeting the 3.5 lb/gal Group II multistage topcoat VOC limit. In response to these problems, the major coating manufacturers' Automotive Refinish Coalition under the auspices of the National Paint and Coating Association petitioned and received on December 19, 1996 a group product variance for one year, until December 18, 1997. The group product variance allowed higher VOC content than required under the rule for the following product categories.

1. Group I single-stage metallic/iridescent topcoats were allowed a maximum VOC content of 3.5 lb/gal until Dec 18, 1997.
2. Group II primer sealers were allowed a maximum VOC content of 3.5 lb/gal until December 18, 1997.
3. Group II multistage topcoats were allowed a maximum 4.5 lb/gal composite VOC content until December 18, 1997 provided the clearcoats did not exceed a VOC content of 3.7 lb/gal.
4. Group II single-stage metallic/iridescent topcoats were allowed a maximum VOC content of 4.3 lb/gal until March 31, 1997.

In October 1997, the Automotive Refinish Coalition of major coating manufacturers formally requested the SCAQMD to amend the rule and increase the VOC limits of Group II multistage topcoats and primer-sealers to 4.5 lb./gal and 3.5 lb./gal, respectively (the limits allowed under the variance). The rationale for the request was that compliant multistage topcoats and primer-sealers lowered the productivity of typical autobody shops and many shops experienced significant application and quality problems with the compliant multistage topcoats. Therefore, the SCAQMD extended the group product variance for two more years, until October 1, 1999 for Group II multistage topcoats.

Akzo-Nobel Inc., a member of the Automotive Refinish Coalition, had developed compliant 3.5 lb/gal multistage topcoats by using parachlorobenzotrifluoride (PCBTF). This solvent was declared an exempt compound by the USEPA and the SCAQMD. This solvent was also used to formulate a new 2.1 lb/gal clearcoat. The SCAQMD staff conducted a survey by visiting and interviewing the personnel of 23 autobody shops who had been using Akzo-Nobel's compliant multistage topcoats. Most of the users interviewed were very satisfied with its performance. Concurrently, another member of the Coalition, Valspar Corporation, was also successful in developing a compliant multistage topcoat system using the same exempt solvent, PCBTF, in its clearcoat.

TABLE 1-1. SCAQMD VOC limits for Group I vehicles
Grams Per Liter of Coating, Less Water and Exempt Compounds
On and After December 12, 1998

Coating	g/L	lb./gal
Pretreatment	780	6.5
Primer/Primer Surfacer	250	2.1
Primer Sealer	420	3.5
Topcoats General	340	2.8
Metallic/Iridescent	340*	2.8*
Multi-Colored	685	5.7
Multistage	340*	2.8*
Specialty Coating	840	7.0

* The VOC limits for Metallic/Iridescent and Multistage topcoats for spot repairs on Group I vehicles and mobile equipment will be 3.5 lb./gal (less water and exempt compounds).

TABLE 1-2. SCAQMD VOC limits for Group II vehicles.
Grams Per Liter of Coating, Less Water and Exempt Compounds

Coating		On and After December 12, 1998		On and After July 1, 1999		On and After October 1, 1999	
		g/L	lb/gal	g/L	lb/gal	g/L	lb/gal
Pretreatment		780	6.5	780	6.5	780	6.5
Primer/Primer Surfacer		250	2.1	250	2.1	250	2.1
Primer Sealer		340	2.8	340	2.8	340	2.8
Topcoats General		420	3.5	420	3.5	420	3.5
Metallic/Iridescent		420	3.5	420	3.5	420	3.5
Multi-Colored		685	5.7	685	5.7	685	5.7
Multistage System	>= 2 gal/day[1]	540	4.5	420[1]	3.5	420	3.5
	< 2 gal/day[2]	540	4.5	540[2]	4.5	420	3.5
Multi-Colored Multistage		420	3.5	420	3.5	420	3.5
Specialty Coating		840	7.0	840	7.0	840	7.0

[1] On and after July 1, 1999, any person who uses two gallons or more of combined basecoat and clearcoat, as applied, on any given day shall comply with the 420 g/L (3.5 lb/gal) limit.

[2] Any person who uses less than two gallons of combined basecoat and clearcoat, as applied, on each day up to September 30, 1999 shall comply with the 3.5 lb/gal limit on and after October 1, 1999.

Sacramento Air Quality Management District

Rule 459 Automotive, Truck and Heavy Equipment Refinishing Operations *(Amended October 2, 1997)*

This rule applies to the finishing or refinishing of Group I and Group II vehicles, their parts or components. For color match of Group I and Group II vehicles, the following VOC limits need to be followed:

TABLE 1-3 Sacramento AQMD VOC limits for Group I vehicles Less Water and Exempt Compounds

COATING	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds January 1, 1997	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds January 1, 1998
Precoat	600 (5.0)	600 (5.0)
Pretreatment Wash Primer	780 (6.5)	780 (6.5)
Primer/Primer Surfacer	340 (2.8)	250 (2.1)
Primer Sealer	600 (5.0)	420 (3.5)
Solid Color Topcoat	600 (5.0)	420 (3.5)
Metallic/Iridescent Topcoat	600 (5.0)	520 (4.3)
Multi-stage Topcoat System	600 (5.0)	540 (4.5)
Rubberized Asphaltic Underbody	540 (4.5)	540 (4.5)
Specialty Coating	840 (7.0)	840 (7.0)

COATING	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal) January 1, 1997	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal) January 1, 1998
Temporary Protective Coating	60 (0.5)	60 (0.5)

TABLE 1-4 Sacramento AQMD VOC limits for Group II vehicles Less Water and Exempt Compounds

COATING	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds January 1, 1997	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds January 1, 1998
Precoat	600 (5.0)	600 (5.0)
Pretreatment Wash Primer	780 (6.5)	780 (6.5)
Primer	340 (2.8)	250 (2.1)
Rubberized Asphaltic Underbody	540 (4.5)	540 (4.5)
Topcoat	420 (3.5)	420 (3.5)
Metallic/Iridescent Topcoat	420 (3.5)	420 (3.5)
Camouflage	420 (3.5)	420 (3.5)
Specialty Coating	840 (7.0)	840 (7.0)

COATING	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal) January 1, 1997	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal) January 1, 1998
Temporary Protective Coating	60 (0.5)	60 (0.5)

Bay Area Air Quality Management District

Under Regulation 8, Rule 45 (*Amended 1/6/99*), a person shall not refinish Group I or Group II vehicles, their parts and components, using a topcoat with a VOC content in excess of 3.5 lbs/gal.

TABLE 1-5 Bay Area AQMD VOC limits for Group I vehicles Less Water and Exempt Compounds

COATING	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds April 1, 1995	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds July 1, 1999
Precoat	600 (5.0)	580 (4.8)
Pretreatment Wash Primer	780 (6.5)	
Primer/Primer Surfacer	250 (2.1)	
Primer Sealer	420 (3.5)	
Solid Color Topcoat	420 (3.5)	
Metallic/Iridescent Topcoat	520 (4.3)	
Multi-stage Topcoat System	540(4.5)	

TABLE 1-6 Bay Area AQMD VOC limits for Group II vehicles Less Water and Exempt Compounds

COATING	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds April 1, 1995	VOLATILE ORGANIC COMPOUND CONTENT g/l (lbs/gal), less water and exempt compounds July 1, 1999
Precoat	600 (5.0)	580 (4.8)
Pretreatment Wash Primer	780 (6.5)	
Primer/Primer Surfacer	250 (2.1)	
Primer Sealer	340 (2.8)	
Solid Color Topcoat	420 (3.5)	
Metallic/Iridescent Topcoat	420 (3.5)	
Multi-stage Topcoat System	420 (3.5)	

1.2 Background on Coatings

Automotive refinishing coatings can generally be categorized as two major types: solvent-based, which contain volatile organic compounds (VOCs), and water-borne.

1.2.1 Solvent-Based Coatings

Solvent-based coatings are, by far, the most common in automobile refinishing. These coatings can be divided into groups that cure by three different methods: cross-linking (two-component epoxies and urethanes, and baked acrylic and alkyd enamels), noncross-linking (thermoplastic acrylics and vinyls and cellulosic lacquers), and drying (some alkyds).

Solvent-based coatings can also be divided into lacquers, enamels, and urethanes. Lacquers were the first coatings used for automotive refinishing. Lacquer paints rely completely on solvent evaporation to transfer pigments and therefore have a high solvent and VOC content. They are usually based on acrylic resins and, in some cases, acrylics modified with nitrocellulose. Enamels used by manufacturers began in the 1950s and by the refinishing industry in the 1960s. Enamels can be divided further into two categories, acrylic enamels and alkyd enamels, which provide different appearance and durability characteristics. Enamels still rely predominantly on solvent evaporation to provide pigment transfer and adhesion, but also rely on chemical linkages formed during their curing process. Since they rely less on solvent evaporation, they usually contain less VOCs than lacquers. Urethanes, on the other hand, are the newest materials used by automotive refinishes. They rely more on chemical processes to form the bonds necessary for adhesion and therefore potentially contain less VOCs than either lacquers or enamels. While this makes them more attractive environmentally, they contain isocyanates which are potentially hazardous to persons who apply the coatings.

1.2.2 Water-Borne Coatings

Water-borne coatings can be divided into four groups: emulsions, latexes, water soluble, and colloidal dispersions. The principal film resin in emulsions and latexes are in a fully polymerized state and are suspended in water when the dispersing agent is added. These polymers are made by emulsion polymerization. The resins used in water soluble and colloidal dispersion systems have relatively low molecular weights and undergo further cross-linking or polymerization during the curing stage. This category includes all electrocoat systems.

Water-borne coatings are gradually accepted in the refinishing industry. While car manufacturers have used them for years as undercoats and primers, their long drying times have delayed their use by refinishers. Technological advances have finally provided suitable water-borne topcoats to replace conventional solvent-borne topcoats.

1.2.3 Current Trends

Automobile original equipment manufacturers (OEMs) dictate the changes in styling demands, increases in finish durability, and new multicomponent substrates. New paint styling will come in the form of specialty pigments and the use of colored aluminum and colored micas in paint formulations. OEMs have begun using tinted clearcoats, more tricoats, and super-smooth clearcoats that refinishers must be prepared to match. Increased corrosion resistance will occur with improvements in electro-deposition. Resistance to environmental deposits will occur with the use of fluorinated clearcoats (which, since they are so durable and long-lasting, present the problem of proper disposal). There are also improvements made in resistance to sunlight (UV stability). Expanding use of treated steel and advanced alloys, aluminum, plastics, and composites means that most refinishers must address the proper coating of plastics and composites (plastics are especially sensitive to solvents, which break down their chemical structure).

The consequences of the changes taking place are seen in four areas: (1) larger shops are necessary to maintain profitability and keep pace with technology, (2) coatings carry a higher apparent cost because of their chemical makeup, (3) new finishes become more and more durable, and (4) more training is necessary to keep up with advances and changes.

In general, there are commercially available low-VOC automotive refinishing coatings that contain VOCs at levels lower than the current limits set by air pollution control district automotive refinishing rules. Additionally, these commercially available low-VOC automotive refinishing coatings have potential of reducing the toxic air contaminant (TAC) according to their materials safety data sheets. The trend toward lower VOC coatings, irrespective of whether they are high solids solvent-borne systems or water-borne systems, will mean that adjustments of the coating to meet substrate and application conditions will not be feasible through adjustment of the amount of solvent in the coating. To meet these varying conditions, the shops will have to be comparatively more sophisticated in their equipment and configuration (e.g. drying equipment and enclosed drying booths).

1.2.4 Refinishing Procedures

While there may be minor differences from shop to shop, the procedure for refinishing an automobile can usually be thought of as a four-step process: (1) vehicle preparation, (2) vehicle priming, (3) topcoat application, and (4) equipment cleanup.

Vehicle preparation consists of cleaning, followed by a solvent-based compound to remove grease, wax, and other contaminants. These compounds are usually comprised entirely of VOCs and contain solvents such as toluene and xylene.

Vehicle priming process may create deficiencies in the present finish or the underlying surface. The materials used in making primers include primer-surfacers (nitrocellulose lacquer, acrylic lacquer, and alkyd enamel).

Solvents in topcoat application are prevalent because they need to properly blend a repair with the surrounding finish (blending requires the application of successively thinner coats, and more solvents). The materials used in topcoats can be divided into lacquers, enamels, and polyurethane.

When vehicles are manufactured, paint is applied by a machine. Then, the vehicles are baked in an oven. This is a relatively simple process as the car is essentially a metal frame at this stage. This process has enabled manufacturers to use more polyurethanes because cyanates in the polyurethane are not a direct hazard to employees. Auto refinishers, however, cannot use high temperatures to cure finishes because an automobile's interior, plastic and electronic components would be ruined. Refinishers must use different materials and techniques from the manufacturers while reproducing the same finish. Drying time becomes important to a refinisher because shorter drying times reduce contamination from dust and dirt and more cars can be finished in a given time. Drying time is even more important for metallic paints.

Most air emissions from autobody shops are VOCs, which cause ground-level ozone (smog). Some of these compounds are also among the 189 substances listed by the USEPA as hazardous air pollutants (HAPs). Air emissions are generated from surface preparation, primer and paint applications, and spray gun cleaning. Also, large quantities of waste coatings and solvents—many having to be treated as hazardous waste—are generated during the refinishing process. Efforts have been made to help autobody refinishers reduce the amount of air emissions (VOCs and HAPs) and paint-related wastes they generate, while maintaining a high-quality product, saving money, avoiding the need for expensive pollution control equipment, and escaping unnecessary regulation.

SECTION 2.0 LOW-VOC COATING INFORMATION

The availability of ultra-low-VOC automotive refinishing coatings (that contain VOCs at levels significantly lower than the current limits set by air pollution control district automotive refinishing rules) was determined by gathering information on the commercially available low-VOC, low-TAC coatings (see Appendix A). Materials Safety Data Sheets (MSDS) were obtained for U.S. and foreign manufactured coatings (see Appendix B). AVES gathered information for low-VOC, low-TAC automotive refinishing coatings from the following sources:

(1) Coating manufactures,
(2) U.S. coating distributors of both domestic and foreign coatings, and
(3) Professional associations, for example, National Paint and Coating Association (NPCA), Refinish Coalition and California Autobody Association.

The practical (user-friendly) and performance characteristic of the existing coatings were identified, where available. Of specific interest, data collection and analysis were for three different formulation types: organic solvent-based, water-based and mixed water-/solvent-based. The practical aspects include application methods, application equipment requirements, drying times, drying condition requirements, air dry or oven bake, clean-up ease, waste disposal requirements, and shelf life. The performance characteristic data can only be verified when actual test data become available and should include adhesion, durability, impact resistance, chemical resistance, hardness, chip resistance and other important factors.

AVES contacted many major automotive coating manufactures to gather low-VOC coating information. The manufacturers that AVES contacted are presented in Table 2-1. Due to the proprietary and confidential nature of manufacturers' R&D data, NPCA Automotive Refinish Coalition and coating manufactures are not prepared to release those data. AVES was advised by the coating industry to conduct this study using low-VOC coatings that are currently marketed in SCAQMD (see attached letters in Appendix C). AVES has received commercially available low-VOC coating information from several manufacturers. These products are listed in Table 2-2 to Table 2-5. The description of the products are presented in these tables too. The toxic compounds contained in the products are also presented in Table 3-6.

Based on the information collected and analyzed, AVES identified many low-VOC automotive refinishing coatings that contain VOCs at levels lower than the current limits set by air pollution control district automotive refinishing rules. Additionally, some of these commercially available low-VOC automotive refinishing coatings have minimum amounts of toxic air contaminant (TAC) according to their materials safety data.

Table 2-1. A List of Contacts

Manufacturer	Contact Person	Phone No.
DuPont	Karl Shultze	(302) 992-2372
Sherman-Williams Company	Tim Kearn Mat Snyder	(626) 301-9945 (216) 566-6546
Akzo-Nobel	Jim Lallement	(770) 662-8464
Spies-Hecker Paint Co.	Brian Spencer	(888) 371-3313
Valspar	Jim Mcinerney	(601) 798-4731
Pacific Coast Lacquer	Joseph Tashgian & Ruben Laguna	(313) 780-2734
PPG	Ron Hilovsky	(216) 671-0050

Table 2-2. VOC Compliant Products From Valspar

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids (%)	Price ($/gal)
AquaMax (533 Series)	1.7 lbs/gal coating	This is a waterborne urethane acrylic basecoat.	Ease of application	1.7 lbs per gallon coating/0.6 lbs. Per gallon material	29.0	85-190
AC2135 Low VOC Overall Clearcoat	(mix ratio 2:1:1) = 2.1 - 3.5 lbs/gal	This is a high gloss, high solid, acrylic polyurethane clearcoat.	It offers excellent flow, distinctiveness of image (DOI), and outstanding durability. This versatile clearcoat offers 2.1/3.5 VOC and 4.4 VOC ratings.	639 sq. ft per mil per gallon	39.3	131
Colorable (333 Series)	4.9 lbs/gal	This is a basecoat.	It is easy to use and fast drying. It may be clearcoated with any of the Valspar line of clears to produce excellent color hold out and gloss retention.	451 Sq. ft. per mil per gallon (average)	29.0	60-180

Table 2-3. VOC Compliant Products From Pacific Coast Lacquer

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids(%)	Price ($/gal)
Polyprimer Surfacer	< 1.66 lbs/gal	It is a corrosion-resistant, sanding primer based on an air-drying polyester resin.	It is fast drying and has excellent filling properties and adhesion over fiberglass, metal, plastic and wood. It can be topcoated with all types of finishes, acrylics, lacquers, synthetic enamels and two-component urethance coatings. It has high solids co	1200 sq. ft per gallon @1 mil DFT	75.0	$58.08/ 4 gal case
Aquaprimer Surfacer	< 2.08 lbs/gal	It is a waterborne acrylic, single component primer surfacer.	It has excellent adhesion properties to a wide variety of OEM finishes and other substrates such as steel, plastic and wood. It is a quick-dry, wet or dry sanding, single component primer surfacer which offers excellent filling and corrosion resistant pr	450-470 sq. ft. per gallon @1 mil DFT	28.0	$41.87/ 4 gal case

Table 2-3. VOC Compliant Products from Pacific Coast Lacquer(continued)

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids(%)	Price ($/gal)
Speedprime	2.08 lbs/gal coating	It is a two-component primer consisting of Part 911A and Part 911B.	It is fast drying. This premium primer offers excellent high-build and adhesion properties. It is corrosion-resistant, and may be wet and dry sanded. It has superior filling properties.	280 squire feet per gallon @1.0 mil DFT	17.7	Part A: $18.95/ 4 gal case Part B: $39.95/ 4 gal case
Euroseal Primer Sealer	2.8 lbs/gal	It is a two-component corrosion-resistant primer sealer.	It is formulated to be used over sanded original finishes or properly prepared and cleaned bare metal. It is intended to be used as a final step before applying topcoat. It is easy to use and compatible with all topcoats.		36.0-37.0	Part A: gray $51.82/ 4 gal case read oxide and buff $56.94/4 gal case, Part B: $27.15/4 gal case
Enviro-Finish	2.8 lbs/gal (Group I Vehicles)	It is a non-yellowing, high quality polyurethane topcoat.	It provides a high gloss, extremely durable, chemical-resistant finish.	950-970 sq. feet per gallon @1.0 mil dry	59.0-60.0	Part A: $104.95 - 178.50, Part B: $69.25/gal$ 23.10/qt.

Table 2-3. VOC Compliant Products from Pacific Coast Lacquer(continued)

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids(%)	Price ($/gal)
Euroclear 2200	2.1 lbs/gal	This product can be applied over a variety of base coats in base coat/clear coat systems. It is two-component polyurethance system.	It offers a durable, high gloss finish. It is user-friendly, resulting in increased production. It can be polished easily after 24 to 48 hours. It is easy to mix, fast dry and low viscosity.		43.0	Part A: $65.85/ 4 gal case Part B: $32.90/ 4 gal case Accelerator: $15.95/ .5 pt, Fish Eye Eliminator: $15.95/ .5 pt.
Premium Production Euroclear 2400	2.1 lbs/gal	This product can be applied over a variety of base coats in base coat/clear coat systems. It is two-component polyurethance system.	It offers a durable, high gloss finish. It is user-friendly, resulting in increased production. It can be polished easily after 12 hours. It is easy to mix, fast dry and low viscosity.		43.0	$89.95/ 4 gal, Catalyst: $33.45/ 4 qt.

Table 2-3. VOC Compliant Products from Pacific Coast Lacquer(continued)

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids(%)	Price ($/gal)
Euroclear II 2300	3.5 lbs/gal	This product can be applied over a variety of base coats in base coat/clear coat systems. It is two-component polyurethance system.	It offers a durable, high gloss finish. It is user-friendly, resulting in increased production. It can be polished easily after 24 to 48 hours. It is easy to mix, fast dry and low viscosity.		43.0	Part A: $45.85/ 4 gal case, Part B: $22.90/ 4 gal case, Accelerator: $15.95/ .5 pt, Fish Eye Eliminator: $15.95/ .5 pt.

Table 2-4. VOC Compliant Products from DuPont

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids	Price
Kwik Clean 3949S (Surface Cleaners)	0.4 lbs/gal	This is a an extremely versatile surface cleaner that handles all cleaning needs. It is designed to be effective in any cleaning step - from pre-cleaning to final wipe prior to applying the topcoat.	It is an easy-to-use surface cleaner in any cleaning step.			$30./gal
Low VOC Final KleanTM 3909S (Surfacer Cleaner)	0.5 lbs/gal	This is an ultra-low VOC, multi-purpose surface cleaner that leaves no surface residue.	It is excellent for dissolving water soluble and surface contaminants. It dries quickly and won't affect tape or paint adhesion.			$30/gal
Kwik Prep 244S (Pretreat-ment)	6.5 lbs/gal	This is a product that conditions steel or ferrous metal. It is applied directly from the package; no mixing or dilution is necessary.	Conditions, stabilizes and cleans metal for priming - offers improved corrosion resistance with any Du Pont primer system. It is ready to use, dries fast, and eliminates metal treatment blowback.			$15.6/qt.

Table 2-4. VOC Compliant Products from DuPont(continued)

Product Name	VOC Content lbs/gal	General Description	Product Features	Theoretical Coverage	Volume Solids	Price
2K Waterborne Primer-Filler (Primers/ Primer Surfacer)	1.9	This is a high gloss, high solid clear coat. It has excellent filling capabilities (fills 80 grit) and provides a smooth final texture.	This product provides good corrosion resistance, and is lead and chromate free.			$104/gal
Primer-Surfacer 2220S (Primers/ Primer Surfacer)	2.0	This is a single-component, ready-to-spray, higher performance, waterborne primer-surfacer that can be wet or dry sanded..	2220S dries to a smooth surface, reducing labor and sanding. It resists edge swelling, provides excellent holdout, and is outstanding for wet sanding.	464 sq. ft. per ready-to-spray gallon at 1 mil.	28.90%	$86.7/gal
2K High Build Primer 3240S (Primers/ Primer Surfacer)	2.1	This is a two-component, urethane primer.	It has excellent fill and resistance to featheredge swelling. It combines superior performance with good dry times and sanding properties. It is designed for spot, panel and overall applications.	1132 sq. ft/gal at 1 mil.	70.60%	$151.3/gal
Waterborne Primer sealer 2440S (Primer Sealer)	2.1	This is an ultra-low VOC, two component, waterborne, epoxy primer sealer.	It has good application properties, very good flow and leveling, and good sag resistance. 2440S have good adhesion to properly treated steel and galvanized.	546 sq. ft. per ready-to-spray gallon at 1 mil.	34%	$104/gal

Table 2-4. VOC Compliant Products from DuPont(continued)

Product Name	VOC Content lbs/gal	General Description	Product Features	Theoretical Coverage	Volume Solids	Price
Velvaseal WPS Primer-Sealer 2120S (Primer Sealer)	1.9	This is a productivity waterborne primer-sealer.	This product provides excellent adhesion to cut-through, there is no need to prime.	510 sq. ft. at 1 mil.	31.8%	$78.4/gal
Velvaseal WPS Primer-Sealer 2140S (Primer Sealer)	2.0	This waterborne primer-sealer is packaged ready to spray.	It dries fast and smooth, and is ready to topcoat in 30 minutes. Available in three colors to maximize topcoat hiding. This product can be used under all Du Pont topcoat systems. It gives out superior color holdout compared to conventional sealers.	504 sq. ft. at 1 mil.	31.4%	$76.25/gal
Imron 5000 Polyurethane Enamel (Singlestage Topcoat)	3.5	A low VOC, premium quality, high performance polyurethane topcoat.	It has excellent durability and appearance.	860 sq. ft. per ready-to-spray gal at 1 mil dry film thickness	54%	$171/gal
ChromaOne High Solids Acrylic Urethane Single Stage	3.5	This is a high-performance, acrylic urethane single-stage finish.	This product is low-VOC. It has excellent gloss, appearance and durability. It is easy to use.	826 sq. ft. per ready-to-spray gallon at 1 mil.	51.5%	$162/gal

Table 2-4. VOC Compliant Products from DuPont(continued)

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids	Price
Imron 6000 (Multistage Topcoat)	<3.5 lbs/gal; used with 3500S, 3600S, 2100S, 72400S, EZ-3460S respectively as a system, VOC=4.5 lbs/gal	This is a high performance polyurethane basecoat. This basecoat can also be combined with 1280S Clear Coat for fast drying, or 3400S for fast build and VOC conformance.	This product retained its gloss through the worst conditions. It gives vehicles ultimate protection against severe environmental conditions, harsh chemicals and mechanical wear and tear.	1280s Clear Coat: 520 sq. ft./gal @1 mil	32.4%	$171/gal
Chroma-Base (Multistage Topcoat)	VOC = 6.2 lbs/gal ready to spray; used with 2100S as a system VOC =2.1 lbs/gal	This is a basecoat with good fill.	It is easy to use, fast drying. It provides with high quality and high productivity. User can select from a wide choice of solid, metallic and pearl colors.	140 sq. ft. (silver) and 167 sq. ft. (white) per RTS gal at 1 mil.	8.7% (silver), 10.4%(white) ready-to-spray	$146.15/ gal

Table 2-4. VOC Compliant Products from DuPont(continued)

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids	Price
Chroma PremierTM Basecoat (Multistage Topcoat)	VOC = 6.2 lbs/gal read to spray, used with 2100S as a system, VOC=4.5 lbs/gal	This is a high performance, fast drying, isocyanate-activated basecoat.	This product has excellent mottle control. It delivers superior appearance in solid, metallic and pearlescent colors.	150 sq. ft. (silver) and 192 sq. ft. (white) per RTS at 1 mil.	9.4% (silver) and 12.0% (white) ready-to-spray using 7160S	$185.04/ gal
Chroma-clear High-Solids 3500S (Clearcoat)	3.5 lbs/gal	This is an acrylic urethane clear coat designed for panel and overall repairs of OEM base/clear finishes.	It provides outstanding appearance and durability, exceptional handling, and excellent resistance to shrinkage and diebck. The high-solids content of this product results in improved coverage, fewer coats and reduced material consumption.	795 sq. ft. per ready-to-spray gallon at 1 mil.	49.5% ready-to-spray	$155.1/g al
Chromacle ar High-Solids 3600S (Clearcoat)	3.6 lbs/gal	ChromaClear low VOC productive 3600S is a fast, three-component, air dry, urethane clear for use in spot and panel repairs of OEM base/clear finishes.	It features good dry times, high gloss and easy application. It may also be force dried for improved productivity.	699 sq. ft. per ready-to-spray gallon at 1 mil.	41.7% ready-to-spray	$130.2/g al

Table 2-4. VOC Compliant Products from DuPont(continued)

Product Name	VOC Content	General Description	Product Features	Theoretical Coverage	Volume Solids	Price
Imron ClearCoat EZ-3460	< 3.5 lbs/gal	This is a two-component polyurethane clearcoat	It provides exceptional cleanup properties and resists dirt, road tar and tree sap.	835 sq. ft. per gallon RTS at 1 mil.	58.3% RTS	$143.65/ gal
ChromaPremier Appearance Clear 72400SC (Clearcoat)	3.6 lbs/gal	This is a high solids, three-component urethane clear.	This product provides outstanding application properties and excellent appearance. This product is designed for multi-panel and overall repairs in downdraft, force dry environment.	803.8 sq. ft. per ready-to-spray gal at 1 mil.	50.1% ready-to-spray	$167.65/ gal
Chroma-Clear Multi-use 2100S (Clearcoat)	2.1 lbs/gal	This is a versatile, three-component urethane clearcoat for use in spot, panel and overall refinishing of base/clear finishes.	This product provides easy application, build and good gloss in two coats, and is well suited for cross-flow and downdraft booth conditions. It is easy to mix.	674 sq. ft. per ready-to-spray gallon at 1 mil.	42.1% ready-to-spray	$170.7/gal

Table 2-5. VOC Compliant Products From Species Hecker

Product Name	VOC Content	General Description	Product Feasters	Theoretical Coverage	Volume Solids	Price
Permahyd 1K Primer Surfacer 4100	1.48 lbs/gal	This is a waterborne product. For spot repairs and for isolating areas of conventional 2K surfacers and old finishes which have been sanded through.	It is particularly suitable for recoating with the waterborne Permahyd Base Coat Series 280/285. It is available to both gray and beige.	75.3 sq. ft. /l at 50 um dry film thickness	35.30%	$36.8/qt.
Permasoild 2:1 Surfacer 5150	2.01 lbs/gal	This is a acrylic product based on a special reactive binder with a very high solid content at application viscosity.	This surfacer has excellent vertical stability, very high build, and good sanding properties and, because of its lower solvent content, less tendency to produce edge mapping.	70.2 sq. ft./l at 100 um dry film thickness	79.70%	$41/l
Permasolid VHS Wet on Wet Surfacer 5190	2.42 lbs/gal	This is a two-component Very High Solid acrylic urethane.	It can be applied in either a 2.8 lb/gal VOC or a 3.5 lb/gal VOC, wet on wet operation.	226 sq. ft/l at 25 um dry film thickness, 113 sq. ft./l at 50 um dry film thickness	84.7% by weight	$42.2/l
Permasoild 2:1 Surfacer 5150	VOC Coating =2.01 lbs/gal	This is a acrylic product based on a special reactive binder with a very high solid content at application viscosity.	This surfacer has excellent vertical stability, very high build, and good sanding properties and, because of its lower solvent content, less tendency to produce edge mapping.	70.2 sq. ft./l at 100 um dry film thickness	79.70%	$41/l

Table 2-5. VOC Compliant Products from Species Hecker (continued)

Product Name	VOC Content	General Description	Product Feasters	Theoretical Coverage	Volume Solids	Price
Permahyde Pearl Base Coat Series 280	VOC Coating =2.09-2.54 lbs/gal	This is a high quality paint. It can be used for all two stage solid, and metallic finishes on passenger cars.	After recoating with Permasolide Clear coat, the result is a high gloss, weather resistant finish.	170 sq. ft/l - 144.2 sq. ft/l at 15 um dry film thickness, 119.5 sq. ft. at 12 um dry film thickness	23.5%-13.7%	$41/l
Permahyd Pearal Base Coat Series 285	VOC Coating =2.59-3.02 lbs/gal	This is a high quality paint. It can be used for all two or three stage pearl finishes on passenger cars.	After recoating with Permasolide Clear coat, the result is a high gloss, weather resistant finish.	About 161.4 sq. ft./l at 12 um dry film thickness	18.00%	$41/l
Permasolid HS Clear Coat 8030	VOC Coating = 3.38 lbs/gal	This is a high gloss, high solid clear coat.	Due to its very high solid content and good filling power it can be applied efficiently in a single operation. The high coverage, shorter spraying time and fast low baking enables HS Clear Coat 8030 can be applied very economically. The product has high resistance to all weathering and environmental influences, hence providing the finish with long lasting protection.	106.5 sq. ft. /l at 50 um dry film thickness	53.40%	$223.5/5 liters

Table 2-6. Toxic Compounds Contained in Products

MANUFACTURER	PRODUCT NAME	SUBSTANCES CONTAINED IN COATINGS PERSUANT TO CALIFORNIA STATE ASSEMBLY BILL 2588	VAPOR PRES. (20 Deg. C, mm Hg)	PERCENT BY WEIGHT
Spies Hecker	Permahyd 1K Primer Surfacer	2-Butoxyethano Zinc phosphate		6.40% 9.30%
	Permasolid 2:1 VHS Surfacer 5150	Methoxypropyl acetate Zinc phosphate		1.50% N.E.
	Permasolid VHS Wet on Wet Surfacer	Methoxypropyl acetate 1,2,4-Trimethyl-benzene		5.30% N.E.
	Permahyd	n-Butanol 2-Butoxyethanol		4.50% 4.30%
	Permasolid HS Clear Coat	1,2,4-Trimethyl-benzene		N.E.
Valspar	ColorBase (333 Series)	Ethylbenzene Toluene Isopropyl alcohol Xylene		3.81% 14% 18%
	BaseCoat Stabilizer Fast	Ethylbenzene Toluene Isopropyl alcohol Xylene		4.30% 1% 21%
	AquaMax	Dipropylene glycol monomethyle ether		N/A
	AC-2135	Xylene Ethylbenzene Hexamethylene diisocyanate		0.70% 0.20% N/A
Pacific Coast Lacquer	Surface Prep 185	2-Butoxyethanol ethylene glycol butyl ehter Proppylene Glycol Monomethyl Ether Ethylene glycol monopropyl ether		3% 2% 2%

Table 2-6. Toxic Compounds Contained in Products(continued)

MANUFACTURER	PRODUCT NAME	SUBSTANCES CONTAINED IN COATINGS PERSUANT TO CALIFORNIA STATE ASSEMBLY BILL 2588	VAPOR PRES. (20 Deg. C, mm Hg)	PERCENT BY WEIGHT
	Aquaprimer Surfacer White	Diethylene glycol monomethyle ether		4%
		2-Butoxyethanol, Ethylene Glycol butyl Ether		3%
		Butyl bBenzyl phthalate		1%
Pacific Coast Lacquer	Aquaprimer Surfacer Gray	Diethylene glycol monomethyle ether		4%
		2-Butoxyethanol, Ethylene Glycol Butyl Ether		3%
		Butyl benzyl phthalate		1%
	Aquaprimer Surfacer Buff	Diethylene glycol monomethyle ether		34%
		2-Butoxyethanol, ethylene glycol butyl ether		3%
		Butyl benzyl phthalate		1%
	Speedprime Gray Primer Surfacer -Part A	Xylene		1%
		Isopropyl alcohol, 2-propanol		3%
		Di-Phthalate		1%
	Speedprime Gray Primer Surfacer -Part B	Di-Phthalate		1%
	Polyprimer Gray	Styrene		16%
		Methyle isobutyl ketone		2%
		Methyl ethyl ketone		2%
		N-Butyl acetate		2%
	Euroseal Non Sanding Primer Sealer Gray	N-Butyl acetate		12%
		Methyl amyl ketone, 2-heptanone		1%
		Toluene		0.44%

Table 2-6. Toxic Compounds Contained in Products(continued)

MANUFAC-TURER	PRODUCT NAME	SUBSTANCES CONTAINED IN COATINGS PERSUANT TO CALIFORNIA STATE ASSEMBLY BILL 2588	VAPOR PRES. (20 Deg. C, mm Hg)	PERCENT BY WEIGHT
	Euroseal Urethane Catalyst	2-Ethoxyethyl acetate		2%
		Xylene		2%
		N-Butyl acetate		5%
		Methyl amyl ketone, 2-heptanone		4%
		Toluene		1%
	Enviro-Finish Urethane Catalyst	Methyl isobutyl ketone		9%
		Xylene		8%
		N-Butyl acetate		8%
	Euroclear II 3.5 VOC Clear	N-Butyl acetate, butyl ethanoate		13%
		N-Butyl acetate		12%
		Xylene		1%
		Toluene		1%
Pacific Coast Lacquer	Euroclear II 3.5 VOC Catalyst	N-Butyl acetate, butyl ethanoate		
		1,2,4-Trimethyl benzene		
	Premium Production Euroclear	Toluene		1%
	Premium Production Euroclear Catalyst	1,2,4TriMeBenze		1%
DuPont	ChromaClear Clearcoat	Ethylbenzene	7	
		Xylene	7.0@ 25 oC	
		1,6-Hexamethylene diisocyanate	unknown	
	Waterborne Products	Formaldehyde		

Table 2-6. Toxic Compounds Contained in Products(continued)

MANUFAC-TURER	PRODUCT NAME	SUBSTANCES CONTAINED IN COATINGS PERSUANT TO CALIFORNIA STATE ASSEMBLY BILL 2588	VAPOR PRES. (20 Deg. C, mm Hg)	PERCENT BY WEIGHT
		Ethylene glycol monobutyl ether Methyl alcohol Xylene 1,2,4-Trimethyl benzene 2-propoxyethanol	0.6 100 7.0@25 oC 7.0@44.4 oC 1.3@25 oC	
	Metal Treatments	Chromic Acid Ethylene glycol monobutyl ether Isopropyl alcohol Zinc Oxide	 0.6 33 None	
	Chroma One & Chroma One High Solids Binders, Activators & Reducers	Cumene	3.7	
		Diethylene glycol monobutyl ether Ethylbenzene Methyl ethyl ketone Xylene 1,2,4-Trimethyl benzene 1,6-Hexamethylene diisocyanate	0.1 7 71 7.0@ 25 oC 7.0@44.4 oC	
DuPont	Imron 5000 Polyurethane Enamels	Aluminum Ethylbenzene Isopropyl alcohol Lead chromate Methyl ethyl ketone N-Butyl Alcohol Nickel Oxide Propylene glycol monomethyl ether Toluene	 7 33 71 5.5 3.7 36.7	

Table 2-6. Toxic Compounds Contained in Products(continued)

MANUFACTURER	PRODUCT NAME	SUBSTANCES CONTAINED IN COATINGS PERSUANT TO CALIFORNIA STATE ASSEMBLY BILL 2588	VAPOR PRES. (20 Deg. C, mm Hg)	PERCENT BY WEIGHT
		Xylene 1,6-Hexamethylene diisocyanate	7.0@ 25 oC	
	Chromapremier System	Cumene Ethylbenzene Isopropyl alcohol Methyl ethyl ketone Methyl isobutyl ketone N-butyl alcohol Toluene Xylene 1,2,4-Trimethyl benzene 1,6-hexameethylene diisocyanate	3.7 7 33 71 15 5.5 36.7 7.0@25 oC Unknown Unknown	
	Cromax WBC Waterborne Basecoats	Aluminum Ethylene glycol monobutyl ether N-Butyl alcohol 2-Propoxyethanol	 0.6 5.5 1.3@2.5 oC	
	Low VOC Products	Butyl benzyl phalate Cumene Cyclohexane Ethylene glycol monobutyl ether acetate Ethylene glycol monobutylether	0.8 3.7 100@60 oC 0.1 0.3	
		Isopropyl alcohol Methyl ethyl ketone Methyl isobutyl ketone N-butyl alcohol Naphthalene Propylene glycol methyl ethyl Propylene Glycol Monomethyl Ether Acetate	33 71 15 5.5 1.0@52.6 oC 3.4@2.5 oC 10.9@2.5 oC	

Table 2-6. Toxic Compounds Contained in Products(continued)

MANUFACTURER	PRODUCT NAME	SUBSTANCES CONTAINED IN COATINGS PERSUANT TO CALIFORNIA STATE ASSEMBLY BILL 2588	VAPOR PRES. (20 Deg. C, mm Hg)	PERCENT BY WEIGHT
DuPont		Toluene Xylene 1,2,4-Trimethyl benzene 1,6 Hexamethylene diisocyanate 2-Propoxyethane	36.7 7.0@2.5 oC 7.0@44.4 oC 1.3@25 oC	
	Chromabase Clear	Cumene Ethylbenzene Ethylene glycol monobutyl ether acetate Methyl ethyl ketone Methyl isobutyl ketone Propylene Glycol Monomethyl Ether Acetate Toluene Xylene 1,2,4-Trimethyl benzene 1,6 Hexamethylene diisocyanate	3.7 7 0.3 71 15 3.7 36.7 7.0@25 oC 7.0@44.4 oC Unkown	

Note: N.E – Not Established.

SECTION 3.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the requirement from RFP No. 98-02 (Page 3), Phase I study should identify coatings commercially available (or close to commercialization) that satisfy the objectives of the study. AVES identified many low-VOC automotive refinishing coatings that contain VOCs at levels lower than the current limits set by air pollution control district automotive refinishing rules. Additionally, these commercially available low-VOC automotive refinishing coatings contain minimum amounts of toxic air contaminant (TAC) according to their materials safety data sheets.

Automotive coating manufactures stated coating properties on their product sheets. However, VOC contents, TAC contents, performance properties of coatings information (such as dry time, adhesion, durability, impact resistance, appearance, chemical resistance, and for topcoats, the ability to color match with existing coatings); recommended methods of application; and ease of use can only be verified by a third-party independent testing laboratory. Therefore, the only way to determine the true technical feasibility of these low-VOC/low-TAC automotive refinishing coatings is to conduct actual laboratory and field testing. These selected low-VOC coatings should:

1. Contain a VOC content lower than the current limits set forth by air pollution control districts (SCAQMD, SACAQMD, and BAAQMD).
2. Be low in toxic air contaminant (TAC) content.

Twelve low-VOC/low-TAC automotive refinishing coatings (three primer surfacer, three primer sealer, three basecoat, and three clearcoat) are recommended for side-by-side testing with eight solvent-borne coatings (two primer surfacer, two primer sealer, two basecoat, and two clearcoat). The total member of coatings recommended for testing is twenty which is consistent with the contract requirement. Even though no zero-VOC green coating are ready for testing, many low-VOC coatings are available with VOC contents significantly lower than the most stringent limits set forth by air pollution control districts (SCAQMD, SACAQMD and BAAQMD). Coatings listed in Table 3-1 are some of the potential candidates which can be selected for side-by-side testing, the actual list of coatings for testing is under Phase II study.

In general, the major obstacles for switching to low-VOC automotive refinishing coatings are durability compared to current solvent-borne coatings, ease of application, ability to color match with existing coatings, and cost relative to conventional coatings. Since there is no durability base line for these low-VOC automotive refinishing coatings, actual laboratory (including accelerated tests for weathering, corrosion resistance, hardness, performance characteristics), and/or field testing data are extremely critical for successful future rule making.

Table 3-1 Low VOC Coatings Recommended for Side-by-Side Testing

Coating Type	Product Name	VOC Content (g/l)	Manufacturer
Surfacer	Permahyd 1K Primer Surfacer 4100	178	Spies Hecker
	Polyprimer Surfacer	199	Pacific Coast Lacquer
	Primer-Surfacer 2220S	240	DuPont
Sealer	Euroseal Primer Sealer	336	Pacific Coast Lacquer
	Velvaseal WPS Primer Sealer 2120S	228	DuPont
	Velvaseal WPS Primer Sealer 2120S	240	DuPont
Basecoat	AquaMax	204	Valsper
	Permahyde Pearl Basecoat	251-305	Spies Hecker
	ChromaBase	252	DuPont
Clearcoat	ChromaClear Multi-Use 2100S	252	DuPont
	AC2135 Low VOC Overall Clearcoat	252-420	Valsper
	ChromaClear High Solids 3600S	432	DuPont

APPENDIX A

Automotive Coating Product Sheet

APPENDIX B

Automotive Coating Materials Safety Data Sheet

APPENDIX C

LETTERS FROM NATIONAL PAINT & COATINGS ASSOCIATION AND DUPONT

APPENDIX A

Automotive Coating Product Sheet

ColorBase (333 Series)

Basecoat

DESCRIPTION

ColorBase 333 is a basecoat that is easy to use and fast drying. It may be clearcoated with any of the Valspar line of clears to produce excellent color hold out and gloss retention.

COMPONENTS

- ColorBase . . . . . Color
- 161 . . . . . Fast Basecoat Reducer up to 75°F
- 162 . . . . . Medium Basecoat Reducer 75°F - 85°F
- 163 . . . . . Slow Basecoat Reducer 85°F - 95°F
- 164 . . . . . .Very Slow Basecoat Reducer 95°F and over

MIXING RATIO

Mix one (1) part Base Color with one part 161, 162, 163, or 164 Reducer.

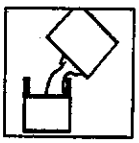
POT LIFE @ 77°F

N/A

CLEAN UP

Valspar Refinish 100 Thinner
(Check local regulations)

ADDITIVES



ACCELERATOR: Not recommended

FISHEYE: Not recommended

FLEX ADDITIVE: Not required

TINTING

Up to 5% with Solar System Intermix tinting color.

SURFACE PREPARATION

- Surfaces should be prepared using the proper undercoat system following recommended procedures.
- All surfaces should be finish sanded with 400/P800 grit wet or dry sandpaper or equivalent.

SUBSTRATES

- Z-777 Adhesion Promoter
- AquaPrime 9 Series
- SunLock 88 Series
- ColorFil 92 Series
- Properly prepared previously painted surfaces
- 96N
- 97N
- VP-40 Series
- VP-50 Series
- Properly prepared OEM Finishes

ColorBase (333 Series)

Basecoat

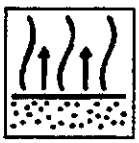
APPLICATION

- Spray two to three medium wet coats until hiding and color match is achieved.
- Allow 5 - 10 minutes flash time between coats.
- Apply no more than is necessary for color hiding.

BLENDING TECHNIQUES

Apply one coat Z-777 Adhesion Promoter to entire panel. Taper out each coat of base color staying with the area covered by Z-777. (SEE BLENDING TECHNIQUE DATA SHEET)

FLASH / DRY TIMES



AIR DRY @ 77°F

Flash between coats	5-10 Minutes
To tape	10-15 Minutes
To Clearcoat	30 Minutes

NOTE: If base is allowed to dry more than 48 hours before clearcoating, scuff and respray basecoat.

FORCE DRY
Force dry not required

GUN SETUPS

CONVENTIONAL

Gravity Feed	1.3 mm - 1.5 mm (.052" - .059")
Siphon Feed	1.6 mm - 1.8 mm (.063" - .070")

HVLP	FLUID TIP	AIR CAP
Accuspray Series 10	.028 - .036	#9
Binks M1G	#94	93P
Devilbiss JGHV-530	GX	#33
Devilbiss GFHV-501	DFW	#57
Mattson LP-DC	(.0432) Black	*
Sata NR95 gravity	1.5mm	*
Sharpe SGF-HVLP	1.4mm (.055)	#12

AIR PRESSURES

Conventional @ Gun	PANEL	OVERALL
Gravity Feed	25 - 35 psi	35 - 40 psi
Siphon Feed	30 - 40 psi	45 - 50 psi
HVLP @ Cap	6 - 8 psi	8 - 10 psi

PHYSICAL DATA

VOC (Packaged)	4.9 lbs. per gallon (Average)
Volume Solids	28.2% (Average)
Theoretical Coverage	451 sq. ft. per mil per gallon (Average)
Flash Point	52°F (TCC)

SAFETY

Refer to Material Safety Data Sheet (MSDS) for complete safety instructions. The technical data listed herein has been compiled in good faith for your convenience and guidance. No warranty, expressed or implied, is intended or given by the information on this sheet.

AquaMax (533 Series)

Urethane Modified Acrylic Waterborne Basecoat

DESCRIPTION

AquaMax Basecoat (533 Series) is a Waterborne Urethane Acrylic basecoat designed for ease of application

COMPONENTS

Ready to spray

MIXING RATIO

Ready to spray (Do not reduce)

POT LIFE @ 77°F

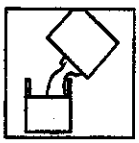
Indefinite

CLEAN UP

170 AquaClean for VOC compliance.

Optional: Warm soapy water followed by Valspar Refinish 100 Thinner.

ADDITIVES



ACCELERATOR: N/A

FISHEYE: N/A

FLEX ADDITIVE: N/A

Note: Do not spray when surface temperature is below 50°F.

SURFACE PREPARATION

- Wash surface with mild detergent and water.
- Rinse and dry surface.
- Wipe surface with 155 SunPrep or 170 Aquaclean and wipe dry with clean cloth before product flashes dry.
- Sand and featheredge substrate with P600 grit sandpaper or equivalent.

SPECIAL NOTE

For added corrosion resistance, use SunLock II 88 as a pre-treatment on bare steel, aluminum, galvanized.

AquaMax (533 Series)

Urethane Modified Acrylic Waterborne Basecoat

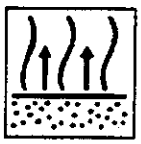
SUBSTRATES

- Z-777 Adhesion
- AquaPrime 9
- SunSeal 82/85
- SunLock II 88 Series
- SunGrip 42
- SunFil/ColorFil 92/092

APPLICATION

- Spray one to two medium wet coats allowing each coat to dry thoroughly.
- If more coats are required, each coat must thoroughly flash before proceeding.
- Heavier film thickness will require longer dry times.

FLASH / DRY TIMES



AIR DRY @ 77°F

Flash between coats	20 Minutes
Dust Free	30-35 Minutes
To Tape	45 Minutes

FORCE DRY

Flash before Force Dry	10 Minutes
Force Dry Time	30 Minutes @ 130°F
To Tape	After Cool Down (1 Hour)
To Topcoat	After Cool Down (1 Hour)

GUN SETUPS

CONVENTIONAL

Gravity Feed	1.4 mm - 1.6 mm (.055" - .063")
Siphon Feed	1.5 mm - 1.8 mm (.059" - .070")

HVLP ..... .043" - .052"

AIR PRESSURES

CONVENTIONAL @ GUN	PANEL	OVERALL
Gravity Feed	30 - 35 psi	35 - 45 psi
Siphon Feed	35 - 45 psi	40 - 50 psi
HVLP @ Cap	6 - 8 psi	8 -10 psi

PHYSICAL DATA

VOC (Unreduced)	1.7 lbs. per gallon coating / 0.6 lbs. per gallon material
Volume Solids	29% (Average)
Theoretical Coverage	470sq. ft. per mil per gallon
Flash Point	Greater than 200°F
Recommended DFT	0.5 - 1. mils

SAFETY

Refer to Material Safety Data Sheet (MSDS) for complete safety instructions. The technical data listed herein has been compiled in good faith for your convenience and guidance. No warranty, expressed or implied, is intended or given by the information on this sheet.

AC2135

Low VOC Overall Clearcoat

DESCRIPTION

AC2135 is an acrylic polyurethane Clearcoat which offer excellent flow, distinctiveness of image (DOI), and outstanding durability. This versatile clearcoat offers 2.1 VOC/3.5 VOC and 4.4 VOC ratings, making it compliant in a variety of VOC regulated areas. AC2135 is included in the *Limited Lifetime Warranty* category for CTE certified shops.

COMPONENTS

- AC2135 . . . . . Clearcoat
- AK21 . . . . . Activator
- AK35 . . . . . Activator
- X-01 . . . . . Exempt Reducer
- X-02 . . . . . Diluent
- X-28 . . . . . Exempt Reducer

NON COMPLIANT AREAS
or for 5.0 Multi-Stage Systems

- 171 . . . . . .Fast Reducer
- 172 . . . . . .Medium Reducer
- 173 . . . . . .Slow Reducer
- 174 . . . . . .Very Slow Reducer

MIXING RATIO

For 2.1 VOC
Mix two (2) parts AC2135 to one (1) part AK21 to one (1) part X-01 Reducer or X-02 Diluent. (2:1:1)
For 3.5 VOC
Mix two (2) parts AC2135 to one (1) part AK35 to one (1) part X series reducers including X-28 Reducer (2:1:1)
For 4.4 VOC
Mix two (2) parts AC2135 to one (1) part AK35 to one and a half parts (1 1/2) urethane reducer (171-174). (2:1:1 1/2)

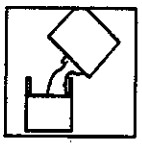
POT LIFE @ 77°F

3 Hours

CLEAN UP

Valspar Refinish 100 Thinner
(Check local regulations)

ADDITIVES



ACCELERATOR: T555 up to 2 ounces per mixed gallon (cool weather only)
FISHEYE: T152 up to 1 oz. per mixed gallon
FLEX ADDITIVE: Not required
Note: Do not spray when surface temperature is below 50°F.

SURFACE PREPARATION

FOR APPLICATION OVER RECOMMENDED BASECOAT SYSTEM

- Mask all adjacent areas to prevent overspray problems.
- Allow basecoats sufficient dry times.
- Over OEM finish use gray scuff pad / Z-777

SUBSTRATES

- ColorBase Basecoat 333
- AquaMax Basecoat 533
- Z-777 Adhesion Promoter

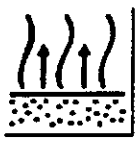
AC2135

Low VOC Overall Clearcoat

APPLICATION

- Spray two medium wet coats allowing 10-15 minutes flash between coats.

FLASH / DRY TIMES



AIR DRY @ 77°F

Flash between coats	10-15 Minutes
Dust Free	30 Minutes
To Sand/Buff	Overnight
To Deliver	Overnight

FORCE DRY

Flash before Force Dry	20 Minutes
Force Dry Time	30 Minutes @130°F
Sand and Buff	After Cool Down (1-2 hours)
To Deliver	After Cool Down (1-2 hours)

INFRARED *(Shortwave)*

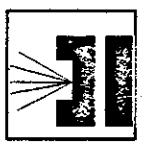
Flash before Force Dry	.8 Minutes
Force Dry Time	.15 Minutes
Sand and Buff	.After Cool Down (1-2 hours)
To Deliver	.After Cool down (1-2 Hours)

GUN SETUPS

CONVENTIONAL

Gravity Feed	1.3 mm - 1.5 mm
Siphon Feed	1.6 mm - 1.8 mm

HVLP	FLUID TIP	AIR CAP
Accuspray Series 10	.043	#9
Binks M1G	#94	93P
Devilbiss GFHV-501	DFW	#57
Devilbiss OMX-611	1.4-1.6	.#97
Mattson LP-DC	(.040) Gold	*
Sata NR95 gravity	1.5mm	*
Sharpe SGF-HVLP	1.8mm	#12
Sharpe 975HVLP pressure	0.8mm	.#12S



AIR PRESSURES

Conventional @ Gun	PANEL	OVERALL
Gravity Feed	35 - 40 psi	.45 - 50 psi
Siphon Feed	40 - 45 psi	.45 - 55 psi
HVLP @ Cap	8 - 10 psi	.8 - 10 psi

PHYSICAL DATA

Volume Solids	39.3%
Theoretical Coverage	639 sq. ft. per mil per gallon
Flash Point	4°F
Recommended DFT	.2 mils.
Recomennded Zahn #2 Viscosities	.17 - 20 seconds

SAFETY

Refer to Material Safety Data Sheet (MSDS) for complete safety instructions. The technical data listed herein has been compiled in good faith for your convenience and guidance. No warranty, expressed or implied, is intended or given by the information on this sheet.

COMPLIANT COATINGS SYSTEM

PRIMER SURFACER

AQUAPRIMER SURFACER

Less than 250 g/l VOC – 2.08 lb/gl

AQUAPRIMER SURFACER is a waterborne acrylic with excellent adhesion properties to a wide variety of OEM finishes and other substrates such as steel, plastic and wood. AQUAPRIMER is a quick-dry, wet or dry sanding, single component primer surfacer which offers excellent filling and corrosion-resistant properties.

ADVANTAGES:

- ▼ Meets air quality regulations
- ▼ Superior filling properties
- ▼ Easy to apply, quick dry
- ▼ Corrosion-resistant
- ▼ Non-flammable

Product Number: 882 WHITE, 883 GRAY, 887 BUFF

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800) 752-1566 / FAX (323) 780-9940

PCL

COMPLIANT COATINGS SYSTEM

AQUAPRIMER SURFACER

SURFACE PREPARATION

Prior to application, the surface must be dry, clean and free from wax, grease, oil, rust, dirt or any other foreign matter. Use 1071 Compliant Surface Cleaner on unpainted surfaces or 185 on painted surfaces. Sand and featheredge original finish with 220 or 320 wet or dry sandpaper. Use 195 Pro Etch over bare metal for better adhesion.

MIXING *IMPORTANT*

STIR OR SHAKE WELL BEFORE USING.

THINNING

No thinning is required. AQUAPRIMER is packaged ready to spray.

If thinning is desired, add small amounts of water.

APPLICATION

Apply 2 wet coats to the substrate at 40 to 45 PSI for Siphon HVLP Gun or 35 to 40 PSI for Gravity HVLP Gun, with 10 minutes flash time between coats. Sand using paint manufacturer's recommended grit.

DRY SANDING: AQUAPRIMER can be dry sanded in 30 to 60 minutes, depending on film thickness and weather conditions.

WET SANDING: AQUAPRIMER can be wet sanded in 1 to 2 hours, depending on film thickness and weather conditions. Wet sand a section at a time. Use small amounts of water while sanding. Rinse with water and immediately dry the surface with air gun or wipe with clean, dry cloth. Do not use excessive amounts of water.

RECOAT: Apply topcoat after dry sanding. If wet sanding, allow surface to dry before topcoat application.

CLEANING

Return unused portion of AQUAPRIMER into its original container. Equipment should be cleaned with 3520 Universal Compliant Solvent in an enclosed system.

TECHNICAL DATA

VOC:	Less than 250 g/l – 2.08 lb/gl
Color:	White, Gray or Buff
Finish:	Flat
Solvent:	Glycol Ethers & Water
Flash Point:	>200°F TCC
Dry-to-Touch:	30 minutes
% Solids by Volume:	28–30
% Solids by Weight:	44–48
Coverage:	450–470 sq. ft. per gallon @ 1 mil DFT
Viscosity:	64–66 KU @ 77°F
Recoat Time:	1 hour

NOTE: FOR USE BY PROFESSIONAL, TRAINED PERSONNEL, USING PROPER EQUIPMENT WITH STANDARD SAFETY PROCEDURES. NOT INTENDED FOR SALE TO THE GENERAL PUBLIC. FOR PROFESSIONAL USE ONLY. NOT FOR RESIDENTIAL USE.

SEE LABEL FOR ADDITIONAL SAFETY INFORMATION.

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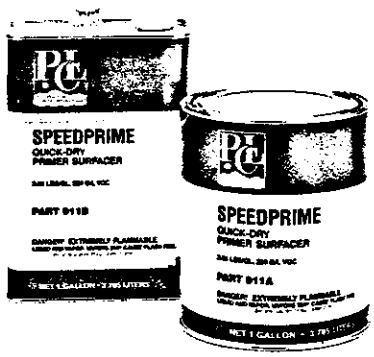
COMPLIANT COATINGS SYSTEM

PRIMER SURFACER

SPEEDPRIME

QUICK-DRY PRIMER SURFACER

250 g/l VOC – 2.08 lb/gl (Combined Components)



SPEEDPRIME QUICK-DRY PRIMER SURFACER is a two-component, low VOC primer consisting of Part 911A and Part 911B. This premium primer offers excellent high-build and adhesion properties. SPEEDPRIME is also corrosion-resistant, and may be wet or dry sanded.

ADVANTAGES:

- ▼ Meets air quality regulations
- ▼ High speed drying
- ▼ Superior filling properties
- ▼ Sand wet or dry
- ▼ Excellent adhesion

Product Numbers: 911A and 911B

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800) 752-1566 / FAX (323) 780-9940

PCL

COMPLIANT COATINGS SYSTEM

SPEEDPRIME
QUICK-DRY PRIMER SURFACER

IMPORTANT
Read all directions and warnings for safe and optimal results.

SURFACE PREPARATION

Prior to application, the surface must be dry, clean and free from wax, grease, oil, rust, dirt or any other foreign matter. Use 1071 Compliant Surface Cleaner on unpainted surfaces or 185 on painted surfaces. Sand and featheredge original finish with 220 or 320 wet or dry sandpaper. Use 195 Pro Etch over bare metal for additional corrosion protection.

MIXING – *IMPORTANT*

Always maintain the proper mixing ratio – one Part 911A to one Part 911B.

IMPORTANT!
The contents of Part A must be mixed with Part B before the product can be used. Any mixture of components will have the hazards of ALL components. Before opening the packages, read all label warnings. OBSERVE ALL APPLICABLE PRECAUTIONS.

THINNING

No thinning is required. If additional thinning is desired, use 2010 Acetone.

APPLICATION

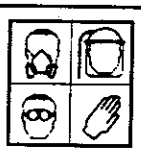
Apply 2 wet coats to the substrate at 40 to 45 PSI for Siphon HVLP Gun or 35 to 40 PSI for Gravity HVLP Gun, with 10 minutes flash time between coats. Allow 25 to 35 minutes dry time before wet or dry sanding. Use paint manufacturer's recommended grit.

CLEANING

Equipment should be cleaned with 3520 Universal Compliant Solvent in an enclosed system.

TECHNICAL DATA

VOC:	250 g/l – 2.08 lb/gl (combined)
Color:	Gray
Finish:	Flat
Solvent:	Aliphatic Hydrocarbons, Ketones, Xylene, Alcohol, Esters and PCBTF.
Flash Point:	1°F TCC
Dry-to-Touch:	10–15 minutes
% Solids by Volume:	17.7
% Solids by Weight:	30
Coverage:	280 square feet per gallon @ 1.0 mil DFT
Viscosity:	15–16 seconds #2 Zahn cup
Recoat Time:	1 hour



NOTE: FOR USE BY PROFESSIONAL, TRAINED PERSONNEL, USING PROPER EQUIPMENT WITH STANDARD SAFETY PROCEDURES. NOT INTENDED FOR SALE TO THE GENERAL PUBLIC. FOR PROFESSIONAL USE ONLY. NOT FOR RESIDENTIAL USE.
SEE LABEL FOR ADDITIONAL SAFETY INFORMATION.

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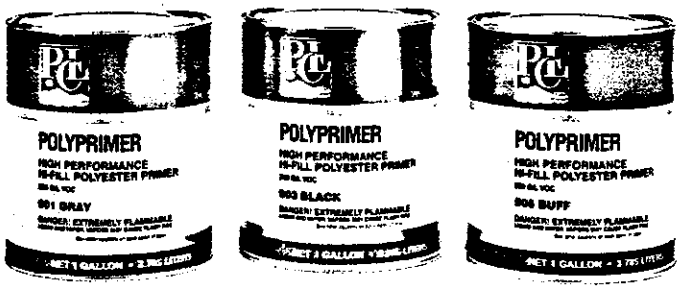
PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800) 752-1566 / FAX (323) 780-9940

COMPLIANT COATINGS SYSTEM

PRIMER SURFACER

POLYPRIMER SURFACER

Less than 200 g/l VOC – 1.66 lb/gl



POLYPRIMER SURFACER is a corrosion-resistant, sanding primer based on an air-drying polyester resin. The pigmentation is carefully balanced for optimum sanding properties. It is fast drying and has excellent filling properties and adhesion over fiberglass, metal, plastic and wood. Can be topcoated with all types of finishes, acrylics, lacquers, synthetic enamels and two-component urethane coatings.

ADVANTAGES:

- ▼ Meets air quality regulations
- ▼ Excellent filling properties
- ▼ Minimum shrinking due to high solids content
- ▼ Low VOC
- ▼ Lead and chromate-free

Product Numbers: 901 GRAY, 903 BLACK, 905 BUFF

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (323)261-8114 / FAX (323)780-9940

PCL

COMPLIANT COATINGS SYSTEM

POLYPRIMER SURFACER

IMPORTANT
Read all directions and warnings for safe and optimal results.
Contents must be activated with MEKP.

SURFACE PREPARATION

Prior to application, the surface must be dry, clean and free from wax, grease, oil, rust, dirt or any other foreign matter. Use 1071 Compliant Surface Cleaner on unpainted surfaces or 185 on painted surfaces. Sand and feather edge original finish with 220 or 320 wet or dry sandpaper. Use 195 Pro Etch over bare metal for better adhesion.

APPLICATION

Apply a wet mist coat with 5 minutes flash time. Follow with a medium wet coat. Allow 15 minutes between subsequent coats. Do not apply more than 3 medium coats.

CAUTION: Dry spray of POLYPRIMER may cause blistering of color coat.

SANDING: Depending on temperature, Polyprimer can be sanded between 45 minutes to 1 hour. For optimum results, dry sand using 320 to 400 grit paper. If wet sanding is preferred, surface must be completely dry prior to applying topcoat.

MIXING *IMPORTANT*

Mix 1/2 oz. bottle of MEKP with one quart of the primer, or one 2 oz. bottle of MEKP with one gallon of the primer. Contents must be mixed thoroughly.

Primer catalyzed with MEKP will have workable pot life of approximately 30–35 minutes at 77°F. Higher temperatures will shorten the pot life. Do not mix more than can be applied in one application.

CLEANING

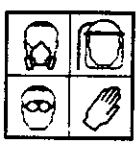
Equipment should be cleaned immediately after use with 3520 Universal Compliant Solvent in an enclosed system.

THINNING

No thinning is required. If additional thinning is desired, use 2010 Acetone.

TECHNICAL DATA

VOC:	Less than 200 g/l – 1.66 lb/gl
Color:	Gray, Black or Buff
Finish:	Flat
Solvent:	Styrene/Ketones/Ester/ Aliphatic Hydrocarbon
Flash Point:	1°F TCC
Dry-to-Touch:	Within 30 minutes
% Solids by Volume:	75
% Solids by Weight:	85
Coverage:	1200 sq. ft. per gallon @ 1 mil DFT
Pot Life:	Approximately 30–35 minutes @ 77°F
Viscosity:	25–26 seconds #3 Zahn cup
Shelf Life:	6 months



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6/98

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (323)261-8114 / FAX (323)780-9940

COMPLIANT PRODUCTS for Automotive Refinishing

INTRODUCING

EUROSEAL
NON-SANDING PRIMER SEALER

2.8 lb/gl VOC – 340 g/l
(Combined Components)

Meets Air Quality Regulations

EUROSEAL NON-SANDING PRIMER SEALER is a compliant, wet-on-wet primer sealer. This two-component 2.8 VOC corrosion-resistant primer sealer is formulated to be used over sanded original finishes or properly prepared and cleaned bare metal. EUROSEAL is intended to be used as a final step before applying topcoat.

FEATURES:

- ▼ 2.8 VOC
- ▼ Easy to use
- ▼ Versatile

ADVANTAGES:

- ▼ Meets Air Quality Regulations
- ▼ Wet on wet
- ▼ Compatible with all topcoats

Product Numbers: 701A GRAY, 702A RED OXIDE, 707A BUFF, 798B CATALYST

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)672-4900 / FAX (323)780-9940

PCL

COMPLIANT COATINGS SYSTEM

EUROSEAL
NON-SANDING PRIMER SEALER
700 SERIES

NOTES FOR USE

IMPORTANT!

PCL EUROSEAL 700 Series must be blended with Part 798B CATALYST and COMPLIANT REDUCER before the product can be used. Before adding catalyst and reducer, READ CAUTION STATEMENTS ON CATALYST AND REDUCER LABELS. Any mixture containing catalyst and reducer will have the hazards of ALL components. OBSERVE ALL APPLICABLE PRECAUTIONS.

MIX ONLY WHEN READY TO SPRAY! Mix ratio is 3 parts EUROSEAL with 1 part 798B CATALYST and 1 part COMPLIANT REDUCER. MIX ONLY ENOUGH MATERIAL TO SPRAY 2 WET COATS.

VISCOSITY: Viscosity of the mixed product as supplied is approximately 17–19 seconds in a #2 Zahn Cup at 77°F.

POT LIFE: Pot life for the mixed components is approximately 4 hours at 77°F. The pot life will shorten at a higher temperature.

Compliant reducers available:

2010 Acetone
8025 zero VOC Solvent, Fast
8050 zero VOC Solvent, Medium
8075 zero VOC Solvent, Slow

APPLICATION

Apply base coat. Let dry. (Refer to base coat manufacturer's product information sheet for its application and dry times).

Apply 1 wet coat of EUROSEAL.

FLUID TIP: 1.4mm at 10 PSI at the air cap for HVLP guns. 45–50 PSI at the gun for conventional guns.

DRY TIME

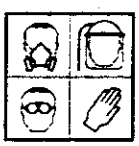
Dry to topcoat:	One coat
70°F (21°C)	20 minutes
90°F (32°C)	10 minutes

CLEANING

Equipment should be cleaned immediately after use with 3520 Universal Compliant Solvent in an enclosed system.

PROPERTIES

Solids by weight:	50–52%
Solids by volume:	36–37%
Initial viscosity:	17–19 seconds #2 Zahn cup
Pot life–	
viscosity after 1 hour:	18–20 seconds #2 Zahn cup
viscosity after 2 hours:	19–21 seconds #2 Zahn cup
Drying:	Can be topcoated in 20 minutes



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SEE LABEL FOR ADDITIONAL SAFETY INFORMATION.

5/99

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)672-4900 / FAX (323)780-9940

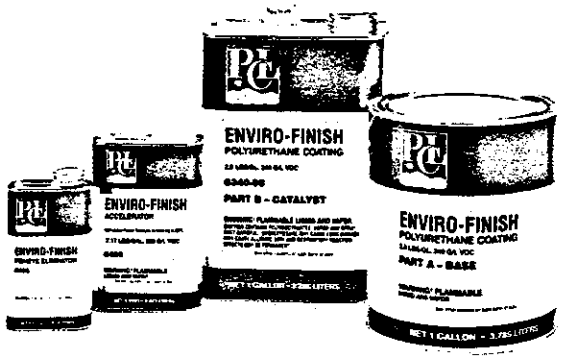
COMPLIANT COATINGS SYSTEM

POLYURETHANE COATING

ENVIRO-FINISH

POLYURETHANE COATING

340 g/l VOC – 2.8 lb/gl (Combined Components)



ENVIRO-FINISH POLYURETHANE COATING is a non-yellowing, high quality polyurethane, manufactured from the finest raw materials available. Enviro-Finish is designed to provide a high gloss, extremely durable, chemical-resistant topcoat. This tough, wet-look finish will far surpass the performance of acrylic enamels and epoxies. Enviro-Finish is lead and chromate-free.

ADVANTAGES:

- ▼ Meets air quality regulations
- ▼ Lead and chromate-free
  – durable polyurethane
- ▼ High gloss
  – easy to use
- ▼ Resistant to chemicals
  – including Skydrol
- ▼ Multi-market system
  – 2.8 and 3.5 VOC for Group I and Group II vehicles

Product Numbers: PART A BASE, 6340-98 CATALYST

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)752-1566 / FAX (323)780-9940

PCL

COMPLIANT COATINGS SYSTEM

ENVIRO-FINISH
POLYURETHANE COATING

FILM PROPERTIES

ADHESION:
ASTM D-3359 — Cross-hatch – 100% adhesion

FLEXIBILITY AND ELONGATION:
ASTM D-1737 — 1/2" Mandrel, no cracking

MAR RESISTANCE:
Comparative Test — Excellent

HARDNESS:
ASTM D-3363 — H – 2H

ULTRAVIOLET WEATHERING:
ASTM G-53 — 1,000 hours, no loss of gloss

PRINT AND BLOCK RESISTANCE:
ASTM D-2793 — Pass
ASTM D-3003 — Pass

DIRECT IMPACT:
ASTM D-2794 — 160 in-lbs, no cracking

REVERSE IMPACT:
ASTM D-2794 — 160 in-lbs, no cracking

MEK 100 RUB-UP:
Pass, no change

SURFACE PREPARATION

Prior to application, the surface must be dry, clean and free from wax, grease, oil, rust, dirt or any other foreign matter. Use 1071 Compliant Surface Cleaner on unpainted surfaces or 185 on painted surfaces. Sand and featheredge original finish with 220 or 320 wet or dry sandpaper. Use 195 Pro Etch over bare metal for additional corrosion protection.

MIXING – *IMPORTANT*

ENVIRO-FINISH POLYURETHANE COATING Part A Base to be used only with ENVIRO-FINISH 6340-98 Part B Catalyst. Mix one part of ENVIRO-FINISH POLYURETHANE COATING Part A Base with one part ENVIRO-FINISH 6340-98 Part B Catalyst. Stir thoroughly to a uniform mixture. Strain mixture prior to application. Spray viscosity of mixture is approximately 20 to 22 seconds, #2 Zahn cup at 77°F. Mix no more material than will be used in a 2-hour period.

THINNING

No reduction required for 2.8 VOC application. For 3.5 VOC application use15% of PCL Urethane Reducer 6007 (fast), 6009 (medium) or 6011 (slow) .

APPLICATION

Apply 2 medium wet coats. Apply first coat, then allow 10 to 15 minutes flash-off time, then follow with full second coat.

ACCELERATOR: To accelerate dry time, add 6499 ACCELERATOR to the mixed material. Follow label directions. Pot life will be reduced to 1 hour at 77°F.

FISHEYES: To eliminate "fisheyes," add 6496 Fisheye Eliminator to the mixed material. Do not use commercial fisheye eliminator as it may not be compatible with the ENVIRO-FINISH mixture.

TAPE: Overnight.

FORCE DRY: Purge 20 minutes. Dry Time 20 to 25 minutes at 140°F.

RECOAT: Within 48 hours @ 70–80°F.

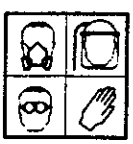
CUT & BUFF: After 24 hours.

CLEANING

Equipment should be cleaned immediately after use with 3520 Universal Compliant Solvent in an enclosed system.

TECHNICAL DATA

VOC:	340 g/l – 2.8 lb/gl (combined components)
Color:	Assorted
Finish:	High gloss "wet look"
Solvent:	Esters / Ketones / Aromatic Hydrocarbons
Flash Point:	40°F TCC
Dry-to-Touch:	1–2 hours @ 77°F
% Solids by Volume:	59–60
% Solids by Weight:	65–71
Coverage:	950–970 square feet per gallon @ 1.0 mil dry
Pot Life:	Approximately 2 hours @ 77°F
Viscosity:	20–22 seconds #2 Zahn cup
Recoat Time:	48 hours @ 70–80°F



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SEE LABEL FOR ADDITIONAL SAFETY INFORMATION.

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COMPLIANT PRODUCTS for Automotive Refinishing

INTRODUCING

EUROCLEAR 2200

2.1 lb/gl VOC – 252 g/l
(Combined Components)

Meets Air Quality Regulations

EUROCLEAR 2200, formulated at 2.1 VOC, can be applied over a variety of base coats in base coat/clear coat systems. This two-component polyurethane system offers a durable, high gloss finish. EUROCLEAR 2200 is user-friendly, resulting in increased production. This product polishes easily after 24 to 48 hours.

EUROCLEAR 2200 is multi-use, to be applied as a spot, panel or overall application.

FEATURES:

- ▼ Easy to mix
- ▼ Fast dry
- ▼ Low viscosity
- ▼ 2.1 VOC

ADVANTAGES:

- ▼ 3:1 ratio
- ▼ Dust-free in 60 minutes
- ▼ 17–18 seconds in a #2 Zahn cup for great atomization
- ▼ VOC-compliant for 3.5 multi-stage topcoats

Product Numbers: 2200A CLEAR & 2298B CATALYST

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)752-1566 / FAX (323)780-9049

PCL

COMPLIANT COATINGS SYSTEM

EUROCLEAR 2200

[illegible] use

IMPORTANT!

PCL EUROCLEAR 2200A is to be mixed only with 2298B Catalyst. Before mixing 2200A Clear and 2298B Catalyst, read the cautions and warnings on both labels. Any mixture containing 2298B Catalyst will have the hazards of BOTH components. OBSERVE ALL APPLICABLE PRECAUTIONS.

[illegible]

MIX ONLY WHEN READY TO SPRAY! Mix ratio is 3 parts 2200A CLEAR with 1 part 2298B CATALYST. MIX ONLY ENOUGH MATERIAL TO SPRAY 2 WET COATS.

VISCOSITY: Viscosity of the mixed product as supplied is approximately 17 to 18 seconds in a #2 Zahn Cup at 77°F.

POT LIFE: Pot life for the mixed components is approximately 1½ hours at 77°F. The pot life will shorten at a higher temperature.

[illegible]

If necessary, add 6496 FISHEYE ELIMINATOR to the mixed material. Do not use commercial fisheye eliminator as it may not be compatible with the EUROCLEAR mixture.

[illegible]

To accelerate the dry time, add 2199 ACCELERATOR 1 oz. per sprayable quart. Pot life will be reduced to 45 minutes.

APPLICATION

Apply base coat. Let dry. (Refer to base coat manufacturer's product information sheet for its application and dry times).

Apply 1 wet coat of EUROCLEAR. Wait approximately 10 to 15 minutes for flash time, then follow with another wet coat.

FLUID TIP: 1.4mm at 10 PSI at the air cap for HVLP guns. 45–50 PSI at the gun for conventional guns.

DRY TIME

Dust-free:	Approximately 1 hour
Hard dry:	5 hours
Full cure:	7 days
Dry to cut & buff:	24 to 48 hours
Force dry:	Purge time – 15 minutes Dry time – 20 minutes @ 140°F

CLEANING

Equipment should be cleaned immediately after use with 3520 Universal Compliant Solvent in an enclosed system.

PROPERTIES

Solids by weight:	44%
Solids by volume:	43%
Initial viscosity:	17–18 seconds #2 Zahn cup
Pot life–	
viscosity after 1 hour:	20 seconds #2 Zahn cup
viscosity after 2 hours:	27 seconds #2 Zahn cup
Drying–	
Dust-free:	Approximately 1 hour
Hard dry:	5 hours

NOTE: FOR USE BY PROFESSIONAL, TRAINED PERSONNEL, USING PROPER EQUIPMENT WITH STANDARD SAFETY PROCEDURES. NOT INTENDED FOR SALE TO THE GENERAL PUBLIC. FOR PROFESSIONAL USE ONLY. NOT FOR RESIDENTIAL USE.

SEE LABEL FOR ADDITIONAL SAFETY INFORMATION.

3/99

/ 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)752-1566 / FAX (323)780-9940

COMPLIANT PRODUCTS for Automotive Refinishing

INTRODUCING

EUROCLEAR II 2300

3.5 lb/gl VOC – 420 g/l
(Combined Components)

Meets Air Quality Regulations

EUROCLEAR II 2300, formulated at 3.5 VOC, can be applied over a variety of base coats in base coat/clear coat systems. This two-component polyurethane system offers a durable, high gloss finish. EUROCLEAR II 2300 is user-friendly, resulting in increased production. This product polishes easily after 24 to 48 hours.

EUROCLEAR II 2300 is multi-use; can be applied as a spot, panel or overall application.

FEATURES:

- 3.5 VOC
- Easy to mix
- Fast dry
- Low viscosity

ADVANTAGES:

- Meets Air Quality Regulations
- 3:1 ratio
- Dust-free in 1 hour
- 17–18 seconds in a #2 Zahn cup for great atomization

Product Numbers: 2300A CLEAR & 2398B CATALYST

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)672-4900 / FAX (323)780-9940

PCL

COMPLIANT COATINGS SYSTEM

EUROCLEAR II
2300

IMPORTANT!

PCL EUROCLEAR II 2300A is to be mixed only with 2398B Catalyst. Before mixing 2300A Clear and 2398B Catalyst, read the cautions and warnings on both labels. Any mixture containing 2398B Catalyst will have the hazards of BOTH components. OBSERVE ALL APPLICABLE PRECAUTIONS.

MIX ONLY WHEN READY TO SPRAY! Mix ratio is 3 parts 2300A CLEAR with 1 part 2398B CATALYST. MIX ONLY ENOUGH MATERIAL TO SPRAY 2 WET COATS.

VISCOSITY: Viscosity of the mixed product as supplied is approximately 17 to 18 seconds in a #2 Zahn Cup at 77°F.

POT LIFE: Pot life for the mixed components is approximately 2 hours at 77°F. The pot life will shorten at a higher temperature.

If necessary, add 2296 FISHEYE ELIMINATOR to the mixed material. Do not use commercial fisheye eliminator as it may not be compatible with the EUROCLEAR II mixture.

To accelerate the dry time, add 2199 ACCELERATOR 1 oz. per sprayable quart. Pot life will be reduced to 1 hour.

APPLICATION

Apply base coat. Let dry. (Refer to base coat manufacturer's product information sheet for its application and dry times).

Apply 1 wet coat of EUROCLEAR II. Wait approximately 10 to 15 minutes for flash time, then follow with another wet coat.

FLUID TIP: 1.4mm at 10 PSI at the air cap for HVLP guns. 45–50 PSI at the gun for conventional guns.

DRY TIME

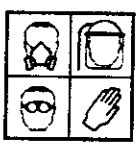
Dust-free:	Approximately 1 hour
Hard dry:	4 hours
Full cure:	7 days
Dry to cut & buff:	24 to 48 hours
Force dry:	Purge time – 15 minutes Dry time – 20 minutes @ 140°F

CLEANING

Equipment should be cleaned immediately after use with 3520 Universal Compliant Solvent in an enclosed system.

PROPERTIES

Solids by weight:	49%
Solids by volume:	43%
Initial viscosity:	17–18 seconds #2 Zahn cup
Drying–	
Dust-free:	Approximately 1 hour
Hard dry:	4 hours



NOTE: FOR USE BY PROFESSIONAL, TRAINED PERSONNEL, USING PROPER EQUIPMENT WITH STANDARD SAFETY PROCEDURES. NOT INTENDED FOR SALE TO THE GENERAL PUBLIC. FOR PROFESSIONAL USE ONLY. NOT FOR RESIDENTIAL USE.

SEE LABEL FOR ADDITIONAL SAFETY INFORMATION.

5/99

PCL 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)672-4900 / FAX (323)780-9940

COMPLIANT PRODUCTS for Automotive Refinishing

INTRODUCING

PREMIUM PRODUCTION EUROCLEAR 2400

2.1 lb/gl VOC – 252 g/l
(Combined Components)

Meets Air Quality Regulations

PREMIUM PRODUCTION EUROCLEAR 2400 is formulated for premium productivity at 2.1 VOC. PREMIUM PRODUCTION EUROCLEAR 2400 can be applied over a variety of base coats in base coat/clear coat systems. This two-component polyurethane system offers a durable, high gloss finish. PREMIUM PRODUCTION EUROCLEAR 2400 is user-friendly, resulting in increased production. This product polishes easily after 12 hours.

PREMIUM PRODUCTION EUROCLEAR 2400 is multi-use, to be applied as a spot, panel or overall application.

FEATURES:

- ▼ Easy to mix
- ▼ Fast dry
- ▼ Low viscosity
- ▼ 2.1 VOC

ADVANTAGES:

- ▼ 4:1 ratio
- ▼ Dust-free in 20 minutes
- ▼ 17–18 seconds in a #2 Zahn cup for great atomization
- ▼ VOC-compliant for 3.5 multi-stage topcoats

Product Numbers: 2400 CLEAR & 2498 CATALYST

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)672-4900 / FAX (323)780-9940

PCL

COMPLIANT COATINGS SYSTEM

PREMIUM PRODUCTION EUROCLEAR 2400

DIRECTIONS FOR USE

IMPORTANT!

PREMIUM PRODUCTION EUROCLEAR 2400 is to be mixed only with 2498 Catalyst. Before mixing 2400 Clear and 2498 Catalyst, read the cautions and warnings on both labels. Any mixture containing 2498 Catalyst will have the hazards of BOTH components. OBSERVE ALL APPLICABLE PRECAUTIONS.

MIXING

MIX ONLY WHEN READY TO SPRAY! Mix ratio is 4 parts 2400 CLEAR with 1 part 2498 CATALYST. MIX ONLY ENOUGH MATERIAL TO SPRAY 2 WET COATS.

VISCOSITY: Viscosity of the mixed product as supplied is approximately 17 to 18 seconds in a #2 Zahn Cup at 77°F.

POT LIFE: Pot life for the mixed components is approximately 1½ hours at 77°F. The pot life will shorten at a higher temperature.

FISHEYES

If necessary, add 6496 FISHEYE ELIMINATOR to the mixed material. Do not use commercial fisheye eliminator as it may not be compatible with the EUROCLEAR mixture.

ACCELERATOR

To accelerate the dry time, add 2199 ACCELERATOR 1 oz. per sprayable quart. Pot life will be reduced to 45 minutes.

APPLICATION

Apply base coat. Let dry. (Refer to base coat manufacturer's product information sheet for its application and dry times).

Apply 2 wet coats of PREMIUM PRODUCTION EUROCLEAR 2400. Wait approximately 10 to 15 minutes for flash time between coats.

FLUID TIP: 1.4mm at 10 PSI at the air cap for HVLP guns. 45–50 PSI at the gun for conventional guns.

DRY TIME

Dust-free:	20 minutes
Hard dry:	Overnight
Full cure:	7 days
Dry to cut & buff:	Minimum 12 hours
Force dry:	Purge time – 15 minutes Dry time – 20 minutes @ 140°F

CLEANING

Equipment should be cleaned immediately after use with 3520 Universal Compliant Solvent in an enclosed system.

PROPERTIES

Solids by weight:	44%
Solids by volume:	43%
Initial viscosity:	17–18 seconds #2 Zahn cup
Pot life–	
viscosity after 1 hour:	20 seconds #2 Zahn cup
viscosity after 2 hours:	27 seconds #2 Zahn cup
Drying–	
Dust-free:	20 minutes
Hard dry:	Overnight

NOTE: FOR USE BY PROFESSIONAL, TRAINED PERSONNEL, USING PROPER EQUIPMENT WITH STANDARD SAFETY PROCEDURES. NOT INTENDED FOR SALE TO THE GENERAL PUBLIC. FOR PROFESSIONAL USE ONLY. NOT FOR RESIDENTIAL USE.

SEE LABEL FOR ADDITIONAL SAFETY INFORMATION.

3/00

PCL / 3150 East Pico Boulevard, Los Angeles, CA 90023 / Phone (800)672-4900 / FAX (323)780-9940

KWIK CLEAN™ 3949S SURFACE CLEANER

KWIK CLEAN 3949S is an easy-to-use surface cleaner in any cleaning step. It gives you outstanding performance and works extremely well on the following difficult-to-remove elements:

- wax
- grease
- silicone
- dirt
- tar
- tree sap
- insect remnants
- salt/road film
- pin stripe adhesives
- oxidized paint
- sanding sludge

Introducing KWIK CLEAN 3949S — the multi-purpose surface cleaner that's tough on dirt and easy on finishes.

Du Pont introduces KWIK CLEAN 3949S, an extremely versatile surface cleaner that handles all your cleaning needs. 3949S is a one-step cleaning agent; it is designed to be effective in any cleaning step — from pre-cleaning to final wipe prior to applying the topcoat.

3949S lets you get cleaning jobs done quickly and efficiently. It does not leave residues that can affect paint or tape adhesion. And 3949S is a low-VOC product; it contains less than 1.67 lbs. of VOC per gallon. It is non-flammable and low in toxicity.

Ready to Use

Shake KWIK CLEAN 3949S well before using. Some separation of ingredients may occur during shelf life.

Application

Soak a clean cloth with 3949S, or use a spray bottle and generously spray the surface to be cleaned. Wipe the surface to loosen and lift the surface contaminants. Follow immediately by wiping with a clean dry cloth to thoroughly remove the contaminants and dry the surface.

For hard to remove spots, such as tar, undercoating or tree sap, wet the surface well with 3949S and allow it to remain on the surface for a couple of minutes. Then wipe the surface to loosen and lift the contaminants. Wipe dry with a clean cloth.

Note

If 3949S is allowed to dry on the surface without wiping, re-wet the surface with 3949S and wipe dry with a clean cloth.

KWIK CLEAN™ 3949S SURFACE CLEANER

Technical Information

Description
An outstanding, multi-purpose surface cleaner that can be used for any step in the cleaning procedure — from pre-cleaning to the final wipe prior to applying the topcoat. 3949S does not leave residues that can affect paint or tape adhesion. It is non-flammable and low in toxicity. 3949S is a low-VOC product, containing less than 1.67 lbs. of VOC per gallon.

3949S is excellent for removing the following elements:

- wax
- grease
- silicone
- dirt
- tar
- tree sap
- insect remnants
- salt/road film
- pin stripe adhesives
- oxidized paint
- sanding sludge

Products
KWIK CLEAN 3949S Surface Cleaner

Ready to Use
Use 3949S full strength. Shake well before using.

Application
Soak a clean cloth with 3949S, or spray the surface generously from a bottle. Wipe the surface to loosen and lift the surface contaminants. Follow immediately by wiping with a clean dry cloth to thoroughly remove the contaminants and dry the surface.

For hard to remove spots, such as tar, undercoating or tree sap, wet the surface well with 3949S and allow it to remain on the surface for a couple of minutes. Then wipe the surface to loosen and lift the contaminants. Wipe dry with a clean cloth.

Note
If 3949S is allowed to dry on the surface without wiping, re-wet the surface with 3949S and wipe dry with a clean cloth.

Safety and Handling
Du Pont is committed to helping you develop and maintain a safe working environment. Carefully read the specific warnings and precautions printed on the labels of all Du Pont products before handling or using. These products are for industrial use by trained professional painters only.

DUPONT

AUTOMOTIVE REFINISH PRODUCTS

Product Usage Data Sheet - 3909S

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ChromaSystemTM Technical Manual

DuPont Automotive

Low VOC Final KleanTM 3909S

Description

Low VOC Final KleanTM 3909S is an ultra-low VOC (0.5 lbs/gal), multi-purpose surface cleaner that leaves no surface residue. Its unique, clear formulation makes it excellent for dissolving water soluble and surface contaminants. It dries quickly and won't affect tape or paint adhesion.

3909S is conveniently packaged in one-gallon plastic containers. It is recommended for use with Cromax WBC(R) and can be used as a final cleaner for all DuPont topcoat systems. It works well on sanding sludge, grease smears, dirt, insect remnants, bird droppings, tree sap, silicone, salt/road film, tape adhesives, fingerprints and compound sludge.

General Information

Components
3909S - Low VOC Final KleanTM

Mix Ratio
Ready to use.

Tips for Success
Shake 3909S well before using.

Application

Substrates
All DuPont topcoats
Sanded substrates
OEM finishes
Cured, repainted surfaces
Sanded primers
Cured sealers

Application
^ Soak a clean cloth with 3909S, or spray 3909S on the surface thoroughly with a spray bottle.
^ Wipe the surface while it is still wet to loosen and lift the contaminants; follow immediately by wiping thoroughly with a clean, dry cloth.
^ For hard to remove surface contamination, reapply 3909S and wipe off with a clean, dry cloth.

Storage
Store 3909S at room temperature. Do not store in areas subject to freezing temperatures.

Product Usage Data Sheet - 39099

MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM

Physical Properties

VOC: 0.5 lbs/gal ready to use.
Flash Point: Above 200ºF.

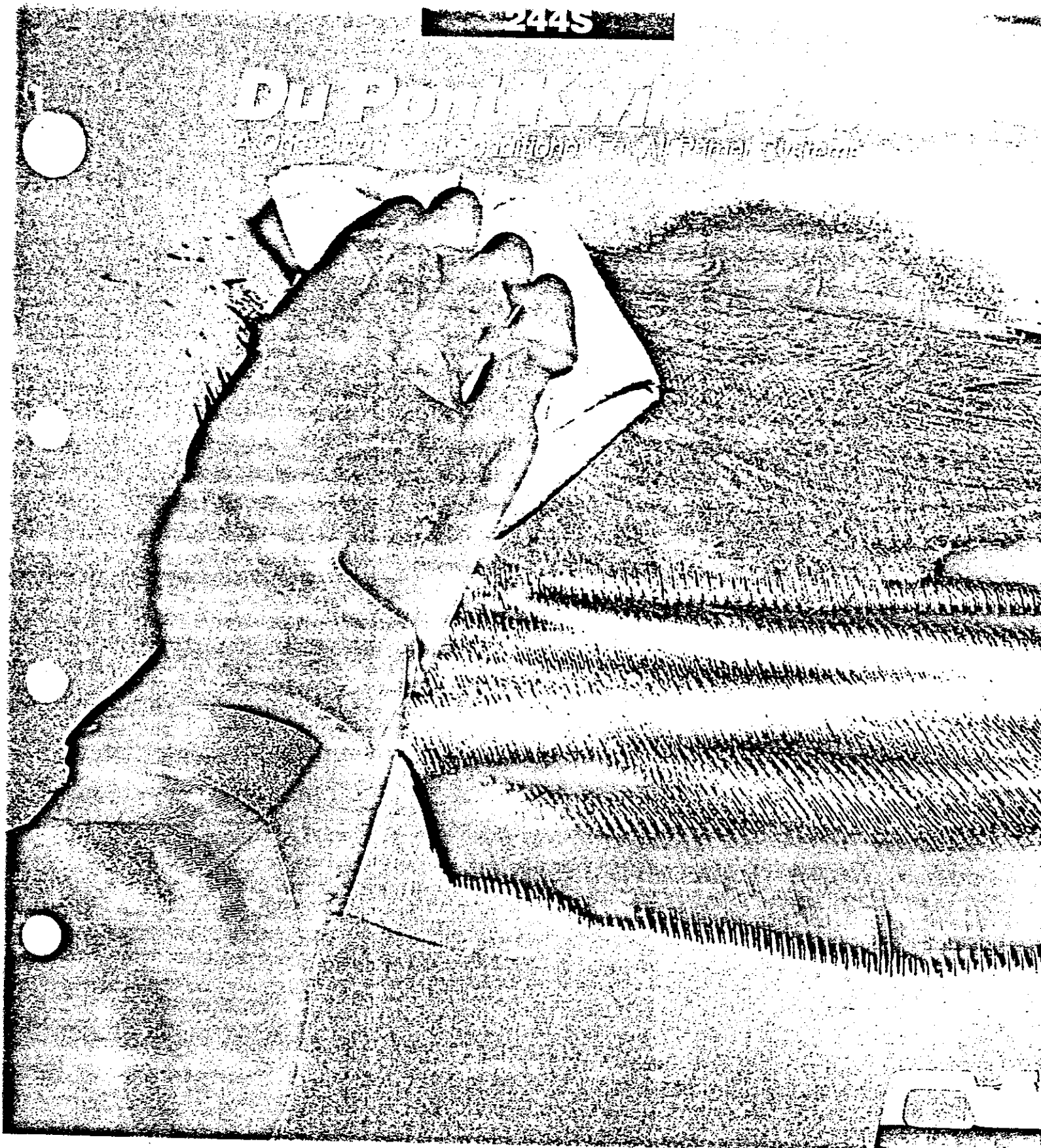
VOC Regulated Areas

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow recommendations in the VOC Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont product, be sure to read all safety directions and warnings. WEAR A PROPERLY FITTED VAPOR/PARTICULATE RESPIRATOR approved by NIOSH for use with paints (TC-23C), eye protection, gloves and protective clothing during application and until all vapors and spray mists are exhausted. In confined spaces, or in situations where continuous spray operations are typical, or if proper respirator fit is not possible, wear a positive pressure, supplied-air respirator (NIOSH TC-19C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

244S



Kwik Prep 244S is a simple-to-use product that conditions steel or ferrous metal. It is applied directly from the package; no mixing or dilution is necessary. After flashing, a uniform blueing indicates a complete reaction.

Benefits: Conditions, stabilizes and cleans metal for priming • Offers improved corrosion resistance with any Du Pont primer system • Consistent performance because it is ready to use as packaged • Dries fast (flashes off in 5 to 10 minutes) • Helps clean seams, hard-to-reach places • Aids in removal of mild flash rusting • Evaporates from crevices; eliminates metal treatment blowback.

Surface Prep:

Before using *Kwik Prep* 244S, large quantities of milling oils may need to be removed with 3812S, 3822S or 3919S. In high rust areas, mechanical abrasion (sanding, DA), is required. For most applications, once the area is free of oils, grease or rust, apply *Kwik Prep* to bare metal areas so as to properly condition metal prepcoating or priming.

Application:

Simply apply *Kwik Prep* 244S directly to bare metal areas right from the bottle. No mixing or dilution is required. Once applied, allow 244S to flash dry (5 to 10 minutes), leaving the conditioning effect and blue-toned color. Once flashed, the metal is ready for priming or prepcoating.

Safety and Handling Information:

Carefully read and follow the specific warnings and precautions printed on the label. This product is FLAMMABLE and must be used only in well-ventilated areas away from heat, sparks and open flames. Do not breathe vapor or spray mist. Do not get in eyes or on skin. This product is intended for use only by professionally trained painters.

First Aid:

In case of skin contact, flush with plenty of water; for eyes, flush with plenty of water for 15 minutes and get medical attention. If affected by inhalation of vapor, remove to fresh air. If swallowed, CALL A PHYSICIAN IMMEDIATELY. Induce vomiting. KEEP OUT OF REACH OF CHILDREN.

Du Pont is committed to developing and maintaining a safe working environment. To ensure maximum safety, Du Pont recommends wearing the proper respirator, protective garments, goggles, gloves and shoes whenever you are working with potentially hazardous materials and/or conditions in the body shop. Always wear a paint spray respirator and use only with adequate ventilation. This product is flammable and all label precautions should be followed.

DU PONT

AUTOMOTIVE REFINISH PRODUCTS

E-R1063
E-77833

DU PONT VELVASEAL® WPS PRIMER-SEALER 2120S/2125S/2140S

The high-productivity waterborne primer-sealer for superior color holdout and leveling.

Velvaseal WPS was designed with today's refinisher in mind. This high-productivity waterborne primer-sealer is packaged ready-to-spray. One application is all it takes. Velvaseal WPS dries fast and smooth, and is ready to topcoat in 30 minutes. You can also force dry with heat or infrared units.

Available in three colors to maximize topcoat hiding, Velvaseal WPS can be used under all Du Pont topcoat systems. It gives you superior color holdout compared to conventional sealers. And it provides excellent adhesion to cut-throughs; there is no need to re-prime.

Velvaseal WPS works well on sensitive substrates and fresh bodywork, and is ideal for preparing new parts. Transparent 2120S dries clear, so you can cut down on prep work — especially useful for jamb areas.

Velvaseal WPS is lead-free and chromate-free. With less than 2.1 lbs/gal VOC, it meets and exceeds all California VOC requirements through 1995 and beyond.

With Velvaseal WPS, you get the job done quickly and easily.

- High productivity.
- Ready-to-spray, one-coat application.
- Dries fast and smooth; ready to topcoat in 30 minutes.
- May be force dried with heat or infrared units.
- Available in three colors to maximize topcoat hiding.
- Can be used under all Du Pont topcoat systems.
- Superior color holdout compared to conventional sealers.
- Excellent adhesion to cut-throughs; no need to re-prime.
- Excellent for sensitive substrates and fresh bodywork, and for preparing new parts.
- Transparent sealer dries clear, requiring less preparation of jamb areas.
- Lead-free and chromate-free.
- Less than 2.1 lbs/gal VOC.
- Meets and exceeds all California VOC requirements through 1995 and beyond.

VELVASEAL® WPS PRIMER-SEALER 2120S/2125S/2140S

Technical Information

Products
- 2120S (Transparent)
- 2125S (Gray)
- 2140S (High-Hiding Red)

Mix Ratio
Velvaseal WPS comes ready-to-spray. Hand stir prior to using.

Compatible Products
Velvaseal may be applied over any of the following products:
- 131S/181S
- 1120S/1140S
- 210S
- 275S
- 2600S/2610S/2640S

Velvaseal WPS can also be used over cleaned, sanded plastic parts. Do not apply directly over TPO.

Topcoating
Topcoat with any of the following:
- Cronar®
- ChromaBase®
- ChromaOne™
- Imron® 6000
- Imron® 5000
- Imron®
- Centari®

Surface Preparation
Finish-sand the substrate with 320 grit on a DA, or 400 dry or 600 wet before applying sealer.

Application
For best results, apply one medium-wet coat of Velvaseal WPS. Allow sealer to dry until the surface is uniformly dull before topcoating. Heavy coats will increase the dry time.

Spray Equipment
Prior to using spray equipment, condition the gun by running water through it.

HVLP:
- Gravity Feed: .066 tip
- Siphon Feed: .036 - .040 tip
- Pressure Feed: .040 tip

CONVENTIONAL: .070 tip

Air Pressure
- HVLP: 8 - 10 psi at the cap.
- Conventional: 35 - 45 psi at the gun.

Dry Time
Force Dry
Bake 5 - 10 minutes at 140°F.

Air Dry
Allow primer to air dry 15 - 20 minutes @ 70°F.

Airflow and humidity will alter these times.

Sanding
No sanding is necessary. If sanding is required to remove imperfections, wet-sand with 600 - 1000 grit, using light hand pressure to avoid cut-throughs. It may also be dry-sanded to remove dust and dirt particles, again using light pressure.

Cleanup
Clean thoroughly with water. To recondition for solvent, flush with Du Pont V-3661S or 3661S.

Tips For Success
- Do not reduce.
- Hand shake or stir prior to use.
- After opening, place an agitator lid on the can and place on your mixing machine.
- Do not shake on a mechanical shaker.
- Look for shade change indicating sealer is ready to topcoat.
- Airflow will significantly help dry.
- Sealer will appear heavy when first sprayed — exhibiting a texture or orange peel finish when wet — but the sealer dries to a very smooth finish.
- Apply medium-wet coats; avoid heavy wet coats.
- Store product at room temperature.
- Do not spray below 55°F.
- Condition gun with water prior to using Velvaseal WPS.
- When using over plastic pieces, clean plastic thoroughly with Plastic-Prep 2319S. Then scuff-sand, and rewipe with 2319S.

VOC

	Less Water & Exempt Solvents	As Packaged
2120S	1.9 lbs/gal	0.8 lbs/gal
2125S	1.8 lbs/gal	0.7 lbs/gal
2140S	2.0 lbs/gal	0.8 lbs/gal

Percent Solids by Weight
2120S: 39.5% ready-to-spray
2125S: 44.5% ready-to-spray
2140S: 45.8% ready-to-spray

Percent Solids by Volume
2120S: 31.8% ready-to-spray
2125S: 31.4% ready-to-spray
2140S: 31.4% ready-to-spray

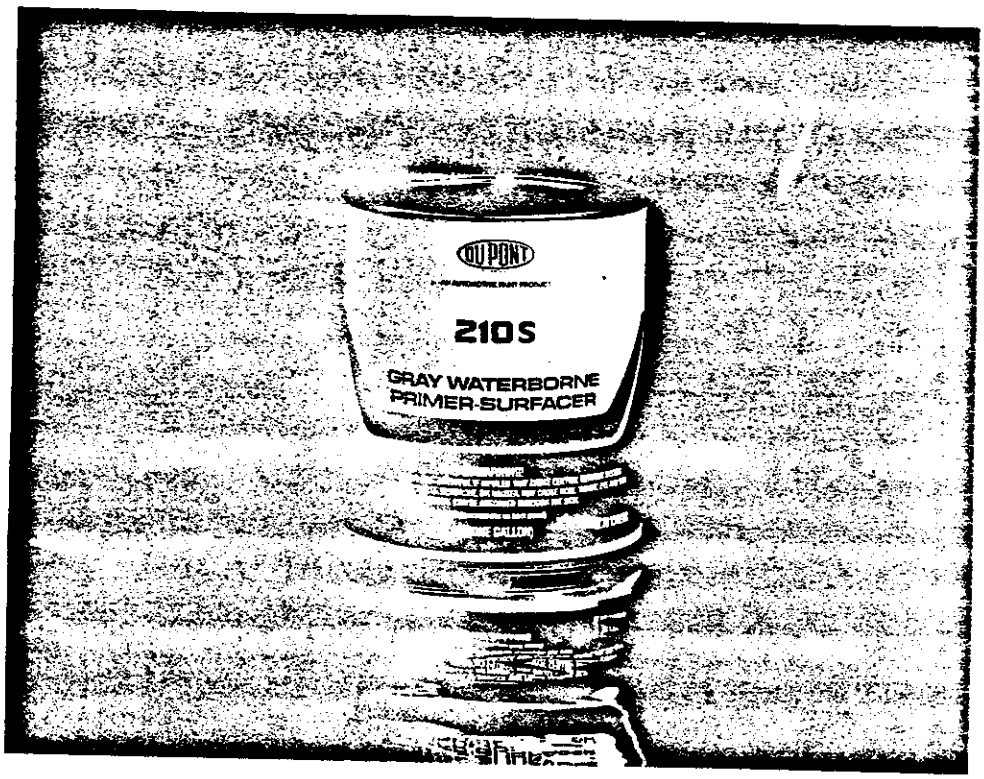
Theoretical Coverage
2120S: 510 sq. ft. at 1 mil
2125S: 504 sq. ft. at 1 mil
2140S: 504 sq. ft. at 1 mil

VOC Compliance
These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the Du Pont Compliant Products Chart for your area.

Safety and Handling
Du Pont is committed to helping you develop and maintain a safe working environment. Carefully read the specific warnings and precautions printed on the labels of all Du Pont products before handling or using. These products are for industrial use by trained professional painters only.

DU PONT

AUTOMOTIVE REFINISH PRODUCTS



A PRIMER THAT PUTS QUALITY *AND* THE ENVIRONMENT FIRST

WATERBORNE PRIMER 210S is Du Pont's first high-performance waterborne undercoat. It is an example of Du Pont's commitment to keeping quality and productivity high and VOC output low.

210S has less than 2.1 pounds of VOC per gallon, less water and exempt solvent. This makes it ideal if you are in a VOC-regulated area. It's also lead and chromate free.

Ready-to-spray 210S minimizes prep work, increasing your productivity. It fills 80 grit sandscratches and builds feathered edges quickly for a smooth appearance. You can apply it with either high-volume, low-pressure (HVLP) or conventional spray guns.

Rely on WATERBORNE PRIMER 210S to benefit your customers, the environment, and you.

- ensures high-quality and productivity
- meets stringent emissions rules – less than 2.1 lbs/VOC per gallon
- corrosion resistant
- easy-to-use
- fast-drying
- provides good topcoat solvent holdout to keep colors from dulling
- can be sprayed over Variprime® or directly onto bare metal
- can be wet-sanded or dry-sanded

WATERBORNE PRIMER 210S – THE PRIME CHOICE FOR OVERALL USE OR SPOT AND PANEL REPAIR USE.

DESCRIPTION

210S is a high-performance, non-aggressive waterborne gray primer surfacer. It has excellent filling capabilities (fills 80 grit) and provides a smooth final texture. 210S is ready to spray, provides good corrosion resistance, and is lead and chromate free.

SURFACE PREPARATIONS

Before spraying 210S, wash the surface thoroughly with a mild detergent. Clean and degrease the area with Prep-Sol II® 3929S, then sand and featheredge. Use Prep-Sol II 3929S again to clean sanding sludge.

To get top performance and increase corrosion protection with 210S, first apply 244S Kwik-Prep™ on clean bare metal areas. For large bare metal surfaces, such as a full panel, use 615S Variprime, mixed 1:1 with either 616S or 620S converter. For small areas and for maximum productivity, spray 210S directly to sanded and cleaned bare metal.

APPLICATION

For best performance, allow first coat of 210S to dry thoroughly followed by a second or third medium-wet coat. For extra fill, a fourth coat can be applied. A medium uniforming coat may be applied as a sealer after sanding dried 210S from the first filling application; or apply it directly to OEM or to sanded, previously refinished areas. Allow 210S to dry and lightly scuff sand or wet-sand to remove dirt as required before applying topcoat.

DRYING

Fast-drying 210S air dries in 30 to 60 minutes depending on shop conditions (airflow, humidity and temperature). It force dries in 30 minutes with a heat or infrared lamp. Be sure to allow 210S to cool before sanding.

SAFETY AND HANDLING

BEFORE USING it is important that you carefully read all specific warnings and precautions on this product. DuPont is committed to helping you develop and maintain a safe working environment.

With this and all DuPont products, be sure to wear proper respiratory protection. When working with 210S, wear a properly fitted vapor/particulate respirator approved by NIOSH/MSHA (TC-23C) while applying paints and until all vapors and spray mists are exhausted. In confined spaces or where continuous spray operations are common, wear a positive pressure supplied air respirator (TC-19C). Also wear the TC-19C if proper respirator fit is not possible.

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Product Usage Data Sheet - 3240S

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2K High Build Primer 3240S

Description

3240S is a 2.1 VOC, two-component, urethane primer with excellent fill and resistance to featheredge swelling. It combines superior performance with good dry times and sanding properties. 3240S is designed for spot, panel and overall applications.

General Information

Components
3240S - Primer (Gray)
3205S - Activator
3289S - Accelerator (Optional)

Mix Ratio/Viscosity
Combine the components either by volume or weight and then mix thoroughly.

	Volume	Weight (cumulative pt)	Weight (cumulative qt)
3240S Primer	2	507 grams	1014 grams
3205S Activator	1	669 grams	1337 grams

Viscosity
13 - 15 seconds in a Zahn #3 cup.

Tips for Success
Shake primer thoroughly on a mechanical agitator before first usage. To maintain thorough agitation, place primer on a mixing machine.

Pot Life
30 - 45 minutes @ 70 deg F.

Additives

Accelerator:	3289S; use up to 1 oz. (23.6 grams)per RTS quart in hot, dry conditions.
Fish Eye Eliminator:	Not required.
Flex Additive:	Not recommended.
Reducer:	Not required.
Retarder:	Not required.

Tinting
Use up to 10 % MasterTint mixing color.

Sealer
Low VOC Prime 'N Seal
Velvaseal WPS
2K Waterborne Sealer 2440S

Topcoats
ChromaPremier Basecoat (activated)*
ChromaPremier Single-Stage
ChromaBase (activated)*
ChromaOne
ChromaOne High Solids

Imron 6000
Imron 5000
Centari 5000
Cromax WBC

*ChromaPremier B/C and ChromaBase must be activated when applied over 3240S.

Application

Substrates
Properly sanded/treated aluminum
Direct to clean, sanded steel and galvanized
Properly sanded OEM finishes
Direct to Low VOC Prime 'N Seal
Properly sanded SMC/fiberglass/body fillers/polyester putties

Tips for Success
Where VOC regulations permit, apply 3240S over Low VOC Prime 'N Seal for maximum corrosion protection on steel and galvanized substrates.

Surface Preparation
- Clean surface thoroughly with mild detergent and water.
- For substrates other than plastic or fiberglass, wipe surface with First Klean 3900S, Prep-Sol 3919S or Kwik Clean 3949S.
- For rigid plastic and fiberglass, wipe with Plastic-Prep 2319S. Polypropylene parts must be primed with Plas-Stick Adhesion Promoter for Plastics 2322S before applying 3240S. For flexible fascia, refer to the DuPont Automotive Plastics Refinishing Guide.
- Sand and featheredge metal substrates with 180 grit paper followed by 240 grit paper.
- Remove sanding sludge with Final Klean 3901S or Low VOC Final Klean 3909S.
- Aluminum must be treated with 225S/226S before applying 3240S.

Tips for Success
When working with 36/40 grit scratches, step your way up through 80/180/240 grit prior to priming to remove coarse scratches and avoid sandscratch swelling in OEM finishes.

Gun Setups
Conventional

Siphon Feed:	1.6 mm - 1.8 mm (.063" - .071")
Gravity Feed:	1.3 mm - 1.5 mm (.051" - .059")

HVLP

Siphon Feed:	1.6 mm - 2.2 mm (.063" - .087")
Gravity Feed:	1.3 mm - 1.5 mm (.051" - .059")

Air Pressure

Conventional	Panel	Overall
Siphon Feed:	30 - 40 psi @ the gun.	45 - 50 psi @ the gun.
Gravity Feed:	25 - 35 psi @ the gun.	35

HVLP

Siphon Feed:	8 - 10 psi @ the gun cap.	8 - 10 psi @ the gun cap.
Gravity Feed:	8 - 10 i @ the gun cap.	8 - 10 psi @ the gun cap.

Product Usage Data Sheet - 3240S

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Application

Apply 1 - 2 medium coats depending on fill required, and allow 5 - 10 minutes flash between coats.

Tips for Success

* Apply medium coats; heavy-wet coats have a tendency to sag and can lead to solvent popping.
* Two coats should be sufficient for most applications
* 3289S Accelerator should only be used when applying 3240S under low humidity conditions (less than 50% relative humidity).

Flash/Dry Times Air Dry

Flash between Coats:	5 - 10 minutes.
Time to Sand:	1 - 2 hours at high humidity (50% RH or higher). 3 - 4 hours at low humidity (30% RH or less). 1 1/2 - 3 hours with 1 oz. 3289S Accelerator per RTS quart. (3289S is not recommended in high humidity conditions.

Force Dry

Flash before Force Dry:	15 minutes.
Cycle Time:	30 minutes @ 140 deg F.
Cool Down:	30 minutes.

Infrared Dry	For a 2000 Watt unit, cure for 20 - 30 minutes at a distance of 30 inches. Allow to flash 15 minutes before applying IR.

Recoatability/Re-repair

When recoating 3240S with itself, sanding is required. Sanding cut throughs should be reprimed with 3240S.

Sanding

* Primer must be thoroughly sanded before topcoating.
* For air-dried primer, apply topcoat within 4 hours of sanding.
* For force-dried primer, apply topcoat within 16 hours of sanding.
* To dry sand: Begin sanding with 280 grit. Finish with appropriate grit for the topcoat (P400 - P600).
* To wet sand: Begin sanding with 320 grit. Finish with appropriate grit for the topcoat (P400 - P600).

Tips for Success

For optimum performance, a minimum of 2 mils of primer should remain after sanding.

Cleanup

Clean spray equipment as soon as possible with DuPont Thinner V-3661S.

Physical Properties

VOC:	2.1 lbs/gal RTS (Primer 1.7 lbs/gal; Activator 2.8 lbs)
Theoretical Coverage:	1132 sq ft/gal at 1 mil.
Weight Solids:	82.2%
Volume Solids:	70.6%
Dry Film Thickness:	4 - 6 mils in 2 coats.
Flash Point:	See MSDS.

VOC Regulated Areas

These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C), eye protection, gloves and protective clothing while mixing components, during application, and until all vapor and mist are exhausted. In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

DuPont Automotive Finishes
E-R1654
M-18657
(12/97)

Product Usage Data Sheet - 2220S

CHROMASYSTEMtm
Technical Manual

WATERBORNE PRIMER-SURFACER 2220S

DESCRIPTION

2220S is a single-component, ready-to-spray, high performance, waterborne primer-surfacer that can be wet or dry sanded. 2220S dries to a smooth surface, reducing labor and sanding. It resists edge swelling, provides excellent holdout, and is outstanding for wet sanding. Lead and chromate free 2220S can be used with any DuPont topcoat. It has no pot life restriction and has less than 2.1 lbs/gal VOC.

GENERAL INFORMATION

Components
2220S -- Primer-Surfacer (Beige)

MIX RATIO
Mix Ratio
Ready-to-spray. Stir material thoroughly or shake on a mechanical agitator for five minutes. No reduction is needed; however, 2220S may be reduced with up to 5% deionized water (6 oz/gal) to improve handling, especially in hot, dry conditions.

POT LIFE
Indefinite.

ADDITIVES

Accelerator:	Not recommended.
Fish Eye Eliminator:	Not recommended.
Flex Additive:	Not recommended.
Reducer:	Use up to 5% deionized water (6 oz/gal).
Retarder:	Not recommended.

Tinting
2220S may be tinted with up to 5% Cromax A-Ttm.

Sealer
VelvasealR WPS 2120S/2125S/2140S

Topcoats

ChromaBaseR	ChromaOneR High Solids	ImronR 5000
ChromaPremierTM	ChromaOneR	CentariR 5000
Cromax WBCtm	CronarR	ImronR

APPLICATION

Substrates
Properly sanded OEM finishes
Properly treated and sanded plastic
Veriprim 615S/625S (For best performance over bare metal areas, use two coats of 615S or 625S.)

Surface Preparation
* Clean surface thoroughly with mild detergent and water.
* Wipe surface with Kwik CleanTM 3949S.
* Sand and featheredge with 180 grit paper followed by 240 grit paper. Apply 2 medium coats of VariprimeR 615S or Lead and Chromate Free 625S to bare metal areas prior to applying 2220S. Allow VariprimeR to dry for a minimum of 20 minutes.

Tips for Success
* When working with 36/40 grit scratches, step your way up through 80/180/240 grit prior to priming to avoid sandscratch swelling in body filler areas and OEM finishes.
* Bring cold panel to room temperature (70 deg F) before applying 2220S to metal surface.

Gun Setups
HVLP

Siphon Feed:	1.5 mm - 1.7 mm (.059" -.067")
Gravity Feed:	1.5 mm - 1.7 mm (.059" -.067")
Conventional	1.5 mm - 1.7 mm (.059" -.067")

Air Pressure
HVLP

Siphon Feed:	8 - 10 psi @ the gun cap.
Gravity Feed:	8 - 10 psi @ the gun cap.
Conventional	30 - 40 psi @ the gun.

Application
* Apply 2 - 3 medium-wet coats of 2220S depending on fill required.
* Allow each coat to dry thoroughly before applying the next coat.
* Do not apply 2220S in temperatures below 65 F.

Tips for Success
* Force drying is recommended for best performance.
* To speed up flash times between coats, warm the area to be primed with an IR unit.
* Do not apply in cool or humid conditions if primer will be air dried. Applying 2220S when temperatures are lower than 65 F and humidity is higher than 60% will result in poor film performance.
* Do not dry primer by blowing off with air.

Flash/Dry Times

Infrared Dry	Recommended for maximum productivity. Cure for 20 minutes at a 30-inch distance with a 2000 Watt unit. No flash-off time is necessary prior to applying IR. Apply IR immediately after

final coat of primer is applied. Cool down time is 30 minutes.

Bake

Flash before Bake:	No flash-off time required. Bake immediately after final coat of primer is applied.
Cycle Time:	30 minutes @ 140 F.
CoolDown:	30 minutes.

Air Dry

Flash between Coats:	15 - 20 minutes at 70 F and 50% relative humidity.
Wet Sanding:	2 hours.
Dry Sanding:	2 hours.

Note: Temperature, humidity and airflow will affect dry times.

Recoatability/Re-repair

2220S may be recoated with itself when completely dry. Sand thoroughly prior to repriming. Do not apply lacquer-based putties over 2220S. If necessary, use 2K glazing putties to fill large surface defects.

Sanding

* 2220S can be wet or dry sanded.
* When wet sanding, remove all sanding sludge with clean water.
* Finish sand with 400 grit (P-600) or finer.
* For dry sanding, use minimal pressure to avoid clogging paper and gouging primer-surfacer.

Topcoating

Prior to topcoating, use 3909S to wipe off any leftover residue or contaminates left on the substrate to be topcoated.

Cleanup

Clean spray equipment thoroughly with clean water, then condition with DuPont Thinner V-3661S if gun will be used for solvent borne material.

Storage

Store 2220S at room temperature. Do not store in areas subject to freezing temperatures.

Physical Properties

VOC: 2.0 lbs/gal (less water); 0.9 lbs/gal as packaged.
Theoretical Coverage: 464 sq. ft. per ready-to-spray gallon at 1 mil.
Weight Solids: 45.6% ready-to-spray.
Volume Solids: 28.9% ready-to-spray.
Recommended Dry Film Thickness: 2 - 3 mils in 2 coats.
Flash Point: 135F closed cup.

VOC Regulated Areas

These directions refer to the use of products which may be restricted or

require special mixing instructions in your area. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a properly fitted vapor/particulate respirator approved for use with paints (NIOSH/MSHA TC-23C), eye protection, gloves and protective clothing during application and until all vapor and mist are exhausted. In confined spaces, or in situations where continuous spray operations are typical, or if respirator fit is not possible, wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area.

Product Usage Data Sheet - 2440S

Waterborne Primer Sealer 2440S

Description

2440S is an ultra-low VOC, two-component, waterborne, epoxy primer sealer. As a non-sanding sealer, it provides excellent color holdout and resists shrinkage. It has good application properties, very good flow and leveling, and good sag resistance. 2440S has good adhesion to properly treated steel and galvanized, and it works well with aluminum when used over Variprime-R. With a ready-to-spray VOC of 2.1 lbs/gallon, 2440S is compliant with all current VOC regulations in California.

General Information

Components:
- 2440S - Primer-Sealer (gray)
- 2405S - Activator - (recommended for collision shop use, when topcoating with ChromaPremier-TM, ChromaBase-R or Croma: WBC-R)
- 2407S - Activator (recommended for fleet use, when topcoating with Imron-R 6000, Imron-R 5000 or Centari-R 5000)

Tips for Success
Use specific activator recommended for your topcoat system to avoid problems with dieback.

Mix Ratio/Viscosity
Mix ratio by volume (4:1)
Mix 4 parts 2440S to 1 part Activator 2405S or 2407S.
Mix Ratio by Weight (cumulative)

	RTS Quart	RTS Pint
2440S	1000 grams	4000 grams
2405S or 2407S	1190 grams	4760 grams

Viscosity
15 - 19 seconds in a Zahn #3 cup.

Pot Life
1 hour at 70 F.

Additives

Accelerator:	Not required.
Fish Eye Eliminator:	Not required.
Flex Additive:	Not required.
Reducer:	Deionized water; use up to 5% by volume to improve flow and leveling.
Retarder:	Not required.

Tinting
Tinting is not recommended.

Topcoats
When using 2405S Activator:
ChromaPremier-TM Basecoat
ChromaPremier-TM Single-Stage
ChromaBase-R
ChromaOne-R
ChromaOne-R High Solids

Product Usage Data Sheet - 2440S

Cromax WBC-R

When using 2407S Activator:
Imron-R 6000
Imron-R 5000
Imron-R
Centari-R 5000

Application
Substrates
Properly treated steel, aluminum and galvanized
Clean, sanded steel and galvanized
Factory replacement parts
Variprime-R 615S/625S

Waterborne Primer-Surfacer 2220S
2K Waterborne Primer-Filler 275S
2K High Build Primer 3240S

Surface Preparation
- Clean surface thoroughly with mild detergent and water.
- Wipe surface with First Klean-TM 3900S, Prep-Sol-R 3919S or Kwik Clean-TM 3949S. For plastic or fiberglass, wipe with Plastic-Prep 2319S.
- Finish sand substrate with 320 grit dry or 400 grit wet paper.
- Remove sanding sludge with Final Klean -TM 3901 S or Low VOC Final Klean-TM 3909S.

Note: Refer to the DuPont Compliant Products Chart for the surface cleaner recommended for your area.

Gun Setups

Conventional	1.6 mm - 1.8 mm (.063" -.070")
HVLP	
Pressure Feed:	0.8 mm - 1.1 mm (.031 " -.043")
Siphon Feed:	1.4 mm - 1.6 mm (.055 " -.063")
Gravity Feed:	1.3 mm - 1.6 mm (.051 " -.063")

Air Pressure

Conventional	45 - 55 psi @ the gun.
HVLP	
Siphon Feed:	8 - 10 psi @ the gun cap.
Gravity Feed:	8 - 10 psi @ the gun cap.

Application
Apply one medium-wet coat.

Tips for Success
When applying 2440S over Variprime-R, allow Variprime-R to dry a minimum of 30 minutes.

Flash/Dry Times
Note: Force drying is recommended for maximum productivity.

Force Dry	One Coat Application
Flash before Force Dry:	None required.
Cycle Time:	20 minutes @ 140 F.
Cool Down:	10 minutes.

Product Usage Data Sheet - 2440S

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Infrared Dry	One Coat Application
Flash before Bake:	None required.
Bake Time:	20 minutes @ a 30-inch distance with a 2000 Watt unit.
Cool Down:	10 minutes.
Max Allowable Dry Time:	16 hours; then sanding is required.

Air Dry	One Coat Application
Wet Sanding:	1 hour @ 75 F and 30% relative humidity.
Topcoating:	30 minutes @ 75 F and 30% relative humidity.

Tips for Success
- Temperature, humidity and air flow will affect dry times.
- 2440S must be thoroughly dry before topcoating.

Recoatability/Re-repair
2440S may be recoated at any stage of dry or cure. If allowed to dry longer than 16 hours, 2440S should be scuff sanded thoroughly before topcoating.

Cleanup
Clean spray equipment thoroughly with clean water, then condition with DuPont Thinner V-3661S if gun will be used for solventborne material.

Physical Properties

VOC:	2.1 lbs/gal ready-to-spray.
Theoretical Coverage:	546 sq. ft. per ready-to-spray gallon at 1 mil.
Weight Solids:	48.7% ready-to-spray.
Volume Solids:	34.0% ready-to-spray.
Recommended Dry Film Thickness:	0.8 - 1.2 mils in 1 coat.
Flash Point:	See MSDS.

VOC Regulated Areas
These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling
Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a properly fitted vapor/particulate respirator approved for use with paints (NIOSH/MSHA TC-23C), eye protection, gloves and protective clothing during application and until all vapor and mist are exhausted. In confined spaces, or in situations where continuous spray operations are typical, or if respirator fit is not possible, wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area.

DuPont Automotive Finishes

E-RI754 (12/97)
H-18762

Product Usage Data Sheet - 2120S

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VELVASEAL WPS PRIMER SEALER 2120S/2125S/2140S

Velvaseal WPS was designed with today's refinisher in mind. This high-productivity waterborne primer-sealer is packaged ready-to-spray. One application is all it takes. Velvaseal WPS dries fast and smooth, and is ready to topcoat in 30 minutes. You can also force dry with heat or infrared units.

Available in three colors to maximize topcoat hiding, Velvaseal WPS can be used under all Du Pont topcoat systems. It gives you superior color holdout compared to conventional sealers. And it provides excellent adhesion to cut-throughs; there is no need to re-prime.

Velvaseal WPS works well on
ideal for preparing new parts. Transparent 2120S dries clear, so you can cut down on prep work - especially useful for jamb areas.

Velvaseal WPS is lead-free and chromate-free. With less than 2.1 lbs/gal VOC, it meets and exceeds all California VOC requirements through 1995 and beyond.

With Velvaseal WPS, you get the job done quickly and easily:

* High productivity.
* Ready-to-spray, one-coat application.
* Dries fast and smooth; ready to topcoat in 30 minutes.
* May be force dried with heat or infrared units.
* Available in three colors to maximize topcoat hiding.
* Can be used under all Du Pont tooat systems.
* Superior color holdout compared to conventional sealers.
* Excellent adhesion to cut-throughs; no need to re-prime.
* Excellent for sensitive substrates and fresh bodywork, and for preparing new parts.
* Transparent sealer dries clear, requiring less preparation of jamb areas.
* Lead-free and chromate-free.
* Less than 2.1 lbs/gal VOC.
* Meets and exceeds all California VOC requirements through 1995 and beyond.

PRODUCTS

* 2120S (Transparent)
* 2125S (Gray)
* 2140S (High-Hiding Red)

MIX RATIO

Velvaseal WPS comes ready-to-spray. Hand stir prior to using.

COMPATIBLE PRODUCTS

Velvaseal may be applied over any of the following products:

* 131S/181S
* 1120S/1140S
* 210S
* 275S
* 2600S/2610S/2640S

Velvaseal WPS can also be used over cleaned, sanded plastic parts. Do

not apply directly over TPO.

TOPCOATING

Topcoat with any of the following:

* Cronar
* ChromaBase
* ChromaOne
* Imron 5000
* Imron 6000
* Imron
* Centari

SURFACE PREPARATION

Finish-sand the substrate with 320 grit on a DA, or 400 dry or 600 wet before applying sealer.

APPLICATION

For best results, apply one medium-wet coat of Velvaseal WPS. Allow sealer to dry until the surface is uniformly dull before topcoating. Heavy coats will increase the dry time.

SPRAY EQUIPMENT

Prior to using spray equipment, condition the gun by running water through it.

HVLP:
* Gravity Feed: .066 tip
* Siphon Feed: .036-.040 tip
* Pressure Feed: .040 tip

CONVENTIONAL: .070 tip

AIR PRESSURE

* HVLP: 8-10 psi at the cap.
* Conventional: 35-45 psi at the gun.

DRY TIME

Force Dry
Bake 5-10 minutes at 140 deg F.

Air Dry
Allow primer to air dry 15-20 minutes @ 70 deg F.

Airflow and humidity will alter these times.

SANDING

No sanding is necessary. If sanding is required to remove imperfections, wet-sand with 600-1000 grit, using light hand pressure to avoid cut-throughs. It may also be dry-sanded to remove dust and dirt particles,

again using light pressure.

CLEANUP

Clean thoroughly with water. To recondition for solvent, flush with DuPont V-3661S or 3661S.

TIPS FOR SUCCESS

* Do not reduce.
* Hand shake or stir prior to use.
* After opening, place an agitator lid on the can and place on your mixing machine.
* Do not shake on a mechanical shaker.
* Look for shade change indicating sealer is ready to topcoat.
* Airflow will significantly help dry.
* Sealer will appear heavy when first sprayed - exhibiting a texture or orange peel finish when wet - but the sealer dries to a very smooth finish.
* Apply medium-wet coats; avoid heavy wet coats.
* Store product at room temperature.
* Do not spray below 55 deg F.
* Condition gun with water prior to using Velvaseal WPS.
* When using over plastic pieces, clean plastic thoroughly with Plastic-Prep 2319S. Then scuff-sand, and rewipe with 2319S.

VOC

	Less Water & Exempt Solvents	As Packaged
2120S	1.9 lbs/gal	0.8 lbs/gal
2125S	1.8 lbs/gal	0.7 lbs/gal
2140S	2.0 lbs/gal	0.8 lbs/gal

PERCENT SOLIDS BY WEIGHT

2120S: 39.5% ready-to-spray
2125S: 44.5% ready-to-spray
2140S: 45.8% ready-to-spray

PERCENT SOLIDS BY VOLUME

2120S: 31.8% ready-to-spray
2125S: 31.4% ready-to-spray
2140S: 31.4% ready-to-spray

THEORETICAL COVERAGE

2120S: 510 sq. ft. at 1 mil
2125S: 504 sq. ft. at 1 mil
2140S: 504 sq. ft. at 1 mil

VOC COMPLIANCE

These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the Du Pont Compliant Products Chart for your area.

SAFETY AND HANDLING

Du Pont is committed to helping you develop and maintain a safe working environment. Carefully read the specific warnings and precautions printed on the labels of all Du Pont products before handling or using. These products are for industrial use by trained professional painters only.

Du Pont Automotive Refinish Products (11/92)

Product Usage Data Sheet - 2125S

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VELVASEAL WPS PRIMER SEALER 2120S/2125S/2140S

Velvaseal WPS was designed with today's refinisher in mind. This high-productivity waterborne primer-sealer is packaged ready-to-spray. One application is all it takes. Velvaseal WPS dries fast and smooth, and is ready to topcoat in 30 minutes. You can also force dry with heat or infrared units.

Available in three colors to maximize topcoat hiding, Velvaseal WPS can be used under all Du Pont topcoat systems. It gives you superior color holdout compared to conventional sealers. And it provides excellent adhesion to cut-throughs; there is no need to re-prime.

Velvaseal WPS works well on
ideal for preparing new parts. Transparent 2120S dries clear, so you can cut down on prep work - especially useful for jamb areas.

Velvaseal WPS is lead-free and chromate-free. With less than 2.1 lbs/gal VOC, it meets and exceeds all California VOC requirements through 1995 and beyond.

With Velvaseal WPS, you get the job done quickly and easily:

* High productivity.
* Ready-to-spray, one-coat application.
* Dries fast and smooth; ready to topcoat in 30 minutes.
* May be force dried with heat or infrared units.
* Available in three colors to maximize topcoat hiding.
* Can be used under all Du Pont tooat systems.
* Superior color holdout compared to conventional sealers.
* Excellent adhesion to cut-throughs; no need to re-prime.
* Excellent for sensitive substrates and fresh bodywork, and for preparing new parts.
* Transparent sealer dries clear, requiring less preparation of jamb areas.
* Lead-free and chromate-free.
* Less than 2.1 lbs/gal VOC.
* Meets and exceeds all California VOC requirements through 1995 and beyond.

PRODUCTS

* 2120S (Transparent)
* 2125S (Gray)
* 2140S (High-Hiding Red)

MIX RATIO

Velvaseal WPS comes ready-to-spray. Hand stir prior to using.

COMPATIBLE PRODUCTS

Velvaseal may be applied over any of the following products:

* 131S/181S
* 1120S/1140S
* 210S
* 275S
* 2600S/2610S/2640S

Velvaseal WPS can also be used over cleaned, sanded plastic parts. Do

not apply directly over TPO.

TOPCOATING

Topcoat with any of the following:

* Cronar
* ChromaBase
* ChromaOne
* Imron 5000
* Imron 6000
* Imron
* Centari

SURFACE PREPARATION

Finish-sand the substrate with 320 grit on a DA, or 400 dry or 600 wet before applying sealer.

APPLICATION

For best results, apply one medium-wet coat of Velvaseal WPS. Allow sealer to dry until the surface is uniformly dull before topcoating. Heavy coats will increase the dry time.

SPRAY EQUIPMENT

Prior to using spray equipment, condition the gun by running water through it.

HVLP:
* Gravity Feed: .066 tip
* Siphon Feed: .036-.040 tip
* Pressure Feed: .040 tip

CONVENTIONAL: .070 tip

AIR PRESSURE

* HVLP: 8-10 psi at the cap.
* Conventional: 35-45 psi at the gun.

DRY TIME

Force Dry
Bake 5-10 minutes at 140 deg F.

Air Dry
Allow primer to air dry 15-20 minutes @ 70 deg F.

Airflow and humidity will alter these times.

SANDING

No sanding is necessary. If sanding is required to remove imperfections, wet-sand with 600-1000 grit, using light hand pressure to avoid cut-throughs. It may also be dry-sanded to remove dust and dirt particles,

again using light pressure.

CLEANUP

Clean thoroughly with water. To recondition for solvent, flush with DuPont V-3661S or 3661S.

TIPS FOR SUCCESS

* Do not reduce.
* Hand shake or stir prior to use.
* After opening, place an agitator lid on the can and place on your mixing machine.
* Do not shake on a mechanical shaker.
* Look for shade change indicating sealer is ready to topcoat.
* Airflow will significantly help dry.
* Sealer will appear heavy when first sprayed - exhibiting a texture or orange peel finish when wet - but the sealer dries to a very smooth finish.
* Apply medium-wet coats; avoid heavy wet coats.
* Store product at room temperature.
* Do not spray below 55 deg F.
* Condition gun with water prior to using Velvaseal WPS.
* When using over plastic pieces, clean plastic thoroughly with Plastic-Prep 2319S. Then scuff-sand, and rewipe with 2319S.

VOC

	Less Water & Exempt Solvents	As Packaged
2120S	1.9 lbs/gal	0.8 lbs/gal
2125S	1.8 lbs/gal	0.7 lbs/gal
2140S	2.0 lbs/gal	0.8 lbs/gal

PERCENT SOLIDS BY WEIGHT

2120S: 39.5% ready-to-spray
2125S: 44.5% ready-to-spray
2140S: 45.8% ready-to-spray

PERCENT SOLIDS BY VOLUME

2120S: 31.8% ready-to-spray
2125S: 31.4% ready-to-spray
2140S: 31.4% ready-to-spray

THEORETICAL COVERAGE

2120S: 510 sq. ft. at 1 mil
2125S: 504 sq. ft. at 1 mil
2140S: 504 sq. ft. at 1 mil

VOC COMPLIANCE

These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the Du Pont Compliant Products Chart for your area.

SAFETY AND HANDLING

Du Pont is committed to helping you develop and maintain a safe working environment. Carefully read the specific warnings and precautions printed on the labels of all Du Pont products before handling or using. These products are for industrial use by trained professional painters only.

Du Pont Automotive Refinish Products (11/92)

Product Usage Data Sheet - 2140S

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VELVASEAL WPS PRIMER SEALER 2120S/2125S/2140S

Velvaseal WPS was designed with today's refinisher in mind. This high-productivity waterborne primer-sealer is packaged ready-to-spray. One application is all it takes. Velvaseal WPS dries fast and smooth, and is ready to topcoat in 30 minutes. You can also force dry with heat or infrared units.

Available in three colors to maximize topcoat hiding, Velvaseal WPS can be used under all Du Pont topcoat systems. It gives you superior color holdout compared to conventional sealers. And it provides excellent adhesion to cut-throughs; there is no need to re-prime.

Velvaseal WPS works well on
ideal for preparing new parts. Transparent 2120S dries clear, so you can cut down on prep work - especially useful for jamb areas.

Velvaseal WPS is lead-free and chromate-free. With less than 2.1 lbs/gal VOC, it meets and exceeds all California VOC requirements through 1995 and beyond.

With Velvaseal WPS, you get the job done quickly and easily:

* High productivity.
* Ready-to-spray, one-coat application.
* Dries fast and smooth; ready to topcoat in 30 minutes.
* May be force dried with heat or infrared units.
* Available in three colors to maximize topcoat hiding.
* Can be used under all Du Pont tooat systems.
* Superior color holdout compared to conventional sealers.
* Excellent adhesion to cut-throughs; no need to re-prime.
* Excellent for sensitive substrates and fresh bodywork, and for preparing new parts.
* Transparent sealer dries clear, requiring less preparation of jamb areas.
* Lead-free and chromate-free.
* Less than 2.1 lbs/gal VOC.
* Meets and exceeds all California VOC requirements through 1995 and beyond.

PRODUCTS

* 2120S (Transparent)
* 2125S (Gray)
* 2140S (High-Hiding Red)

MIX RATIO

Velvaseal WPS comes ready-to-spray. Hand stir prior to using.

COMPATIBLE PRODUCTS

Velvaseal may be applied over any of the following products:

* 131S/181S
* 1120S/1140S
* 210S
* 275S
* 2600S/2610S/2640S

Velvaseal WPS can also be used over cleaned, sanded plastic parts. Do

not apply directly over TPO.

TOPCOATING

Topcoat with any of the following:

* Cronar
* ChromaBase
* ChromaOne
* Imron 5000
* Imron 6000
* Imron
* Centari

SURFACE PREPARATION

Finish-sand the substrate with 320 grit on a DA, or 400 dry or 600 wet before applying sealer.

APPLICATION

For best results, apply one medium-wet coat of Velvaseal WPS. Allow sealer to dry until the surface is uniformly dull before topcoating. Heavy coats will increase the dry time.

SPRAY EQUIPMENT

Prior to using spray equipment, condition the gun by running water through it.

HVLP:
* Gravity Feed: .066 tip
* Siphon Feed: .036-.040 tip
* Pressure Feed: .040 tip

CONVENTIONAL: .070 tip

AIR PRESSURE

* HVLP: 8-10 psi at the cap.
* Conventional: 35-45 psi at the gun.

DRY TIME

Force Dry
Bake 5-10 minutes at 140 deg F.

Air Dry
Allow primer to air dry 15-20 minutes @ 70 deg F.

Airflow and humidity will alter these times.

SANDING

No sanding is necessary. If sanding is required to remove imperfections, wet-sand with 600-1000 grit, using light hand pressure to avoid cut-throughs. It may also be dry-sanded to remove dust and dirt particles,

again using light pressure.

CLEANUP

Clean thoroughly with water. To recondition for solvent, flush with DuPont V-3661S or 3661S.

TIPS FOR SUCCESS

* Do not reduce.
* Hand shake or stir prior to use.
* After opening, place an agitator lid on the can and place on your mixing machine.
* Do not shake on a mechanical shaker.
* Look for shade change indicating sealer is ready to topcoat.
* Airflow will significantly help dry.
* Sealer will appear heavy when first sprayed - exhibiting a texture or orange peel finish when wet - but the sealer dries to a very smooth finish.
* Apply medium-wet coats; avoid heavy wet coats.
* Store product at room temperature.
* Do not spray below 55 deg F.
* Condition gun with water prior to using Velvaseal WPS.
* When using over plastic pieces, clean plastic thoroughly with Plastic-Prep 2319S. Then scuff-sand, and rewipe with 2319S.

VOC

	Less Water & Exempt Solvents	As Packaged
2120S	1.9 lbs/gal	0.8 lbs/gal
2125S	1.8 lbs/gal	0.7 lbs/gal
2140S	2.0 lbs/gal	0.8 lbs/gal

PERCENT SOLIDS BY WEIGHT

2120S: 39.5% ready-to-spray
2125S: 44.5% ready-to-spray
2140S: 45.8% ready-to-spray

PERCENT SOLIDS BY VOLUME

2120S: 31.8% ready-to-spray
2125S: 31.4% ready-to-spray
2140S: 31.4% ready-to-spray

THEORETICAL COVERAGE

2120S: 510 sq. ft. at 1 mil
2125S: 504 sq. ft. at 1 mil
2140S: 504 sq. ft. at 1 mil

VOC COMPLIANCE

These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the Du Pont Compliant Products Chart for your area.

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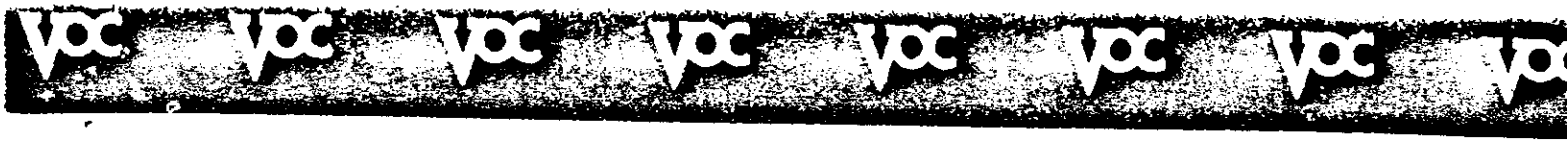
SAFETY AND HANDLING

Du Pont is committed to helping you develop and maintain a safe working environment. Carefully read the specific warnings and precautions printed on the labels of all Du Pont products before handling or using. These products are for industrial use by trained professional painters only.

IMRON 5000 Low VOC Polyurethane Enamel

TECHNICAL INFORMATION

Description:	A Low VOC, premium quality, high performance Polyurethane Topcoat with excellent durability and appearance. IMRON 5000 is available in factory package, mixing machine and lead-free options.
Products:	IMRON 5000 Polyurethane Enamel IMRON 5000 Activator 193S
Additives:	IMRON 5000 Fast Dry Accelerator 389S IMRON 5000 Reducer 8685S Paint Additive 359S
Mixing Ratios:	3:1 3 parts IMRON 5000 Polyurethane Enamel to 1 part IMRON 5000 Activator 193S
Pot Life:	2-4 hours at 70°F with IMRON 5000 Fast Dry Accelerator 398S.
Viscosity:	9-20 seconds in a DuPont M-333 (Zahn #3) cup.
Application Equipment:	IMRON 5000 Low VOC Polyurethane Enamel can be applied using: Pressure Pot Gravity Feed Air Assisted Airless Airless (See IMRON 5000 Low VOC Application Guide for specific recommendations.)
Atomizing Air Pressure:	Pressure Pot: Solid Colors: 60 PSI at the gun Metallics: 65 PSI at the gun
Fluid Delivery:	10-12 oz. per minute for pressure pot equipment.
Application:	Apply one cross-coat.
Flash Times:	5 minutes between coats; 15 minutes before force drying.
Drying:	Air Dry: Tack free 2-4 hours with IMRON 5000 Accelerator 389S 6-8 hours without Accelerator Tape free 4-6 hours with IMRON 5000 Accelerator 389S 10-12 hours without Accelerator Force Dry: 30 minutes at 180°F after a flash dry of 15 minutes following application of final coat.
Cleaning Equipment:	Immediately use DuPont Acrylic Lacquer Thinner 3602S or IMRON 5000 Reducer 8685S.
Special Notes:	For best results, do not mix until ready to spray. No further reduction is required for application. If reducer is added, the resulting mixture may have a VOC content greater than 3.5 lbs. per ready-to-spray gallon.
V.O.C.	Maximum 3.5 pounds per ready to spray gallon.
Recommended Film Thickness:	2.0 - .2 mils DFT (depending on color)



Theoretical Coverage:	860 square feet per ready-to-spray gallon at 1 mil dry film thickness
Percent Solids by Weight:	64 ± 6% ready to spray
Percent Solids by Volume:	54 ± 1% ready to spray
Recoating:	Recoating can be done at any stage of dry. Striping, lettering or decals may be applied when tape-free. For films cured over 72 hours, scuff-sand before recoating, striping, lettering or applying decals.

Physical Properties:

Crosshatch Adhesion	Excellent
Flexibility (Conical Mandrel)	Excellent
Pencil Hardness	2H
Chip Resistance*	Very Good
Impact Resistance*	Very Good
Humidity Resistance*	Excellent
Salt Spray Resistance*	Excellent

*Using CORLAR® Epoxy Primer

Chemical Resistance:

5% Sodium Hydroxide Solution	No Effect
20% Hydrochloric Acid Solution	No Effect
20% Phosphoric Acid Solution	No Effect
5% Tannic Acid Solution	No Effect
10% Sulphuric Acid Solution	No Effect

Solvent Resistance:

Methyl Ethyl Ketone	No Effect
Toluene/Naptha (50/50)	No Effect
Grease	No Effect
Diesel Fuel	No Effect
Gasoline	No Effect
Gasohol	No Effect
Road Tar	No Effect

Safety and Handling:

DuPont is committed to helping you develop and maintain a safe working environment. Carefully read the specific warnings and precautions printed on the labels of all DuPont products before handling or using. These products are for industrial use by trained professional painters only.

To ensure maximum protection, always wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C), eye protection, gloves and protective clothing while mixing activator with enamel, during application and until all vapors and spray mist are exhausted. Always spray in a well-ventilated area. Individuals with a history of lung or breathing problems should not use or be exposed to this product. Do not permit anyone without protection in the painting area.

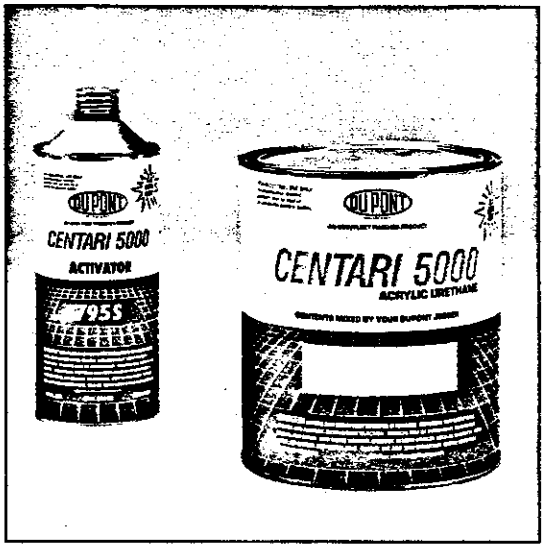
Additionally, wear protective garments including goggles, gloves and safety shoes whenever potentially hazardous materials and/or conditions are present in the body shop.

WARNING: IMRON products are flammable. They should be kept away from heat, sparks and open flame. The breathing of vapors or spray mist may cause a variety of health problems, including lung irritation, allergic respiratory reaction, or skin and eye irritation. The spray mist should not come in contact with your skin. Always keep containers closed when not in use. **Important:** When mixed, IMRON products will have hazards of all components. Do not breathe vapors or spray mist. Do not get in eyes or on skin.

Observe all applicable label warnings. Refer to the Material Safety Data Sheets for these products for more information.

Du Pont
Refinish Sales
Automotive Products
Wilmington, DE 19898

DUPONT



Introducing Centari 5000 — the versatile, VOC compliant, acrylic urethane that delivers over the long haul.

The Best of Both Worlds for Fleet Finishes.
Give your customers a tough finish that covers all their color choices. Centari 5000 combines Du Pont's advanced urethane technology with VOC compliance. Now there's no need to sacrifice. Customers get the colors they prefer in a finish that goes the distance.

Fast, Easy Single-Stage Application.
Get the fleet back on the road. Centari 5000 is easy to apply and fast to dry. Centari 5000 gives you an easy-to-use high solids topcoat. And its fast tape-free time makes striping and multiple color applications easier.

Urethane Technology Makes Finishes Durable and Tough.
Centari 5000 is Du Pont's new single-stage acrylic urethane for fleet refinishing. Durable Centari 5000 gives you high gloss and DOI. So your vehicles get a tough, easy-to-maintain finish — one that stays clean and looks great.

VOC Compliance to Meet Your Needs.
Centari 5000 makes it easy to meet VOC regulations — with 3.5 lbs/gal VOC. You get the easy-to-use features of Centari, the durability of an acrylic urethane, and the VOC compliance you need for today's finishes.

Surface Preparation

Cleaning

1. Wash surface thoroughly with a mild detergent.
2. Clean and degrease with Kwik Clean™ 3949S or Lacquer and Enamel Cleaner 3939S.*
3. Grind off rust and old paint, then sand and featheredge using 320 grit or finer on a DA.
4. Remove sanding dust with Kwik Clean 3949S or Lacquer and Enamel Cleaner 3939S.*
5. Prepare substrate according to the recommendations below.

*Use of Lacquer and Enamel Cleaner 3939S is allowed in some regulated areas — notably the Bay Area.

Substrate Treatment

For steel or galvanized:
Use Metal Conditioner 5717S. Follow with Conversion Coating 224S for steel or 227S for galvanized.

For aluminum:
Use Cleaner 225S. Follow with Conversion Coating 226S.

	For VOC Regulated Areas		For Non-Regulated Areas	
	Medium Fill	**Maximum Fill**	**Medium Fill**	**Maximum Fill**
Precoat	VARIPRIME® 615S/625S	VARIPRIME® 615S/625S	VARIPRIME® 615S/625S	VARIPRIME® 615S/625S
Primer	WATERBORNE 210S	2K WATERBORNE 275S	CORLAR® 824S/825S or TUFCOTE™ 1855S/1856S/1857S	URO® 1120S/1140S or TUFCOTE™ 1855S/1856S/1857S
Sealer	VELVASEAL® WPS 2120S/2125S/2140S	VELVASEAL® WPS 2120S/2125S/2140S	PRIME 'N SEAL™ 2600S/2610S/2640S or Sealer 9140S	PRIME 'N SEAL™ 2600S/2610S/2640S or Sealer 9140S

Centari® 5000 Single-Stage Application

Mixing

1. Shake Centari 5000 for at least 90 seconds on the Cyclone™ Paint Shaker before mixing.
2. Mix Centari 5000 3:1 with Centari 5000 Activator 795S.*
3. Add 2 ounces of Imron® Fast Accelerator 389S or 1 ounce of Imron Super Fast Accelerator 8989S.
4. Stir thoroughly and strain.
5. Viscosity is 9 - 20 seconds in a Zahn #3 cup, depending on color.

Pot life is 2 hours at 70°F. Pot life can be extended with 2 ounces of Imron 389S.
Note: 1 ounce of Imron 8989S will decrease pot life to 45 minutes.

*Using an activator other than 795S will result in a VOC level greater than 3.5 lbs/gal.

Recommended Spray Gun Setups:

HVLP Spray Equipment (HVLP spray equipment is required in most VOC regulated areas.)

Binks Mach 1G — (Gravity Feed)

	Tip:	#905/.085"
	Cap:	#905P
	Fan Control Assembly:	#6
Mattson LP-DC	Fluid tip:	.032" Black Ring or .040" Gold Ring
	Cup pressure:	6 - 7 psi

Conventional Pressure Pot Spray Equipment	Needle	Nozzle	Air Cap	Nozzle Orifice	PSI (at the gun)
DeVilbiss MBC/JGA/JGV	FF	FW	797	0.062"	60 - 65 solid colors 65 - 75 metallic colors
Blinks Model 62 Siphon	365	66 x 66SD	63C x 63 PW		60 - 65 solid colors
Pressure	363A	65	Fluid & Air Nozzle		65 - 75 metallic colors

NOTE: Gravity feed can be used for spot repairs using 0.055" - 0.070" needle orifice and 40 - 55 psi at the gun.

Air Assisted Airless	Orifice	PSI (at the gun)
Kremlin 09-113/09-133/14-133 or equivalent	0.013" - 0.015"	35 (first adjust spray pattern using fluid pressure — typically 350 psi)
Airless		
Graco 413/415/417 or equivalent	0.013" - 0.015"	

NOTE: Other spray equipment is available. Contact your local Du Pont representative or gun manufacturer for additional information. The information in this chart is given for ambient temperature product (75°F). Heating paint to higher temperatures (90 - 95°F) will result in lower viscosity, which may require a smaller orifice with air-assisted airless spray.

Application

Use a cross-coat technique. With a 12-inch gun distance, spray a medium-wet first pass using a top-to-bottom motion. Spray a medium-wet second pass using a side-to-side motion. Minimize flash time between passes for optimum appearance.

Do not spray Centari® 5000 if the paint temperature is less than 75°F. Use warm water to heat the paint to an optimum temperature of 85 - 95°F. In case of fish eyes, use Paint Additive 359S to 1 ounce per ready-to-spray gallon of Centari 5000. Do not use FEE.

Dry Time

Air Dry — Dust free in 30 minutes; tack free in 1 - 2 hours; before moving outdoors 2 - 3 hours.
Force Dry — 30 minutes at 140°F (60°C).

Tape Free Time

Allow to dry 4 hours, or 2 - 4 hours with 2 oz/gal of 389S, or 1 hour with 1 oz/gal of 8989S. (Caution: Exceeding these recommended amounts can result in VOC greater than 3.5 lbs/gal.)

Recoating

Recoating can be done at any stage of dry. Striping, lettering or decals may be applied when tape-free. For films cured over 48 hours, scuff sand before recoating, striping, lettering or applying decals.

Polishing

If polishing is required to remove dirt or to better match the OEM texture: Wet sand with 1000 grit or finer paper. Polish with Du Pont 1500S. Follow with Du Pont 3000S if needed. (Do not use heavy-duty compounds or coarse paper.)
Allow to air dry 16 - 24 hours before polishing. When force drying, allow 2 - 4 hours after cool down before polishing.

Cleanup

Clean spray equipment as soon as possible with Acrylic Lacquer Thinner 3602S. Do not leave activated material in the gun.

Compatible Products

Kwik Clean™ 3949S
Lacquer and Enamel Cleaner 3939S
Conversion Coating 224S, 226S, 227S
Metal Conditioner 5717S
Cleaner 225S
Variprime® 615S, 625S
Waterborne Primer-Surfacer 210S
2K Waterborne Primer-Filler 275S
Corlar® Epoxy Primer 824S, 825S
URO® Primer-Filler 1120S, 1140S
Tufcote™ 1855S, 1856S, 1857S
Velvaseal® WPS 2120S, 2125S, 2140S
Prime 'N Seal™ 2600S, 2610S, 2640S
Sealer 9140S
Centari® 5000 Activator 795S
Fast Accelerator 389S
Super Fast Accelerator 8989S
Paint Additive 359S

Technical Information: Centari® 5000 Acrylic Urethane

Recommended Film Thickness	2.0 ± 0.2 mils dry film thickness (depending on color)
Theoretical Coverage	577 square feet as packaged (average of all colors)
Percent Solids by Volume	49.6% ± 3
Percent Solids by Weight	58.5% ± 3

Physical Properties

Crosshatch Adhesion	Excellent
Flexibility (Conical Mandrel)	Good
Pencil Hardness	2H
Chip Resistance	Very Good
Impact Resistance	Very Good
Humidity Resistance*	Very Good
Salt Spray Resistance*	Very Good

*Using Corlar Epoxy Primer

Chemical Resistance

5% Sodium Hydroxide Solution	No Effect
20% Hydrochloric Acid Solution	No Effect
20% Phosphoric Acid Solution	No Effect
5% Tannic Acid Solution	No Effect
10% Sulfuric Acid Solution	No Effect

Solvent Resistance

Methyl Ethyl Ketone	No Effect
Toluene/Naptha (50/50)	No Effect
Grease	No Effect
Diesel Fuel	No Effect
Gasoline	No Effect
Gasohol	No Effect
Road Tar	No Effect

Graffiti Resistance

"KIWI" Shoe Polish	Cleanable
"SHARPIE" Marker	Cleanable

Safety

Before using any Du Pont Refinish product, be sure to read all safety directions and warnings. Wear a properly fitted vapor/particulate respirator approved for use with paints (NIOSH/MSHA TC-23C), eye protection, gloves and protective clothing during application and until all vapor and mist are exhausted. In confined spaces, or in situations where continuous spray operations are typical, or if respirator fit is not possible, wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area.

VOC Compliance

These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the Du Pont Compliant Products Chart for your area.

DU PONT

FLEET FINISHES

H-17915 (9/92)
E-R0916 Printed in USA

DUPONT

CHROMASYSTEM™

Technical Manual

ChromaOne™ High Solids Acrylic Urethane Single-Stage

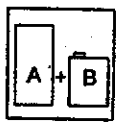
Description

ChromaOne™ High Solids is a high-performance, low VOC, acrylic urethane single-stage finish that features excellent gloss, appearance and durability. Made from the MasterTint® Mixing Machine system, ChromaOne™ has an easy 3:1 mix ratio. Use for spot, panel and overall repairs of OEM single-stage finishes. ChromaOne™ High Solids is compliant with all 1995 California VOC limits for single-stage finishes for automotive repairs (3.5 VOC solid colors, 4.3 VOC metallics).

General Information

Components

ChromaOne™ High Solids - Single-Stage "E" Color
7006S - ChromaOne™ High Solids Activator



Mix Ratio/Viscosity

Mix Ratio (3:1)
Mix 3 parts ChromaOne™ High Solids to 1 part Activator 7006S.

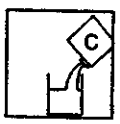
Viscosity
23 - 28 seconds in a Zahn #2 (DuPont M-222) cup.

Tips for Success
Use the ChromaOne™ High Solids Mixing Stick for accurate measurements.

Pot Life

30 - 45 minutes at 70°F. Higher temperatures will decrease pot life.

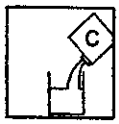
Tips for Success
For overall paint jobs, activate only enough material for each coat.



Additives

Accelerator:	389S; use 1 - 2 ounces per ready-to-spray gallon. 389S will not extend pot life.
Fish Eye Eliminator:	459S; use 1 - 2 ounces per ready-to-spray gallon. Do not use FEE.
Flex Additive:	Not required.
Reducer:	In non-regulated areas, 5-10% ChromaOne™ Reducer (7012S, 7065S, 7075S, 7085S, 7095S or 7099S) may be added to activated color to improve flow and leveling.

ChromaOne™ High Solids Acrylic Urethane Single-Stage



Flatteners
Not recommended.

Application

Substrates
Adhesion Promoter 222S
Adhesion Promoter for Plastics 2322S
2K Waterborne Primer-Filler 275S
Waterborne Primer-Surfacer 210S
Waterborne Primer-Surfacer 2220S
Velvaseal® WPS Waterborne Primer-Sealer 2120S/2125S/2140S
2K Waterborne Primer-Sealer 2440S

Surface Preparation
- Prepare all surfaces to be repainted using the recommended undercoat systems, following recommended procedures.
- Finish sand with 400 grit paper or finer (wet or dry).
- Mask the entire vehicle to prevent overspray from sticking.
- Tack with appropriate tack cloth prior to applying color.

Gun Setups

HVLP	***Spot***	***Panel/Overall***
Siphon (pressurized cup):	0.8 mm - 1.2 mm (.030"-.045")	0.8 mm - 1.2 mm (.030"-.045")
Gravity Feed:	1.3 mm - 1.5 mm (.051"-.059")	1.5 mm - 1.8 mm (.059"-.070")

Air Pressure

	Spot	***Panel/Overall***
HVLP	6 - 8 psi @ the gun cap.	8 - 10 psi @ the gun cap.

Application
Apply 2 - 3 wet coats until hiding and desired match are achieved. Spray each coat to achieve flow. Allow each coat to flash a full 15 minutes.

Flash/Dry Times (*force dry is recommended*)

Force Dry

Flash before Force Dry:	10 minutes.
Force Dry Cycle Time:	40 minutes @ 140°F.
Dust Free:	After cool down.
Tape Free:	3 hours after cool down.
Time to Handle (Assemble):	3 - 5 hours after cool down.
Time to Polish:	6 - 8 hours after cool down.
Time to Stripe:	3 - 5 hours after cool down.
Time to Deliver:	Overnight.
Two Toning:	1 hour after cool down. Remove tape immediately.

Infrared Dry — Cure for 30 minutes at a 36-inch distance with a 2000 watt unit.

ChromaOne™ High Solids Acrylic Urethane Single-Stage

Flash/Dry Times *(continued)*

Air Dry (at 75° F)	***With 389S Accelerator***	***Without 389S Accelerator***
Dust Free:	75 minutes.	2 hours.
Tape Free:	18 hours.	24 hours.
Time to Handle (Assemble):	8 - 10 hours.	18 hours.
Time to Polish:	12 - 24 hours.	24 hours.
Time to Stripe:	12 - 24 hours.	24 hours.
Time to Deliver:	12 - 24 hours.	24 hours.
Two Toning:	Overnight.	24 hours.

Blending

Use 7601S or ChromaOne™ Reducer for blending. There are 2 methods used for blending ChromaOne™ High Solids:

One-Gun Technique

Apply two coats of color, extending the second beyond the first. Immediately following the last color coat, over-reduce the remaining color 200 - 300% with reducer or ChromaClear® Blender 7601S. Apply light coats of the color/blender mixture at the color edge using 6 - 8 psi at the gun cap.

Two-Gun Technique

With color in one cup and color/blender mixture (color over-reduced with 200 - 300% reducer or ChromaClear® Blender 7601S) in the second cup, apply the first coat of color; then, apply color/blender mixture at the color edge using 6 - 8 psi at the gun. Apply the second coat of color and, again, blend the edge with the color/blender mixture using 6 - 8 psi at the gun cap.

Recoatability/Re-repair

ChromaOne™ High Solids may be recoated at any stage of dry or cure. If recoating after 24 hours, scuff sand with 600 grit or finer.

Clear Coat Option

The high gloss of ChromaOne™ High Solids eliminates any need for clear coating. However, if clear coating is desired, the following options are available:

- In the last coat of color: Add one part of ready-to-spray ChromaClear® 3500S to one part ready-to-spray ChromaOne™ High Solids color. Apply this last coat of color/clear mixture directly over the previous coats of color.
- ChromaClear® 3500S may be applied after color has flashed 45 minutes at 75°F.

ChromaOne™ High Solids Acrylic Urethane Single-Stage

Polishing

Optimum Times

Air Dry:	18 - 48 hours.
Force Dry:	6 - 36 hours.

Sanding

Use 1500 grit (wet).

Polishing

Use 1500S or equivalent. Apply a thin ribbon of material to the area to be polished. Use a double-sided wool polishing pad or a foam pad. Maintain air polisher or variable speed buffer at 1200 - 1800 rpm. Remove excess 1500S with a clean soft cloth prior to applying 3000S.

Use 3000S or equivalent (shake well before using). Apply a ribbon of material to work a 2 - 3 foot square area. Use a foam pad or a terry cloth cover. Maintain a variable speed buffer or an orbital polisher at 1200 - 1800 rpm.

Keep the polisher/buffer moving at all times. Overlap each pass approximately 50%. As 3000S begins to dry, stop polishing. Wipe off excess 3000S with a clean soft cloth. Hand buff with a clean soft cloth as a finishing touch.

Cleanup

Clean spray equipment with DuPont Thinner V-3661S immediately after use.

Physical Properties *(for typical white color)*

VOC: 3.5 lbs/gal ready-to-spray.
Theoretical Coverage: 826 sq. ft. per ready-to-spray gallon at 1 mil.
Weight Solids: 65.2% ready-to-spray.
Volume Solids: 51.5% ready-to-spray.
Recommended Dry Film Thickness: 2.5 mils in 2 coats.
Flash Point: Below 80°F closed cup ready-to-spray.

VOC Regulated Areas

These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C), eye protection, gloves and protective clothing while mixing components, during application, and until all vapor and mist are exhausted. In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

Product Usage Data Sheet - IMRON 6000 ✓

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IMRON 6000 BASE/CLEAR SYSTEM

A Specially Designed 3.5 VOC Product
A VOC compliant fleet finish for world class color and gloss, toughness and durability.

The Premium Quality, VOC Conforming B/C System
Imron 6000 * 3.5 VOC is a premium quality, high performance polyurethane base coat with outstanding durability and appearance. It is available in factory package or mixing machine - all lead-free formulations. Imron 6000 Base Coat can be combined with 1280S Clear Coat for fast drying, or 3400S for fast build and VOC conformance. Either way, you get a higher performance, higher technology finish for your fleet.

* All Product references to Imron 6000 are for Imron 6000 3.5 VOC "L" quality.

Durability That Can't Be Beat
Imron 6000 retains its gloss and DOI through the worst conditions. It gives your vehicles ultimate protection against severe environmental conditions, harsh chemicals and mechanical wear and tear. Imron 6000 provides maximum performance at the longest life cycle, for a "wet look" that shines brighter and lasts longer.

A Mirror-Like Gloss
Imron 6000 delivers the highest glamour, highest gloss finish you can get. Its lasting gloss and DOI (distinctness of image) give your vehicles superior shine and brightness for that mirror-like appearance. When your customers demand the absolute best, Imron 6000 is the finish of choice.

The Colors You Want ... The Matching You Need.
Extensive color development makes Imron 6000 the easy match for your fleet finishing jobs. Choose from thousands of colors, including "glamour" colors with a full line of pearls. Color matching and striping is more productive, and "in-kind" repairs are easier. Whatever the color, Imron 6000 gives you the match you're looking for.

SURFACE PREPARATION

Cleaning

1. Wash surface thoroughly with a mild detergent.
2. Clean and degrease with Prep-Sol 3919S or Kwik Clean 3949S.
3. Grind off rust and old paint, then sand and featheredge using 400 grit or finer on a DA.
4. Remove sanding dust with Lacquer and Enamel Cleaner 3939S or Kwik Clean 3949S.
5. Prepare substrate according to the recommendations below.

Substrate Treatment
For steel or galvanized:
Use Metal Conditioner 5717S. Follow with Conversion Coating 224S for steel or 227S for galvanized.

For aluminum:
Use Cleaner 225S. Follow with Conversion Coating 226S.

For VOC Regulated Areas		For Non-Regulated Areas	
Medium Fill	Maximum Fill	Medium Fill	Maximum Fill

Product Usage Data Sheet - IMRON 6000

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Precoat	VARIPRIME 615S/625S	VARIPRIME 615S/625S	VARIPRIME 615S/625S	VARIPRIME 615S/625S
Primer	WATERBORNE 210S*	2K WATERBORNE 275S	CORLAR 824S/825S or TUFCOTE 1855S/1856S/1857S	URO 1120S/1140S or TUFCOTE
Primer-Sealer	VELVASEAL WPS 2120S/2125S/2140S	VELVASEAL WPS	PRIME 'N SEAL 2600S/2610S/2640S or Sealer 9140S	PRIME 'N SEAL Sealer 9140S

* For small area repairs

IMRON 6000 3.5 VOC BASE COLOR

Mixing
1. Shake Imron 6000 3.5 VOC Base Color for at least 90 seconds on a Cyclone Paint Shaker before mixing.
2. Mix Imron 6000 3.5 VOC Base Color 3:1 with Imron Activator 193S.*
3. Add 2 ounces of Fast Accelerator 389S or up to 1 ounce of Super Fast Accelerator 8989S.
4. Mix together thoroughly and strain.
5. Viscosity is 9-20 seconds in a Zahn #3 cup, depending on color. Pot Life is 2 hours at 70 degrees F. Pot life can be extended with 2 ounces of 389S. Note: 1 ounce of 8989S will decrease pot life to 45 minutes.

* Using an Activator other than 193S can result in a VOC level greater than 3.5 lbs/gal.

Recommended Spray Gun Setups

HVLP Spray Equipment (HVLP spray equipment is required in most VOC regulated areas.)

	Tip	Cap	Fan Control Assembly	Cup Pressure
Binks Mach 1G (Gravity Feed)	#905/.085"	#905P	#6	6-7 psi
DeVilbiss V3	FF/.055"	#33	-	6-7 psi

Conventional Pressure Pot Spray Equipment

	Needle	Nozzle	Air Cap	Nozzle Orifice	PSI (at the gun)
DeVilbiss MBC/JGA/JGV	FF	FW	797	0.062"	60-65 solid colors 65-75 metallics
Binks Model 62					
Siphon	365	66x66SD	63Cx63PW		60-65 solid colors
Pressure	363A	65	Fluid/Air Nozzle		65-75 metallics

NOTE: Gravity feed can be used for spot repairs using 0.055"-0.070" needle orifice and 40-55 psi at the gun.

Product Usage Data Sheet - IMRON 6000

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	Orifice	PSI (at the gun)
Air Assisted Airless Kremlin 09-113/09-133/14-133 or equivalent	0.013"-0.015"	35 (first adjust spray pattern using fluid pressure - typically 350 psi)
Airless Graco 413/415/417 or equivalent	0.013"-0.015"	

NOTE: Other spray equipment is available. Contact your local Du Pont representative or gun manufacturer for additional information. The information in this chart is given for ambient temperature product (75 degrees F). Heating paint to higher temperatures (90-95 degrees F) will result in lower viscosity, which may require a smaller orifice with air-assisted airless spray.

Application
Use a cross-coat technique. With a 12-inch gun distance, spray a medium-wet first pass using a top-to-bottom motion. Spray a medium-wet second pass using a side-to-side motion. Minimize flash time between passes for optimum appearance. Generally, there is no need to mist-coat metallics with this product.

Do not spray Imron 6000 if the paint temperature is less than 75 degrees F. Use warm water to heat the paint to an optimum temperature of 85-95 degrees F.

Fish Eyes
In case of fish eyes, use Paint Additive 359S up to 1 ounce per ready-to-spray gallon of Imron 6000. Do not use FEE.

Recoating
Recoating can be done at any stage of dry. Films should not be allowed to cure over 72 hours before recoating or clear coating.

Flash Time
10 minutes before applying Clear.

Tape Free Time
10-12 hours, or 2-4 hours with 2 oz/gal of 389S, or 1 hour with 1 oz/gal of 8989S. (Caution: Exceeding these recommended amounts can result in VOC greater than 3.5 lbs/gal.)

Sanding
Do not sand base color before applying clear. If nib sanding is needed, reapply color prior to clear coat.

IMRON 6000 3.5 VOC CLEAR 3400S
Clear Option: Primary Recommendation For Low VOC Conformance

Mixing
1. Stir Imron 6000 3.5 VOC Clear 3400S for 90 seconds before mixing.
2. Mix Imron 6000 3.5 VOC Clear 3400S 3:1 with Imron Activator 193S.*
3. Mix together thoroughly and strain.
4. Viscosity is 12-14 seconds in a Zahn #3 cup. Pot life is 2 hours at 70 degrees F. Pot life can be extended with 2 ounces of 389S.
   Note: 1 ounce of 8989S will decrease pot life to 45 minutes.

* Using an activator other than 193S can result in a VOC level greater than 3.5 lbs/gal.

Recommended Spray Gun Setups
See Recommended Spray Gun Setups for Base Coat.
Note: Pressure pot spray pressure for 3400S is 60-65 psi at the gun (fluid delivery 12-14 oz/min).

Application
Use a cross-coat technique. With a 12-inch gun distance, spray a medium-wet first pass using a top-to-bottom motion. Spray a medium-wet second pass using a side-to-side motion. Minimize flash time between passes for optimum appearance.

Do not spray 3400S if the paint temperature is less than 75 degrees F. Use warm water to heat the paint to an optimum temperature of 85-95 degrees F.

Fish Eyes
Use Paint Additive 359S up to 1 ounce per ready-to-spray gallon of 3400S. Do not use FEE. (Caution: Exceeding this recommended amount can result in VOC greater than 3.5 lbs/gal.)

Dry Time
Air Dry: Dust free in 1-2 hours; tack free in 6-8 hours. The use of 389S (2 oz/gal) or 8989S (1 oz/gal) is highly recommended for air dry.
Force Dry: Allow 10-15 minutes flash after final coat, then force dry at 140 degrees F for 30 minutes. Allow vehicle to cool overnight before delivery.

Cleanup
Use Acrylic Lacquer Thinner 3602S immediately. Do not leave activated material in the gun.

IMRON 6000 CLEAR 1280S (4.4 lbs/gal)
Clear Option: For Non-Regulated Areas

Mixing
1. Stir Imron 6000 Clear 1280S for 90 seconds before mixing.
2. Mix Imron 6000 Clear 1280S 8:2:1 with Imron Activator 1282S and Imron Reducer 1275S Fast or 1285S Slow, depending on shop temperature.
3. Mix together thoroughly and strain.
4. Viscosity is 17-19 seconds in a Zahn #2 (Du Pont M-222) cup. Pot life is 3-4 hours at 70 degrees F. (For faster dry time and extended pot life, use 2 ounces of 389S.)

Recommended Spray Gun Setups

Spray Gun	Air Cap	Needle/Nozzle
DeVilbiss		
MBC/JGA/JGV	30	EX (0.070")
	80	EX (0.070")
GFG	30	FW (0.062")
Binks		
#7	SC	35 (0.059")
	SD or SK	36 (0.070")
#69	SK, SH, SK	565/66 (0.070")

Sharpe
#775 10 0.075/10-70 (0.070")

Spray Pressure
Pressure Pot: 55-60 psi (16-18 ounces per minute)
Air Assisted Airless: 40 psi atomizing air; fluid pressure 350 psi (.018".015" orifice).
Siphon: 35-55 psi at the gun.
Gravity: 35-55 psi at the gun.
HVLP: 7-10 psi at the air cap.

Application
Use a cross-coat technique. With a 12-inch gun distance, spray a medium-wet first pass using a top-to-bottom motion. Spray a medium-wet second pass using a side-to-side motion. Minimize flash time between passes for optimum appearance.

Fish Eyes
Use Paint Additive 259S up to 1 ounce per ready-to-spray gallon of clear. Do not use Fee.

Dry Time
Air Dry: Dust free in 10-15 minutes; tack free in 30 minutes. Wait 2-3 hours before placing outdoors, and overnight before delivery.
Force Dry: Allow 10-15 minutes flash after final coat, then force dry at 140 degrees F for 30 minutes. Allow vehicle to cool overnight before delivery.

COMPATIBLE PRODUCTS

Prep-Sol 3919S
Lacquer and Enamel Cleaner 3939S
Kwik Clean 3949S
Conversion Coating 224S, 226S, 227S
Metal Conditioner 5717S
Cleaner 225S
Variprime 615S, 625S
Waterborne Primer-Surfacer 210S
2k Waterborne Primer-Filler 275S
Corlar Epoxy Primer 824S, 825S
URO Primer-Filler 1120S, 1140S
Tufcote 1855S, 1856S, 1857S
Velvaseal WPS 2120S, 2125S, 2140S

Prime 'N Seal 2600S, 2610S, 2640S
Sealer 9140S
Imron 6000 Activator 193S
Fast Accelerator 389S
Super Fast Accelerator 8989S
Imron 6000 3.5 VOC Clear 3400S
Imron 6000 Clear 1280S
Imron 6000 Clear Activator 1282S
Imron 6000 Clear Reducer 1275S/1285S
Paint Additive 259S, 359S

TECHNICAL INFORMATION

Recommended Film Thickness
Base Coat: 1.2 +/- 0.3 mils minimum (or to hiding)
Clear Coat: 2 +/- 0.2 mils

Theoretical Coverage
Base Coat: 858 sq. ft./gal @ 1 mil
1280S Clear Coat: 520 sq. ft./gal @ 1 mil
3400S Clear Coat: 935 sq. ft./gal @ 1 mil

Physical Properties (with 1280S or 3400S)
Crosshatch Adhesion Excellent

Flexibility (Conical Mandrell)	Excellent
Pencil Hardness	2H
Chip Resistance*	Very Good
Impact Resistance*	Very Good
Humidity Resistance*	Excellent
Salt Spray Resistance*	Excellent

* Using Corlar Epoxy Primer

Chemical Resistance	
5% Sodium Hydroxide Solution	No Effect
20% Hydrochloric Acid Solution	No Effect
20% Phosphoric Acid Solution	No Effect
5% Tannic Acid Solution	No Effect
10% Sulfuric Acid Solution	No Effect

Percent Solids by Weight
Base Coat: 67% (average) activated
1280S Clear Coat: 37.6% activated
3400S Clear Coat: 52.1% activated

Percent Solids by Volume
Base Coat: 53.5% (average) activated
1280S Clear Coat: 32.4% activated
3400S Clear Coat: 58.3% activated

Solvent Resistance	
Methyl Ethyl Ketone	No Effect
Toluene/Naptha (50/50)	No Effect
Grease	No Effect
Diesel Fuel	No Effect
Gasoline	No Effect
Gasohol	No Effect
Road Tar	No Effect

Graffiti Resistance (with 1280S or 3400S)	
"KIWI" Shoe Polish	Cleanable
"SHARPIE" Marker	Cleanable

Safety
Before using any Du Pont Refinish product, be sure to read all safety directions and warnings. Wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C), eye protection, gloves and protective clothing during application and until all vapor and mist are exhausted. In Confined spaces, or in situations where continuous spray operations are typical, or if respirator fit is not possible, wear a properly fitted vapor/particulate respirator approved for use with paints (NIOSH/MSHA TC-23C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area.

VOC Compliance
These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the Du Pont Compliant Products Chart for your area.

Du Pont Fleet Finishes
H-17647-01 (11/92)

Product Usage Data Sheet - IMRON 6000

E-R0513

Product Usage Data Sheet - CHROMABASE

ChromaSystemTM Technical Manual

DuPont Automotive

ChromaBase(R) Basecoat

Description

ChromaBase(R) is an easy to use, fast drying basecoat with good fill. It provides high quality and high productivity. ChromaBase(R) is available in both mix and factory package, for spot, panel and overall repairs. Select from a wide choice of solid, metallic and pearl colors, and a multitude of special effects colors.

General Information

Components
ChromaBase(R) - Base Color "K"
7155S - Non-Penetrating ChromaSystem Basemaker(R)
7160S - Low Temp ChromaSystem Basemaker(R)
7175S - Mid Temp ChromaSystem Basemaker(R)
7185S - High Temp ChromaSystem Basemaker(R)
7195S - Very High Temp ChromaSystem Basemaker(R)
12305S - ChromaPremierTM Activator (optional)

	60xF	70xF	80xF	90xF
Spot Repair	7160S	7175S	7175S	7185S
Panel Repair	7160S	7175S	7185S	7185S
Overall Repair	7175S	7185S	7185S	7195S

Tips for Success
" For sensitive substrates, use 7155S for less aggressivity.
" For temperatures above 90xF, use 7195S for increased flow and leveling.

Mix Ratio/Viscosity
Mix Ratio (1:1)
Mix 1 part ChromaBase(R) to 1 part ChromaSystemTM Basemaker(R). ChromaBase(R) Basecoat should be activated with ChromaPremierTM Activator 12305S for optimum performance and for lifetime warranty.
Mix basecoat with Basemaker(R) at normal 1:1 ratio. Stir thoroughly, then activate: Add 1 ounce of Activator 12305S to a ready-to-spray quart of ChromaBase(R), or add 1/2 ounce of 12305S to a ready-to-spray pint of basecoat.

RTS Color	12305S Activator
1 quart	1 ounce (32 grams)
1 pint	(r) ounce (16 grams)
(r) pint	, ounce (8 grams)

Viscosity
15 - 17 seconds in a Zahn #2 (DuPont M-222) cup.

Tips for Success
" Use mixing stick for accurate measurements.
" Use activated basecoat within 2 hours for optimum performance.
" Do not use activated basecoat after the 8-hour pot life.

* Activate only what you intend to spray.

Pot Life
Indefinite (unactivated).
8 hours (activated).

Additives

Accelerator:	Not recommended.
Fish Eye Eliminator:	Not recommended.
Flex Additive:	Not required. See Tips for Success.
Retarder:	Not recommended.

Tips for Success
* If fish eyes occur, allow the basecoat to dry thoroughly, then apply dry coats of base color to bridge the affected area.
* The use of ChromaPremierTM Activator 12305S in ChromaBase(R) (1 ounce of 12305S per RTS quart of basecoat) is required over flexible substrates. No other flex additive is necessary.
* Do not add Accelerator to activated basecoat. It will not speed cure and could damage film properties.

Tinting
Up to 5% with MasterTint mixing color.

Clearcoats
ChromaPremierTM Appearance Clear 72400S
ChromaPremierTM Productive Clear 72200S
ChromaClear(R) 7500S/7600S/7800S/V-7500S/V-7600S

Flatteners
Flattening agents are not recommended to flatten ChromaBase(R). Small amounts of Flop Control Agent 4530S may be used to adjust color for flake orientation in metallic and pearl colors.

Application

Substrates
DuPont URO(R) Primer-Filler
ChromaFilTM
ChromaPrimeTM
Fill 'N SandTM
2K Waterborne Primer-Filler 275S
ChromaPremierTM Sealer
Prime 'N SealTM
Low VOC Prime 'N SealTM
Velvaseal(R)
Velvaseal WPS Waterborne Primer-Sealer
Adhesion Promoter 222S
Plas-StickTM Flexible Adhesion Sealer 2340S

Tips for Success
For information on ValueShadeTM, see the Specialty Procedures section.

Surface Preparation
Prepare all surfaces to be repainted using the recommended undercoat systems,

following recommended procedures. Finish sand with P400 DA grit paper or finer (wet or dry).

Gun Setups*

Conventional	
Siphon Feed:	1.4 mm - 1.6 mm (.055" - .063")
Gravity Feed:	1.4 mm - 1.5 mm (.055" - .059")
HVLP	
Siphon Feed:	1.4 mm - 1.6 mm (.055" - .063")
Gravity Feed:	1.4 mm - 1.6 mm (.055" - .063")

Air Pressure*

Conventional	Spot/Panel	Overall
Siphon Feed:	30 - 40 psi @ the gun.	45 psi @ the gun.
Gravity Feed:	25 - 35 psi @ the gun.	35 - 45 psi @ the gun.
HVLP	6 - 8 psi @ the gun cap.	7 - 9 psi @ the gun cap.

*The listed setups cover the usual range for various application equipment. For information on specific manufacturers' equipment, see the Appendix section titled "Equipment Information."

Application

Apply 2 - 3 medium coats until hiding and color match are achieved.

Flash/Dry Times

Air Dry	
Flash between Coats:	5 - 10 minutes.
Flash before Clearcoat:	15 - 30 minutes.
Flash before Tape:	30 minutes.
Flash before Two-Toning:	30 minutes.
Maximum Allowable Dry before Clearcoating:	Overnight.
Force Dry	Not recommended.

Blending

Apply 1 coat of Adhesion Promoter 2225 over the entire repair area. Apply the first coat of color beyond the primed area. Apply the second coat just beyond the first coat. Apply subsequent coats just beyond the previous coats, staying within the area covered by 2225. Follow recommended flash times, then apply clearcoat over the entire panel.

Tips for Success:

^ Tapering out each consecutive coat melts the new color into the old color.
^ For alternate blending techniques, refer to Systems & Procedures section.

Recoatability/Re-repair

ChromaBase(R) may be recoated with itself within 24 hours.

Sanding

ChromaBase(R) base color dries to a smooth matte finish and should not be sanded. Nib sanding of small areas to remove dirt must be followed by the application of more color before clearcoating.

Cleanup

Clean spray equipment as soon as possible with DuPont Thinner.

Physical Properties

VOC: 6.2 lbs/gal ready-to-spray (maximum).
Theoretical Coverage: 140 sq. ft. (silver) and 167 sq. ft. (white) per RTS gal. at 1 mil.
Weight Solids: 13.2% (silver) and 20.1% (white) ready-to-spray using 7160S.
Volume Solids: 8.7% (silver) and 10.4% (white) ready-to-spray using 7160S.
Recommended Dry Film Thickness: 0.5 - 2.0 mils.
Flash Point: See MSDS.

VOC Regulated Areas

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow mixing and usage recommendations in the VOC Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont product, be sure to read all safety directions and warnings. WHEN USED WITH PAINTS REQUIRING ISOCYANATE ACTIVATORS/HARDENERS, WEAR A POSITIVE-PRESSURE, SUPPLIED AIR RESPIRATOR (NIOSH TC-19C), EYE PROTECTION, GLOVES AND PROTECTIVE CLOTHING WHILE MIXING ACTIVATOR/HARDENER WITH PAINT, DURING APPLICATION AND UNTIL ALL VAPORS AND SPRAY MISTS ARE EXHAUSTED. If product is used without isocyanate activators/hardeners, aproperly fitted NIOSH TC-23C approved paint spray respirator can be used. Follow respirator manufacturer's directions for respirator use. INDIVIDUALS WITH HISTORY OF LUNG OR BREATHING PROBLEMS OR PRIOR REACTION TO ISOCYANATES SHOULD NOT USE OR BE EXPOSED TO THIS PRODUCT IF MIXED WITH ISOCYANATE ACTIVATORS/HARDENERS. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

Product Usage Data Sheet - CHROMAP BC

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ChromaSystemTM Technical Manual

DuPont Automotive

ChromaPremierTM Basecoat

Description

ChromaPremierTM Basecoat is a high performance, fast drying, isocyanate-activated basecoat that brings a new level of productivity to premium spot, panel and overall repairs. High-hiding ChromaPremierTM Basecoat lays down smoothly, with trouble free application and excellent mottle control. It delivers superior appearance in solid, metallic and pearlescent colors.

General Information

Components

ChromaPremierTM - Basecoat "F"

12305S - ChromaPremierTM Activator
7155S - Non-Penetrating ChromaSystemTM- Basemaker(R)
7160S - Low Temp ChromaSystemTM Basemaker(R)
7175S - Mid Temp ChromaSystemTM Basemaker(R)
7185S - High Temp ChromaSystemTM Basemaker(R)
7195S - Very High Temp ChromaSystemTM Basemaker(R)

	65x F	75x F	85x F	95x F
Spot Repair	7160S	7175S	7185S	7185S
Panel Repair	7160S	7175S	7185S	7195S
Overall Repair	7175S	7185S	7195S	7195S

Tips for Success

~ For sensitive substrates, use 7155S for less aggressively

~ For spray-sensitive colors, select a slower Basemaker(R) for improved application and appearance.

Mix Ratio/Viscosity

ChromaPremierTM Basecoat must be activated with ChromaPremierTM Activator. Mix 1 part ChromaPremierTM Basecoat to 1 part ChromaSystemTM Basemaker(R). Stir thoroughly, then activate: Add 1 ounce of 12305S Activator to a ready-to-spray quart of ChromaPremierTM Basecoat, or add 1/2 ounce of 12305S Activator to a ready-to-spray pint of basecoat.

RTS Color	12305S Activator
1 quart	1 ounce (32 grams)
1 pint	1/2 ounce (16 grams)
1/2 pint	1/4 ounce (8 grams)

Tips for Success

ChromaPremierTM Basecoat may be reduced up to a 2:1 ratio when faster coverage is desired. Apply first coats of Basecoat at 2:1 to build-up coverage quickly; then apply final coats at 1:1 for optimum color match, appearance and texture.

Note: Be sure to activate the ready-to-spray basecoat at the normal 1 ounce of Activator per ready-to-spray quart of color before application.

Viscosity
15 - 17 seconds in a Zahn #2 (DuPont M-222) cup.

Tips for Success
Use mixing stick for accurate measurements.
^ Use activated basecoat within 2 hours for optimum performance.
^ Do not use activated basecoat after the 8-hour pot life.
^ Activate only what you intend to spray.

Pot Life
8 hours.

Additives

Accelerator:	Not recommended.
Fish Eye Eliminator:	Not recommended.
Flex Additive:	Not recommended: see Tips for Success.
Retarder:	Not recommended.

Tips for Success
^ If fish eyes occur, allow the basecoat to dry thoroughly, then apply dry coats of base color to bridge the affected area.
^ The use of Activator 12305S in ChromaPremierTM Basecoat is mandatory. The recommended 1 ounce of 12305S per ready-to-spray quart of basecoat gives optimum performance over flexible substrates. No other flex additive is necessary.
^ Do not add Accelerator to activated basecoat. It will not speed cure and could damage film properties.

Tinting
Up to 5% with MasterTint mixing color.

Clearcoats
ChromaPremierTM Appearance Clear 72400S
ChromaPremierTM Productive Clear 72200S
ChromaClear 7500S / 7600S / 7800S / V-7500S / V-7600S

Flatteners
Flattening agents are not recommended to flatten ChromaPremierTM Basecoat. Small amounts of Flattener 4530S may be used to adjust color for flake orientation in metallic and pearl colors.

Application

Substrates
Adhesion Promoter 222S
Plas-StickTM Flexible Adhesion Sealer 2340S
DuPont URO(R) Primer-Filler
ChromaFilTM

Product Usage Data Sheet - CHROMAP BC

ChromaPremierTM Sealer
Prime 'N SealTM
Low VOC Prime 'N SealTM

Tips for Success
For information on ValueShadeTM, see the Specialty Procedures section.

Surface Preparation
Prepare all surfaces to be repainted using the recommended undercoat systems, following recommended procedures. Finish sand with P400 DA or P600 grit or finer (wet or dry).

Gun Setups*

Conventional	Spot/Panel	Overall
Siphon Feed:	1.4 mm - 1.6 mm (.055" - .063")	1.6 mm - 1.8 mm (.063" - .070")
Gravity Feed:	1.4 mm - 1.6 mm (.055" - .063")	1.4 mm - 1.6 mm (.055" - .063")
HVLP		
Siphon Feed:	1.6 mm - 1.8 mm (.063" - .070")	1.8 mm - 2.2 mm (.070" - .086")
Gravity Feed:	1.3 mm - 1.6 mm (.051" - .063")	1.6 mm - 1.8 mm (.063" - .070")

Air Pressure*

Conventional	
Siphon Feed:	35 - 45 psi @ the gun.
Gravity Feed:	35 - 45 psi @ the gun.
HVLP	
Siphon Feed:	6 - 8 psi @ the gun cap.
Gravity Feed:	6 - 8 psi @ the gun cap.

* The listed setups cover the usual range for various application equipment. For information on specific manufacturers' equipment, see the Appendix section titled "Equipment Information."

Application
Apply 2 - 3 medium coats until hiding and color match are achieved.

Flash/Dry Times

Flash between Coats:	5 - 10 minutes.
Air Dry @ 70x F.	
Flash before Clearcoat:	15 - 30 minutes.
Flash before Tape:	30 minutes.
Flash before-Two-toning:	30 minutes.
Maximum Allowable Dry before Clearcoating:	Overnight.
Force Dry:	Not recommended.

Tips for Success
- Extend the basecoat flash to the full 30 minutes for higher film builds or in cooler temperatures.

Blending

Apply 1 coat of Adhesion Promoter 222S, over the entire repair area. Apply the first coat of color beyond the primed area. Apply the second coat just beyond the first coat. Apply subsequent coats just beyond the previous coats, staying within the area covered by 222S. Follow recommended flash times, then apply clearcoat over the entire panel.

Tips for Success

^ Tapering out each consecutive coat melts the new color into the old color.
^ Use of a slower Basemaker(R) can improve the appearance of the blend edge.
^ For advanced blending techniques, see Special Blending Procedures in the Specialty Procedures section.

Recoatability/Re-repair

ChromaPremierTM Basecoat may be recoated with itself at any time within 24 hours.

Sanding

ChromaPremierTM Basecoat dries to a smooth matte finish and should not require sanding. Nib sanding of small areas to remove dirt must be followed by the application of more color before clearcoating.

Cleanup

Clean spray equipment as soon as possible with DuPont Lacquer Thinner.

Physical Properties

VOC: 6.2 lbs/gal ready-to-spray (maximum).
Theoretical Coverage: 150 sq.ft.(silver) and 192 sq.ft.(white) per RTS gal. at 1 mil.
Weight Solids: 14.0% (silver) and 23.1% (white) ready-to-spray using 7160S.
Volume Solids: 9.4% (silver and 12.0% (white) ready-to-spray using 7160S.
Recommended Dry film Thickness: 0.5 - 2.0 mils.
Flash Point: See MSDS.

VOC Regulated Areas

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow mixing and usage recommendations in the VOC Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont product, be sure to read all safety directions and warnings. WEAR A POSITIVE-PRESSURE, SUPPLIED AIR RESPIRATOR (NIOSH TC-19C), EYE PROTECTION, GLOVES AND PROTECTIVE CLOTHING WHILE MIXING ACTIVATOR WITH PAINT, DURING APPLICATION AND UNTIL ALL VAPORS AND SPRAY MISTS ARE EXHAUSTED. Follow respirator manufacturer's directions for respirator use. INDIVIDUALS WITH HISTORY OF LUNG OR BREATHING PROBLEMS OR PRIOR REACTION TO ISOCYANATES SHOULD NOT BE EXPOSED TO THIS PRODUCT. Do not permit anyone without protection

in the painting area. This product is intended for industrial use only by professional, trained painters.

Product Usage Data Sheet - 3500S

CHROMACLEAR HIGH-SOLIDS 3500S

Description
ChromaClear 3500S is a very high-solids, low VOC (3.5 lbs /gal) acrylic urethane clear coat designed for panel and overall repairs of OEM base/clear finishes. 3500S provides outstanding appearance and durability, exceptional handling, and excellent resistance to shrinkage and dieback. The high- solids content of 3500S results in improved coverage, fewer coats and reduced material consumption.

Components
3500S - ChromaClear High-Solids
3575S - ChromaClear High-Solids Activator
1075S - Low Temp URO Reducer
1085S - Mid Temp URO Reducer
1095S - High Temp URO Reducer

Mix Ratio - 3:1:10%
Mix 3 parts 3500S to 1 part Activator 3575S. Reduce with 10% URO Reducer 1075S/1085S/1095S. Stir thoroughly.

Viscosity - 20 - 21 seconds in a Zahn #2 (DuPont M-222) cup.

Pot Life
1 hour at 75 deg F.
Tips for success - Use 389S for extended pot life.

Additives

Accelerator:	389S; use 1 -2 ounces per activated gallon. (To maintain VOC compliance, 389S may replace up to 2 ounces of reducer per gallon of ready-to-spray clear.)
Fish Eye Eliminator:	295S; use 1 - 2 ounces per ready-to- spray gallon. Do not use FEE.
Flex Additive:	Not required.
Retarder:	Not required.

Tips for success
For large repair jobs, or when working at high temperatures (90 deg F+), activate only enough material for each coat.

Base Coats/ Substrates
ChromaBase
Imron 6000
Cronar "C" Quality
Centari
Lucite (Use Adhesion Promoter 222S between base coat and clear coat application.)

Surface Preparation
For application over a properly prepared base coat repair:
* Fully mask the vehicle to prevent overspray from sticking.
* Allow base coat to dry 15 - 30 minutes.
* Tack with appropriate base coat tack cloth prior to applying clear.

Gun Setups

HVLP	Siphon/Gravity Feed:	1.3 mm - 1.5 mm (.051" - .059")
Conventional	Siphon/Gravity Feed:	1.3 mm - 1.5 mm (.051" - .059")

Product Usage Data Sheet - 3500S

Air Pressure	Panel	Overall
HVLP	6-8 psi @ the gun cap.	8-10 psi @ the gun cap.
Conventional		
Siphon Feed	45 psi @ the gun.	55 psi @ the gun.
Gravity Feed	40 psi @ the gun.	50 psi @ the gun.

Application
Apply a medium first coat. Flash 5-10 minutes. Apply a second wet coat.

Flash/Dry Times
Air Dry (At 75 deg F)

Flash between Coats:	5 - 10 minutes.
Dust Free:	60 minutes.
Time to Handle (Assemble):	Overnight.*
Time to Polish:	Overnight.*
Time to Stripe:	Overnight.*
Time to Deliver:	Overnight.*

Note: Dry times will vary depending on air flow and temperature.

Force Dry

Flash before Force Dry:	5 - 10 minutes.
Cycle Time:	30 minutes @ 140 deg F.
Dust Free:	30 minutes.
Time to Handle (Assemble):	5 - 6 hours.*
Time to Polish:	Overnight.*
Time to Stripe:	Overnight.*
Time to Deliver:	Overnight.*
Infrared Dry	30 minutes at a distance of 36 inches using a 2000 watt unit. (Refer to the Infrared Guide for more information.)

* To speed cure times, use 3895 at a rate of 1-2 oz. per ready-to-spray gallon.

Blending - Use 7601S or URO Reducer (1075S/1085S/1095S) for blending.

Blend the last coat of clear with the remaining clear coat in the cup, over-reduced with blending solvent. The ratio should be 1 - 2 parts blending solvent to 1 part ready-to- spray clear. After the final coat of clear has been blended with the mixture of solvent and clear, use the save gun to finish melting in the edge with straight blender or reducer.

Recoatability/Repair - 3500S may be recoated or repaired after overnight dry.

Polishing - Optimum Times

Air Dry:	14 - 24 hours at 70 deg F.
Force Dry:	14 hours.

Sanding - Use 1500 grit (wet).

Polishing
Use 1500S or equivalent. Apply a thin ribbon of material to the area to be polished. Use a double-sided wool polishing pad or a foam pad. Maintain air polisher variable speed buffer at 1200 - 1800 rpm. Remove excess 1500S with a clean soft cloth prior to applying 3000S.

Use 3000S or equivalent. Apply a ribbon of material to work a 2-3 foot square

area. Use a foam pad or a terry cloth cover. Maintain a variable speed buffer or an orbital polisher at 1200 - 1800 rpm.

Keep the polisher/buffer moving at all times. Overlap each pass approximately 50%. As 3000S begins to dry, stop polishing. Wipe off excess 3000S with a clean soft cloth. Hand buff with a clean soft cloth as a finishing touch.

Cleanup - Clean spray equipment as soon as possible with DuPont Thinner V-3661S.

Physical Properties

VOC:	3.5 lbs/gal ready-to-spray.
Theoretical Coverage:	795 sq. ft. per ready-to-spray gallon at 1 mil.
Weight Solids:	56.7% ready-to-spray.
Volume Solids:	49.6% ready-to-spray.
Recommended Dry Film Thickness:	2.0-2.5 mils in 2 coats.
Flash Point:	Less than 73 deg F closed cup ready-to-spray.

VOC

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-19C), eye protection, gloves and protective clothing while mixing components, during application, and until all vapor and spray mist are exhausted. Follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

H-18102 (7/93) E-R0174

Product Usage Data Sheet - 3600S

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ChromaClear Low VOC Productive 3600S

Description

ChromaClear Low VOC Productive 3600S is a fast, three-component, air dry, urethane clear for use in spot and panel repairs of OEM base/clear finishes. 3600S features good dry times, high gloss and easy application. 3600S may also be force dried for improved productivity.

General Information

Components:
3600S - ChromaClear Low VOC Productive.
3605S - ChromaClear Low VOC Productive Activator.
1075S - Low Temp ChromaSystem Reducer.
1085S - Mid Temp ChromaSystem Reducer.
1095S - High Temp ChromaSystem Reducer.

Mix Ratio/Viscosity:
Mix Ratio (4:1:10%)

By Volume:
Mix 4 parts 3600S to 1 part 3605S Activator.
Reduce 10% with ChromaSystem Reducer 1075S/1085S/1095S.
Stir thoroughly and strain.

By Weight (1 quart, cumulative):

3600S	680.3
3605S	876.1
Reducer	951.8

Viscosity:
18 - 20 seconds in a Zahn #2 (DuPont M-222) cup.

Tips for Success:
^ Use a mixing stick or scale for accurate measurements.

Pot Life:
1 hour at 75xF Pot life will vary depending on temperature and humidity.

Additives:

Accelerator	-	389S; add 1/2 - 1 ounce per ready-to-spray quart.
Fish Eye Eliminator	-	459S; add 1/4 -1/2 ounce per ready-to-spray quart.
Flex Additive	-	Not required.
Retarder	-	Not required.

Basecoats:
ChromaPremier
Chromabase
Cromax WBC

Application:
Substrates
ChromaPremier
Chromabase
Cromax WBC
Adhesion Promoter 222S for blend areas

Surface Preparation:
For application over a properly prepared basecoat repair;
~ Fully mask the vehicle to prevent overspray from sticking.
~ Allow basecoat to dry thoroughly.
~ Tack with appropriate basecoat tack cloth prior to applying clear.

Gun Setups:
Conventional
Siphon Feed: 1.5 mm - 1.7 mm (.059" - .067")
Gravity Feed: 1.3 mm - 1.5 mm (.051" - .059")
HVLP
Siphon Feed: 1.7 mm - 1.9 mm (.067" - .075")
Gravity Feed: 1.3 mm - 1.5 mm (.051" - .059")

Air Pressure:
Conventional
Siphon Feed: 50 - 60 psi @ the gun.
Gravity Feed: 45 - 55 psi @ the gun.
HVLP: 10 psi @ the gun cap.

Application:
Apply a medium first coat.
Flash 10 minutes.
Apply a second wet coat.

Flash/Dry Times:
Air Dry*
Flash between Coats: 10 minutes.
Dust Free: 40 minutes.
Time to Handle (Assemble): 6 - 8 hours.
Time to Polish: Overnight.
Time to Stripe: Overnight.
Time to Deliver: Overnight.
Express Dry*
Flash before Express Dry: 10 minutes.
Dry Cycle: 10 - 15 minutes @ 140%F.
Cool Down: 5 - 10 minutes.
Dust Free: After cool down.
Time to Handle (Assemble): 4 - 6 hours.
Time to Polish: Overnight.
Time to Stripe: Overnight.
Time to Deliver: Overnight.

Force Dry*
Flash before Force Dry: 10 minutes.
Cycle Time: 30 minutes @ 140%F.
Dust Free: At cool down.
Time to Handle (Assemble). 2 hours.
Time to Polish: 4 - 6 hours.
Time to Stripe: 4 - 6 hours.
Time to Deliver: 4 - 6 hours.

* To speed up through cure, use 389S at a rate of 1/2 - 1 ounce per ready-to-spray quart.

Blending:

Panel repair is the approved procedure for clearcoat warranty repairs. This allows the refinisher to attain the recommended film builds. If the refinisher chooses to blend, use 7601S or ChromaSystem Reducer (1075S or 1085S).

Blend the last coat of clear with the remaining clearcoat in the cup, over-reduced with blending solvent/reducer. (Use 1 - 2 parts blending solvent/ reducer to 1 part ready-to-spray clear.)

After the final coat of clear has been blended with the mixture of solvent/ reducer and clear, further reduce the mixture and use the same gun to finish melting in the edge.

Tips for Success:
* For sail panel blending, be sure 222S is applied beyond the intended clearcoat area.

Recoatability/Re-repair:
3600S may be recoated or repaired at any stage of dry or cure.

Polishing:
Optimum Times
Air Dry: 16 - 48 hours.
Express Dry: 12 - 48 hours.
Force Dry: 6 - 48 hours.

Sanding:
Use 1500 grit (wet).

Polishing:
Use finishing compound. Apply a thin ribbon of material to the area to be polished. Use a double-sided wool polishing pad or a foam pad. Maintain air polisher or variable speed buffer at 1200 to 1800 rpm. Remove excess finishing compound with a clean soft cloth prior to applying finishing polish.

Use finishing polish (shake well before using). Apply a ribbon of material to work a 2 - 3 foot square area. Use a foam pad or a terry cloth cover. Maintain a variable speed buffer or an orbital polisher at 1200 - 1800 rpm.

Keep the polisher/buffer moving at all times. Overlap each pass approximately 50%. As finishing polish begins to dry, stop polishing. Wipe off excess finishing polish with a clean soft cloth. Hand buff with a clean soft cloth as a finishing touch.

Tips for Success:
* Do not use medium to heavy-duty compounds.
* Use clean cloths and pads to insure that the clear does not get scratched with dirt particles from old or re-used cloths or pads.

Cleanup:
Clean spray equipment as soon as possible with DuPont Thinner V-3602S.

Physical Properties:

VOC:	3.6 lbs/gal ready-to-spray.
Theoretical Coverage:	669 sq. ft. per ready-to-spray gallon at 1 mil.
Weight Solids:	46.3.% ready-to-spray.
Volume Solids:	41.7% ready-to-spray.
Recommended Dry Film Thickness:	1.8 - 2.2 mils in 2 coats.

Product Usage Data Sheet - 3600S

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Flash Point: See MSDS.

VOC Regulated Areas:
These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling:
Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-1 9C), eye protection, gloves and protective clothing while mixing components, during application, and until all vapor and mist are exhausted. In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

DuPont Automotive Finishes

E-R1827 (11/96)
H-18831

Product Usage Data Sheet - EZ-3460S

IMRONr CLEARCOAT EZ-3460S

ImronR Clearcoat EZ-3460S is highly resistant to the effects of chemical and graffiti exposure. This two-component polyurethane clearcoat was chemically formulated based on DuPont TeflonR technology. It provides exceptional cleanup properties and resists dirt, road tar and tree sap.

EZ-3460S was designed for use with ImronR 6000 solid and metallic base colors and ImronR 5000 single-stage topcoats. When used over these topcoats, you get an extremely durable, high gloss clearcoat that resists yellowing.

You'll find EZ-3460S very easy to use and apply. It mixes 3:1 with no induction time. One cross-coat provides the desired build and appearance, with no flash between coats. It delivers good flow out and excellent sag resistance.

EZ-3460S dries to the touch in 2 - 4 hours and may be force dried in only 30 minutes. It contains less than 3.5 lbs/gal VOC ready-to-spray.

EZ-3460S is the ideal clearcoat for transits, OEMs and national fleets.
* formulated based on DuPont
* TeflonR technology
* exceptional repellency - cleans up easily
* outstanding cleanability and
* chemical/graffiti resistance
* extremely durable and high gloss
* simple to mix (3: 1); easy to apply
* no induction or flash times
* one cross-coat for desired build and appearance
* good flow out and excellent sag resistance
* air or force dry
* less than 3.5 lbs/gal VOC ready-to-spray

Technical Information

Components

EZ-3460S - ImronR Clearcoat
EZ-3461S - ImronR Activator

Mix Ratio

(3: 1) Mix 3 parts EZ-3460S with 1 part EZ-3461S Activator

Tips for Success

Stir EZ-3460S thoroughly prior to activation.

Viscosity

12 - 14 seconds in a Zahn #3 cup.

Pot Life

2 - 4 hours at 70DF

Additives

Accelerator:	389S; up to 2 oz/RTS gal
Fish Eye Eliminator:	Not required.
Flex Additive:	Not required.
Reducer:	Not required.
Retarder:	Not required.

Basecoats
ImronR 6000
ImronR 5000

Surface Preparation
For application over a properly prepared basecoat:

* For wet-on-wet applications, the base color must be activated with EZ-3461S.
* EZ-3460S can be applied after cure to ImronR 6000 base color or ImronR 5000. ImronR enamels should be lightly scuff sanded if allowed to dry for more than 16 hours

Gun Setups/Air Pressure
For pressure pot equipment, use 65 pounds atomizing air pressure at the gun with a fluid delivery of 10 - 12 ounces per minute.

Application
Apply one cross-coat technique (two passes with no flash time) to a dry film build of 1.8 - 2.0 mils dry film thickness.

Tips for Success
Filter mixed product prior to spray application.
For wet-on-wet applications, the base color must be activated with EZ-3461S.

Flash/Dry Times
Air Dry
Dry to Touch in 2 - 4 hours.
Tack Free in 6 - 8 hours.

Force Dry
The product can be force dried 30 minutes at 140 - 160 deg F

Tips for Success
For improved dry time, use 389S at a rate of 2 oz/RTS gal.

Recoatability/Re-repair
EZ-3460S can only be repaired with itself. Do not use other products for spot or panel repairs. For overall refinishing, sand EZ-3460S with 320 grit paper.

Cleanup
Clean spray equipment as soon as possible with DuPont Thinner 3602S.

Physical Properties
VOC
< 3.5 lbs/gal RTS.

Theoretical Coverage
835 sq ft/gal RTS at 1 mil.

Weight Solids
52.1% RTS.

Volume Solids
58.3% RTS.

Dry Film Thickness
1.8 - 2.0 mils in 1 cross-coat.

Flash Point
See MSDS.

VOC Regulated Areas
These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling
Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC- 19C), eye protection, gloves and protective clothing while mixing components, during application, and until all vapor and mist are exhausted. in all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

DuPont OEM/Fleet Finishes
E-R1788 (10/96)
H-18814 Printed in USA

Product Usage Data Sheet - LUCITE-SS

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LUCITE ACRYLIC LACQUER

RESPIRATOR: Wear a properly fitted vapor/particulate or a positive-pressure supplied-air respirator (NIOSH/MSHA TC-19C).

PROTECTIVE GARMENTS: Wear goggles or safety glasses
+
Gloves and protective clothing.

POT LIFE: Indefinite

WHERE USED: As a topcoat for repair of all original automotive finishes, as well as complete repaint jobs.

PERFORMANCE: Equal to the finest original factory finishes in durability and appearance. Air dry or force dry.

ADDITIVES: Use Fish Eye Eliminator (FEE) to eliminate the effect of silicone contamination only when necessary.

THINNERS: In spot repair, panel repair and overall repaint, 3696S High Performance Thinner is preferred for color matching, because of wide temperature latitude and excellent flow-out which minimizes compounding. In hot weather or high humidity, add 3979S Retarder to 3696S or 3602S. For small area repairs or cold shop conditions, use 3661S Thinner.

MIXING RATIO: one to 1-1/2 parts thinner
+
one part topcoat

FOR VOC REGULATED AREAS: These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow recommendations in the VOC systems chart for specific mixing instructions.

VISCOSITY: 18-22 seconds for spot repair, panel repair and overall repaint in a Du Pont M-50 Cup.

AIR PRESSURE: 20-35 pounds for spot and panel repair; 40-45 pounds for overall repaint

APPLICATION: For spot and panel repair, spray three full wet coats--each a little wider than the previous one.

Let each coat flash four to five minutes. After the third coat, let the job set up for 10 to 15 minutes, then apply two more wet coats,

Product Usage Data Sheet - 72400SC

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ChromaPremier Appearance Clear 72400S
(For California)

Description

ChromaPremier Appearance Clear 72400S is a high solids, three-component urethane clear that provides outstanding application properties and excellent appearance. 72400S is designed for multi-panel and overall repairs in a downdraft, force dry environment.

General Information

Components:
72400S - ChromaPremier Appearance Clear
12305S - ChromaPremier Activator
12375S - ChromaPremier Medium Reducer
12385S - ChromaPremier Slow Reducer
12395S - ChromaPremier Very Slow Reducer

	65xF	75xF	85xF	95xF
Multi-Panel Repair	12375S	12375S	12385S	12395S
Overall Repair	12375S	12385S	12385S	12395S

Mix Ratio/Viscosity:
Combine the components by volume or weight, then mix thoroughly.
3.6 VOC - Compliant in California markets subject to a 4.5 VOC basecoat/ clearcoat limit.

	Volume	Weight (cumulative qt)
72400S Clear	2	561 grams
12305S Activator	1	864 grams
12375S Reducer	10%	940 grams (sprayable qt)

Viscosity:
21 - 23 seconds in a Zahn #2 (DuPont M-222) cup.

Pot Life:
1 hour at 75xF. Pot life will be shorter at higher temperatures.

Additives:
Accelerator - 389S; use up to 1 ounce per ready-to-spray quart.
Fish Eye Eliminator - 459S; use 1/4 - 1/2 ounce per ready-to-spray quart.
Flex Additive - 2350S.
Retarder - Not required.

Basecoats:
ChromaPremier Basecoat
ChromaBase
Cromax WBC

Application:
Substrates
ChromaPremier Basecoat
ChromaBase
Cromax WBC
Adhesion Promoter 222S for blend areas.

Product Usage Data Sheet - 72400SC

Surface Preparation:
For application over a properly prepared basecoat repair:
^ Mask the entire vehicle to protect from overspray.
^ Allow basecoat to dry 15 - 30 minutes.
^ Extend basecoat flash to 30 minutes when applying higher film build or in cooler shop conditions.

Gun Setups:
Conventional
Siphon Feed: 1.4 mm - 1.6 mm (.055" -.063")
Gravity Feed: 1.4 mm - 1.6 mm (.055" -.063")
HVLP
Siphon Feed: 1.4 mm - 1.6 mm (.055" -.063")
Gravity Feed: 1.3 mm - 1.5 mm (.051" -.059")

Air Pressure:
Conventional
Siphon Feed: 50 - 55 psi @ the gun.
Gravity Feed: 45 - 55 psi @ the gun.
HVLP 9 - 10 psi @ the gun cap.

Application:
Apply 2 medium-wet coats with a 12-minute flash between coats.

Tips for Success:
^ Use a high atomizing air cap for best results.

Flash/Dry Times:

Force Dry	No Accelerator	1 Ounce 3895*
Flash between Coats:	12 minutes.	12 minutes.
Fash before Force Dry:	None.	None.
Cycle Time:	30 minutes @ 140xF.	30 minutes @ 140xF.
Dust Free:	At cool down.	At cool down.
Dry to Touch:	At cool down.	At cool down.
Time to Handle (Assemble):	2 hrs after cool down.	1 1/2 hrs after cool down.
Time to Polish:	2 hrs after cool down.	1 1/2 hrs after cool down.
Time to Stripe:	4-6 hrs after cool down.	3 hrs after cool down.
Time to Deliver:	4-6 hrs after cool down.	3 hrs after cool down.
Time to Decal:	After 48 hours.	After 48 hours.

*Intermediate volumes of 3895 may be added to give times between those listed above.

Blending:
Panel repair is the approved procedure for clearcoat warranty repairs. This allows the refinisher to attain the recommended film builds. If the refinisher chooses to blend, use ChromaPremier reducers.
^ Blend the last coat of clear using the remaining clearcoat in the cup, over-reduced with ChromaPremier Reducer. (Use 1 - 2 parts reducer to 1 part ready-to-spray clear.)
^ After the final coat of clear has been blended with the mixture of reducer and clear, further reduce the mixture and use the same gun to finish melting in the edge.

Tips for Success:
^ Apply 2225 beyond the intended clearcoat area for sail panel blending.

Recoatability/Re-repair:

Product Usage Data Sheet - 72400SC

724008 can be re-repaired during any stage of dry or cure.

Polishing:
Optimum Times
Force Dry: 2 - 48 hours after cool down.

Sanding:
Use 1500 wet or finer.

Compounding:
Use finishing compound. Apply a thin ribbon of material to the area to be compounded. Use a wool pad. Maintain air polisher or variable speed buffer at 1800-3000 rpm. Remove excess finishing compound with a clean soft cloth prior to applying finishing polish.

Polishing:
Use finishing polish. Apply a ribbon of material to work a 2-3 foot square area. Using a polishing pad, maintain a variable speed buffer at 1800-3000 rpm.

Keep the polisher/buffer moving at all times. Overlap each pass approximately 50%. As finishing polish begins to dry, stop polishing. Wipe off excess polish with a clean soft cloth, or glaze with an orbital buffer.

Tips for Success:
* Do not use heavy-duty compounds.
* Use clean cloths and pads to insure that the clear does not get scratched with dirt particles from old or re-used cloths or pads.

Cleanup:
Clean spray equipment immediately with DuPont Thinner 3602S or V-3602S.

Physical Properties:

VOC:	3.6 lbs/gal ready-to-spray.
Theoretical Coverage:	803.8 sq.ft.per ready-to-spray gallon at 1 mil.
Weight Solids:	56.2% ready-to-spray.
Volume Solids:	50.1 % ready-to-spray.
Recommended Dry Film Thickness:	2.0 - 2.4 mils in 2 coats.
Flash Point:	See MSDS.

VOC Regulated Areas:
These directions refer to the use of products which may be restricted or require special mixing instructions in your area. Follow recommendations in the DuPont Compliant Products Chart for your area.

Safety and Handling:
Before using any DuPont Refinish product, be sure to read all safety directions and warnings. Wear a positive-pressure, supplied-air respirator (NIOSH/MSHA TC-1 9C), eye protection, gloves and protective clothing while mixing components, during application, and until all vapor and mist are exhausted. In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

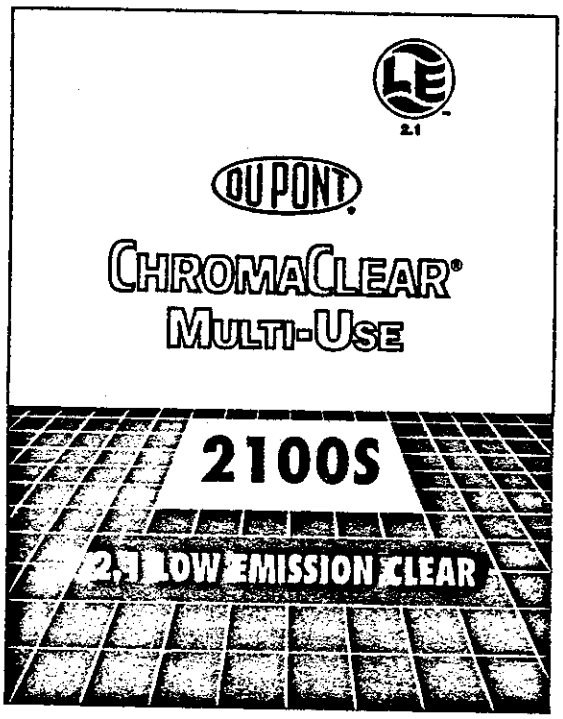
DuPont Automotive Finishes

Product Usage Data Sheet - 72400SC

H-18841

DuPont Automotive

ChromaClear® Multi-Use 2100S (2.1 VOC)



ChromaClear® Multi-Use 2100S – the versatile 2.1 VOC clear that's as easy to handle as conventional 3.5 VOC or 4.4 VOC clears!

ChromaClear® 2100S gives you the enhanced application latitude you want, in a 2.1 clear that meets regulatory requirements in areas requiring 2.1 VOC clearcoat.

Our "LE" logo tells you it's one of the lowest-VOC products available. And the ChromaSystem™ name tells you it delivers the user-friendly performance you've come to count on. You'll find it's as easy to mix and handle as the conventional 3.5 or 4.4 VOC clears you used to use.

2100S was developed for use over ChromaPremier™ and ChromaBase® basecoats. And it's an integral part of our ChromaSystem™ warranty program, so you can offer Lifetime, 7-year, or 5-year warranties, depending upon which system you choose.

Multi-Use 2100S is easy to mix, using a simple 3:1:1 ratio. And it gives you the enhanced application latitude you want. Three temperature-related Reducers enable you to have smooth application under a wide range of environmental conditions. A pot life of 1½ hours (at 75° F) gives you flexibility in planning your workflow. And you'll love the great handling and sprayability, as well as the build and good gloss.

2100S is versatile enough to handle every spot, panel and overall repair. It air-dries dust-free in 45 to 50 minutes, and is ready to handle in 4 hours. And it's bakeable in a downdraft booth. (When you bake, it's dust-free and ready to handle after cool-down.) You'll have no trouble meeting those delivery deadlines either, because 2100S buffs easily and polishes to a great appearance.

For more information, contact your DuPont Jobber or DuPont Sales Representative.

DuPont Automotive

ChromaClear® Multi-Use 2100S

Description

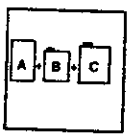
ChromaClear® Multi-Use 2100S is a versatile, three-component, 2.1 VOC-compliant, urethane clearcoat for use in spot, panel and overall refinishing of base/clear finishes. 2100S provides easy application, build and good gloss in two coats, and is well suited for cross-flow and downdraft booth conditions.

General Information

Components

2100S ChromaClear® Multi-Use
2105S ChromaClear® 2.1 Activator
2165S ChromaClear® 2.1 Fast Reducer
2175S ChromaClear® 2.1 Medium Reducer
2185S ChromaClear® 2.1 Slow Reducer

	60°F	70°F	80°F	90°F
Spot	2165S	2175S	2175S	2185S
Panel	2165S	2185S	2185S	2185S
Overall	2175S	2185S	2185S	2185S



Mix Ratio/Viscosity

Combine the components either by volume or weight and then mix thoroughly.

	Volume	Weight (Cumulative qt)
2100S Clear	3	630.5 grams
2105S Activator	1	841.2 grams
ChromaClear® 2.1 Reducer	1	*see below

*Due to the difference in weight between the three ChromaClear® 2.1 reducers, the amount needed by weight to make a quart of 2100S ready-to-spray differs. Use the following reducer weights to finish the cumulative sprayable quart.

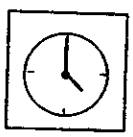
2165S Reducer	1	1006.9 grams (sprayable qt)
2175S Reducer	1	1040.5 grams (sprayable qt)
2185S Reducer	1	1096.2 grams (sprayable qt)

Viscosity

18-19 seconds in a Zahn #2 (DuPont M-222) cup.

Tips for Success

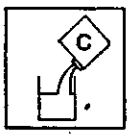
Use mixing stick in a container with vertical sides for accurate measurements.



Pot Life

1 ½ hours at 70°F.

ChromaClear® Multi-Use 2100S



Additives

Accelerator:	**389S; use up to ½ ounce per ready-to-spray quart.
Fish Eye Eliminator:	**459S; use ¼ - ½ ounce per ready-to-spray quart.
Flex Additive:	2350S; use 2 ounces per ready-to-spray quart.
Retarder:	not available.

**Note: For use in areas where clearcoat VOC requirement is greater than 2.1 lbs/gal.

Basecoats

ChromaBase®
ChromaPremier™
Imron® 6000

Application

Substrates

ChromaBase® Basecoat
ChromaPremier™ Basecoat
Imron® 6000 Basecoat
AdhesionPromoter 222S

Surface Preparation

For application over properly prepared basecoat:

- Mask the entire vehicle to prevent overspray from sticking.
- Allow the basecoat to dry 15 - 30 minutes.
- Extend the basecoat dry time to 30 minutes when applying several base color coats and/or in cooler shop conditions.

Gun Setups

HVLP	**Spot and Panel**	**Overall**
Siphon Feed:	1.7 mm - 1.9 mm	1.8 mm - 2.0 mm
Gravity Feed:	1.3 mm - 1.5 mm	1.4 mm - 1.5 mm
Pressure Feed:	0.8 mm - 1.0 mm	1.0 mm - 1.2 mm

Air Pressure*

HVLP 6 - 8 psi @ the gun cap.

*The listed setups cover the usual range for various application equipment. For information on specific manufacturer's equipment, see the Appendix section titled "Equipment Information."

Application

Apply 2 medium-wet coats.

ChromaClear® Multi-Use 2100S

Flash/Dry Times

Air dry

Flash between Coats:	10 minutes.
Dust Free:	45 - 50 minutes.
Time to Handle:	4 hours.
Time to Assemble:	16 hours.
Time to Polish:	16 hours.
Time to Stripe:	16 hours.
Time to Deliver:	16 hours.
Time to Decal:	72 hours.

Express Dry

Flash between Coats:	10 minutes.
Flash before Force Dry:	0 - 5 minutes.
Cycle Time:	15 minutes @140°F.
Time to Handle:	1 hour after cool down.
Time to Assemble:	3 hours after cool down.
Time to Polish:	12 hours.
Time to Stripe:	12 hours.
Time to Deliver:	12 hours.
Time to Decal:	after 72 hours.

Force Dry

Flash between Coats:	10 minutes.
Flash before Force Dry:	0 - 5 minutes.
Cycle Time:	30 minutes @140°F.
Time to Handle:	After cool down.
Time to Assemble:	2 hours after cool down.
Time to Polish:	2 hours after cool down.
Time to Stripe:	4 - 6 hours after cool down.
Time to Deliver:	4 - 6 hours after cool down.
Time to Decal:	after 48 hours.

Blending

Panel repair is the approved procedure for clearcoat warranty repairs. This allows the refinisher to attain the recommended film builds. If the refinisher chooses to blend, use 7601S ChromaSystem™ Blender.

- Blend the last coat of clear with the remaining clearcoat in the cup, over reduce with 7601S ChromaSystem™ Blender.
- After the final coat of clear has been blended with the mixture of blender and clear, further reduce the mixture and use the same gun to finish melting in the edges.

Tips for Success:

For sail panel blending, be sure 222S is applied beyond the intended clearcoat area.

Recoatability/Re-repair

2100S may be recoated during any stage of dry or cure. If recoating after 24 hours, scuff sand with 1200 - 1500 grit.

ChromaClear® Multi-Use 2100S

Polishing

Optimum Times

Air Dry:	16 - 72 hours.
Force Dry:	2 - 72 hours.
Express Dry:	12 - 72 hours.

Sanding

Use 1500 grit wet or finer. Or use P1500 DA or finer.

Compounding

Use finishing compound. Apply a thin ribbon of material on the area to be polished. Use a double-sided wool polishing pad or a foam pad. Maintain air polisher or variable speed buffer at 1200 - 1500 rpm. Remove excess finishing compound with a clean soft cloth prior to applying finishing polish.

Polishing

Use finishing polish (shake well before using). Apply a ribbon of material to work a 2 - 3 foot square area. Use a foam pad or terry cloth cover. Maintain a variable speed buffer or an orbital polisher at 1200 - 1500 rpm. Keep the polisher/buffer moving at all times. Overlap each pass approximately 50%. As finishing polish begins to dry, stop polishing. Wipe off excess finishing polish with a clean soft cloth. Hand buff with a clean soft cloth as a finishing touch.

Tips for Success:

- *Do not use medium to heavy-duty compounds. Use clean cloths and pads to insure that the clear does not get scratched with dirt particles from old or re-used cloth or pads.*
- *Do not wax for the first 120 days after painting.*

Cleanup

Clean spray equipment as soon as possible with DuPont Lacquer Thinner.

Physical Properties

VOC: 2.1 lb/gal. maximum ready-to-spray.
Theoretical Coverage: 674 sq. ft. per ready-to-spray gallon at 1 mil.
Weight Solids: 43.3% ready-to-spray.
Volume Solids: 42.0% ready-to-spray.
Recommended Dry Film Thickness: 1.8 - 2.2 mils in 2 coats.
Flash Point: See MSDS.

VOC Regulated Areas

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow mixing and usage recommendations in the VOC Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont product, be sure to read all safety directions and warnings. WEAR A POSITIVE-PRESSURE, SUPPLIED AIR RESPIRATOR (NIOSH TC-19C), EYE PROTECTION, GLOVES AND PROTECTIVE CLOTHING WHILE MIXING ACTIVATOR WITH ENAMEL, DURING APPLICATION AND UNTIL ALL VAPORS AND SPRAY MISTS ARE EXHAUSTED. Follow respirator manufacturer's directions for respirator use. INDIVIDUALS WITH HISTORY OF LUNG OR BREATHING PROBLEMS OR PRIOR REACTION TO ISOCYANATES SHOULD NOT BE EXPOSED TO THIS PRODUCT. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

Technical Data Sheet

Permahyd®

General Application Instructions for Water-Borne Products

This product is for professional painting of vehicles only.

SPIES HECKER

Miscellaneous

Substrate preparation

When applying water-borne products, the substrate must always be prepared with great care using only agents recommended for water-borne products.
Metal substrates should preferably be cleaned with Permahyd® Silicone Remover 7090.
Clean sanded surfacer areas and old finishes with Permahyd® Silicone Remover 7090 (see Data Sheet 770.2). Plastic surfaces must be carefully prepared in accordance with the System Data Sheet for painting plastics (see Data Sheet 901.1) and cleaned once more with Permahyd® Silicone Remover 7090 before further recoating.

Masking

Use only water-proof masking tapes and masking paper or plastic sheeting.

Spray guns/spray equipment

It is not advisable to use the same spray gun/spray equipment to alternately apply water-borne and conventional products. The components of spray guns/spray equipment coming into contact with water-borne products in the course of application must be made of a corrosion-resistant material (stainless steel).

Mixing containers

For mixing and adjusting the viscosity of water-borne products use only tins made of plastic or coated tinplate.

Material temperature

Since the viscosity and thus the application characteristics of water-borne products depend to a great extent on the material temperature, water-borne products must be at least 65°F at the time of viscosity adjustment/application.

- Store at min. 65°F or allow corresponding warming time before viscosity adjustment/application.

Minimum reaction temperature

When applying two pack water-borne products, the minimum reaction temperature given in the Technical Data Sheet must always be allowed for drying.

- see respective Product Data Sheet

Maximum mixing temperature

If the maximum mixing temperature of two pack water-borne products is exceeded the pot life may be reduced by such an extent that application is no longer possible.

- see respective Product Data Sheet
- store correctly
- cool down before mixing if required

Miscellaneous

Application

The application of water-borne products is influenced to a great extent by temperature and air humidity. This may restrict the application or make it even impossible unless certain conditions are fulfilled.
Assuming that in an up-to-date paint shop an application temperature of at least 58°F is guaranteed, particular measures are required only with regard to the air humidity if it is outside the application range.

Measures If relative humidity of air is too high

Excessively high air humidity may cause color deviations, moulling of metallic colors and insufficient settling on upright surfaces.
The following measures may be useful:

1. Increase temperature in the spray booth as far as acceptable for the staff.
2. Choose max. application viscosity given in Technical Data Sheet.

Measures If air humidity is too low

Inadequate air humidity may cause increased overspray and insufficient overspray absorption.
The following measures may be useful:

1. Reduce application temperature if possible. Observe the minimum of 65°F/18°C.
2. Choose lowest possible application viscosity given in Technical Data Sheet.

Intermediate and final flash-off times, recoating times

When applying water-borne products, the flash-off times between individual coats and final flash-off or recoating times are adversely affected by low temperatures and high air humidity. The drying processes between the individual coats and before further recoating can be accelerated by:

1. Accelerated evacuation of moist air
* blow with Sata Easy Dry (diffuser nozzle for spray gun)
* use Speed Dry air jet system
* increase air rate in the spray booth (spray booths of recent design take account of this option)

2. Use of drying energy
* IR
* combination booth
* oven

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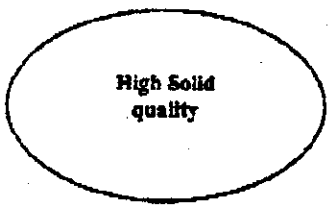
Miscellaneous

Technical Data Sheet.

Permasolid®
HS Clear Coat
8030



Permasolid® HS Clear Coat is a high gloss, high solid clear coat from our "2K-Acryl-HS-System".
Due to its very high solid content and good filling power it can be applied efficiently in a single operation. The high coverage, shorter spraying time and fast low baking enable HS Clear Coat 8030 to be applied very economically.
This clear is also more environmentally friendly than the usual clear coats, thanks to its markedly lower solvent emission. Its high resistance to all weathering and environmental influences provides the finish with long lasting protection.

This product is for professional painting of vehicles only.

SPIES HECKER

Substrates

Suitable Substrates: Permacron® Base Coat Series 293/295
Permahyd® Base Coat Series 280/285

Application

Mixing ratio: 2:1 by volume with Permasolid® Topcoat Hardener 3300 extra fast, 3310 Fast, 3315 Medium, or 3320 Slow.

Pot Life: Ready for Spraying approx. 90 minutes at 68°F/20°C

Reducer: Permacron® Reducer:
Ex. -Permacron® Dura plus 8580 or
-Permacron® Reducer 3363 Medium
-Permacron® Reducer 3365 Slow

Method of application	High pressure spraying	
	gravity feed 	suction feed 
Application viscosity 4mm, 68°F/20°C, DIN 53211	Mixing viscosity 20 - 22 seconds	
Reducer at 68°F/20°C material temperature	0-5%	
Spray nozzle	1.3 - 1.4 mm	1.7 - 1.8 mm
Spray pressure	40 - 65 psi	
Number of coats	1 ½ coat (1 medium coat followed by 1 full coat without flash off time between) or 2 coats with intermediate flash off time	

Recommended film thickness: 50 - 60µm dry film thickness

Drying

Air drying:

At 68°F/20°C	
dust free	40 - 50 minutes
dry for assembly	4 - 6 hours
dry through	12 hours

Low bake:

Flash-off time:	approx. 5 10 minutes
Drying time at 140°F/60°C metal temperature:	30 minute

Note:

- For faster dry time, see TDS # 600.0 on Permasolid® HS Accelerator 9030

Data

Viscosity as supplied:	65 - 75 seconds	
Flash point:	HS Clear Coat 8030 and HS Hardener	above 73°F/23°C
Solid content: (without reducer)	**Base product** approx. 58.9% by weight approx. 53.4% by volume	**Mixed** approx. 55.9% by weight approx. 49.9% by volume
Specific weight:	1.00 g/cm³	1.00 g/cm³
Coverage*:	approx. 106.5 sq. ft./l at 50µm dry film thickness	

* The coverage has been calculated based on the recommended dry film thickness and the percentage volume solids (without any additional reducer). The associated losses during application have also been ignored.

Warnings*

Hazardous substances:	HS Clear Coat 8030	-not required
	HS Topcoat Hardener 3310	-not required
	HS Topcoat Hardener 3309	-not required
	HS Topcoat Hardener 3315	-not required
	HS Topcoat Hardener 3320	-not required
	Dura plus 8580	-not required
	Reducer 3363 Medium	-St. Andrews cross (irritant)
	Reducer 3365 Slow	-St. Andrews cross (irritant)
	Silicone Remover 7010 Slow	- not required
	Silicone Remover 7090	- not required
	Silicone Remover 7799 Fast	-flame
Flammable liquids:	HS Clear Coat 8030	N/A § 2.4
	HS Topcoat Hardener 3310	All
	HS Topcoat Hardener 3315	All
	HS Topcoat Hardener 3320	All
	Dura plus 8580	All
	Reducer 3363 Medium	All
	Reducer 3365 Slow	All
	Silicone Remover 7010 Slow	All
	Silicone Remover 7090	All
	Silicone Remover 7799 Fast	Al

* According to current legislation and product formulation at the time of going to press. The paramount authority is in all cases the product label or the Material Safety Data Sheets.

Important Notice:

Flashpoint:

In the case of mixtures, the component with the lowest flashpoint normally determines the flas spoint of the mixture. Increased safety precautions are demanded when using A1 materials and mixtures with a flashpoint belo / +21°C./70°F. -see UVV (VBG 23) - which specify, for example, that such products can only be used in spray booths cleared f r A1.

V.O.C.

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow recommendations in the "Spies Hecker Compliant Products Chart" for your area

Storage

Guaranteed shelf-life:	HS Clear Coat 8030	- 6 mo ths in unopened original cont iners

This Data is given to the best of our knowledge and is to provide information on our products and their potential applications. Thus, it cannot be regarded as a comprehensive guide to specific properties of the products or their suitability for any concrete practical application. Warnings on the product label are to be followed. Any existing commer ial protective rights are to be heeded. We guarantee very high quality within the framework of our General Conditions of S le - Export

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Technical Data Sheet.

Primers

Environmentally friendly

contains less than 10% organic solvent

Permahyd® 1K Primer Surfacer 4100

Permahyd®1K Primer Surfacer 4100 primarily used for spot repairs and for isolating areas of conventional 2K surfacers and old finishes which have been sanded through.
It is particularly suitable for recoating with the waterborne Permahyd® Base Coat Series 280/285. Permahyd®1K Primer Surfacer 4100 is available in both gray and beige.

This product is for professional painting of vehicles only.

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Permahyd® 1K Primer Surfacer 4100

Substrates

Suitable Substrates:

Bare Steel
Galvanized Steel
Aluminum
Sanded E-Coat
Original or old paintwork
Radera® Polyester products

Substrate pretreatment:

Degrease and sand.

Before further treatment, clean all substrates once more with Silicone Remover 7090, 7010, or 7799
*7090 must be used for final cleaning

Application

Mixing ratio:

Approximately 5-10% Permahyd® Demineralized Water 6000

Pot Life:

Reducer:

Permahyd® Demineralized Water 6000

Method of application	High pressure spraying: gravity feed	suction feed
Application viscosity 4mm, 68°F/20°C, DIN 53211	23 - 28 seconds	
Reducer at 68°F/20°C material temperature	5-10% (measure carefully)	
Spray nozzle	1.4 - 1.5 mm	1.5 -1.7 mm
Spray pressure	40 - 65 psi	
Number of coats	2 - 3 (with intermediate flash-off*)	

* The intermediate flash-off time can be shortened by blowing with the spray gun or Sata easy dry after 5 minutes have elapsed.

Recommended film thickness: approx. 50 - 70 µm dry film thickness

Drying

Air drying:

At 68°F/ 20°C
recoatable: after 60 minutes
sandable: approx. 3 hours

Low baking:

flash-off time*: approx. 5 minutes at 68°F/ 20°C
drying time and temperature: approx. 30 minutes at 140°F/60°C metal temperature

Infra-red drying:

flash-off time*:
drying time: short wave approx. 5 minutes at 68°F/ 20°C, 5 minutes at 50% power and then 10 minutes at 10 % power
medium wave 20 minutes

*Note: The flash-off time depends on the temperature, humidity and air flow in the spray booth

Further steps

Dry sanding:

With random orbital sander and dust extraction
Final sanding: P320-500

Wet sanding:

Final sanding: P800

Note: After wet sanding, allow primer surfacer to dry for 30 minutes at 68°F/ 20°C before recoating.

Recoat with:

Permacron®, Permahyd® or Permasolid® Topcoats

Examples:*
Permacron® Series 257
Permacron® Base Coat Series 293/295
Permahyd® Base Coat Series 280/285
Permasolid® HS Topcoat Series 270

Special tips

1. Spraying equipment must be suitable for the application of waterborne products; manufacturer's instructions must be followed. For further information, please refer to VR Technical Data Sheet No. 905.1
2. Rinse spray equipment with Permahyd® Demineralized water 6000 before and after use. For further information, please refer to VR Technical Data Sheet No. 905.0
3. Liquid waste from waterborne products must be collected separately from conventional liquid paint waste. If mixed, disposal may be impossible, and in any case more difficult and consequently more expensive. For further information, please refer to VR Technical Data Sheet No. 905.2
4. A breathing mask must be worn when applying waterborne products.

Permahyd® 1K Primer Surfacer 4100

Data

Viscosity as supplied:	thixotropic
Solid content: (without reducer)	**Base product** approx. 51.6 by weight approx. 35.3 % by volume
Specific weight:	1.46 g/cm³
Coverage*:	approx. 75.3 sq. ft./1 at 50 µm dry film thickness

* The coverage has been calculated based on the recommended dry film thickness and the percentage volume solids (without any additional reducer). The associated losses during application have also been ignored.

Warnings*

Hazardous substances:	1K Primer Surfacer 4100	- not required
	Silicone Remover 7010	- not required
	Silicone remover 7090	- not required
	Silicone Remover 7799	- flame
Flammable liquids:	1K Primer Surfacer 4100	N/A § 2.4
	Silicone Remover 7010	All
	Silicone Remover 7090	All
	Silicone Remover 7799	All

* According to current legislation and product formulation at the time of going to press. The paramount authority is in all cases the product label or the Material Safety Data Sheets.

Important Notice

Flashpoint:
In the case of mixtures, the component with the lowest flashpoint normally determines the flashpoint of the mixture. Increased safety precautions are demanded when using AI materials and mixtures with a flashpoint below 21 °C/70°F -see UVV (VBG 23) - which specify, for example, that such products can only be used in spray booths cleared for AI.

V.O.C.
These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow recommendations in the "Spies Hecker Compliant Products Chart" for your area.

Storage

Guaranteed shelf-life:	1K Primer Surfacer 4100	- 6 months in sealed original containers
Storage conditions:	Store free of frost! Storage temperature between 41 °F/5°C and 86°F/30°C Temperatures above or below this range lead to loss of product quality.	

This Data is given to the best of our knowledge and is to provide information on our products and their potential applications. Thus, it cannot be regarded as a comprehensive guide to specific properties of the products or their suitability for any concrete practical application. Warnings on the product label are to be followed. Any existing commercial protective rights are to be heeded. We guarantee very high quality within the framework of our General Conditions of Sale - Export.

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Technical Data Sheet.

Permasolid® VHS Wet on Wet Surfacer 5190

Permasolid® VHS Wet on Wet Surfacer 5190 is a two-component Very High Solid acrylic urethane. 5190 can be applied in either a 2.8lb/gal VOC or a 3.5 lb/gal VOC, wet on wet operation.

This product is for professional painting of vehicles only.

SPIES HECKER

Substrates

Suitable Substrates:

Fiberglass (UP-DF)
Thoroughly degreased, unsanded or lightly sanded E-coat
Original or old paintwork (except reversible substrates, Example: lacquer)
Raderal® Polyester products
Permahyd® Primer 4100
Prioxal® Primers (With Limitations – See Special Note on next page)

Substrate pretreatment:


Degrease and sand.

Before further treatment, clean all substrates once more with Silicone Remover 7090, 7010, or 7799

Application

Mixing ratio: For 3.5 lbs/gal VOC

2:1 by volume with Permasolid® HS Topcoat Hardener 3309 extra fast, 3310 fast, 3315 medium, or 3320 slow

Mixing ratio: For 2.8 lbs/gal VOC

2:1 by volume with Permasolid® VHS Hardener 3190
(To achieve 2.8 lb/gal, only Permacron® Reducer 3369 may be used.)

Pot Life:

Ready for spraying approx. 60 minutes application time at 68°F/20°C

Reducer: For 3.5 lbs/gal VOC

10% Permacron® Reducer
Ex. -Permacron® Dura plus 8580 or
-Permacron® Reducer 3363 Medium
-Permacron® Reducer 3365 Slow

For 2.8 lbs/gal VOC

20% Permacron® Reducer 3369

Method of application	High pressure spraying	
	gravity feed 	suction feed 
Application viscosity 4mm, 68°F/20°C, DIN 53211	12-16 seconds	
Reducer at 68°F/20°C material temperature	10% - 20%	
Spray nozzle	1.3 - 1.5 mm	1.5 - 1.7 mm
Spray pressure	40 - 65 psi	
Number of coats	1½	

Recommended film thickness:

25-50µm dry film thickness

Drying

Flash-off time: At 68°F/20°C.

For recoating with :

Series 270 Series 293/295*	20 minutes - 60 minutes maximum
Series 280/285	30 minutes - 90 minutes maximum

Further steps

Recoat with:

Permacron®, Permasolid® or Permahyd® Topcoat.
Examples:
Permahyd® Base Coat Series 280/285
Permasolid® HS Automotive Topcoat Series 270
Permacron® Base Coat Series 293/295*

***Special Note:** Permacron® Base Coat Series 293/295 may not be applied if 5190 was applied over Priomat® 1:1 Primer 3688 transparent or any other Priomat® PVB Primer.

Special tips

1. Where required Permasolid® VHS Wet on Wet Surfacer 5190 can also be sanded dry or wet after air drying over night or forced drying (40 minutes 140°F/60°C).
   (For air drying we recommend a minimum ambient temperature of 59°F/15°C.)
2. When a corrosion primer is required prior to the application of 5190, if Series 293 is the topcoat that must be applied, Permahyd® 1K Primer Surfacer 4100 may be used instead of a Priomat® PVB Primer.

Data

Viscosity as supplied:	Thixotropic	
Flash point:	Surfacer 5190 and hardener:	above 73°F/23°C
Solid content:	**Base product** approx. 84.7% by weight	**Mixed** approx. 73.4% by weight
Specific weight:	1.61 g/cm³	
Coverage*:	approx. 226 sq. ft./l at 25µm dry film thickness approx.113 sq. ft./l at 50µm dry film thickness	

* The coverage has been calculated based on the recommended dry film thickness and the percentage volume solids (without any additional reducer). The associated losses during application have also been ignored.

Warnings*

Hazardous substances:

Wet on Wet Surfacer 5190	
HS Topcoat Hardener 3309	-not required
HS Topcoat Hardener 3310	- not required
HS Topcoat Hardener 3315	- not required
HS Topcoat Hardener 3320	-not required
VHS Hardener 3190	-not required
Reducer 3363 Medium	-St. Andrews cross (irritant)
Reducer 3369	- flame
Dura plus 8580	- not required
Silicone Remover 7010	- not required
Silicone Remover 7090	- not required
Silicone Remover 7799	- flame

Flammable liquids:

Wet on Wet Surfacer 5190	
HS Topcoat Hardener 3309	All
HS Topcoat Hardener 3310	All
HS Topcoat Hardener 3315	All
HS Topcoat Hardener 3320	All
VHS Hardener 3190	All
Reducer 3363 Medium	All
Reducer 3369	Al
Dura plus 8580	All
Silicone Remover 7010	All
Silicone Remover 7090	All
Silicone Remover 7799	Al

* According to current legislation and product formulation at the time of going to press. The paramount authority is in all cases the product label or the Material Safety Data Sheets.

Important Notice

Flashpoint:

In the case of mixtures, the component with the lowest flashpoint normally determines the flashpoint of the mixture. Increased safety precautions are demanded when using Al materials and mixtures with a flashpoint below 21 °C/70°F -see UVV (VI G 23) - which specify, for example, that such products can only be used in spray booths cleared for Al.

V.O.C.

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow recommendations in the "Spies Hecker Compliant Products Chart" for your area.

Storage

Guaranteed shelf-life: VHS Wet on Wet Surfacer 5190 - 6 months in unopened original containers

This Data is given to the best of our knowledge and is to provide information on our products and their potential applications. Thus, it cannot be regarded as a comprehensive guide to specific properties of the products or their suitability for any concrete practical application. Warnings on the product label are to be followed. Any existing commercial protective rights are to be heeded. We guarantee very high quality within the framework of our General Conditions of Sale - Export

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SPIES HECKER

Technical Data Sheet.

Permasolid®
2:1 VHS Surfacer 5150

Permasolid® 2:1 VHS Surfacer 5150 is a 2K acrylic product based on a special reactive binder with a very high solid content at application viscosity. It also fulfills the VOC limit of less than 2.1 lbs/gal.
This surfacer has excellent vertical stability, very high build, and good sanding properties and, because of it's lower solvent content, less tendency to produce edge mapping.

This product is for professional painting of vehicles only.

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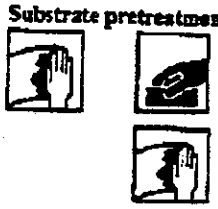
Substrates

Suitable Substrates:

Fiberglass (UP-GF)
Thoroughly degreased, unsanded or lightly sanded E-coat.
Original or old paintwork (except reversible substrate., Example: lacquer)
Radical® Polyester products
Priomat® Primers

Surfaces

Substrate pretreatment:



Degrease and sand.

Before further treatment, clean all substrates once more with Silicone Remover 7090, 7010, or 7799

Application

Mixing ratio:

2:1 by volume with Permasolid® VHS Hardener 3170

Pot Life:

Ready for spraying approx. 60-90 minutes application time at 68°F/20°C

Reducer:

Permacron® Reducer
Ex. -Permacron® Dura plus 8580 or
-Permacron® Reducer 3363 Medium

Method of application:	HVLP / High pressure spray guns gravity feed 	suction feed 
Application viscosity 4mm, 68°F/20°C, DIN 53211	Approx. 25 seconds	
Reducer at 68°F/20°C material temperature	Approx. 10%	
Spray nozzle	1.6 – 1.8 mm	1.7 – 2.2
Spray pressure	40 – 65 psi	
Number of coats	1-3 (with intermediate flash-off time of approx. 10 minutes)	

Recommended film thickness: 70-180 µm dry film thickness (maximum 200 µm)

Drying

Air drying:

At 68°F/20°C ambient temperature

Dry for sanding:	Up to 120µm	after 4 hours
	Above 120µm	overnight

Low bake:

Not recommended for film thicknesses more than 100µm

Flash-off time:	5-15 minutes
Drying time and temperature:	60 minutes at 140°F/60°C metal temperature

Infra-red drying:

flash-off time:	5-15 minutes

drying time:

1. short wave: 5 minutes half power, then 15 minutes full power
2. Medium wave: 30 minutes

Note:

- **After low bake or infra-red drying, allow the surfacer to cool down for 30 minutes before sanding.**
- **With less than 50% air humidity, allow for longer drying time.**

Further Steps

Dry sanding:

With random orbital sander and dust extraction

Initial sanding:	P280
Final sanding:	P320-P500

Wet sanding:

Initial sanding:	P320
Final sanding:	P600-P800

Recoat with: Any Permacron®, Permasolid®, or Permahyd® Topcoat.

Special tips

1. In order to make sanding easier, apply Permaloid® Control Paint black 7878 before sanding. Do not spray onto wet surfacer
2. Any Substrate defects can be treated with Raderal® putty
3. With air drying a minimum temperature of 59°F/15°C must be maintained.

Data

Viscosity as supplied:	Thixotropic	
Flash point:	2:1 VHS surfacer 5150 and VHS Hardener 3170	above 73°F/23°C
Solid content: (without reducer)	**Base product**	***Mixed***
	approx. 90.0% by weight	approx. 88.9% by weight
	approx. 79.9% by volume	approx. 79.7% by volume
VOC level	<2.1 lbs./gal. (2:1 by volume with VHS Hardener 3170	
Specific weight:	1.59 g/cm³	
Coverage*:	approx. 70.2sq. ft./l at 100µm dry film thickness	

* The coverage has been calculated based on the recommended dry film thickness and the percentage volume solids (without any additional reducer). The associated losses during application have also been ignored.

Warnings*

Hazardous substances:	VHS Surfacer 5150	-St. Andrews cross (irritant)
	VHS Hardener 3170	-St. Andrews cross (harmful)
	Reducer 3363	-St. Andrews cross (irritant)
	MS Dura plus 8580	- not required
	Reducer 3366	-St. Andrews cross (harmful)
Flammable liquids:	VHS Surfacer 5150	N/A § 2.4
	VHS Hardener 3170	AII
	Reducer 3363	AII
	MS Dura plus 8580	AII
	Reducer 3366	AIII

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Important Notice

Flashpoint:

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V.O.C.

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow recommendations in the "Spies Hecker Compliant Products Chart" for your area.

Storage

Guaranteed shelf-life:	VHS Surfacer 5150 and Hardener	- 6 months in unopened original containers

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