National Aeronautics and Space Administration (NASA)
Acquisition Pollution Prevention (AP2) Office

Potential Alternatives Report

For Validation of Alternatives to Aliphatic Isocyanate Polyurethanes

FINAL
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May 19, 2006

Prepared by
International Trade Bridge (ITB), Inc.
Beavercreek, OH 45432

Submitted by
NASA Acquisition and Pollution Prevention Program Office

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PREFACE

This report was prepared by International Trade Bridge, Inc. (ITB) through the National Aeronautics and Space Administration (NASA) Acquisition Pollution Prevention (AP2) Office under Contract Number NAS10-03029 Task Order No. 1. The structure, format, and depth of technical content of the report were determined by the NASA AP2 Office, Government contractors, and other Government technical representatives in response to the specific needs of this project.

Information in this report was leveraged from the following documents:

> Logistics Environmental Office Pollution Prevention Project, *Air Force Potential Alternative Report, ZHTV02W147, Low/No-VOC Corrosion-preventive Coatings for ICBM Missile Support Equipment—Phase 1*, dated June 4, 2003; prepared by International Trade Bridge (ITB), Inc.; under GSA Contract GS05T02BMM1604, Order Number 5TS5702D294
>
> Engineering and Technical Services for Joint Group on Acquisition Pollution Prevention (JG-APP) Pilot Projects, *Potential Alternatives Report (TI-A-1-1) for Alternatives to High-Volatile Organic Compound Primers and Topcoats Containing Methyl Ethyl Ketone, Toluene, and Xylene*, dated February 5, 1998; prepared by National Defense Center for Environmental Excellence (NDCEE), operated by Concurrent Technologies Corporation (CTC); under Contract No. DAAA21-93-C-0046, Task No. N.072, CDRL No. A004.

We wish to acknowledge the invaluable contributions provided by all the organizations involved in the creation of this document.

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EXECUTIVE SUMMARY

Isocyanates, as found in aliphatic isocyanate polyurethanes, were the identified hazardous material (HazMat) targeted for elimination under this project.

This Potential Alternatives Report (PAR) provides technical analyses of identified alternatives to the current coatings, criteria used to select alternatives for further analysis, and a list of those alternatives recommended for testing. It also contains a preliminary cost-benefit analysis (CBA) to quantify the estimated capital and process costs of coating removal alternatives and cost savings relative to the current coating removal processes.

The initial coating alternatives list was compiled using existing PARs and Joint Test Reports (JTRs), literature searches and center participant recommendations. The involved project participants initially considered eighteen (18) alternative coatings:

- Ameron PSX 700
- Ameron PSX 1001
- Carboline Carboxane 950
- Carboline Carboxane 2000
- Hempel Hempaxane 55000
- Integrated Polymer Industries IPI-Superbarrier
- Integrated Polymer Industries IPN-FlexFair
- International Protective Coatings Interfine 878
- International Protective Coatings Interfine 979
- Jotun Jotacote PSO
- Keeler & Long Megaflon
- Kimetsan Limited AquaSurTech (AST) D45-AMS
- Revodyne Industries Industrial Coating
- Sherwin Williams Centurion
- Sherwin Williams Fast Clad HB Acrylic
- Sherwin Williams Polysiloxane XLE
- Sherwin Williams SHER-CRYL HPA
- Tego Silikoftal ED

In early 2004, stakeholders identified specific coatings as potential alternatives to the current coating based on available information about these coatings. Technical merits and the potential environmental, safety, and occupational health (ESOH) impacts of these coatings were evaluated. Project participants used this information to select coatings for testing in accordance with the Joint Test Protocol entitled *Joint Test Protocol for Validation of Alternatives to Aliphatic Isocyanate Polyurethanes*, and the Field Test Plan entitled *Field Evaluations Test Plan for Validation of Alternatives to Aliphatic Isocyanate Polyurethanes*, both of which were prepared by ITB. Results of the testing will be documented in a Joint Test Report. The coatings selected for testing were:

- Ameron PSX 1001
- Carboline Carboxane 2000
- International Protective Coatings Interfine 878
- International Protective Coatings Interfine 979
- Kimetsan Limited AquaSurTech (AST) D45-AMS
- Sherwin Williams Fast Clad HB Acrylic
- Sherwin Williams Polysiloxane XLE
- Sherwin Williams SHER-CRYL HPA

A preliminary cost benefit analysis will be performed to determine if implementation of candidate coatings is economically justified.

1. INTRODUCTION

Headquarters National Aeronautics and Space Administration (NASA) chartered the Acquisition Pollution Prevention (AP2) Office to coordinate agency activities affecting pollution prevention issues identified during system and component acquisition and sustainment processes. The primary objectives of the AP2 Office are to:

- Reduce or eliminate the use of hazardous materials (HazMats) or hazardous processes at manufacturing, remanufacturing, and sustainment locations.
- Avoid duplication of effort in actions required to reduce or eliminate HazMats through joint center cooperation and technology sharing.

To reduce HazMats, the AP2 process first identifies the HazMat, related process(es), and affected substrate(s) or part(s). Details of the coating process, such as process flow diagrams; process description; equipment requirements; anticipated changes in material usage; wastes and emissions; environmental, safety, and occupational health (ESOH) issues are part of this Potential Alternatives Report (PAR).

Identifying and selecting alternative materials and technologies that have the potential to reduce the identified HazMats and hazardous air pollutants (HAPs), while incorporating sound corrosion prevention and control technologies, is a complicated task due to the fast pace at which new technologies emerge and rules change. The alternatives are identified through literature searches, electronic database and Internet searches, surveys, and/or personal and professional contacts. Available test data was then compiled on the proposed alternatives to determine if the materials meet the test objectives or if further laboratory or field-testing will be required.

After reviewing technical information documented in the PAR, government representatives, technical representatives from the affected facilities, and other stakeholders involved in the process will select the list of viable alternative coatings for consideration and testing under the project's Joint Test Protocol entitled *Joint Test Protocol for Validation of Alternatives to Aliphatic Isocyanate Polyurethanes* and Field Test Plan entitled *Field Evaluations Test Plan for Validation of Alternatives to Aliphatic Isocyanate Polyurethanes*, both prepared by ITB. Test results will be reported in a Joint Test Report upon completion of testing. The selection rationale and conclusions are documented in this PAR.

A cost benefit analysis will be prepared to quantify the estimated capital and process costs of coating alternatives and cost savings relative to the current coating processes, however, some initial cost data has been included in this PAR.

For this coatings project, isocyanates, as found in aliphatic isocyanate polyurethanes, were identified as the target HazMat to be eliminated. Table 1-1 lists the target HazMats, the related process and application, current specifications, and affected programs.

Table 1-1 Target HazMat Summary				
Target HazMat	**Current Process**	**Applications**	**Current Specifications**	**Candidate Parts/Substrates**
Isocyanates used in urethane coatings	Conventional spray and brush application	Any application where a high-gloss finish is required	NASA Approved Products (listed in Appendix B of NASA-STD-5008); AFSPC Approved Products	Carbon Steel

This PAR focuses on isocyanate-free coatings for structural steel, as required by the project participants. The following subsections describe the coating systems as they relate to applications used by the participants, including description of materials, process flow diagrams, amounts of materials used, and hazardous waste generated.

1.1. Background

NASA and Air Force Space Command (AFSPC) have similar missions and therefore similar facilities and structures in similar environments. Both are responsible for a number of facilities/structures with metallic structural and non-structural components in highly and moderately corrosive environments. Regardless of the corrosivity of the environment, all metals require periodic maintenance activity to guard against the insidious effects of corrosion and thus ensure that structures meet or exceed design or performance life. The standard practice for protecting metallic substrates in atmospheric environments is the application of an applied coating system. Applied coating systems work via a variety of methods (barrier, galvanic and/or inhibitor) and adhere to the substrate through a combination of chemical and physical bonds.

The most common topcoats used in coating systems are polyurethanes that contain isocyanates. Isocyanates are compounds containing the isocyanate group (-NCO). They react with compounds containing alcohol (hydroxyl) groups to produce polyurethane polymers, which are components of polyurethane foams, thermoplastic elastomers, spandex fibers, and the polyurethane paints used in NASA and AFSPC applications.

The use of isocyanates in coatings is being threatened today by environmental concerns and increasing regulations. This pressure to reduce or remove isocyanates is growing at a significant rate. As a result, NASA and AFSPC are searching for isocyanate-free coating alternatives.

1.2. Objectives and Scope of Work

The primary objective of this effort is to demonstrate and validate alternatives to aliphatic isocyanate polyurethanes. Successful completion of this project will result in one or more isocyanate-free coatings qualified for use at AFSPC and NASA centers participating in this project.

One of the objectives of the effort is to develop a concise, focused PAR documenting the technical, production, cost, and environmental information about the baseline coating processes. ESOH issues pertaining to the baseline and alternative coatings will be discussed.

1.3. Isocyanate-Free Coatings Overview

Isocyanates are compounds containing the isocyanate group (-NCO). They react with compounds containing alcohol (hydroxyl) groups to produce polyurethane polymers, which are components of polyurethane foams, thermoplastic elastomers, spandex fibers, and polyurethane paints.

The Occupational Health & Safety Administration (OSHA) states that the effects of isocyanate exposure include irritation of skin and mucous membranes, chest tightness, and difficult breathing. Isocyanates are classified as potential human carcinogens and are known to cause cancer in animals. The main effects of overexposure are occupational asthma and other lung problems, as well as irritation of the eyes, nose, throat, and skin.

2. CURRENT BASELINE PROCESS

This PAR focuses on coating processes that use aliphatic isocyanate polyurethanes, as required by the project participants. The following subsections describe the coating process as it relates to applications used by the participants, including description of materials, process flow diagrams, amounts of coatings used and hazardous waste generated.

The coating systems selected as the controls for testing are:

- Cathacoat 304 (Primer), Devron 201 (Intermediate Coat), and Devthane 359 DTM (Topcoat) produced by ICI Devoe Coatings Co.
- Carbozinc (CZ)-11HS (Primer), Carboguard 893 (Intermediate Coat), and Carbothane 134 HB (Topcoat) produced by Carboline Company.

The baseline process information was gathered by method of interview of participants. The descriptions below are based on "typical" and generalized coating application processes, and are not the exact processes used by any of the participants of the AP2 Alternatives to Aliphatic Isocyanate Polyurethanes project.

The current process flow diagram for priming and topcoating is shown in Section 2.1 and the current process description and process equipment are described in Sections 2.2 and 2.3, respectively. Material usage, and wastes and emissions are described in Sections 2.4 and 2.5, respectively.

2.1. Process Flow Diagram

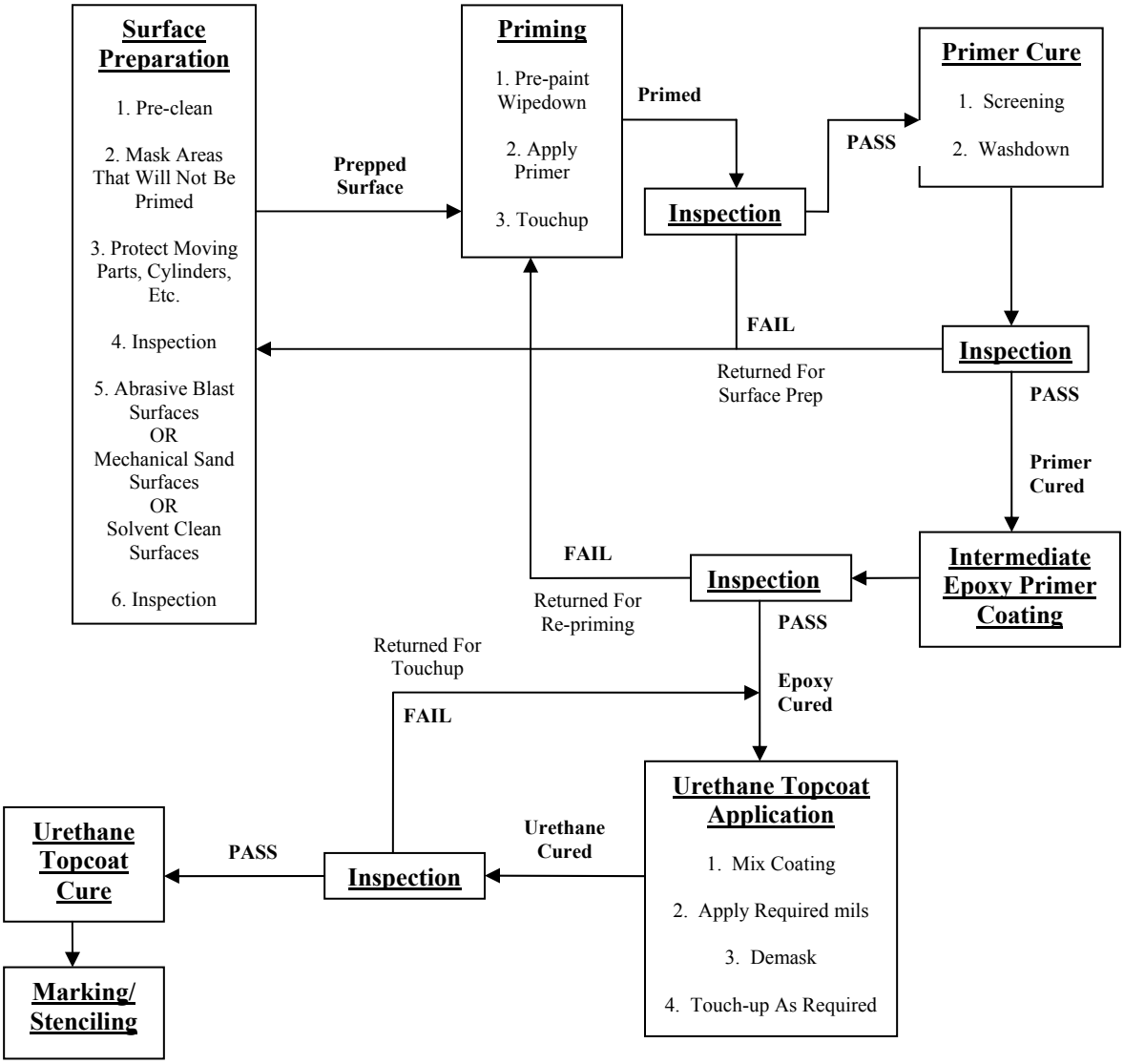
The coating process includes a standard six step coating process. First, the parts undergo surface preparation, such as cleaning, scuff sanding, or abrasive blasting and masking to protect areas on substrates that are not to be coated. Secondly, those parts requiring additional adhesion enhancement or corrosion protection receive one or two coats of primer and then are cured. Then the primed parts receive an intermediate epoxy primer coating. Next the parts are topcoated with a specified coating and cured. Markings such as equipment identification, caution and warning information, operational instructions, etc., are applied using such materials as: aerosol spray, metal data plates, and vinyl decals. The Baseline Process Flow Diagram is shown in Figure 2-1.

2.2. Process Description

As shown in Figure 2-1, the typical organic coating process is surface preparation, priming, intermediate epoxy primer coating, topcoating and marking operations. The coating spray process steps are described below.

In accordance with technical data requirements and coating manufacturer recommendations, coatings are not normally applied under unfavorable atmospheric conditions, such as high humidity, strong drafts, or low temperatures.

Figure 2-1 Process Flow Diagram of Baseline Coating Process



2.2.1. Surface Preparation

Surface preparation, such as cleaning and masking, takes place before priming. Pre-cleaning prior to any surface preparation is the first essential step in successful coating application. Pre-cleaning may be accomplished by water-based cleaning compounds or acceptable solvents to remove carbon, soils, and other contaminants that may become concentrated on the surfaces and in corners and crevices preventing proper coating adherence. Other cleaning operations include various surface preparation activities such as abrasive blasting, manual sanding, or solvent cleaning of the substrate to prepare the surfaces to accept a coating.

To enhance corrosion protection and increase coating adherence many coating manufacturers require the bare metal substrates receive a conversion coating pretreatment prior to coating. The pretreatment may range from iron or zinc phosphate for carbon steel surfaces to chromate conversion coatings or non-chromate conversion coatings for aluminum and magnesium. Zinc phosphate and chromate conversion materials are considered HazMats and must be treated and disposed of in accordance with the local, state, and federal requirements of the locations where the operations occurred.

Adhesive-backed crepe masking tape is typically used for surface masking of small areas not being painted. Additionally, a combination of tape, plastic sheeting, and masking paper may be used to mask large areas. An estimate of the volume of masking materials that are used will vary and is dependent on dimensions of the surface being painted. Actual hours involved in masking are dependent on the size and configuration of the surface being painted.

Waste generated as a result of the surface preparation operations may include spent abrasive media, soiled rags, and masking materials. This media will be considered a HazMat if the primer and topcoat being removed contains chromate and/or heavy metals. Cleaning compound residue may contain oils, cadmium, hydraulic fluid, solvents, and other contaminants and must be treated and disposed of in accordance with the local, state and federal requirements of the locations where the operations occurred.

The equipment, materials, wastes and emissions of surface preparation will not be quantified and discussed in detail as this step will not change with the approval of any new coatings.

2.2.2. Priming and Curing

After the surface of the parts are properly prepared, normally a primer is mixed, strained, and allowed to stand for a period of time to allow the different components to react. The material is then thinned to the proper viscosity (if required) and applied by brush or spraying with airless, conventional pots, or pressure feed paint spray equipment.

After priming, surfaces are allowed to cure at ambient temperature for 12 to 36 hours. Only one wet coat of primer is typically applied to a surface; however, if an engineering drawing specifies more than one coat, then that number of primer coats is applied with air curing between each coat. Excessive primer build-up is normally avoided to prevent intercoat adhesion failures.

Paint spray guns are normally flushed with the appropriate solvent prior to each operator break and at the end of each shift. Newer cleaning equipment may be able to capture Volatile Organic Compounds (VOCs) at the source. If not captured, VOCs associated with equipment cleaning are exhausted to the atmosphere. Spent solvents are sometimes distilled and reused for pre-paint wipe down or paint gun cleaning.

To ensure freshly painted surfaces are not contaminated by dust and other particulate matter, painting areas are cleaned on a regular basis, with the cleaning interval dependent on usage. The painting operations debris such as over-spray materials, paint chips, abrasive media, rags, masking materials, paint strainers, floor covering paper, and leftover pre-catalyzed coatings are collected in drums and disposed of in accordance with the local, state, and federal requirements of the locations where the operations occurred.

2.2.3. Intermediate Epoxy Primer

After areas are sufficiently primed and cured, an intermediate epoxy primer coating is applied by brush work or spraying and then cured per the manufacturer's directions prior to being topcoated.

Spray guns are normally flushed with an approved coating solvent before each operator break and at the end of each shift. Unless captured, VOCs from equipment cleaning are vented to the atmosphere. Used solvents or thinners may be recycled if an appropriate distiller is available. Otherwise, the waste solvents or thinners are collected and disposed of in accordance with the local, state, and federal requirements for the locations where the operations occurred.

Surface coating condition should be inspected during, and at the conclusion of, the painting operations.

2.2.4. Topcoating

After areas are sufficiently primed and cured, a topcoat is applied by field brush, roll or spraying and then cured per the manufacturer's directions.

Spray guns are normally flushed with an approved coating solvent before each operator break and at the end of each shift. Unless captured, VOCs from equipment cleaning are vented to the atmosphere. Used solvents or thinners may be recycled if an appropriate distiller is available. Otherwise, the waste solvents or thinners are collected and disposed of in accordance with the local, state, and federal requirements for the locations where the operations occurred.

Surface coating condition should be inspected during, and at the conclusion of, the painting operations. During painting operations, wet film coating thickness is monitored manually using a wet film gauge. After coating operations are complete, parts are normally allowed to cure at ambient temperature for 72 hours. Coatings are visually inspected for appearance and

coating thickness, and touchup coatings are applied as required. The Dry Film Thickness (DFT) of the coating system is verified using a non-destructive film thickness gauge.

Demasking normally does not occur for at least four hours after topcoating to ensure that the finish does not get damaged. After demasking, coating touchup may be accomplished on any areas where coatings are missing. Nonchromate-containing masking materials are segregated, when possible for disposal in a landfill.

Marking or stenciling occurs after the coating has cured to the touch. Marking or stenciling may be accomplished with vinyl die-cut lettering, paint spray using HVLP stencil spray guns, or with a stencil and paint spray can. The masking tape and paper associated with the vinyl lettering is disposed of as a solid waste. All other nonchromate containing marking or stenciling materials are segregated (when possible) for disposal in a landfill.

2.3. Process Equipment

Equipment that is required for surface preparation is not discussed, as surface preparation is unlikely to change with the viable alternatives. Current process equipment for priming and topcoating specifications are brush or airless, conventional pots, or pressure feed paint spray equipment. If spray equipment is used, a compressor is required.

2.4. Materials Usage

The materials typically consumed in priming and topcoating operations are summarized in Table 2-1. Actual amounts of materials consumed during painting operations will vary between locations and are dependent on a number of factors.

Table 2-1 Baseline Priming and Topcoating Material Usage

Process Step	Material
Primer Coating	Primer
	Thinner (if required)
	Paint filters
	Lint free wipe cloths
	Appropriate primer solvent
Intermediate Epoxy Primer Coating	Intermediate epoxy primer
	Thinner (if required)
	Paint filters
	Lint free wipe cloths
	Appropriate epoxy solvent
Topcoating	Topcoat
	Thinner (if required)
	Paint filters
	Lint free wipe cloths
	Appropriate topcoat solvent

NOTE: This table does not reflect materials that are required for surface preparation, as surface preparation is unlikely to change with the viable alternatives.

2.5. Wastes and Emissions

A summary of the wastes and emissions from priming, intermediate epoxy priming and topcoating is presented in Table 2-2. Actual amounts of waste generated and emissions emitted during painting operations will vary between locations and are dependent on a number of factors.

Table 2-2 Baseline Wastes and Emissions

Process Step	Waste or Emissions
Primer Application	Pre-catalyzed primer (*may contain chromates*)
	Rags, debris, and paint filters (*residue may contain strontium chromate*)
	Waste paint thinner (if required)
	VOC emissions
Primer Curing	VOC emissions
Intermediate Epoxy Primer Application	Pre-catalyzed epoxy primer
	Rags, debris, and paint filters
	Waste paint thinner (if required)
	VOC emissions
Intermediate Epoxy Primer Curing	VOC emissions
Topcoat Application	Pre-catalyzed topcoat
	Rags, debris, and paint filters
	Waste paint thinner (if required)
	VOC emissions
	Masking materials (removed and disposed of after topcoat application)
Topcoat Curing	VOC emissions

NOTE: This table does not reflect wastes and emissions from surface preparation, as surface preparation is unlikely to change with the viable alternatives.

2.6. Environmental, Safety, and Occupational Health (ESOH) Status

The hazardous materials targeted for reduction in this project are isocyanates found in polyurethane coatings. An ESOH analysis of the baseline process was performed based on readily available information from the coating manufacturers to determine whether there were any conspicuous ESOH issues that needed to be addressed.

The results of the ESOH analysis for the baseline materials are included in Section 5 along with the viable alternatives. A detailed description of the ESOH analysis process, including "Environmental Issues" and "Health and Safety Issues" is provided in Appendix A.

3. IDENTIFIED ALTERNATIVES AND PRELIMINARY SCREENING

In order to identify viable alternatives to solvent-borne topcoats and primers, existing PARs and JTRs were reviewed and other surveys were performed to leverage available test and performance data for this project.

3.1. Alternative Technology Selection

Eighteen (18) alternatives were initially identified. Proposed alternatives to the existing baseline coating systems are listed below:

- Ameron PSX 700
- Ameron PSX 1001
- Carboline Carboxane 950
- Carboline Carboxane 2000
- Hempel Hempaxane 55000
- Integrated Polymer Industries IPI-Superbarrier
- Integrated Polymer Industries IPN-FlexFair
- International Protective Coatings Interfine 878
- International Protective Coatings Interfine 979
- Jotun Jotacote PSO
- Keeler & Long Megaflon
- Kimetsan Limited AquaSurTech (AST) D45-AMS
- Revodyne Industries Industrial Coating
- Sherwin Williams Centurion
- Sherwin Williams Fast Clad HB Acrylic
- Sherwin Williams Polysiloxane XLE
- Sherwin Williams SHER-CRYL HPA
- Tego Silikoftal ED

3.2. Potential Alternative Tables

A brief description of the identified alternatives is listed in the following tables. Specific environmental safety and health (ESOH) data for each material is contained Section 5. Some of the tables were not completed because the product was removed from consideration during the initial screening. If so, this is noted in the "Comments" section of the table and the reasoning described in further detail in Section 4.

<table>
<tr><th colspan="5">Table 3-1 Ameron Self Priming PSX 700 Siloxane</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th colspan="2">Manufacturer</th></tr>
<tr><td>Name:
PSX 700 Siloxane Topcoat</td><td rowspan="3">This product is an acrylic polysiloxane hybrid.

It is a self-priming, high-gloss topcoat that provides excellent adhesion and resistance to acid and corrosion.</td><td>Unit Cost:
$</td><td rowspan="3" colspan="2">Ameron International
13010 Morris Rd, Suite 400
Alpharetta, GA 30004
(678) 393-0653</td></tr>
<tr><td>EPCRA: ☐ Yes ☒ No
Material:</td><td>Unit Size:
1 gallon kit</td></tr>
<tr><td>CERCLA: ☐ Yes ☒ No
Material:</td><td>Est. Coverage @ 3 mils DFT:
481 ft^2/gallon</td></tr>
<tr><td>HAPS: ☐ Yes ☒ No
Material:</td><td></td><td>Est. Material Cost Per Ft^2:
$</td><td colspan="2">Est. Coating Life:
5-7 years</td></tr>
<tr><td>VOC:
☒ Yes 204 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:
Low: Does not contain SARA III, HAZMAT, or HAPS. Catalyst does not contain/emit isocyanate</td></tr>
<tr><td>Recommended Surface Prep:
Requires SP-6</td><td colspan="2" rowspan="2">Advantages:
• Self-priming
• Can be applied over inorganic zinc
• Cures at room temperature
• Resists humidity and moisture</td><td colspan="2" rowspan="2">Disadvantages:
• Pot Life - 1½ hours @ 90ºF</td></tr>
<tr><td>Recommended Pretreatment:
No Pretreatment—Direct to Metal</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM CONSIDERATION IN THIS PROJECT BECAUSE PRODUCT HAS ALREADY HAD LIMITED USE AT VARIOUS CENTERS.</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-2 Ameron PSX 1001</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name:
PSX 1001 Acrylic Polysiloxane</td><td colspan="2" rowspan="4">This product is an acrylic polysiloxane hybrid.

A single-component, high gloss topcoat that provides a polyurethane-like finish without the isocyanates.</td><td>Unit Cost:
$ 42.75</td><td rowspan="2">Ameron International
13010 Morris Road, Suite 400
Alpharetta, GA 30004
(678) 393-0653</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Xylene; 1,2,4-trimethyl benzene; ethyl benzene; methanol; benzene; toluene</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☒ Yes ☐ No
Material: Xylene; methanol; ethyl benzene; toluene; and proprietary ingredient</td><td>Est. Coverage @ 3 mils DFT:
330 sq ft/gal</td><td rowspan="2"></td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Xylene; ethyl benzene; toluene</td><td>Est. Material Cost Per Ft^2:
$ 0.13</td><td>Est. Coating Life:
7 years</td></tr>
<tr><td>VOC:
☒ Yes 384 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:
Medium: Toxicity of constituents is Medium-Low, while the exposure risk is Medium-High. An average of the toxicity and exposure risks yields a Medium overall ranking</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Previously painted steel: SSPC-SP10
New steel: SSPC-SP6
Anchor profile: 1-2 mils</td><td colspan="2" rowspan="2">Advantages:
• Single component
• Excellent gloss retention
• Unlimited recoat window
• Compatible with inorganic zinc rich primers, epoxies, etc.</td><td colspan="2" rowspan="2">Disadvantages:
• Flash Point = 66 °F; OSHA: Flammable – Class IB
• Closed containers may explode when exposed to extreme heat and pressure buildup</td></tr>
<tr><td>Recommended Pretreatment:
Surface must be cleaned, dry, undamaged and free of all contaminants, including salt deposits.</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:
• Primer: Ameron Dimetcote 9H (VOC: 323 g/L)
• Intermediate: Ameron 383H (VOC: 231 g/L)</td></tr>
<tr><td colspan="4">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-3 Carboline Carboxane 950</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name:
Carboxane 950</td><td colspan="2" rowspan="3">A fluorourethane finish that provides excellent color and gloss retention and exterior weathering characteristics.</td><td>Unit Cost:
$</td><td rowspan="2">Carboline
350 Hanley Industrial Court
St. Louis, MO 63144
(800) 848-4645</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Xylene, ethyl benzene</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☐ No
Material:</td><td>Est. Coverage @ 3 mils DFT:
233 sq ft/gal</td><td></td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Xylene, ethyl benzene</td><td colspan="2"></td><td>Est. Material Cost Per Ft^2:
$</td><td>Est. Coating Life:
10-15 years</td></tr>
<tr><td>VOC:
☒ Yes 396 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:</td></tr>
<tr><td>Recommended Surface Prep:</td><td colspan="2" rowspan="2">Advantages:</td><td colspan="2" rowspan="2">Disadvantages:
• Contains Isocyanates</td></tr>
<tr><td>Recommended Pretreatment:</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM FURTHER CONSIDERATION BECAUSE THE PRODUCT CONTAINS ISOCYANATES</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-4 Carboline Carboxane 2000</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name:
Carboxane 2000 Modified Siloxane Hybrid</td><td colspan="2" rowspan="4">This product is an epoxy polysiloxane hybrid.

A premium, ultra durable coating that provides outstanding gloss and color retention for exterior exposures.</td><td>Unit Cost:
$ 96.50</td><td rowspan="2">Carboline
350 Hanley Industrial Court
St. Louis, MO 63144
(800) 848-4645</td></tr>
<tr><td>EPCRA: ☐ Yes ☒ No
Material:</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☒ No
Material:</td><td>Est. Coverage @ 3 mils DFT:
455 sq ft/gal</td><td rowspan="2"></td></tr>
<tr><td>HAPS: ☐ Yes ☒ No
Material:</td><td>Est. Material Cost Per Ft^2:
$ 0.21</td></tr>
<tr><td>VOC:
☒ Yes 275 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:
Medium: The toxicity and exposure risks are Medium resulting in an overall Medium Hazard risk</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Minimum: SSPC-SP3
Preferred: SSPC-SP6
Anchor profile: 1.5-2.5 mils</td><td colspan="2" rowspan="2">Advantages:
• No HAPs or hazardous materials
• Pot Life – 8 hrs @ 75 °F
• Excellent weatherability and gloss/color retention
• Excellent abrasion resistance
• Compatible with inorganic zinc rich primers, epoxies, etc.</td><td colspan="2" rowspan="2">Disadvantages:
•
•</td></tr>
<tr><td>Recommended Pretreatment:
Surface must be clean and dry. Employ adequate methods to remove dirt, oil and all other contaminants that could interfere with adhesion.</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:
• Inorganic Zinc Primer: Carboline Carbozinc 11HS (VOC: 479 g/L)
• Intermediate: Carboguard 893 (VOC: 195 g/L)</td></tr>
<tr><td colspan="4">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-5 Hempel Hempaxane 55000</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name:
Hempaxane 55000</td><td colspan="2" rowspan="3">This product is an epoxy polysiloxane hybrid.

A glossy decorative and protective finishing coat for new steel structures in severely corrosive atmospheric environments.

Base 55009 with curing Agent 98000.</td><td>Unit Cost:
$</td><td rowspan="2">HEMPEL Coatings, Inc.
600 Conroe Park North Drive
Conroe, TX 77303
(800) 678-6641</td></tr>
<tr><td>EPCRA: ☐ Yes ☐ No
Material:</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☐ No
Material:</td><td>Est. Coverage @ 3 mils DFT:
455 sq ft/gal</td><td></td></tr>
<tr><td>HAPS: ☐ Yes ☐ No
Material:</td><td colspan="2">Base 55009 with curing Agent 98000.</td><td>Est. Material Cost Per Ft^2:
$</td><td>Est. Coating Life:</td></tr>
<tr><td>VOC:
☒ Yes 160 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:</td></tr>
<tr><td>Recommended Surface Prep:</td><td colspan="2" rowspan="2">Advantages:
• Low VOC content</td><td colspan="2" rowspan="2">Disadvantages:
• For new steel structures
• Pot Life – 3hrs @ 68 °F</td></tr>
<tr><td>Recommended Pretreatment:</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM FURTHER CONSIDERATION BECAUSE THE PRODUCT IS NOT AVAILABLE IN U.S.A.</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="4">Table 3-6 IPI-Superbarrier™ Interpenetrating Polymer Network</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name: IPI-Superbarrier™ Interpenetrating Polymer Network</td><td rowspan="4">Inter Penetrating Networks (“IPN”s) family of products manufactured by Integrated Polymer Industries, Inc (“IPI”).</td><td>Unit Cost:
$</td><td rowspan="2">Integrated Polymer Industries, Inc
3029 S Harbor Blvd
Santa Ana, CA 92704-6448
(714) 434-0800</td></tr>
<tr><td>EPCRA: ☐ Yes ☒ No
Material:</td><td>Unit Size:
1 gallon kit</td></tr>
<tr><td>CERCLA: ☐ Yes ☒ No
Material:</td><td>Est. Coverage @ 3 mils DFT:</td><td rowspan="2"></td></tr>
<tr><td>HAPS: ☐ Yes ☒ No
Material:</td><td>Est. Material Cost Per Ft^2:
$</td></tr>
<tr><td>VOC:
☐ Yes
☒ No Zero VOC</td><td colspan="3">Product Hazard Ranking and Rationale:
Low: No solvents; no fire or explosion risk; no breathing fumes or volatiles risk; no air, water, or environmental pollution risk; zero waste</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Abrasive Blasting

Recommended Pretreatment:
No Pretreatment</td><td colspan="2">Advantages:
• No VOC’s, HAP’s, or HAZMAT’s
• No pretreatments required, one coating
• Quick drying; Long shelf life
• Standard spray equipment can be used
• Rapid manual field repairs practical
• Extreme resistance to corrosion, chemical attack</td><td>Disadvantages:
• Application requires Standard Plural Component Spray Equipment
• Difficult to remove due to adhesive/ cohesive bond strength (but can be recoated without having to remove the old coat)
• Costlier than paints (but more cost effective due to IPN’s durability)</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="2">Manufacturer Recommended Coating System:
• None. Single application system.</td></tr>
<tr><td colspan="3">Comments:

REMOVED FROM FURTHER CONSIDERATION DUE TO PERFORMANCE IN AN AIR FORCE PROJECT</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-7 Integrated Polymer Ind. IPN—FlexFair 166501</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th colspan="2">Manufacturer</th></tr>
<tr><td>Name: IPN—FlexFair™ 166501 Interpenetrating Polymer Network</td><td rowspan="4">Inter Penetrating Networks (“IPN”s) family of products manufactured by Integrated Polymer Industries, Inc (“IPI”).

Two-component, stiff paste, designed as a structural multi-purpose fairing compound with superior LO properties.</td><td>Unit Cost:
$</td><td colspan="2" rowspan="2">Integrated Polymer Industries, Inc
3029 S Harbor Blvd
Santa Ana, CA 92704-6448
(714) 434-0800</td></tr>
<tr><td>EPCRA: ☐ Yes ☒ No
Material:</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☒ No
Material:</td><td rowspan="2">Est. Coverage @ 3 mils DFT:
12.8 sq ft/gal</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>HAPS: ☐ Yes ☒ No
Material:</td></tr>
<tr><td>VOC:
☐ Yes
☒ No Zero VOC</td><td colspan="4">Product Hazard Ranking and Rationale:

Low: No solvents; no fire or explosion risk; no breathing fumes or volatiles risk; no air, water, or environmental pollution risk; zero waste</td></tr>
<tr><td>Recommended Surface Prep:
Abrasive Blasting

Recommended Pretreatment:
No Pretreatment</td><td colspan="2">Advantages:
• No VOC’s, HAP’s, or HAZMAT’s
• No pretreatments required, one coating
• Quick drying; insensitive to moisture
• Rapid manual field repairs practical
• Extreme resistance to corrosion, chemical attack</td><td colspan="2">Disadvantages:
• Applied with a spatula
• Pot Life – 50 min @ 77 °F
• Difficult to remove due to bond strength (but can be recoated without having to remove the old coat)
• Costlier than paints (but more cost effective due to IPN’s durability</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:
• None. Single application system.</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM FURTHER CONSIDERATION DUE TO PERFORMANCE IN AN AIR FORCE PROJECT</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-8 International Protective Coatings Interfine 878</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name:
Interfine 878 Polysiloxane</td><td colspan="2" rowspan="3">This product is a polysiloxane.

A high performance, two component, high solids finish which compliant with current VOC regulations, and exhibits superior gloss and color retention.</td><td>Unit Cost:
$ 119.12</td><td rowspan="2">International Protective Coatings
6001 Antoine Dr
Houston, TX 77091
(800) 589-1267</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Methyl alcohol; isopropyl alcohol; xylenes; barium sulfate; ethyl benzene; aluminum oxide; propylene glycol monomethyl ether acetate</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☒ Yes ☐ No
Material: Ethyl benzene</td><td>Est. Coverage @ 3 mils DFT:
385 sq ft/gal</td><td></td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Ethyl benzene</td><td colspan="2"></td><td>Est. Material Cost Per Ft^2:
$ 0.31</td><td>Est. Coating Life:
20+ years</td></tr>
<tr><td>VOC:
☒ Yes 246 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:
Medium: The toxicity ranking is Medium-Low and the exposure risk is Medium resulting in an overall Hazard ranking of Medium.</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Abrasive Blasting (SSPC-SP6)
Mechanical Removal (SSPC-SP11)

Recommended Pretreatment:
All surfaces should be clean, dry and free from contamination.</td><td colspan="2">Advantages:
• High gloss and color retention
• Good flexibility and abrasion resistance
• Compatible with inorganic zinc rich primers, epoxies, etc.</td><td colspan="2">Disadvantages:
• Pot Life – 2 hrs @ 77 °F</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:
• Carbon Steel:
– Inorganic Zinc Primer: Interzinc 22HS (VOC: 340 g/L)
– Intermediate: High-build epoxy Interseal 670HS (VOC: 240 g/L)
• Aluminum and Stainless Steel: Only requires Interseal 670HS</td></tr>
<tr><td colspan="4">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-9 International Protective Coatings Interfine 979</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name:
Interfine 979 Polysiloxane</td><td rowspan="3" colspan="2">This product is an epoxy polysiloxane hybrid.

A high performance, two-component, high solids inorganic hybrid finish which offers compliance with all current VOC legislation and is free from isocyanates.</td><td>Unit Cost:
$ 119.12</td><td rowspan="2">International Protective Coatings
6001 Antoine Dr
Houston, TX 77091
(800) 589-1267</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Aluminum oxide; barium sulfate; isopropyl alcohol; propylene glycol monoethyl ether acetate</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☒ No
Material:</td><td>Est. Coverage @ 3 mils DFT:
Product requires 4-6 mils thickness resulting in 244 sq ft/gal at 5 mils</td><td></td></tr>
<tr><td>HAPS: ☐ Yes ☒ No
Material:</td><td colspan="2"></td><td>Est. Material Cost Per Ft^2:
$ 0.49 at 5 mils</td><td>Est. Coating Life:
20+ years</td></tr>
<tr><td>VOC:
☒ Yes 165 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:
Medium-Low: While the exposure ranking is Medium, the toxicity is Low resulting in an overall Hazard ranking of Medium-Low</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Abrasive Blasting (SSPC SP-6)
Mechanical Removal (SSPC SP-11)

Recommended Pretreatment:
All surfaces should be clean, dry and free from contamination.</td><td colspan="2">Advantages:
• Low VOC content
• Excellent gloss and color retention
• Compatible with inorganic zinc rich primers, epoxies, etc.</td><td colspan="2">Disadvantages:
• Pot Life – 2 hrs @ 77 °F
• Recoat interval – 10 to 14 days</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:
• Carbon Steel:
– Inorganic Zinc Primer: Interzinc 22HS (VOC: 340 g/L)
– Intermediate: High-build epoxy Interseal 670HS (VOC: 240 g/L)
• Aluminum and Stainless Steel: Only requires Interseal 670HS</td></tr>
<tr><td colspan="4">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-10 Jotun Jotacote PSO</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th colspan="2">Manufacturer</th></tr>
<tr><td>Name: Jotacote PSO Polysiloxane Topcoat</td><td rowspan="4">A two-pack epoxy polysiloxane topcoat with excellent gloss and color retention.</td><td>Unit Cost:</td><td colspan="2" rowspan="3">Jotun Paints (Europe) Ltd.</td></tr>
<tr><td>EPCRA: ☐ Yes ☒ No
Material:</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☐ No
Material:</td><td>Est. Coverage @ 3 mils DFT:</td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Xylene, ethyl benzene</td><td>Est. Material Cost Per Ft^2:</td><td colspan="2">Est. Coating Life:</td></tr>
<tr><td>VOC:
☐ Yes
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:</td></tr>
<tr><td>Recommended Surface Prep:</td><td colspan="2" rowspan="2">Advantages:</td><td colspan="2" rowspan="2">Disadvantages:</td></tr>
<tr><td>Recommended Pretreatment:
No Pretreatment</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM FURTHER CONSIDERATION BECAUSE THE PRODUCT IS NOT AVAILABLE IN U.S.A.</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-11 Keeler & Long Megaflon</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th colspan="2">Manufacturer</th></tr>
<tr><td>Name: Megaflon MS Clearcoat 30</td><td rowspan="3">A fluoropolymer coating that provides excellent weatherability and chemical resistance.</td><td>Unit Cost:</td><td colspan="2" rowspan="2">Keeler & Long/PPG Industries, Inc.
856 Echo Lake Rd
Watertown, CT 06795
(800) 238-8596</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Part A: Xylene, 1,2,4-trimethyl benzene, ethyl benzene</td><td>Unit Size:</td></tr>
<tr><td>CERCLA: ☐ Yes ☐ No
Material:</td><td>Est. Coverage @ 3 mils DFT:</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Xylene, ethyl benzene</td><td></td><td>Est. Material Cost Per Ft^2:</td></tr>
<tr><td>VOC:
☐ Yes
☐ No</td><td colspan="3">Product Hazard Ranking and Rationale:</td><td>Est. Coating Life:
years</td></tr>
<tr><td>Recommended Surface Prep:</td><td rowspan="2">Advantages:</td><td colspan="3" rowspan="2">Disadvantages:</td></tr>
<tr><td>Recommended Pretreatment:
No Pretreatment</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM FURTHER CONSIDERATION BECAUSE THE PRODUCT CONTAINS ISOCYANATES</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-12 Kimetsan AquaSurTech (AST) D45-AMS</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name: Kimetsan AquaSurTech (AST) D45-AMS</td><td colspan="2" rowspan="4">A two part waterborne coating that has low VOC and hazardous material content.</td><td>Unit Cost:
$ 250.00</td><td rowspan="2">AquaSurTech Coating Products, N.A.
1006, rue de la Montagne,
Suite #100
Montreal, Quebec H3G 1Y7
(514) 935-4415</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Tuluol (toluene)</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☒ Yes ☐ No
Material: Tuluol (toluene)</td><td>Est. Coverage @ 3 mils DFT:
Manufacturer recommends 1.5 mils resulting in 500 sq ft/gal</td><td rowspan="2"></td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Tuluol (toluene)</td><td>Est. Material Cost Per Ft^2:
$ 0.50</td><td>Est. Coating Life:
20+ years</td></tr>
<tr><td>VOC:
☒ Yes 150 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:
Medium-High: While the exposure ranking is High, the toxicity is Medium resulting in an overall Hazard ranking of Medium-High</td></tr>
<tr><td>Recommended Surface Prep:
Abrasive Blasting</td><td colspan="2" rowspan="2">Advantages:
• Low VOC content
• No Intermediate coating required
• Pot Life – 6-8 hours depending on ambient conditions</td><td colspan="2" rowspan="2">Disadvantages:
• High cost
• Concerns about difficulty in application</td></tr>
<tr><td>Recommended Pretreatment:
AST Decontaminator</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:
• Wash: AST Decontaminator
• Primer: AST Aquaprimer (VOC: 150 g/L)</td></tr>
<tr><td colspan="4">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-13 Revodyne Industrial Coating</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name:
Revodyne Industrial Coating 716 5141</td><td colspan="2" rowspan="3">This is a complex polymer polyester resin. The catalyst used is Witco Co. #90 high point catalyst.</td><td>Unit Cost:</td><td rowspan="2">Revodyne Industrial Coatings
3700 Campus Drive, Suite 105
Newport Beach, CA 92660
949-581-8897</td></tr>
<tr><td>EPCRA: ☐ Yes ☐ No
Material:</td><td>Unit Size:
5 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☐ No
Material:</td><td>Est. Coverage @ 3 mils DFT:
250 sq ft/gal</td><td></td></tr>
<tr><td>HAPS: ☐ Yes ☐ No
Material:</td><td colspan="2">Est. Material Cost Per Ft^2:</td><td>Est. Coating Life:
5-6 years</td></tr>
<tr><td>VOC:
☐ Yes
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:</td></tr>
<tr><td>Recommended Surface Prep:
None</td><td colspan="2" rowspan="2">Advantages:
• High solids content
• No Primer or Intermediate coating required (can be applied direct-to-metal)
• Compatible with inorganic zinc
• Abrasion resistant</td><td colspan="2" rowspan="2">Disadvantages:
• New material with no MSDS available</td></tr>
<tr><td>Recommended Pretreatment:
No Pretreatment</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM FURTHER CONSIDERATION BECAUSE A MSDS IS NOT AVAILABLE</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-14 Sherwin Williams Centurion</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th colspan="2">Manufacturer</th></tr>
<tr><td>Name: Centurion Water-based Urethane</td><td rowspan="4">This product is a VOC compliant, water based, polyester urethane enamel. It is a high gloss, abrasion resistant urethane with excellent weathering properties.</td><td>Unit Cost:
$ 56.00</td><td colspan="2" rowspan="2">The Sherwin Williams Co
101 Prospect Ave N.W.
Cleveland, OH 44115
(216) 566-2902</td></tr>
<tr><td>EPCRA: ☐ Yes ☒ No
Material:</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☒ No
Material:</td><td colspan="2">Est. Coverage @ 3 mils DFT:</td></tr>
<tr><td>HAPS: ☐ Yes ☒ No
Material:</td><td>Est. Material Cost Per Ft^2:</td><td colspan="2">Est. Coating Life:
years</td></tr>
<tr><td>VOC:
☒ Yes 66 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:</td></tr>
<tr><td>Recommended Surface Prep:</td><td colspan="2">Advantages:
• Low VOC content
• No HAPS or HAZMATs
• High Gloss
• Excellent weathering properties</td><td colspan="2" rowspan="2">Disadvantages:
• Low isocyanate levels
• Two part coating
• Pot Life – 2 hrs @ 77 °F</td></tr>
<tr><td>Recommended Pretreatment:
Zinc Phosphate</td><td colspan="2"></td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:
• None. Single application system.</td></tr>
<tr><td colspan="4">Comments:

REMOVED FROM FURTHER CONSIDERATION BECAUSE THE PRODUCT CONTAINS ISOCYANATES</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-15 Sherwin Williams Fast Clad HB Acrylic</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name: Fast Clad HB Acrylic B66-410 Series</td><td colspan="2" rowspan="3">A one component, fast dry, high build finish designed for one coat application directly to organic or inorganic zinc-rich primers.

Achieves superior gloss and color retention, fast drying, and low odor.</td><td>Unit Cost:
$ 27.00</td><td rowspan="2">The Sherwin Williams Co
101 Prospect Ave N.W.
Cleveland, OH 44115
(216) 566-2902</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Glycol ethers</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☐ Yes ☒ No
Material:</td><td>Est. Coverage @ 3 mils DFT:
Product recommends 8 mils thickness resulting in 85 sq ft/gal</td><td></td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Glycol ethers</td><td colspan="2"></td><td>Est. Material Cost Per Ft^2:
$ 0.32 at 8 mils</td><td>Est. Coating Life:
5-7 years</td></tr>
<tr><td>VOC:
☒ Yes 164 g/L
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:
Low: A Low Hazard ranking was given because no constituents were found to have any serious health concerns for workers</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Minimum: SSPC-SP2
Preferred: SSPC-SP6

Recommended Pretreatment:
SSPC-SP1: Surface must be clean, dry and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.</td><td colspan="2">Advantages:
• Low VOC content
• No Intermediate coating required
• Single component
• Achieves a high film build in a single coat
• Compatible with inorganic zinc rich primers, epoxies, etc.</td><td colspan="2">Disadvantages:
• Cannot be used on Stainless Steel without adhesion promoter (DTM Wash Primer recommended)</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel (only with adhesion promoter)</td><td colspan="4">Manufacturer Recommended Coating System:
• Inorganic Zinc Primer: SW ZincClad 11 (water-based) (VOC: 163 g/L)</td></tr>
<tr><td colspan="4">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="4">Table 3-16 Sherwin Williams Polysiloxane XLE</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name: Polysiloxane XLE Polysiloxane</td><td rowspan="4">This product is an epoxy polysiloxane hybrid.

A high performance, two component, high solids epoxy siloxane that combines the properties of both a high performance epoxy and polyurethane in one coat, but is free from isocyanates.</td><td>Unit Cost:
$ 110.00</td><td rowspan="2">The Sherwin Williams Co
101 Prospect Ave N.W.
Cleveland, OH 44115
(216) 566-2902</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Ethyl benzene, xylene</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☒ Yes ☐ No
Material: Ethyl benzene, xylene</td><td>Est. Coverage @ 3 mils DFT:
Product requires two coats of 3-7 mils thickness resulting in 103-240 sq ft/gal</td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Ethyl benzene, xylene</td><td>Est. Material Cost Per Ft^2:
$ 0.46 for 2 coats at 3 mils
($1.07 for 2 coats at 7 mils)</td><td>Est. Coating Life:
8-10 years</td></tr>
<tr><td>VOC:
☒ Yes 101 g/L
☐ No</td><td colspan="3">Product Hazard Ranking and Rationale:
Medium: Both the toxicity and exposure risks were ranked as Medium resulting in an overall Medium Hazard ranking</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Minimum: SSPC-SP6
Preferred: SSPC-SP10
Anchor profile: 2.0 mil

Recommended Pretreatment:
SSPC-SP1: Surface must be clean, dry and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.</td><td colspan="2">Advantages:
• Self Priming
• Low VOC content
• Long Shelf life – 12 months, unopened
• Compatible with inorganic zinc rich primers, epoxies, etc.</td><td>Disadvantages:
• Cannot be used on Stainless Steel without adhesion promoter (DTM Wash Primer recommended)
• Pot Life – 4 hrs @ 77 °F
• Flash point = 80 °F
• Requires 2 coats of 3-7 mils thickness making it more expensive</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel (only with adhesion promoter)</td><td colspan="3">Manufacturer Recommended Coating System:
• Inorganic Zinc Primer: SW ZincClad 11 (water-based) (VOC: 163 g/L)</td></tr>
<tr><td colspan="3">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="4">Table 3-17 Sherwin Williams Sher-Cryl™ HPA</th></tr>
<tr><th>Material</th><th>Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name: Sher-Cryl™ HPA High Performance Acrylic</td><td rowspan="4">An ambient cured, one component acrylic coating with superior exterior performance properties.</td><td>Unit Cost:
$ 28.49</td><td rowspan="2">The Sherwin Williams Co
101 Prospect Ave N.W.
Cleveland, OH 44115
(216) 566-2902</td></tr>
<tr><td>EPCRA: ☒ Yes ☐ No
Material: Glycol ethers</td><td>Unit Size:
1 gallon</td></tr>
<tr><td>CERCLA: ☒ Yes ☐ No
Material: Glycol ethers</td><td>Est. Coverage @ 3 mils DFT:
Product recommends 2 coats at 3 mils thickness resulting in 125 sq ft/gal</td><td rowspan="2"></td></tr>
<tr><td>HAPS: ☒ Yes ☐ No
Material: Glycol ethers</td><td>Est. Material Cost Per Ft²:
$ 0.23 for 2 coats at 3 mils</td><td>Est. Coating Life:
5-7 years</td></tr>
<tr><td>VOC:
☒ Yes 200 g/L
☐ No</td><td colspan="3">Product Hazard Ranking and Rationale:
Low: A Low Hazard ranking was given because no constituents were found to have any serious health concerns for workers.</td></tr>
<tr><td rowspan="2">Recommended Surface Prep:
Minimum: SSPC-SP2
Preferred: SSPC-SP6

Recommended Pretreatment:
SSPC-SP1: Surface must be clean, dry and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.</td><td colspan="2">Advantages:
• Low VOC content
• Single component
• No Intermediate coating required
• Compatible with inorganic zinc rich primers, epoxies, etc.</td><td>Disadvantages:
• Cannot be used on Stainless Steel without adhesion promoter (DTM Wash Primer recommended)</td></tr>
<tr><td>Applicable Substrates:
☒ Aluminum
☒ Carbon Steel
☒ Stainless Steel (only with adhesion promoter)</td><td colspan="3">Manufacturer Recommended Coating System:
• Inorganic Zinc Primer: SW ZincClad 11 (water-based) (VOC: 163 g/L)</td></tr>
<tr><td colspan="3">Comments:

Include in testing</td><td>Recommended For Testing:
☒ Yes
☐ No</td></tr>
</table>

<table>
<tr><th colspan="5">Table 3-18 Tego Silikoftal ED</th></tr>
<tr><th>Material</th><th colspan="2">Material Description:</th><th>Estimated Cost Factors</th><th>Manufacturer</th></tr>
<tr><td>Name: Silikoftal ED Epoxy-siloxane Resin</td><td colspan="2" rowspan="3">An epoxy-siloxane resin that provides excellent gloss retention, weather resistance, and corrosion resistance.</td><td>Unit Cost:</td><td rowspan="3">Tego Chemie Service
1-800-446-1809</td></tr>
<tr><td>EPCRA: ☐ Yes ☐ No
Material:</td><td>Unit Size:</td></tr>
<tr><td>CERCLA: ☐ Yes ☐ No
Material:</td><td>Est. Coverage @ 3 mils DFT:</td></tr>
<tr><td>HAPS: ☐ Yes ☐ No
Material:</td><td colspan="2">Est. Material Cost Per Ft^2:</td><td colspan="2">Est. Coating Life:</td></tr>
<tr><td>VOC:
☐ Yes
☐ No</td><td colspan="4">Product Hazard Ranking and Rationale:</td></tr>
<tr><td>Recommended Surface Prep:</td><td colspan="2" rowspan="2">Advantages:</td><td colspan="2" rowspan="2">Disadvantages:</td></tr>
<tr><td>Recommended Pretreatment:
No Pretreatment</td></tr>
<tr><td>Applicable Substrates:
☐ Aluminum
☐ Carbon Steel
☐ Stainless Steel</td><td colspan="4">Manufacturer Recommended Coating System:</td></tr>
<tr><td colspan="4">Comments:

THIS PRODUCT REMOVED FROM FURTHER CONSIDERATION BECAUSE IT IS NOT A COATING, BUT A RESIN THAT MUST BE INCORPORATED INTO A COATING (IT IS PART OF SHERWIN WILLIAMS' POLYSILOXANE XLE)</td><td>Recommended For Testing:
☐ Yes
☒ No</td></tr>
</table>

4. PROCESS DESCRIPTIONS FOR VIABLE ALTERNATIVES

This project's purpose is to find isocyanate-free alternatives, therefore; a Waterborne Urethane (Sherwin Williams Centurion) and the Fluorourethanes (Carboline Carboxane 950 and Keeler & Long Megaflon) were removed from further consideration because they still contain isocyanates.

During the initial screening, it was found that two (2) of the products, Hempel Hempaxane 55000 and Jotun Jotacote PSO, currently are not commercially available in the United States and were therefore dropped from further consideration. It was also found that the Tego Silikoftal ED is only a resin that must be incorporated into a coating. The Tego resin is part of the Sherwin Williams Polysiloxane XLE that is to undergo testing.

The Inter Penetrating Networks (IPN) products (Integrated Polymer Industries IPI-Superbarrier and Integrated Polymer Industries IPN-FlexFair) were dropped from further consideration based on problems encountered during a previous project. The Air Force considered IPNs during a project to identify coatings for Intercontinental Ballistic Missiles (ICBMs). The IPNs were dropped due to failing an initial screening test (Pot Life) and issues of highly exothermic reactions causing smoke and heat (Logistics Environmental Office Pollution Prevention Project document *Air Force Potential Alternative Report, ZHTV02W147, Low/No-VOC Corrosion-preventive Coatings for ICBM Missile Support Equipment—Phase 1*, dated June 4, 2003; prepared by ITB under GSA Contract GS05T02BMM1604, Order Number 5TS5702D294).

The Revodyne Industrial Coating does not yet have a Material Safety Data Sheet (MSDS) available for ESOH analysis and as required for storage at NASA facilities and was therefore removed from further consideration under this project.

Ameron PSX 700 has been approved of and used in limited applications at both Kennedy Space Center (KSC) and Stennis Space Center (SSC) and will not be considered under this project.

The remaining identified alternatives were grouped together either as a Two Coating System or a Three Coating System as shown in Table 4-1 below.

Table 4-1 Alternatives Identified as Two or Three Coating System

Two Coating System	Kimetsan AST D45-AMS
	Sherwin Williams Fast Clad HB
	Sherwin Williams Polysiloxane XLE
	Sherwin Williams SHER-CRYL HPA
Three Coating System	Ameron PSX 1001
	Carboline Carboxane 2000
	Int'l Protective Coatings Interfine 878
	Int'l Protective Coatings Interfine 979

Surface preparation and Marking/Stenciling have not been included in these analyses because neither should significantly change from the current painting process (refer to Section 2.2.1. of this PAR for a description of the current surface preparation process).

4.1. Two Coating System

The Two Coating System eliminates the need for the intermediate epoxy primer coating thus resulting in lower emissions, less solid and liquid wastes, and less labor. The Two Coating Systems are:

- Kimetsan AST D45-AMS
- Sherwin Williams Fast Clad HB
- Sherwin Williams Polysiloxane XLE
- Sherwin Williams SHER-CRYL HPA

The Two Coating System process flow diagram is shown in Section 4.1.1. The Two Coating System process description and process equipment are described in Sections 4.1.2. and 4.1.3., respectively. Material usage and wastes and emissions are described in Sections 4.1.4. and 4.1.5., respectively. ESOH issues for each Two Coating System alternative are discussed in Section 5.

4.1.1. Process Flow Diagram

The Two Coating System process is same as the Baseline Process with the intermediate epoxy primer step removed. First, is surface preparation which is the same as the Baseline Process. Second, is the application of one or two coats of primer which are then cured. Finally, the parts are topcoated with the specified coating and cured. Markings are performed the same as the Baseline Process. The Two Coating System Process Flow Diagram is shown in Figure 4-1.

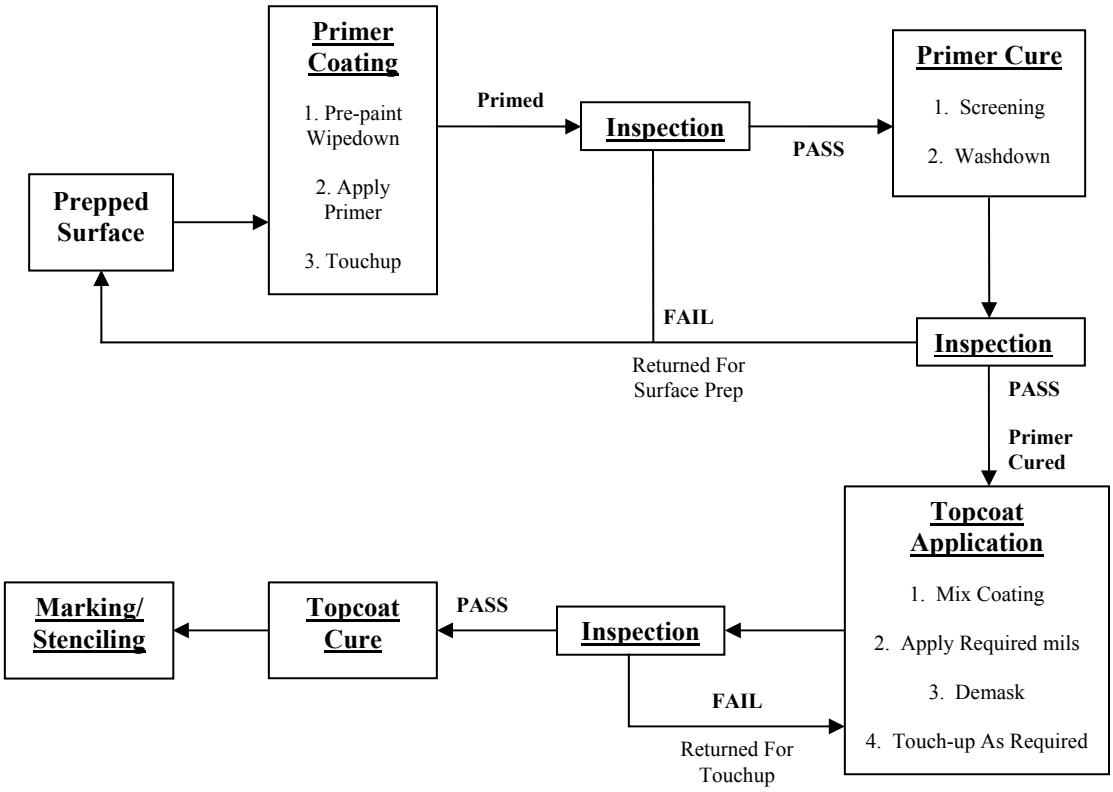
4.1.2. Process Description

The Two Coating System process description is the same as the Baseline process with the exception of the intermediate epoxy primer step that is not performed.

After the surface of the parts are properly prepared, normally a primer is mixed, strained, and allowed to stand for a period of time to allow the different components to react. The material is then thinned to the proper viscosity (if required) and applied by spraying with high volume low pressure (HVLP), electrostatic, or pressure feed paint spray equipment.

After priming, surfaces are allowed to cure. Only one wet coat of primer is typically applied to a surface; however, if an engineering drawing specifies more than one coat, then that number of primer coats is applied with air curing between each coat. Excessive primer build-up is normally avoided to prevent intercoat adhesion failures.

Figure 4-1 Process Flow Diagram for Two Coating System



To ensure freshly painted surfaces are not contaminated by dust and other particulate matter, painting areas are cleaned on a regular basis, with the cleaning interval dependent on usage. The painting operations debris such as over-spray materials, paint chips, abrasive media, rags, masking materials, paint strainers, floor covering paper, and leftover pre-catalyzed coatings are collected in drums and disposed of in accordance with the local, state, and federal requirements of the locations where the operations occurred.

After areas are sufficiently primed and cured, the topcoat is applied and then cured per the manufacturer's directions.

Spray guns are normally flushed with an approved coating solvent before each operator break and at the end of each shift. Unless captured, VOCs from equipment cleaning are vented to the atmosphere. Used solvents or thinners may be recycled if an appropriate distiller is available. Otherwise, the waste solvents or thinners are collected and disposed of in accordance with the local, state, and federal requirements for the locations where the operations occurred.

4.1.3. Process Equipment

All of the Two Coating System alternatives can be applied using conventional or airless spray, brush or roller.

4.1.4. Anticipated Material and Energy Usage

Anticipated changes in the annual material (excluding actual topcoat) and energy usage of the Two Coating System are shown in Table 4-2. Refer to Figure 4-2 for the process flow diagram.

Table 4-2 Two Coating System – Anticipated Changes in Material and Energy Usage	
Process Step	**Material/Energy**
Primer Coating	Changes dependent upon material
Intermediate Epoxy Primer Coating	Epoxy primer no longer required
	Paint filters for intermediate epoxy primer step no longer required
	Lint free wipe cloths for intermediate epoxy primer step no longer required
	Appropriate epoxy solvent no longer required
	Energy required for intermediate epoxy primer step no longer required
	Labor required for intermediate epoxy primer step no longer required
Topcoating	Changes dependent upon material (See Table 4-3.)

Table 4-3 shows how many square feet per gallon each coating can cover at its recommended DFT and number of coatings. A lower amount of coverage means that more coating is required.

Table 4-3 Two Coating System – Coverage at Recommended Thickness		
Coating	**Recommended DFT**	**Coverage (sq ft/gal)**
Kimetsan AST D45-AMS	1.5 mils	500
SW Fast Clad HB Acrylic	8 mils	85
SW Polysiloxane XLE	2 coats of average 5 mils	172
SW SHER-CRYL HPA	2 coats of 3 mils	125

4.1.5. Anticipated Wastes and Emissions

The anticipated changes in the quantities of liquid wastes, solid wastes and air emissions that are expected by converting to the two coating application process are shown in Table 4-3.

Table 4-4 Two Coating System – Anticipated Changes in Wastes and Emissions	
Waste/Emission	**Change from Current Process**

Table 4-4 Two Coating System – Anticipated Changes in Wastes and Emissions	
Wastes	
Intermediate Epoxy Primer	No longer required
Rags, debris, and paint filters	Reduced by the amount required for intermediate epoxy primer step
Emissions	
VOC in Primer	Varies with each alternative
VOC in Intermediate Epoxy Primer	No longer released
VOC in Topcoat	Varies with each alternative (See Table 5-2 for side-by-side comparison)

4.2. Three Coating System

The Three Coating System is the same as the Baseline Process with a primer, an intermediate epoxy primer coat, and the topcoat. The Three Coating Systems are:

- Ameron PSX 1001
- Carboline Carboxane 2000
- IPC Interfine 878
- IPC Interfine 979

The Three Coating System process flow diagram, process description and process equipment are described in the same as the Baseline process. Process equipment is discussed in Section 4.2.3. Material usage and wastes and emissions are described in Sections 4.2.4. and 4.2.5., respectively. ESOH issues for each Three Coating System alternative are discussed in Section 5.

4.2.1. Process Flow Diagram

The Three Coating System Process Flow Diagram is the same as the Baseline process (See Figure 2-1).

4.2.2. Process Description

The Three Coating System Process Description is the same as the Baseline process (See Section 2.2).

4.2.3. Process Equipment

All of the Three Coating Process alternatives can be applied using conventional or airless spray, brush or roller.

4.2.4. Anticipated Material and Energy Usage

There are no anticipated large changes in annual material and energy usage with the Three Coating Process as compared to the Baseline Process. However, material and energy changes are dependent upon the coating.

Table 4-5 shows how many square feet per gallon each coating can cover at its recommended DFT and number of coatings. A lower amount of coverage means that more coating is required.

Table 4-5 Three Coating System – Coverage at Recommended Thickness

Coating	Recommended DFT	Coverage (sq ft/gal)
Ameron PSX 1001	3 mils	330
Carboline Carboxane 2000	3 mils	455
IPC Interfine 878	3 mils	385
IPC Interfine 979	5 mils	244

4.2.5. Anticipated Wastes and Emissions

There are no anticipated changes in the quantities of liquid or solid wastes by converting to the Three Coating Process. The anticipated changes in the quantities of air emissions that are expected by converting to the Three Coating Process vary according to product. A comparison of VOC contents is shown in Table 5-1.

5. PRELIMINARY ESOH ANALYSIS OF VIABLE ALTERNATIVES

As part of the selection of potential alternatives, the baseline material (Carboline) and each of the remaining alternatives were qualitatively assessed for associated ESOH concerns according to the procedures described in Appendix A. This initial assessment was conducted to compare the alternatives with the baseline material and determine whether there were any conspicuous ESOH issues that may need addressed when selecting alternatives for testing. Detailed results of the ESOH analysis of the baseline material and viable alternatives can be found in Appendix A. The results are summarized in Table 5-1. *(Extracted from the product MSDS)*

Environmental Issues

Each viable alternative was evaluated to determine the extent of its regulation under the major federal environmental laws. Based on the product MSDS, each alternative was evaluated using the following criteria:

- *Air Emissions per Clean Air Act (CAA)*
- *Solid/Hazardous Waste Generation per Resource Conservation and Recovery Act (RCRA)*
- *Reporting requirements per Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA)*
- *Hazardous Substances per Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*

Health and Safety Issues

Each viable alternative was evaluated to determine concerns related to safety and occupational health issues. Not all product MSDS contained all of the categories listed below. Only those categories that applied for the specific product are listed on the product MSDS. Using the product MSDS, each alternative was evaluated using the following criteria:

- *Acute Effects (short term)*
- *Chronic Effects (long term)*
- *Inhalation*
- *Skin contact*
- *Eye contact*

Table 5-1 Summary of ESOH Analysis for Viable Alternatives								
Product	**Topcoat VOC (g/L)**	**HAPs[a]**	**RCRA[a]**	**EPCRA[a]**	**CERCLA[a]**	**Ratings[b]**		
						Toxicity	**Exposure**	**Hazard**
Carboline Carbothane 134 HB (Baseline)	419	4	2	2	3	M	M-H	M-H
ICI Devoe Devthane 359 DTM (Baseline)	340	3	2	6	4	M	M-H	M-H
Ameron PSX 1001	384	3	1	6	5	M-L	M-H	M
Carboline Carboxane 2000	275	0	0	0	0	M	M	M
IPC Interfine 878	246	1	1	7	1	M-L	M	M
IPC Interfine 979	165	0	0	4	0	L	M	M-L
Kimetsan AST D45-AMS	150	1	1	1	1	M	H	M-H
SW Fast Clad HB Acrylic	164	1	0	1	0	L	L	L
SW Polysiloxane XLE	101	2	2	2	2	M	M	M
SW SHER-CRYL HPA	200	1	1	1	1	L	L	L

a. Number of reportable constituents that are listed on the MSDS for a particular coating.
b. L = Low M = Medium H = High (Scoring derived from data reflected in the material MSDS, refer to Appendix A)

6. SUMMARY

During the coatings project, isocyanates in coatings currently used by NASA were identified as hazardous materials of concern, and targeted for elimination or reduction. Eighteen (18) alternative materials/processes were identified as potential replacements for topcoats containing isocyanates. These alternatives were identified through literature searches and direct vendor queries. The alternatives initially identified were:

- Ameron PSX 700
- Ameron PSX 1001
- Carboline Carboxane 950
- Carboline Carboxane 2000
- Hempel Hempaxane 55000
- Integrated Polymer Industries IPN-FlexFair
- Integrated Polymer Industries IPI-Superbarrier
- International Protective Coatings Interfine 878
- International Protective Coatings Interfine 979
- Jotun Jotacote PSO
- Keeler & Long Megaflon
- Kimetsan Limited AquaSurTech (AST) D45-AMS
- Revodyne Industries Industrial Coating
- Sherwin Williams Centurion
- Sherwin Williams Fast Clad HB Acrylic
- Sherwin Williams Polysiloxane XLE
- Sherwin Williams SHER-CRYL HPA
- Tego Sililoftal ED

Manufacturers and distributors of the identified alternatives were contacted, and technical, environmental, safety, and occupational health information about the alternatives was gathered and compared with the baseline process.

It was decided in stakeholder technical meetings that the goal of the AP2 effort was to identify an isocyanate-free coating as a replacement for currently used aliphatic isocyanate polyurethanes. Initially, the search for replacement materials or processes included all the identified alternatives to allow for the consideration of all possible new technologies.

Of the 18 identified alternatives, ten (10) were dropped from further consideration because they were not technically feasible or were not commercially available. Those products removed from further consideration were:

- Ameron PSX 700 (already has limited use at NASA and AFSPC installations)
- Carboline Carboxane 950 (contains isocyanates)
- Hempel Hempaxane 55000 (not available in the U.S.A.)
- Integrated Polymer Industries IPN-FlexFair (results of previous work conducted by Air Force)

- Integrated Polymer Industries IPI-Superbarrier (results of previous work conducted by Air Force)
- Jotun Jotacote PSO (not available in the U.S.A.)
- Keeler & Long Megaflon (contains isocyanates)
- Revodyne Industrial Coating
- Sherwin Williams Centurion (contains isocyanates)
- Tego Sililoftal ED

Material Safety Data Sheets and Product Information Sheets for those alternatives removed from further consideration in this project are provided in Appendix C. The remaining identified alternatives which were selected for testing were grouped into a Two Coating System or a Three Coating System as shown below:

Table 6-1 Alternatives Identified as Two or Three Coating System	
Two Coating System	Kimetsan AST D45-AMS
	Sherwin Williams Fast Clad HB Acrylic
	Sherwin Williams Polysiloxane XLE
	Sherwin Williams SHER-CRYL HPA
Three Coating System	Ameron PSX 1001
	Carboline Carboxane 2000
	Int'l Protective Coatings Interfine 878
	Int'l Protective Coatings Interfine 979

Material Safety Data Sheets and Product Information Sheets for those alternatives selected for testing under this project are provided in Appendix B.

APPENDIX A

Environmental, Safety and Occupational Health Analyses For Viable Alternatives Selected for Testing

A.1. BACKGROUND OF ESOH ANALYSIS

As part of the down-selection of potential alternatives, each of the remaining viable alternatives was qualitatively assessed for associated Environmental, Safety and Occupational Health (ESOH) concerns. This initial assessment was conducted to determine whether there were any conspicuous ESOH issues that may need to be addressed.

A.1.1. Environmental Issues

The viable alternatives were evaluated to determine the extent of their regulation under the major federal environmental laws. Using available resources, each alternative was evaluated based on the criteria listed below.

- *Air Emissions:* Each of the identified constituents released to the air during the viable alternative process was analyzed to determine if it is regulated under the Clean Air Act (CAA) as a volatile organic compound (VOC) emission, a hazardous air pollutant (HAP), or an ozone-depleting substance (ODS).
- *Solid/Hazardous Waste Generation:* Each alternative was evaluated to determine whether solid waste is generated by the process, and if so, whether that waste may be regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA).
- *Reporting Requirements*: The viable alternatives were examined to determine whether any of the constituents are required to be listed on the Toxic Release Inventory (TRI) reports under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA).
- *CERCLA Hazardous Substances*: Each alternative was assessed to determine if its constituents are listed as hazardous substances under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).
- *Wastewater Discharges:* Each viable alternative was analyzed to determine whether its use would cause discharge of any wastewaters regulated under the Clean Water Act (CWA). However, all substances designated under CWA Section 307(a) and Section 311(b)(2)(A) are listed as CERCLA hazardous substances and are identified there.

The regulatory impacts of process alternatives are not easily compared, since it is impossible to say that a process that emits a hazardous waste sludge is any more or less desirable than a process that emits a HAP. Therefore, it is not possible to categorize each of the alternatives based on some type of regulatory ranking system. However, an alternative that has few leniently regulated constituents will clearly be preferable to one that has many stringently regulated constituents, so the extent to which an alternative is regulated may be considered as an element of the down-selection process.

A.1.2. Health & Safety Issues

Each viable alternative was evaluated to determine concerns related to safety and occupational health issues. Not all product MSDS contained all of the categories listed below. Only those categories that applied for the specific product are listed on the product

MSDS. Using the product MSDS, each alternative was evaluated using the following criteria:

- *Acute Effects (short term)*
- *Chronic Effects (long term)*
- *Inhalation*
- *Skin contact*
- *Eye contact*
- *Special Precautions*

Based on this information, each alternative was given a Toxicity Ranking and Exposure Ranking which were then used to calculate an overall Hazard Ranking as described below. The rankings represent an average hazard for all of the constituents for each coating system.

Toxicity Ranking: As part of the ESOH down-selection criteria, the viable alternatives were qualitatively assessed for evident hazards (i.e., toxicity and exposure). Toxicity was qualitatively reviewed, and each down-selected product was given a final toxicity ranking. Toxicity rankings of high, medium, and low were assigned to viable alternatives based on the analysis of available literature. Parameters reviewed included median lethal concentrations (LC_{50}) and/or median oral lethal doses (LD_{50}). The LC_{50} and LD_{50} describe the amount or concentration of compound that is estimated to be lethal to 50% of the animals in a test group under stated conditions (e.g., inhalation or oral exposure). The qualitative ranking scheme for alternative products is provided in Table A-1 below.

Table A-1 Toxicity Ranking for Alternative Products

Toxicity Ranking	Descriptive Term	LC_{50} (ppm)	LD_{50} Single Dose (per Kg Body Mass)
H	Highly Toxic	< 50	< 50 mg
M	Moderately Toxic	50-50,000	50 mg – 5 g
L	Relatively Nontoxic	> 50,000	> 5 g

Exposure Ranking: As ESOH hazard down-selection is a function of toxicity and exposure, a qualitative exposure ranking scheme is also provided. The procedure for establishing the exposure ranking scheme is discussed briefly below. Exposure can occur only when the potential exists for a receptor to directly contact released chemical constituents from the identified alternatives, or if there is a mechanism for released constituents to be transported to a receptor. Each component (released constituents, mechanism of transport, point of contact, and presence of a receptor) must be present for a complete exposure pathway to exist. Without exposure, there is no risk; therefore, the exposure assessment is a key element when assessing potential risks associated with a technology alternative. A reliable method of calculating exposure is by conducting a state-of-the-art risk assessment for the potential alternatives that have been identified to replace isocyanate containing coatings.

The exposure criteria used in the screening and ranking are the Occupational Safety and Health Administration (OSHA) promulgated Permissible Exposure Levels (PELs) and the American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit

Values (TLVs). Three exposure ranking levels and associated TLV and PEL intervals were chosen based on the ACGIH recommendations. The qualitative ranking scheme for alternative products is provided in Table A-2 below.

Table A-2 Exposure Ranking for Alternative Products		
Toxicity Ranking	**Descriptive Term**	**TLV and PEL Values**
H	High Exposure Level	< 100 ppm
M	Moderate Exposure Level	100-500 ppm
L	Relatively No Exposure Level	> 500 ppm

If TLVs and PELs were not available, then a subjective interpretation of the available information on the compound was performed. Also, the exposure ranking takes into account the potential for toxic released constituents as well as the physical hazards of the compound (e.g., explosivity and corrosivity).

Hazard Ranking: A final hazard ranking designation was given to the viable alternatives based on toxicity and exposure ranking as described above. The hazard ranking is determined by the matrix provided in Table A-3 below.

Table A-3 Hazard Ranking Matrix			
Exposure Ranking	**Toxicity Ranking**		
	High	***Medium***	***Low***
High	H	M-H	M
Medium	M-H	M	M-L
Low	M	M-L	L

**These judgments are based on available scientific information and are of a limited scope.

A.2. ESOH ANALYSIS OF BASELINE MATERIALS

The baseline materials for this project were Carboline Carbothane 134 HB and ICI Devoe Devthane 359 DTM from the approved products list contained in NASA Technical Standard NASA-STD-5008A, *Protective Coating of Carbon Steel, Stainless Steel, and Aluminum on Launch Structures, Facilities, and Ground Support Equipment*, dated January 21, 2004.

A.2.1. Environmental Issues

A.2.1(a) Carboline Carbothane 134 HB

- *Air Emissions per CAA:*
  - Xylene (Part A)
  - Ethyl benzene (Part A)
  - Butly acetate (Parts A and B)
  - Methyl ethyl ketone (Parts A and B)
  - Hexamethylene-1,6-diisocyanate (HDI Isocyanate) (Part B)
  - VOC content: 419 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - Xylene (Part A)
  - Methyl ethyl ketone (Parts A and B)
- *EPCRA Reporting Requirements*:
  - Xylene (Part A)
  - Methyl ethyl ketone (Parts A and B)
  - Aromatic solvent (Part B)
- *CERCLA Hazardous Substances*:
  - Xylene (Part A)
  - Butyl acetate (Parts A and B)
  - Methyl ethyl ketone (Parts A and B)
  - Hexamethylene-1,6-diisocyanate (HDI Isocyanate) (Part B)

A.2.1(b) ICI Devoe Devthane 359 DTM

- *Air Emissions per CAA:*
  - Ethyl benzene
  - Xylene
  - Hexamethylene diisocyanate
  - VOC content: 340 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - Ethyl benzene
  - Xylene
- *EPCRA Reporting Requirements*:
  - Ethyl benzene
  - Propylene glycol monomethyl ether
  - Xylene
  - Barium sulfate

  - 1,2,4-trimethylbenzene
  - Hexamethylene diisocyanate
- *CERCLA Hazardous Substances*:
  - Ethyl benzene
  - Butyl acetate
  - Xylene
  - Hexamethylene diisocyanate

A.2.2. Health & Safety Issues

A.2.2(a) Carboline Carbothane 134 HB

- *Acute Effects (short term)*
  - May cause dizziness, headache or nausea if inhaled
- *Chronic Effects (long term)*
  - Contains SILICA which can cause cancer
  - Reports have associate repeated and prolonged overexposure to solvent with permanent brain and nervous system damage
- *Inhalation*
  - Harmful if inhaled, may affect the brain or nervous system causing dizziness, headache or nausea
  - May cause nose and throat irritation
- *Skin contact*
  - May cause skin irritation
- *Eye contact*
  - May cause eye irritation
- *Special Precautions:*
  - Respiratory: Supplied-Air Respirator (SAR) or organic vapor/spray mist/mixing
  - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
- *Toxicity Ranking:* Medium
- *Exposure Ranking:* Medium-High
- *Hazard Ranking:* Medium-High

A.2.2(b) ICI Devoe Devthane 359 DTM

- *Acute Effects (short term)*
  - Contains a chemical that may be absorbed through skin
  - Free diisocyanate may cause allergic reaction in susceptible persons
- *Chronic Effects (long term)*
  - Possible human carcinogen (carbon black and ethyl benzene)
  - In a 2-year inhalation study conducted by the national toxicology program (NTP), ethyl benzene vapor at 750 ppm produced kidney and testicular tumors

in rats and lung and liver tumors in mice (the relevance of these results to humans is not known)
    - High exposure to xylene in some animal studies, often at maternally toxic levels, have affected embryo/fetal development (the significance of this finding to humans is not known)
    - Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage
- *Inhalation*
    - Irritation of respiratory tract
    - Possible sensitization to respiratory tract
    - Prolonged inhalation may lead to mucous membrane irritation, fatigue, drowsiness, dizziness and/or lightheadedness, headache, uncoordination, nausea, vomiting, chest pain, blurred vision, flu-like symptoms, coughing, difficulty with speech, central nervous system depression, anesthetic effect or narcosis, difficulty of breathing, allergic response, tremors, severe lung irritation or damage, liver damage, kidney damage, pneumoconiosis, loss of consciousness, respiratory failure, asphyxiation, death
- *Skin contact*
    - Irritation of skin
    - Possible sensitization to skin
    - Skin contact may result in dermal absorption of component(s) of this product which may cause drowsiness, dizziness and/or lightheadedness
    - Prolonged or repeated contact can cause dermatitis, defatting, blistering, severe skin irritation or burns
- *Eye contact*
    - Irritation of eyes
    - Prolonged or repeated contact can cause conjunctivitis, blurred vision, tearing of eyes, redness of eyes, severe eye irritation or buns, corneal injury
- *Special Precautions*
    - Respiratory: Supplied-Air Respirator (SAR) or organic vapor/spray mist/mixing
    - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
    - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
- *Toxicity Ranking:* Medium
- *Exposure Ranking:* Medium-High
- *Hazard Ranking:* Medium-High

A.3. ESOH ANALYSIS OF AMERON PSX 1001

A.3.1. Environmental Issues

- *Air Emissions per CAA:*
  - Xylene
  - Ethyl benzene
  - Toluene (trace contaminant)
  - VOC content: 384 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - Xylene
- *EPCRA Reporting Requirements*:
  - Xylene
  - 1,2,4-trimethyl benzene
  - Ethyl benzene
  - Methanol (hydrolysis generated)
  - Benzene (trace contaminant)
  - Toluene (trace contaminant)
- *CERCLA Hazardous Substances*:
  - Xylene
  - Ethyl benzene
  - Methanol (hydrolysis generated)
  - Toluene (trace contaminant)
  - Proprietary ingredient

A.3.2. Health & Safety Issues

- *Acute Effects (short term)*
  - Irritating to eyes, skin, and if inhaled; to nose and throat
  - Excessive or prolonged inhalation can cause headache, nausea or dizziness
- *Chronic Effects (long term)*
  - Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage
- *Inhalation*
  - Irritant.
  - Lung injury.
  - Central nervous system damage.
  - Chemical pneumonia.
  - Xylene or toluene may cause irregular heart beat
- *Skin contact*
  - Irritant.
  - Burns.
  - Can be absorbed through skin.
  - Can cause defatting and drying of skin
- *Eye contact*
  - Sever irritant.

  - Corneal injury.
  - Irreversible buns and damage.
  - Methanol, if swallowed, can cause eye damage and blindness
- *Special Precautions*
  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist; Supplied-Air Respirator (SAR) for confined spaces
  - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
- *Toxicity Ranking:* Medium-Low
- *Exposure Ranking:* Medium-High
- *Hazard Ranking:* Medium

A.4. ESOH ANALYSIS OF CARBOLINE CARBOXANE 2000

A.4.1. Environmental Issues

- *Air Emissions per CAA:*
  - VOC content: 275 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - NONE
- *EPCRA Reporting Requirements*:
  - NONE
- *CERCLA Hazardous Substances*:
  - NONE

A.4.2. Health & Safety Issues

- *Acute Effects (short term)*
  - Irritating to eyes, skin, and if inhaled; to nose and throat
  - If inhaled, may cause dizziness, headache, or nausea
- *Chronic Effects (long term)*
  - Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage
- *Inhalation*
  - Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea.
  - May cause nose and throat irritation
- *Skin contact*
  - Can cause skin burns
- *Eye contact*
  - Can cause eye burns
- *Special Precautions*
  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist; Supplied-Air Respirator (SAR) for confined spaces
  - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
- *Toxicity Ranking:* Medium
- *Exposure Ranking:* Medium
- *Hazard Ranking:* Medium

A.5. ESOH ANALYSIS OF IPC INTERFINE 878

A.5.1. Environmental Issues

- *Air Emissions per CAA:*
  - Ethyl benzene (Base)
  - VOC content: 246 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - Ethyl benzene (Base)
- *EPCRA Reporting Requirements*:
  - Methyl alcohol (Base)
  - Isopropyl alcohol (Base)
  - Propylene glycol monomethyl ether acetate (Base)
  - Xylenes (o-, m-, p- isomers) (Base)
  - Barium sulfate (Base)
  - Ethyl benzene (Base)
  - Aluminum Oxide (Base)
- *CERCLA Hazardous Substances*:
  - Ethyl benzene (Base)

A.5.2. Health & Safety Issues

Although the product says that it is isocyanate-free, a test of a bulk sample of 878 Light Base for isocyanates is recommended.

- *Acute Effects (short term)*
  - Irritating to eyes, skin, and if inhaled; to nose and throat (Parts A and B)
  - Vapors may affect the brain or nervous system causing dizziness, headache or nausea (Part A)
- *Chronic Effects (long term)*
  - Contains an ingredient which can cause organ damage (Part A)
  - Birth defect hazard (Part A)
  - Possible cancer hazard (Part A)
  - Cancer hazard (Part B)
  - Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage (Part B)
- *Inhalation*
  - May be harmful (Parts A and B) or fatal if inhaled (Part A)
  - Causes lung irritation (Part A)
  - Causes nose and throat irritation (Parts A and B)
- *Skin contact*
  - Causes skin irritation (Part A)
  - Causes skin burns (Part B)
  - May cause allergic skin reaction (Part A)
  - May be harmful if absorbed through the skin (Parts A and B)
- *Eye contact*

  - May cause blindness (Parts A and B)
- *Special Precautions*
  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist (SAR if free isocyanates are present); Supplied-Air Respirator (SAR) for confined spaces
  - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
  - Contains water reactive/corrosive ingredients
- *Toxicity Ranking:* Medium-Low
- *Exposure Ranking:* Medium
- *Hazard Ranking:* Medium

A.6. ESOH ANALYSIS OF IPC INTERFINE 979

A.6.1. Environmental Issues

- *Air Emissions per CAA:*
  - VOC Content: 165 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - NONE
- *EPCRA Reporting Requirements*:
  - Isopropyl alcohol (Base)
  - Aluminum oxide (Base)
  - Barium sulfate (Base)
  - Propylene glycol monoethyl ether acetate (Base)
- *CERCLA Hazardous Substances*:
  - NONE

A.6.2. Health & Safety Issues

Although the product says that it is isocyanate-free, a test of a bulk sample of 979 Light Base for isocyanates is recommended.

- *Acute Effects (short term)*
  - Irritating to eyes, skin, and if inhaled; to nose and throat (Base and Converter)
  - Vapors may affect the brain or nervous system causing dizziness, headache or nausea (Base and Converter)
- *Chronic Effects (long term)*
  - Contains an ingredient which can cause organ damage (Base)
  - Birth defect hazard (Base)
  - Possible cancer hazard (Base)
  - Cancer hazard (Converter)
  - Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage (Base and Converter)
- *Inhalation*
  - May be harmful (Base and Converter) or fatal if inhaled (Base)
  - Causes lung irritation (Base)
  - Causes nose and throat irritation (Base and Converter)
- *Skin contact*
  - Causes skin irritation (Base)
  - Causes skin burns (Converter)
  - May cause allergic skin reaction (Base)
  - May be harmful if absorbed through the skin (Base and Converter)
- *Eye contact*
  - Causes sever eye irritation (Base)
  - May cause blindness (Converter)
- *Special Precautions*

  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist (SAR if free isocyanates are present); Supplied-Air Respirator (SAR) for confined spaces
  - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
  - Contains water reactive/corrosive ingredients
- *Toxicity Ranking:* Low
- *Exposure Ranking:* Medium
- *Hazard Ranking:* Medium-Low

A.7. ESOH ANALYSIS OF KIMETSAN AST D45-AMS

A.7.1. Environmental Issues

- *Air Emissions per CAA:*
  - Tuluol (Toluene)
  - VOC content: 150 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - Tuluol (Toluene)
- *EPCRA Reporting Requirements*:
  - Tuluol (Toluene)
- *CERCLA Hazardous Substances*:
  - Tuluol (Toluene)

A.7.2. Health & Safety Issues

Although the product says that it is isocyanate-free, a test of a bulk sample of components A and B for isocyanates is recommended.

- *Acute Effects (short term)*
  - Working in badly ventilated areas may cause dizziness, indisposition and headache
- *Chronic Effects (long term)*
  - None listed
- *Inhalation*
  - None listed
- *Skin contact*
  - None listed
- *Eye contact*
  - None listed
- *Special Precautions*
  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist (SAR if free isocyanates are present); Supplied-Air Respirator (SAR) for confined spaces
  - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
- *Toxicity Ranking:* Medium
- *Exposure Ranking:* High
- *Hazard Ranking:* Medium-High

A.8. ESOH ANALYSIS OF SHERWIN WILLIAMS FAST CLAD HB

A.8.1. Environmental Issues

- *Air Emissions per CAA:*
  - Glycol ethers
  - VOC content: 164 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - NONE
- *EPCRA Reporting Requirements*:
  - Glycol ethers
- *CERCLA Hazardous Substances*:
  - NONE

A.8.2. Health & Safety Issues

- *Acute Effects (short term)*
  - In confined area, vapors in high concentration may cause headache, nausea or dizziness
  - Redness and itching or burning sensation may indicate eye or excessive skin exposure
- *Chronic Effects (long term)*
  - None listed
- *Inhalation*
  - Irritation of the upper respiratory system
- *Skin contact*
  - Prolonged or repeated exposure may cause irritation
- *Eye contact*
  - Causes irritation
- *Special Precautions*
  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist; Supplied-Air Respirator (SAR) for confined spaces
  - Skin: Tyvek or other disposable coveralls
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
- *Toxicity Ranking:* Low
- *Exposure Ranking:* Low
- *Hazard Ranking:* Low

A.9. ESOH ANALYSIS OF SHERWIN WILLIAMS POLYSILOXANE XLE

A.9.1. Environmental Issues

- *Air Emissions per CAA:*
  - Ethyl benzene (Part B)
  - Xylene (Part B)
  - VOC content: 101 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - Ethyl benzene (Part B)
  - Xylene (Part B)
- *EPCRA Reporting Requirements*:
  - Ethyl benzene (Part B)
  - Xylene (Part B)
- *CERCLA Hazardous Substances*:
  - Ethyl benzene (Part B)
  - Xylene (Part B)

A.9.2. Health & Safety Issues

- *Acute Effects (short term)*
  - Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists (Parts A and B)
  - Redness and itching or burning sensation may indicate eye or excessive skin exposure (Parts A and B)
- *Chronic Effects (long term)*
  - Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage (Part A)
- *Inhalation*
  - Irritation of the upper respiratory system (Part A)
  - Causes burns of the upper respiratory system (Part B)
  - May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death (Part B)
- *Skin contact*
  - Prolonged or repeated exposure may cause irritation (Part A)
  - May cause allergic skin reaction in susceptible persons or skin sensitization (Part A)
  - Causes burns (Part B)
- *Eye contact*
  - Causes irritation (Part A)
  - Causes burns (Part B)
- *Special Precautions*
  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist; Supplied-Air Respirator (SAR) for confined spaces

  - Skin: Tyvek or other disposable coveralls; gloves/barrier cream recommended for exposed skin; safety shower or washing facility required
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
  - Skin sensitizer in Part A (epoxy) requires PPE when handling/mixing
  - Corrosive warning for Part B (polyamine)
- *Toxicity Ranking:* Medium
- *Exposure Ranking:* Medium
- *Hazard Ranking:* Medium

A.10. ESOH ANALYSIS OF SHERWIN WILLIAMS SHER-CRYL HPA

A.10.1. Environmental Issues

- *Air Emissions per CAA:*
  - Glycol ethers
  - VOC content: 200 g/L
- *Solid/Hazardous Waste Generation per RCRA:*
  - Glycol ethers
- *EPCRA Reporting Requirements*:
  - Glycol ethers
- *CERCLA Hazardous Substances*:
  - Glycol ethers

A.10.2. Health & Safety Issues

- *Acute Effects (short term)*
  - In a confined area, vapors in high concentration may cause headache, nausea or dizziness
  - Redness and itching or burning sensation may indicate eye or excessive skin exposure
- *Chronic Effects (long term)*
  - None listed
- *Inhalation*
  - Irritation of the upper respiratory system
- *Skin contact*
  - Prolonged or repeated exposure may cause irritation
- *Eye contact*
  - Causes irritation
- *Special Precautions*
  - Respiratory: Air-Purifying Respiratory (APR)/Powered Air-Purifying Respirator (PAPR) for organic vapor/spray mist; Supplied-Air Respirator (SAR) for confined spaces
  - Skin: Tyvek or other disposable coveralls
  - Eye: Full face respirator for spray application; splash goggles with faceshield when mixing components; eyewash required
- *Toxicity Ranking:* Low
- *Exposure Ranking:* Low
- *Hazard Ranking:* Low

APPENDIX B

Material Safety Data Sheets
For
Viable Alternatives Selected for Testing
Under this Project

product data

carboline®

Carbothane® 134 HB

Selection & Specification Data

Generic Type
Two component, acrylic, aliphatic polyurethane.

Description
Carbothane 134 HB is a fast dry, high gloss, high build, two component polyurethane coating. Carbothane 134 HB exhibits excellent dry times and handling characteristics. This coating has outstanding hardness, adhesion and resistance to: impact, marring, abrasion, chemicals and staining. Typical applications include structural steel, tanks, equipment or others as typically found in both industrial and architectural projects. Not recommended for continuous immersion service.

Features
- VOC compliant – 3.3 pounds per gallon as supplied
- Fast Dry – 6-8 hours to handle at 75°F
- High build, high gloss
- Excellent abrasion resistance
- Application by conventional, airless spray, HVLP or electrostatic
- Excellent chemical resistance
- Meets SSPC Paint Spec 36; Level 3

Color
Available in a wide variety of colors

Finish
High Gloss

Primers
Use over epoxy, zinc rich epoxy or as recommended by Carboline

Dry Film Thickness
3 – 5 mils per coat (75-125 microns).

Solids Content
By Volume: 54% ± 2%

Theoretical Coverage Rate per Gallon
288 ft^2 at 3 mils (75 microns)
216 ft^2 at 4 mils (100 microns)
173 ft^2 at 5 mils (125 microns)
Mixing and application losses will vary and must be taken into consideration when estimating job requirements.

VOC Values
As supplied: 3.3 lbs/gal (395 g/l)
Thinned:
6 oz/gal w/ #25: 3.5 lbs/gal (419 g/l)
These are nominal values.

Ratio By Volume
4:1 Ratio
4 parts Carbothane 134 HB Part A
1 part Converter (Part B)

Pot Life
2 Hours at 75°F (24°C) unthinned
Pot life decreases at higher temperatures. Pot life ends when coating becomes too viscous to use. This product is moisture sensitive. Avoid moisture contamination.

Dry Temp. Resistance
Continuous: 200°F (93°C)
Non-Continuous: 250°F (121°C)
Discoloration is observed above 180°F (82°C).

Substrates & Surface Preparation

General
Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel
Prime with appropriate primer.

Primed Surfaces
Remove any oil or grease from the surface to be coated with Thinner #2 or Carboline Surface Cleaner #3 (Refer to Data Sheet) in accordance with SSPC-SP1.

Curing Schedule

Ambient, Material & Surface Temperature	Dry to Touch	Dry to Handle or Assemble	Dry to Full Cure
75°F (24°C)	60-90 minutes	6-8 hours	7-14 days

These times are based on a 4.0 mil (100 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Note: Product may be force cured.

March 2004 replaces November 2003 0803

Carbothane® 134 HB

Application Equipment

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

General Guidelines:

Spray Application (General) The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.

Conventional Spray Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.

Airless Spray

Pump Ratio:	30:1 (min.)
GPM Output:	3.0 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.011-.015"
Output PSI:	2500-2800
Filter Size:	60 mesh

Teflon packings are recommended and available from the pump manufacturer.

Touch Up Respray or brush. Brushing recommended only for touchup of small areas. Use natural bristle brush applying with full strokes.

Mixing & Thinning

Mixing For plural component application equipment follow the equipment manufacturer's instructions. For batch mixing, power mix part A separately, then combine and power mix thoroughly in the following proportions:
THIS PRODUCT IS MOISTURE SENSITIVE. AVOID MOISTURE CONTAMINATION. DO NOT MIX PARTIAL KITS.

Ratio 4:1 Ratio (A to Converter)

	1 Gallon Kit	5 Gallon Kit
134 HB Part A	.8 gallons (in 1 gallon can)	4 gallons (in 5 gallon can)
Urethane Converter	25.6 fluid ozs.	1 gallon

Thinning Normally not required. May be thinned up to 6 oz/gal (5%) with #25. Thinner #97 used when applying 134 HB in very hot conditions. Use of thinners other than those supplied or recommended by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life 2 hours at 75°F (24°C).

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Normal	60°-85°F (16°-29°C)	60°-85°F (16°-29°C)	60°-85°F (16°-29°C)	40-60%
Minimum	50°F (10°C)	35°F (2°C)	35°F (2°C)	10%
Maximum	130°F (54°C)	120°F (50°C)	95°F (35°C)	80%

Industry standards are for substrate temperatures to be 5°F (3°C) above the dew point.

Caution: This product is moisture sensitive in the liquid stage and until fully cured. Protect from high humidity, dew and direct moisture contact until fully cured. Application and/or curing in humidities above maximum, or exposure to moisture from rain or dew may result in loss of gloss and/or microbubbling of the product.

Cleanup & Safety

Cleanup Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.

Caution This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

Packaging, Handling & Storage

	1 Gallon Kit	5 Gallon Kit
Shipping Weight 134 HB (Approximate)	15 lbs. (6 kg)	58 lbs. (22 kg)
Thinner #25	8 lbs. (4 kg)	41 lbs. (19kg)
Thinner #97	8 lbs. (4 kg)	41 lbs. (19kg)

Flash Point (Setaflash)

Part A:	58°F (14°C)
Converter:	28°F (-2°C)
Thinner #25:	90°F (32°C)

Storage (General) Store Indoors.

Storage Temperature & Humidity 40° - 110°F (4-43°C)
0-80% Relative Humidity

Shelf Life Part A: Min. 36 months at 75°F (24°C)
Converter: Min. 24 months at 75°F (24°C)

***Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.**

carboline®

350 Hanley Industrial Court, St. Louis, MO 63144-1599
314/644-1000 314/644-4617 (fax) www.carboline.com

An RPM Company

March 2004 replaces November 2003

SECTION I - PRODUCT: CARBOTHANE 134HB PART A (0803A1NL)
Date: 02/23/04

CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
SILICA	14808-60-7	25%	0.1MG/M3	NE	NE
BUTYL ACETATE	123-86-4	25%	150 PPM	200 PPM	NE
COLOR PIGMENT	MIXTURE	5%	3.5MG/M3	NE	NE
XYLENE	1330-20-7	5%	100 PPM	150 PPM	NE
PM ACETATE	108-65-6	5%	100PPM	150PPM	NE
METHYL N-AMYL KETONE	110-43-0	5%	50 PPM	100 PPM	NE
METHYL ETHYL KETONE	78-93-3	5%	200 PPM	300 PPM	NE
ETHYL BENZENE	100-41-4	1%	100 PPM	125 PPM	NE

HAZARDOUS INGREDIENTS ADDITIONAL DATA

CHEMICAL NAME	(F)	(G)
SILICA	NOT AVAILABLE	NO/NO/NR/NO
BUTYL ACETATE	7.4 G/KG RABBIT ORAL >1800 PPM/6H INHALATION	NO/NO/1,2,3
COLOR PIGMENT	NOT AVAILABLE	NO/YES
XYLENE	4300MG/KG RAT,ORAL 15000 PPM/4HRS RAT,INHALATION	NO/YES/1,2,3/ 100#/U239
PM ACETATE	NOT AVAILABLE	NO/NO/1,2,3
METHYL N-AMYL KETONE	1670 MG/KG RAT ORAL 12.6 ML/KG RABBIT DERMAL	NO/NO/3
METHYL ETHYL KETONE	2737MG/KG RAT,ORAL 2000PPM/H HRS RAT,INHALATION	NO/YES/1,2,3/ 5000
ETHYL BENZENE	NOT AVAILABLE	NO/YES/1,2,3/ 1000#

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B2 -- D2A -- D2B
HMIS/NFPA CLASSIFICATION: HEALTH 2, FLAMMABILITY 3, REACTIVITY 0, PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 175F(79C)-300F(148C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 34 %. VOLATILE BY VOLUME: 46 %. PRODUCT WT/GAL: 9.7 LBS/U.S.GAL. 1.16 sp gr.

PRODUCT: CARBOTHANE 134HB PART A (0803A1NL)
Date: 02/23/04

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 58 F(14C) (Setaflash) LEL 1.0 % UEL 13.1 %.
OSHA-FLAMMABLE LIQUID/OSHA/CLASS/1B, DOT-PAINT,3,UN1263,PGII, CANADIAN TDGA: PAINT,3,UN1263,PGII
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.
FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate. Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation.
CONTACT: May cause eye irritation. May cause skin irritation.
NOTICE: Contains SILICA which can cause cancer. Risk of cancer depends on duration and level of exposure. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: If you have a condition that could be aggravated by exposure to dust or organic vapors see a physician prior to use.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.
HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning

material as very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, sparks, and open flames.
INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to ensure all personnel are below guidelines. If not sure, or not able to monitor, use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.
VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.
OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages

incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
ACRYLIC COPOLYMER		40%
POLYESTER POLYOL	TRADE SECRET	5%

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

SECTION I - PRODUCT: URETHANE CONVERTER 8800 (8808B1NL)
Date: 04/28/03 Replaces 03/13/00

CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
POLYMERIC HDI	28182-81-2	65%	NE	NE	NE
METHYL ETHYL KETONE	78-93-3	35%	200 PPM	300 PPM	NE
AROMATIC SOLVENT	64742-95-6	5%	25PPM	NE	NE
BUTYL ACETATE	123-86-4	5%	150 PPM	200 PPM	NE
HDI ISOCYANATE	822-06-0	1%	0.005PPM	0.02PPM	NE

HAZARDOUS INGREDIENTS ADDITIONAL DATA

CHEMICAL NAME	(F)	(G)
POLYMERIC HDI	>5,000 MG/KG RAT ORAL 137-1150 MG/M3 4 HOURS; RAT	NO/NO/1,2,3,5
METHYL ETHYL KETONE	2737MG/KG RAT,ORAL 2000PPM/H HRS RAT,INHALATION	NO/YES/1,2,3/ 5000
AROMATIC SOLVENT	4700MG/KG RAT,ORAL 3670PPM/8HRS RAT,INHALATION	NO/YES/1/2/3
BUTYL ACETATE	7.4 G/KG RABBIT ORAL >1800 PPM/6H INHALATION	NO/NO/1,2,3
HDI ISOCYANATE	710MG/KG ORAL 570MG/KG DERMAL 23PPM 4 HRS	NO/NO

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B2 -- D2A -- D2B
HMIS/NFPA CLASSIFICATION: HEALTH 3, FLAMMABILITY 3, REACTIVITY 1, PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 175F(79C)-355F(179C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 39 %. VOLATILE BY VOLUME: 48 %. PRODUCT WT/GAL: 8.3 LBS/U.S.GAL. 1.00 sp gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 28 F(-2C) (Setaflash) LEL 1.0 % UEL 10.4 %.
OSHA-FLAMMABLE LIQUID/OSHA/CLASS/1B, DOT-FLAMMABLE LIQUID,NOS*,3,UN1993,PGII, CANADIAN TDGA: FLAMMABLE LIQUID,NOS*,3,UN1993,PGII
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.

PRODUCT: URETHANE CONVERTER 8800 (8808B1NL)
Date: 04/28/03 Replaces 03/13/00

FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate. Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation. May cause lung irritation. Contains HEXAMETHYLENE DIISOCYANATE which may cause allergic respiratory reaction, effects may be permanent.
CONTACT: May cause eye irritation. May cause skin irritation. May cause allergic skin reaction.
NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: If sensitized to isocyanates or other chemicals do not use. See a physician if a medical condition exists.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.
HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, sparks, and open flames.
INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

PRODUCT: URETHANE CONVERTER 8800 (8808B1NL)
Date: 04/28/03 Replaces 03/13/00

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to ensure all personnel are below guidelines. If not sure, or not able to monitor, use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.
VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.
OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

PRODUCT: URETHANE CONVERTER 8800 (8808B1NL)
Date: 04/28/03 Replaces 03/13/00

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
No materials meet this criteria		

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

DEVOE HIGH PERFORMANCE COATINGS

ICI Devoe Coatings is a member of the ICI Paints World Group

DEVTHANE™ 359

DTM High Build Gloss Aliphatic Urethane Mastic

Cat. # 359KXXXX

PRODUCT DESCRIPTION

Generic: Acrylic Aliphatic Urethane

General Description: A high build, high performance, two-component chemically-cured aliphatic urethane gloss enamel for use in areas where maximum gloss & color retention are required.

Typical Uses: For use on properly prepared steel, concrete or steel floors, masonry, drywall, plaster, metal, concrete block, galvanized, aluminum, poured concrete, and glazed brick. Ideal for use on exterior or interior structural steel, piping, metal buildings, control cabinetry, conveyors, pumps, storage tanks, motors, machinery, and transportation vehicles. Can also be used in the hard service areas of food processing plants, dairies, schools, restaurants, hospitals, correctional facilities, factories, stadiums, arenas, and amusement parks.

Special Qualifications: Suitable for use on structural surfaces or surfaces where there is a possibility of incidental food contact in commercial food preparation establishments, food processing plants and federally inspected meat and poultry plants. USDA no longer requires or furnishes product certification letters.

FEATURES

Advantages:

- Excellent gloss and color retention
- Excellent abrasion and chemical resistance
- Low VOC
- Easily applied by brush, roller or spray
- Wide color selection, including safety colors
- Excellent resistance to marring, chipping, and scratching
- High Build
- Excellent application properties
- May be used direct to metal

Limitations of Use: Color may change as temperature approaches 250°F (121°C) limit, but the film will remain intact.

SPECIFICATION DATA

Color: Available in white, black and a full range of custom colors

Finish: High Gloss

Reduction Solvent: T-9 for spray, T-17 for brush or roller

Clean-up Solvent: T-9 Thinner

Weight/Gallon: 10.3 lbs./gal. (1.23 kg/L) – varies with color

VOC (EPA 24)**:** 2.8 lbs./gal. (340 g/L) – varies with color

Solids By Volume (ASTM 2697-7 days)**:** 60%

Theoretical Coverage at 1.0 Mil (25 microns)**Dry:** 962 sq. ft., (23.7 m^2/L)

Recommended Film Thickness: 4.0-6.0 mils (100-150 microns) dry – 6.7-10.0 mils (168-250 microns) wet. Direct to metal application requires a dry film thickness of 5-6 mils (125-150 microns)

Systems: Please consult the appropriate system guide, the particular job specification or your ICI Devoe Coatings' Industrial Coatings Specialist for proper systems using this product. Systems must be selected considering the particular environment involved.

Service Temperature Limits: 250°F (121°C) dry

Minimum Dry Time (ASTM D 1640)**:** 4 mils (200 microns) DFT

Substrate Temperature	40°F (4°C)	60°F (16°C)	80°F (27°C)
Minimum Recoat	8 hours	5 hours	3 hours
Dry Hard	14 hours	9 hours	5 hours
Maximum Recoat			
Self	2 weeks	2 weeks	2 weeks

Ventilation, film thickness, humidity, thinning, and other factors can influence the rate of dry.

Warning: The above table provides general guidelines only. Always consult your ICI Devoe Coatings Specialist for appropriate recoat windows since the maximum aged recoat time of this product may be significantly shortened or lengthened by a variety of conditions, including, but not limited to humidity, surface temperature, and the use of additives or thinners. The use of accelerators or force curing may shorten the aged recoat of individual coatings. The above recoat windows may not apply if recoating with a product other than those listed above. If the maximum aged recoat window is exceeded, please consult your ICI Industrial Coatings Specialist for appropriate recommendations to enhance adhesion. Failure to observe these precautions may result in intercoat delamination.

Shelf Life: Over 12 months at 77°F (25°C) – unopened

Hardness (ASTM D 3363 – 7 day cure @ 77°F (25°C)**:** 5H

Mix Ratio By Volume: 4 (base): 1 (converter) – see mixing instructions.

Induction: None

Pot Life: 8 hours @ 77°F (25°C) & 50% R.H.

PERFORMANCE DATA

Adhesion: (ASTM D 4541) – Excellent

Salt Spray Resistance: (ASTM B 117) – Excellent

Abrasion Resistance: (ASTM D 4060) – Excellent

Humidity Resistance: (ASTM D 2247) – Excellent

Exterior Exposure: 45° South Florida – Excellent

Chemical Resistance: (ASTM D 1308 – 24 hr. contact) Excellent. Resists splash and spillage of alkalis, salts, moisture, oils, greases, foodstuffs and detergents.

Stain Resistance: (ASTM D 1308 – 1 week contact) Excellent. Resists stains such as crayon, lipstick, coffee, soil medium, shoe polish, grape juice, ink pen, marker, and spray paint.

09800

DANGER! FLAMMABLE. HARMFUL OR FATAL IF SWALLOWED. Read label and Material Safety Data Sheet Prior to Use. See other cautions on last page. DSF3-0696

GENERAL SURFACE PREPARATION

All surfaces must be sound, clean, dry, and free of oil, grease, mildew, form release agents, curing compounds, laitance, and other foreign matter. To insure the best appearance, the primer or undercoat should be smooth and free of any surface defects such as runs, dry spray or heavy orange peel.

New Surfaces: Steel – For direct to steel application, abrasive blast to near- white metal surface cleanliness in accordance with SSPC-SP-10 or SSI-Sa2 1/2. Blast profile on steel should be 1 1/2 to 2 1/2 mils (38-63 microns) in depth and be of a sharp, jagged nature as opposed to a "peen" pattern (from shot blasting) or clean and prime with DEVRAN® 224HS, BAR-RUST™ 235 or BAR-RUST 233H Epoxy. **Concrete Block –** Fill with DEVRAN 224HS, BAR-RUST 235 or BAR-RUST 233H Epoxy. **Fiberglass –** Solvent wipe, scuff sand and solvent wipe again. Prime with DEVRAN 201. **Concrete Floors, Poured Concrete –** Cure at least 30 days. Acid etch or abrasive blast slick, glazed concrete or concrete with laitance. Prime with DEVRAN 224HS, BAR-RUST 235 or BAR-RUST 233H Epoxy thinned 25% with recommended thinner or use PRE-PRIME™ 167 Penetrating Sealer. **Drywall –** Prime with a premium acrylic latex vapor barrier primer-sealer. **Galvanized Steel and Aluminum –** Remove dirt and oils by solvent cleaning or with Devoe Coatings DEVPREP® 88 Cleaner followed by a thorough water rinsing. Prime with DEVRAN 201 or 205 Epoxy Primers. For direct to metal use, brush-off blast in accordance with SSPC-SP-7 to create a surface profile.

Previously Painted Surfaces: Remove loose and peeling paint. Scuff sand glossy areas. Old coatings should be tested for lifting and bleeding. If they lift or bleed, remove them. Prime bare areas with a primer specified under **New Surfaces**.

DIRECTIONS FOR USE

Tinting: Tint the appropriate base with CHROMA-CHEM 844 colorants. (Do not use water based or other colorants.) Add colorants to only the base portion. Mix thoroughly before adding the converter portion. When using Devthane 359 direct to metal, best results are obtained using ready mixed colors.

Thinning: Thinning is not normally required. However, depending on local VOC and air quality regulations, small amounts (5% or less) of the solvents on the reverse page may be added. Small amounts (5% or less) of Devoe Coatings T-17 Thinner will improve roller or brush applications. If local VOC and/or air quality regulations are not an issue, and depending on the individual set-up of the spray equipment, additional thinning may be allowed to obtain the desired individual finish. Contact your local ICI Devoe Coatings Representative for additional information.

Mixing: DEVTHANE 359 Enamel is a two-component product supplied in 5 gallon or 1 gallon kits which contain the proper ratio of ingredients. The entire contents of each container must be mixed together. It is important that all mixing equipment is free of moisture and that moisture does not contaminate the coating. Mix the base portion to obtain a smooth, homogeneous condition. After mixing the base portion, add the converter slowly with continued agitation. Mix thoroughly. The pot life of the mixed material is 8 hours at 77° (25°C). Higher temperatures will reduce working life of the coating; lower temperatures will increase it.

Application: Apply by airless spray, air spray, roller or brush. For airless spray, any air, electric, or gas operated airless sprayer capable of 3,000 psi (207 bars) and able to support a .015'' to .019'' tip sizes can be used. Multiple guns and long fluid lines require pumps with adequate capacity. For air spray application, use a DeVilbiss MBC-510 Gun, “E” or “D” Tip and 704 air cap or equivalent. Adust fluid and air pressure to get a good spray pattern. Brushing and rolling may require multiple coats to achieve correct film thickness and/or hiding.

Note: Be sure all spray equipment and fluid lines are clean, and free of water or non-compatible solvents. For brush application, use good quality, dry, clean brushes. For roller application, use short nap, new rollers. Do not apply over wet surfaces or under very humid conditions where condensation or fog could settle on the coating during the cure process.

Spreading Rate: Apply at 160-241 sq. ft. per gallon (3.9-5.9 m^2/L) depending on surface texture and porosity. Make allowance for any losses due to overspray or surface irregularities.

Dry Time: At 70°F (21°C) & 50% R.H., dries to recoat in 5 hours and dries hard in 7 hours.

Clean-up: Use T-9 Thinner.

Cure Acceleration: Urethane catalyst 070A0000 may be used to accelerate cure at or below 40°F (5°C). The addition of one or two ounces per gallon will decrease the dry hard time approximately one-third to one-half respectively at 40°F (5°C). The pot life will be reduced one-half to three-fourths.

PRECAUTIONS

DANGER! FLAMMABLE LIQUID AND VAPOR. CAUSES EYE AND SKIN BURNS. HARMFUL OR FATAL IF SWALLOWED. ASPIRATION HAZARD-CAN ENTER LUNGS AND CAUSE DAMAGE. HARMFUL IF INHALED. MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS, INCLUDING DIZZINESS, HEADACHE OR NAUSEA. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. OVEREXPOSURE MAY CAUSE BLOOD, LIVER, KIDNEY DAMAGE. USE ONLY WITH ADEQUATE VENTILATION. KEEP OUT OF THE REACH OF CHILDREN. NOTICE: This product contains solvents. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. For emergency information call (800) 545-2643. For additional safety information, refer to the Material Safety Data Sheet for this product. Keep away from heat, sparks and flame. **Do not** smoke. Vapors may ignite. Extinguish all flames, burners, stoves, heaters and pilot lights and disconnect all electrical motors and appliances before use and until all vapors are gone. If sanding is done, wear a dust mask to avoid breathing of sanding dust. Do not breathe vapors or spray mist. If you experience eye watering, headaches, or dizziness, leave the area. If properly used, a respirator may offer additional protection. Obtain professional advice before using. Close container after each use. **FIRST AID:** In case of skin contact, wash off **quickly** with plenty of soap and water, remove contaminated clothing. For eye contact flush **immediately** with large amounts of water, for at least 15 minutes. **Obtain emergency medical treatment.** If swallowed, **obtain medical treatment immediately.** If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs, **get medical help. Note: These warnings encompass the product series. Prior to use, read and follow product-specific MSDS and label information.**

DS212-0499

SHIPPING

Freight Classification: Paint, 3, PG III, UN1263 (Flammable Liquid)
Flash Point: 80°F (27°C)

Packaging:

1 gallon kit (3.785L)	5 gallon kit (18.925L)
0.80 gallon base	4.00 gallon base
0.20 gallon converter	1.00 gallon converter

Shipping Weight: 4 - 1 gallon kits - 60 lbs. (27.2kg)
5 gallon kit - 66 lbs. (29.9 kg)

359KXXXX (8/01)
Ad Stock #68656B

DEVOE HIGH PERFORMANCE COATINGS
Cleveland, Ohio, U.S.A.
800-654-2616
www.devoecoatings.com
ICI Devoe Coatings is a member of the ICI Paints World Group

HAZARDS IDENTIFICATION (ANSI Section 3)

Primary route(s) of exposure : Inhalation, skin contact, eye contact, ingestion.

Effects of overexposure :

Inhalation : Irritation of respiratory tract. Prolonged inhalation may lead to mucous membrane irritation, fatigue, drowsiness, dizziness and/or lightheadedness, headache, uncoordination, nausea, vomiting, chest pain, blurred vision, flu-like symptoms, coughing, difficulty with speech, central nervous system depression, anesthetic effect or narcosis, difficulty of breathing, allergic response, tremors, severe lung irritation or damage, liver damage, kidney damage, pneumoconiosis, loss of consciousness, respiratory failure, asphyxiation, death. Possible sensitization to respiratory tract.

Skin contact : Irritation of skin. Prolonged or repeated contact can cause dermatitis, defatting, blistering, severe skin irritation, severe skin irritation or burns. Possible sensitization to skin. Skin contact may result in dermal absorption of component(s) of this product which may cause drowsiness, dizziness and/or lightheadedness.

Eye contact : Irritation of eyes. Prolonged or repeated contact can cause conjunctivitis, blurred vision, tearing of eyes, redness of eyes, severe eye irritation, severe eye irritation or burns, corneal injury.

Ingestion : Ingestion may cause lung inflammation and damage due to aspiration of material into lungs, mouth and throat irritation, drowsiness, headache, nausea, vomiting, diarrhea, gastro-intestinal disturbances, abdominal pain, central nervous system depression, burns of the mouth, throat, stomach, severe irritation of the mouth, throat, stomach, liver damage, kidney damage, pulmonary edema, loss of consciousness.

Medical conditions aggravated by exposure : Eye, skin, respiratory disorders, asthma-like conditions, kidney disorders, liver disorders.

FIRST-AID MEASURES (ANSI Section 4)

Inhalation : Remove to fresh air. Restore and support continued breathing. Get emergency medical attention. Have trained person give oxygen if necessary. Get medical help for any breathing difficulty. Remove to fresh air if inhalation causes eye watering, headaches, dizziness, or other discomfort. Get medical attention if discomfort or irritation persists.

Skin contact : Wash thoroughly with soap and water. If any product remains, gently rub petroleum jelly, vegetable or mineral/baby oil onto skin. Repeated applications may be needed. Remove contaminated clothing. Wash contaminated clothing before re-use. If irritation occurs, consult a physician.

Eye contact : Flush immediately with large amounts of water, especially under lids for at least 15 minutes. If irritation or other effects persist, obtain medical treatment.

Ingestion : If swallowed, obtain medical treatment immediately.

FIRE-FIGHTING MEASURES (ANSI Section 5)

Fire extinguishing media : Dry chemical or foam water fog. Carbon dioxide. Closed containers may explode when exposed to extreme heat or fire. Vapors may ignite explosively at ambient temperatures. Vapors are heavier than air and may travel long distances to a source of ignition and flash back. Vapors can form explosive mixtures in air at elevated temperatures. Dust explosion hazard. May decompose under fire conditions emitting irritant and/or toxic gases.

Fire fighting procedures : Water may be used to cool and protect exposed containers. Firefighters should use full protective clothing, eye protection, and self-contained breathing apparatus. Self-contained breathing apparatus recommended.

Hazardous decomposition or combustion products : Carbon monoxide, carbon dioxide, oxides of nitrogen, oxides of sulfur, hydrogen cyanide, toxic gases, isocyanate, barium compounds. Acrylic monomers

ACCIDENTAL RELEASE MEASURES (ANSI Section 6)

Steps to be taken in case material is released or spilled : Comply with all applicable health and environmental regulations. Eliminate all sources of ignition. Ventilate area. Ventilate area with explosion-proof equipment. Spills may be collected with absorbent materials. Use non-sparking tools. Evacuate all unnecessary personnel. Place collected material in proper container. Complete personal protective equipment must be used during cleanup. Vacuum with grounded equipment. Large spills - shut off leak if safe to do so. Dike and contain spill. Pump to storage or salvage vessels. Use absorbent to pick up excess residue. Keep salvageable material and rinse water out of sewers and water courses. Small spills - use absorbent to pick up residue and dispose of properly.

HANDLING AND STORAGE (ANSI Section 7)

Handling and storage : Store below 80f. Keep away from heat, sparks and open flame.

Other precautions : Use only with adequate ventilation. Do not take internally. Keep out of reach of children. Avoid contact with skin and eyes, and breathing of vapors. Wash hands thoroughly after handling, especially before eating or smoking. Keep containers tightly closed and upright when not in use. Avoid conditions which result in formation of inhalable particles such as spraying or abrading (sanding) painted surfaces. If such conditions cannot be avoided, use appropriate respiratory protection as directed under exposure controls/personal protection. Empty containers may contain hazardous residues. Ground equipment when transferring to prevent accumulation of static charge.

EXPOSURE CONTROLS/PERSONAL PROTECTION (ANSI Section 8)

Respiratory protection : Respiratory protection is required for use in isocyanate containing environments. Consider type of application and environmental concentrations when selecting respiratory protection. Observe governmental regulations for respirator use. (29 CFR 1910.134(OSHA))(Canadian z94.4) The use of positive pressure supplied air respirator is mandatory when the airborne isocyanate concentrations are not known. Note: isocyanate based materials have been determined to cause allergic sensitization in humans. Avoid inhalation and dermal (skin) contact with the uncured material.

Ventilation : Provide dilution ventilation or local exhaust to prevent build-up of vapors. Use explosion-proof equipment. Use non-sparking equipment.

Personal protective equipment : Eye wash, safety shower, safety glasses or goggles. Impervious gloves, impervious clothing, apron.

STABILITY AND REACTIVITY (ANSI Section 10)

Under normal conditions : Stable see section 5 fire fighting measures

Materials to avoid : Oxidizers, acids, reducing agents, bases, halogens, amines, water, peroxides, nitric acid, alcohols, metal compounds, surface active materials. Nitrates.

Conditions to avoid : Elevated temperatures, moisture, contact with oxidizing agent, sparks, open flame, ignition sources.

Hazardous polymerization : Will not occur

TOXICOLOGICAL INFORMATION (ANSI Section 11)

Supplemental health information : Contains a chemical that may be absorbed through skin. Free diisocyanate may cause allergic reaction in susceptible persons. Notice - reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Other effects of overexposure may include toxicity to liver, kidney, lungs, central nervous system, blood.

Carcinogenicity : The international agency for research on cancer (IARC) has classified carbon black as possibly carcinogenic to humans (group 2b) based on sufficient evidence in animals and inadequate evidence in humans. The international agency for research on cancer (IARC) has evaluated ethylbenzene and classified it as a possible human carcinogen (group 2b) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. In a 2 year inhalation study conducted by the national toxicology program (NTP), ethylbenzene vapor at 750 ppm produced kidney and testicular tumors in rats and lung and liver tumors in mice. Genetic toxicity studies showed no genotoxic effects. The relevance of these results to humans is not known.

Reproductive effects : High exposures to xylene in some animal studies, often at maternally toxic levels, have affected embryo/fetal development. The significance of this finding to humans is not known.

Mutagenicity : No mutagenic effects are anticipated

Teratogenicity : No teratogenic effects are anticipated

ECOLOGICAL INFORMATION (ANSI Section 12)

No ecological testing has been done by ICI paints on this product as a whole.

DISPOSAL CONSIDERATIONS (ANSI Section 13)

Waste disposal : Dispose in accordance with all applicable regulations. Avoid discharge to natural waters.

REGULATORY INFORMATION (ANSI Section 15)

As of the date of this MSDS, all of the components in this product are listed (or are otherwise exempt from listing) on the TSCA inventory. This product has been classified in accordance with the hazard criteria of the CPR (controlled products regulations) and the MSDS contains all the information required by the CPR.

Physical Data (ANSI Sections 1, 9, and 14)

Product Code	Description	Wt. / Gal.	VOC gr. / ltr.	% Volatile by Volume	Flash Point	Boiling Range	HMIS	DOT, proper shipping name
359B2635	devthane 359 dtm high build gloss aliphatic urethane, flowserve gray	11.20	431.90	47.81	80 f	212-289	*330	paint, 3, UN1263, PGIII
359B3501	devthane 359 dtm high build gloss aliphatic urethane mastic - white base	11.70	410.20	45.03	80 f	147-295	230	paint, 3, UN1263, PGIII
359B3601	devthane 359 dtm high build gloss aliphatic urethane mastic - special white base	12.96	421.83	45.94	80 f	212-295	230	paint, 3, UN1263, PGIII
359B7460	devthane 359 dtm uva high build gloss aliphatic urethane mastic - architectural brn	12.68	371.26	41.05	80 f	147-263	*330	paint, 3, UN1263, PGIII
359B8912	devthane 359 dtm high build gloss aliphatic urethan - yellow	9.45	408.77	45.08	80 f	212-415	230	paint, 3, UN1263, PGIII
359B9400	devthane 359 dtm high build gloss aliphatic urethane, safety yellow	10.21	448.07	49.58	80 f	212-415	330	paint, 3, UN1263, PGIII
359B9500	devthane 359 dtm high build gloss aliphatic urethane mastic - white tint base	10.91	404.33	44.65	80 f	147-263	230	paint, 3, UN1263, PGIII
359B9501	devthane 359 dtm high build gloss aliphatic urethane mastic - deep tint base	10.95	401.82	44.34	80 f	212-263	230	paint, 3, UN1263, PGIII
359B9502	devthane 359 dtm high build gloss aliphatic urethane mastic - neutral tint base	10.98	411.16	45.45	80 f	147-263	230	paint, 3, UN1263, PGIII
359C0910	devthane 359 high build gloss alphatic urethane - converter	8.85	265.67	29.30	80 f	n/d	*331	resin solution,3,UN1866,PGIII

Ingredients Product Codes with % by Weight (ANSI Section 2)

Chemical Name	Common Name	CAS. No.	359B2635	359B3501	359B3601	359B7460	359B8912	359B9400	359B9500	359B9501	359B9502	359C0910
benzene, ethyl-	ethylbenzene	100-41-4		.1-1.0		.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	
2-propanol, 1-methoxy-, acetate	propylene glycol monomethyl ether	108-65-6		1-5	5-10							
ethane, 1,1',1"-methylidenetris(oxy)-tris-	ethyl orthoformate	122-51-0			1-5							
acetic acid, butyl ester	butyl acetate	123-86-4	30-40	20-30	10-20	20-30	30-40	30-40	20-30	20-30	20-30	10-20
benzene, dimethyl-	xylene	1330-20-7	.1-1.0	.1-1.0	1-5	.1-1.0	1-5	1-5	.1-1.0	.1-1.0	.1-1.0	10-20
iron oxide	iron oxide	1332-37-2				1-5						
carbon black	carbon black	1333-86-4	.1-1.0			1-5						
titanium oxide	titanium dioxide	13463-67-7	10-20	20-30	20-30	1-5	1-5	1-5	10-20	5-10		
butanamide, 2-((4-chloro-2-nitrophenyl)azo)-n-(2-methoxyphenyl)-3-oxo-	c.i. pigment yellow 73	13515-40-7					5-10					
hexane, 1,6-diisocyanato-, homopolymer	aliphatic polyisocyanate	28182-81-2										70-80
c.i. pigment yellow 42	yellow iron oxide	51274-00-1	1-5			1-5						
butanamide, 2-((2-methoxy-4-nitrophenyl)azo) -n-(2-methoxyphenyl)-3-oxo-	pigment yellow 74	6358-31-2						1-5				
ethanol	ethyl alcohol	64-17-5		.1-1.0		.1-1.0			.1-1.0	.1-1.0	.1-1.0	
butanamide, 2-((4-methoxy-2-nitrophenyl)azo))- n-(2-methoxyphenyl)-3-oxo-	yellow pigment	6528-34-3					1-5					
rosin, polymerized	rosin, polymerized	65997-05-9						.1-1.0				
sulfuric acid, barium salt	barium sulfate	7727-43-7	10-20	10-20	20-30	30-40	5-10	10-20	10-20	20-30	30-40	

Ingredients (Continued)

Product Codes with % by Weight (ANSI Section 2)

Chemical Name	Common Name	CAS. No.	359B2635	359B3501	359B3601	359B7460	359B8912	359B9400	359B9500	359B9501	359B9502	359C0910
hexane, 1,6-diisocyanato-	hexamethylene diisocyanate	822-06-0										1-5
benzene,1,2,4-trimethyl-	pseudocumene	95-63-6		.1-1.0		.1-1.0			.1-1.0	.1-1.0	.1-1.0	
polysiloxane defoamer	polysiloxane defoamer	Sup. Conf.	1-5				1-5					
acrylic resin	acrylic resin	Sup. Conf.	20-30	30-40	20-30	20-30	30-40	30-40	30-40	30-40	30-40	
vegetable oil derivative	anti-settling additive	Sup. Conf.			1-5							
trade secret	trade secret	Sup. Conf.				1-5						

Chemical Hazard Data

(ANSI Sections 2, 8, 11, and 15)

		ACGIH-TLV				OSHA-PEL				S.R. Std.	S2	S3	CC	H	M	N	I	O
Common Name	CAS. No.	8-Hour TWA	STEL	C	S	8-Hour TWA	STEL	C	S									
ethylbenzene	100-41-4	100 ppm	125 ppm	not est.	not est.	100 ppm	not est.	not est.	not est.	not est.	n	y	y	y	n	n	y	n
propylene glycol monomethyl ether	108-65-6	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
ethyl orthoformate	122-51-0	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
butyl acetate	123-86-4	150 ppm	200 ppm	not est.	not est.	150 ppm	not est.	not est.	not est.	not est.	n	n	y	n	n	n	n	n
xylene	1330-20-7	100 ppm	150 ppm	not est.	not est.	100 ppm	not est.	not est.	not est.	not est.	n	y	y	y	n	n	n	n
iron oxide	1332-37-2	5 mg/m3	not est.	not est.	not est.	10 mg/m3	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
carbon black	1333-86-4	3.5 mg/m3	not est.	not est.	not est.	3.5 mg/m3	not est.	not est.	not est.	not est.	n	n	n	n	n	n	y	n
titanium dioxide	13463-67-7	10 mg/m3	not est.	not est.	not est.	10 mg/m3	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
c.i. pigment yellow 73	13515-40-7	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
aliphatic polyisocyanate	28182-81-2	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
yellow iron oxide	51274-00-1	5 mg/m3	not est.	not est.	not est.	10 mg/m3	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
pigment yellow 74	6358-31-2	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
yellow pigment	6528-34-3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
rosin, polymerized	65997-05-9	5 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
barium sulfate	7727-43-7	10 mg/m3	not est.	not est.	not est.	5 mg/m3	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
hexamethylene diisocyanate	822-06-0	0.005 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	y	y	y	n	n	n	n
polysiloxane defoamer	Sup. Conf.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
anti-settling additive	Sup. Conf.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
trade secret	Sup. Conf.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n

Footnotes:

C=Ceiling - Concentration that should not be exceeded, even instantaneously.

S=Skin - Additional exposure, over and above airborn exposure, may result from skin absorption.

n/a=not applicable
not est=not established
CC=CERCLA Chemical

ppm=parts per million
mg/m3=milligrams per cubic meter
Sup Conf=Supplier Confidential

S2=Sara Section 302 EHS
S3=Sara Section 313 Chemical
S.R.Std.=Supplier Recommended Standard

H=Hazardous Air Pollutant, M=Marine Pollutant
P=Pollutant, S=Severe Pollutant
Carcinogenicity Listed By:
N=NTP, I=IARC, O=OSHA, y=yes, n=no

AMERON
INTERNATIONAL
Performance Coatings & Finishes

PSX® 1001

Single pack acrylic polysiloxane

Product Data/ Application Instructions

- Single component
- Non-isocyanate
- High-gloss topcoat
- Excellent gloss retention
- Unlimited recoat window
- High solids, low VOC
- Ease of application, brush, roll and spray

Typical Uses

PSX 1001 provides a polyurethane-like finish, in one component, without the isocyanate, as well as better weathering than a standard aliphatic polyurethane.

Used with Amercoat 1000 primer to give a high performance maintenance system with the ease of single pack application.

PSX 1001 is compatible with epoxy, alkyds and other types of primers, **it should not be used with Amercoat 385**.

Application Equipment

The following is a guide; suitable equipment from other manufacturers may be used. Changes in pressure, hose and tip size may be needed for proper spray characteristics.

Conventional spray – Industrial equipment, such as DeVilbiss, MBC or JGA spray gun. Separate regulators for air and fluid pressure, mechanical pot agitator and a moisture and oil trap in the main air supply line are recommended.

Airless spray – Standard equipment such as Graco, DeVilbiss, Nordson, Spee-Flo or others having 28:1 or higher pump ratio and fluid tip with a 0.013- to 0.017-inch orifice.

Brush – Natural bristle. Maintain a wet edge.

Roller – Industrial roller. Level any air bubbles with bristle brush.

Surface Preparation

Prior to coating, all surfaces must be undamaged, clean, dry and free of all contaminants, including salt deposits.

See specific primer.

Application Procedure

1. Flush all equipment with Amercoat 911 or Amercoat 12 before use.
2. Mix to a uniform consistency.
3. If needed for workability, thin with Amercoat 911 up to ½ pint per gallon.
4. Apply a wet coat in even, parallel passes, overlap each pass 50 percent to avoid holidays, bare areas and pinholes. If required, follow with a cross spray at right angles to first pass.
5. Clean all equipment with Amercoat 911 or Amercoat 12 immediately after use.

Physical Data

Finish	Gloss
Color	See Ameron standard Industrial and Marine color charts

Yellow, red and orange colors will fade faster than other colors due to the replacement of lead-based pigments with lead-free pigments in these colors.

Components	1
Curing mechanism	Chemical reaction, solvent evaporation
Volume solids (calculated)	55 ± 3%
Dry film thickness per coat	2 to 3 (50 to 75 microns)
Coats	1 or 2

Uniform appearance may require two coats over contrasting primer colors.

Theoretical coverage	ft^2/gal	m^2/L
1 mil (25 microns)	882	21.7
2 mils (50 microns)	441	10.8
	lb/gal	g/L
VOC	3.2	384

Flash point (SETA)	°F	°C
PSX 1001	66	19
Amercoat 911	81	27
Amercoat 12	2	-17

Application Data

Applied over	Primed steel: Amercoat 180, 230, 235, 235ER, 370, 1000, or Amerlock® 400.
Surface preparation	See specific primer.
Method	Airless or conventional spray
Environmental conditions	

Temperature	°F	°C
air	40 to 110	4 to 43
surface	40 to 120	4 to 43

Relative humidity 20% to 90%

Surface temperatures must be at least 5°F (3°C) above dew point to prevent condensation.

Drying time (hours)	°F/°C			
	120/49	90/32	70/21	50/10
touch	½	1	2	3
through	3	8	12	24
Topcoat				
minimum (hours)				
Amercoat 180	1	2	2 ½	4
Amercoat 370	¼	½	1	3
Amercoat 1000	1	2	2	4
Amerlock 400	3	7	14	28
Topcoat				
maximum (days)				
Amercoat 180			None	
Amercoat 370	--	--	30	--
Amercoat 1000			None	
Amerlock 400	--	--	30	--
Recoat				
minimum (hours)	½	2	4	12
maximum (hours)	None	None	None	None
Thinner	Amercoat 911			
Equipment cleaner	Amercoat 911 or Amercoat 12			

Formerly Amercoat 3448

Temperature Resistance (Dry)	°F	°C
continuous	200	93
intermittent	250	121

See temperature limits for primer or coating used as first coat.

Safety Precautions

Read material safety data sheet before use. Safety precautions must be strictly followed during storage, handling and use.

CAUTION – Improper use and handling of this product can be hazardous to health.

Do not use this product without first taking all appropriate safety measures to prevent property damage and injuries. These measures may include, without limitation: implementation of proper ventilation, use of proper lamps, wearing of proper protective clothing and masks, tenting and proper separation of application areas. Consult your supervisor. Proper ventilation and protective measures must be provided during application and drying to keep spray mist concentrations within safe limits and to protect against toxic hazards. Necessary safety equipment must be used and ventilation requirements carefully observed, especially in confined or enclosed spaces, such as tank interior and buildings.

This product is to be used by those knowledgeable about proper application methods. Ameron makes no recommendation about the types of safety measures that may need to be adopted because these depend on application environment and space, of which Ameron is unaware and over which it has no control.

If you do not fully understand these warnings and instructions or if you cannot strictly comply with them, do not use the product.

Note: Consult Code of Federal Regulations Title 29, Labor, parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable federal, state and local regulations on safe practices in coating operations.

This product is for industrial use only. Not for residential use in California.

Shipping Data

Packaging	1 gal	5 gal
Shipping weight (approx)	lb	kg
1-gal can	12.6	5.7
5-gal can	62	28.2

Shelf life when stored indoors at 40 to 100°F (4 to 38°C) 1 years from date of manufacture.

Numerical values are subject to normal manufacturing tolerances, color and testing variances. Allow for application losses and surface irregularities. See application instructions for complete information and safety precautions.The product is photochemically reactive as defined by the South Coast Air Quality Management District's Rule 102 or equivalent regulations.

Warranty

Ameron warrants its products to be free from defects in material and workmanship. Ameron's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at Ameron's option, to either replacement of products not conforming to this Warranty or credit to Buyer's account in the invoiced amount of the nonconforming products. Any claim under this Warranty must be made by Buyer to Ameron in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life, or one year from the delivery date, whichever is earlier. Buyer's failure to notify Ameron of such nonconformance as required herein shall bar Buyer from recovery under this Warranty.

Ameron makes no other warranties concerning the product. No other warranties, whether express, implied, or statutory, such as warranties of merchantability or fitness for a particular purpose, shall apply. In no event shall Ameron be liable for consequential or incidental damages.

Any recommendation or suggestion relating to the use of the products made by Ameron, whether in its technical literature, or in response to specific inquiry, or otherwise, is based on data believed to be reliable; however, the products and information are intended for use by Buyers having requisite skill and know-how in the industry, and therefore it is for Buyer to satisfy itself of the suitability of the products for its own particular use and it shall be deemed that Buyer has done so, at its sole discretion and risk. Variation in environment, changes in procedures of use, or extrapolation of data may cause unsatisfactory results.

Limitation of Liability

Ameron's liability on any claim of any kind, including claims based upon Ameron's negligence or strict liability, for any loss or damage arising out of, connected with, or resulting from the use of the products, shall in no case exceed the purchase price allocable to the products or part thereof which give rise to the claim. **In no event shall Ameron be liable for consequential or incidental damages.**

AMERON INTERNATIONAL

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AMERON
Coatings

M. S. D. S.
Material Safety Data Sheet

1001S20130

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : PSX 1001 PEARL GRAY
IDENTIFICATION NUMBER: 1001S20130
PRODUCT CLASS : ACRYLIC MODIFIED POLYSILOXANE PATENT NO. 5,275,645
HEALTH : WARNING HMIS/NFPA : H2F3R0

Ameron International
Protective Coatings Group
201 North Berry St.
Brea, CA 92821

EMERGENCY:800-424-9300 (ChemTrec)
24 Hours Emergency Hotline

INFORMATION: William B. Dances, PHONE: 714-529-1951 PREPARE DATE: 06/06/02
PREVIOUS REVISION DATE: 05/14/02

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	+ TITANIUM DIOXIDE (As TiO2 trace contaminants 2.5% aluminum hydroxide 3% amorphous silica)	13463-67-7	20.0 %
02	XYLENE (STEL 150ppm; Ceiling 300ppm; trace contaminant benzene**# @<10ppm, toluene#<1%)	1330-20-7	13.60 %

(HAPS, SARA, CERCLA)

03 PROPRIETARY PROPRIETARY 15.0 %
(Methanol, hydrolysis generated, 250 ppm ceiling)
04 Acrylic resin Mixture 15.0 %
05 ALUMINO SILICATE 37244-96-5 15.0 %

06 Acrylic resin Mixture 10.0 %
07 HIGH FLASH NAPHTHA 64742-95-6 5.10 %
(Mfg TLV 50ppm; trace contaminant benzene**#<1ppm SARA, toluene#<0.1%SARA)

08 1,2,4-Trimethyl benzene 95-63-6 3.80 %

(SARA)

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
09	ETHYL BENZENE ACGIH: A3 IARC: 2B (STEL 125ppm)	100-41-4	3.20 %

(HAPS, SARA, CERCLA)
10 PROPRIETARY PROPRIETARY 5.0 %
(Methanol [SARA] @ 3%; additional may be produced upon hydrolysis)

(CERCLA)
11 PROPRIETARY PROPRIETARY 5.0 %
(Trace contaminant toluene# @<10ppm, ethanol 0.5%)

12 PROPRIETARY PROPRIETARY 5.0 %
(Trace contaminant toluene# <0.5% HAPS)

	EXPOSURE LIMITS					
	ACGIH		OSHA		VP	TOXICITY
	TLV-TWA	TLV-TWA	PEL-TWA	PEL-TWA	mmHg	LD50 LC50

ITEM	ppm	Mg/M3	ppm	Mg/M3	@68F	g/kg	ppm
01	dna	5.0	dna	5.0	N.A.	10.000	6820.000
02	100	434	100	435	6.6	3.900	6700.000
03	dna	dna	dna	dna	N.A.	dna	dna
04	dna	dna	dna	dna	N.A.	dna	dna
05	dna	3.0	dna	5.0	N.A.	dna	dna
06	dna	dna	dna	dna	6.4	dna	dna
07	dna	dna	100	dna	2.7	3.100	3670.000
08	25.0000	125.00	25.000	125.000	1.0	dna	dna
09	100	434	100	435	7.1	dna	dna
10	dna	dna	dna	dna	N.A.	dna	dna
11	dna	dna	dna	dna	N.A.	1.700	dna
12	dna	10.0	dna	5.0	N.A.	dna	dna

REGULATORY: + Pigment content is dependent on color. **CALIF.TITLE 26:22-12000 (PROP 65). WARNING: This product contains a chemical known to the State of California to cause cancer. #CALIF.TITLE 26:22-12000 (PROP 65). WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. All ingredients are on TSCA inventory or are exempt. Toxic chemicals marked (SARA, CERCLA, HAPs) are subject to reporting requirements of SARA (40CFR 355 and 372), CERCLA (40CFR 302), or

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

HAPs (40CFR 63).

(S)=Skin; LD50=Dermal.rabbit; LC50=Inhalation,rat; dna=data not available; na=not applicable

SECTION 3 - HAZARDS IDENTIFICATION

EXPOSURE EFFECTS: Vapor or spray mist or spattered material can be harmful. Irritating to eyes, skin, and if inhaled; to nose and throat. Excessive or prolonged inhalation can cause headache, nausea or dizziness. Repeated and prolonged occupational overexposure to solvents is associated with permanent brain and nervous system damage. Intentional abuse, misuse or other massive exposure to solvents may cause multiple organ damage and/or death.

OVER-EXPOSURE (prolonged or repeated use): CAN AGGRAVATE OR ACCENTUATE ANY
OF THESE EFFECTS.

SKIN: Irritant. Burns. Can be absorbed through skin. Can cause

defatting and drying of skin.

INHALATION: Irritant. Lung injury. Central nervous system damage. Chemical pneumonia. Xylene or toluene may cause irregular heart beat.

EYES: Severe irritant. Corneal injury. Irreversible burns and damage. Methanol, if swallowed, can cause eye damage and blindness. DO NOT wear contact lenses when using this material.

INGESTION: Can be fatal if swallowed. Aspiration into lungs can damage lungs and cause chemical pneumonia. Can cause burns.

TARGET ORGANS: Kidneys. Liver. Lungs. Heart. Skin. Eyes. Stomach. Central nervous system. Fetal defects.

MEDICAL CONDITIONS AGGRAVATED: Kidneys. Liver. Skin. Eyes. Respiratory. Lungs.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INHALATION INGESTION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID PROCEDURES: INHALATION: Remove to fresh air. Restore normal breathing. Treat symptomatically. See physician. SKIN: Wash thoroughly with soap and water. Remove contaminated clothing.Consult physician if irritation persists. EYES: Flush immediately with plenty of water for at least 15 minutes and get medical attention. INGESTION: Drink 1 or 2 glasses

SECTION 4 - FIRST AID MEASURES

of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting. Consult physician or poison control center IMMEDIATELY. Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 66 F (SETA) LOWER EXPLOSIVE LIMIT: 1.0 %
UPPER EXPLOSIVE LIMIT: 7.0 %

FLAMMABILITY - OSHA: FLAMMABLE - CLASS IB
DOT: FLAMMABLE

EXTINGUISHING MEDIA: FOAM CO2 DRY CHEMICAL

LOWEST FLASHING SOLVENT: 100-41-4

UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may explode when exposed to extreme heat and pressure buildup. May produce a floating fire hazard. Isolate from electrical equipment, sparks, heat and open flame. Vapors may spread long distances, cause flash fire or ignite explosively.

FIREFIGHTING PROCEDURES: Wear full protective equipment, self-contained breathing apparatus. Water may be used to cool closed containers to prevent pressure build-up or explosion when exposed to extreme heat.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL, LEAKS: Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Use absorbent, inert cleanup materials. (DO NOT use sawdust.) Remove absorbent material with non-sparking tools. Place in separate container. Keep out of sewers and waterways. If entry is threatened or occurs, notify local authorities.

SECTION 7 - HANDLING AND STORAGE

HANDLING AND STORAGE: Keep container closed, upright when not in use. Store in cool, dry, well-ventilated area. Avoid prolonged storage temperatures above 100F. Use caution when pouring. Avoid breathing sanding dust. Do not weld or flame cut on empty container.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION: Implement administrative and engineering controls to reduce exposure. Provide sufficient ventilation in volume and pattern to keep air contaminant concentrations below the TLV limits. Remove welding or flame cutting decomposition products; follow current,ANSI Z49.1,"Safety in Welding and Cutting". Refer to 29 CFR parts 1910 and 1915, for coating operations; part 1910.146, Confined Spaces.

RESPIRATORY PROTECTION: Wear NIOSH/MSHA certified respirator designed to remove a combination of particulates (dust or spray mist) and vapor. When brushing, rolling or spreading; select the appropriate respiratory protection for the conditions. For specific conditions, refer to current

"NIOSH Pocket Guide to Chemical Hazards". In confined or restricted ventilation areas use air-line respirators or hoods. Refer to 29 CFR, OSHA parts 1910.134 and 1915 for coating operations;part 1910.146 Confined Spaces;ANSI Z88.2,Practices for Respiratory Protection; 42 CFR, part 84 Particulate Respirators.

PROTECTIVE CLOTHING AND EQUIPMENT: Dependent upon application method, wear resistant coveralls, gloves and shoe coverings to prevent skin contact. Wear solvent resistant glasses with splash guards or face shield to protect eyes from splash, spatter and/or spray mist.Consult 29 CFR 1910.132, 133, 136, 138; ANSI Z87.1, Z41. Use explosion and spark-proof equipment.

HYGIENIC PRACTICES: Wash thoroughly after handling and before eating, smoking or using toilet. Launder contaminated clothing before use. Destroy contaminated leather and absorbent shoes, which cannot be decontaminated, to prevent reuse.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE : 212 - 336 F VAPOR DENSITY : Is heavier than air
ODOR : SOLVENT WEIGHT PER GAL : 10.6756
APPEARANCE : LIQUID EVAPORATION RATE: Is slower than Butyl
SOLUBILITY IN H2O : NO Acetate
MIXED VOC, G/L : 384 MIXED THINNED VOC, G/L : 413
THINNER : 911 @ 0.5 pints PHOTOCHEMICALLY REACTIVE: Yes
VOLATILE VOLUME % : 41.12

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Heat, open flame, arc or sparks. Water or moisture. High temperatures.

INCOMPATIBILITY: Strong oxidizers, acids and alkalies. Water.

HAZARDOUS DECOMPOSITION PRODUCTS: (BY FIRE, BURNING OR WELDING); CO, CO2. NOx. Aldehydes. Acrylic monomer fumes. Silicon oxide fumes. Methanol.

SECTION 10 - STABILITY AND REACTIVITY

Toxic gases or fumes. Formaldehyde at temperatures above 300F (150C).

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

TOXICOLOGICAL PROPERTIES: See Section 2.

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

EPA Waste No.: D001

DISPOSAL METHOD: Place in separate, appropriate, closed container in accordance with all applicable local, State, and Federal regulations. This material has NOT been tested by Toxicity Characteristic Leaching Procedure (TCLP).

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Paint

DOT HAZARD CLASS: 3 HAZARD SUBCLASS: NA

DOT UN/NA NUMBER: 1263 IMO: NA PACKING GROUP : II

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

SECTION 15 - REGULATORY INFORMATION

NEW JERSEY RIGHT-TO-KNOW:
The following materials are non-hazardous, but are among the top five components in this product:

---------- CHEMICAL NAME ---------- CAS NUMBER
No non-hazardous materials are among the top five ingredients.

PENNSYLVANIA RIGHT-TO-KNOW:
The following non-hazardous ingredients are present in the product at greater than 3%:

---------- CHEMICAL NAME ---------- CAS NUMBER
No non-hazardous ingredients are present at greater than 3%.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

SECTION 16 - OTHER INFORMATION

NOTICE: Removal of old lead paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For additional information, contact the USEPA/Lead Information Hotline at 1-800-424-LEAD.

product data

carboline®

Carboxane 2000

Selection & Specification Data

Generic Type	Modified Siloxane Hybrid
Description	Carboxane 2000 is a premium, ultra-durable coating that provides outstanding gloss and color retention for exterior exposures. Carboxane 2000 combines the chemical resistant properties of epoxies with the weathering characteristics of acrylic-polyurethanes. This tightly cross-linked film results in a finish with outstanding barrier properties and weathering performance that far exceeds polyurethanes.
Features	▪ Exceptional weatherability ▪ Long life performance ▪ Outstanding gloss/color retention ▪ VOC compliant ▪ Excellent abrasion resistance ▪ Isocyanate free ▪ Flexible Film
Color	Refer to Carboline Color Guide
Finish	Gloss
Primers	Compatible with inorganic and organic zinc rich primers, epoxies and others as recommended by Carboline Technical Service
Dry Film Thickness	3 - 7 mils (75 -175 microns) depending on application.
Solids Content	By Volume: 75%
Theoretical Coverage Rates	1203 mil ft² (30 m²/l at 25 microns) Allow for loss in mixing and application
VOC Values (calculated)	As supplied: 1.8 lbs/gal (216 g/l) mixed Thinned: 13 oz/gal w/ #10 2.29 lbs/gal (275 g/l) These are nominal values and may vary with color.
Dry Temp. Resistance	Continuous: 200°F (93°C) Non-Continuous: 250°F (121°C)

Substrates & Surface Preparation

General	Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating. Refer to specific primer's Product Data Sheet for detailed requirements of the specified primer.
Steel	SSPC-SP6 with a 1.5-2.5 mil (37.5-62.5 micron) surface profile for maximum protection. SSPC-SP2 or SP3 as minimum requirement. Prime with recommended primer.
Galvanized Steel or Aluminum	SSPC-SP1 and prime with specific Carboline primers as recommended by your Carboline sales representative.

Carboxane 2000

Application Equipment

Listed below are the general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.
General Guidelines:

Spray Application This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers such as Binks, Devibiss and Graco.

Airless Spray Application

Pump Ratio:	30:1 (min.)	
Volume Output:	2.5 gpm min.	11.5 l/min min.
Material Hose:	½" I.D. min.	12.5mm min.
Tip Size:	0.017-0.021"	0.43-0.53mm
Output Pressure:	1500-2000 psi	105-140kg/cm²

Brush & Roller Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive re-brushing or re-rolling.

Brush Use a medium natural bristle brush.

Roller Use a short to medium-nap mohair roller cover with phenolic core.

Mixing & Thinning

Mixing Power mix Part A separately. Part B requires no mixing. Then combine power mix.
DO NOT MIX PARTIAL KITS.

Ratio 2.2:1 Part A: Part B by volume.

Thinning Not normally required. May be thinned up to 10% (13 oz/gal) with Thinner #10.

Pot Life 8 hours at 75°F (23°C) and less at higher temperatures.

Material is moisture sensitive. If left uncovered for extended periods or under very high humidity conditions, check for and remove any skinning that may occur.

Cleanup & Safety

Cleanup Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Cleanup & Safety (Cont.)

Ventilation When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.

Application Conditions

Condition	Material	Substrate	Ambient	Humidity
Optimum	60°F – 80°F (16°C –27°C)	50°F-86°F (10°C-30°C)	50°F-86°F (10°C-30°C)	40-85%
Minimum	50°F (10°C)	35°F (4°C)	35°F (4°C)	20%
Maximum	90°F (32°C)	110°F (43°C)	110°F (43°C)	90%

Industry standards are for substrate temperatures to be 5°F (3°C) above the dew point. Protect from high humidity, dew and direct moisture contact until fully cured. Application and/or curing in humidities above maximum, or exposure to moisture from rain or dew may result in a loss of gloss and/or staining of the product.

Curing Schedule

Temperature @ 50% RH	Touch Dry	Time to Recoat (minimum)	Hard Cure*
35°F (2°C)	8 hours	24 hours	30 hours
60°F (14°C)	2.5 hours	12 hours	24 hours
75°F (24°C)	2 hours	6 hours	18 hours

These times are based on recommended coverage rates. Curing under low humidity conditions will extend times.
*Fingernail hard

Packaging, Handling & Storage

Shipping Weight (Approximate) 1 Gallon kit: 13 lbs (6 kg); 5 Gallon Kit: 67 lbs (30 kg)

Flash Point (Setaflash)

Part A:	96°F (36°C)
Part B:	75°F (24°C)
Thinner 10:	83°F (28°C)
Thinner 2:	23°F (-5°C)

Storage (General) Store Indoors. **KEEP DRY**

Storage Temperature & Humidity 40 -110°F (4°C-43°C)
0-90% Relative Humidity

Shelf Life

Part A:	12 months at 76°F (24°C)
Part B:	12 months at 76°F (24°C)

***Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.**

carboline®
350 Hanley Industrial Court, St. Louis, MO 63144-1599
314/644-1000 314/644-4617 (fax) www.carboline.com
An RPM Company

December 2002 replaces November 2002

SECTION I - PRODUCT: CARBOXANE 2000 PART A (2000A1NL)
Date: 01/09/03 Replaces 11/07/02
(aka ACF PF 2000 EPOXY PRIMER PT A)
CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
COLOR PIGMENT	MIXTURE	40%	3.5MG/M3	NE	NE
PROPRIETARY	PROPRIETARY	5%	.1 MG/M3	NE	NE
METHYL N-AMYL KETONE	110-43-0	5%	50 PPM	100 PPM	NE

CHEMICAL NAME	HAZARDOUS INGREDIENTS (F)	ADDITIONAL DATA (G)
COLOR PIGMENT	NOT AVAILABLE	NO/YES
PROPRIETARY	NOT AVAILABLE	NO/NO/1,2
METHYL N-AMYL KETONE	1670 MG/KG RAT ORAL 12.6 ML/KG RABBIT DERMAL	NO/NO/3

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B2 -- D2A -- D2B
HMIS/NFPA CLASSIFICATION: HEALTH 1, FLAMMABILITY 3, REACTIVITY 0, PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 300F(148C)-300F(148C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 3 %. VOLATILE BY VOLUME: 6 %. PRODUCT WT/GAL: 12.6 LBS/U.S.GAL. 1.51 sp gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 96 F(35C) (Setaflash) LEL 1.1 % UEL 7.9 %.
OSHA-FLAMMABLE LIQUID/OSHA/CLASS/1C, DOT-PAINT,3,UN1263,PGIII, CANADIAN TDGA: PAINT,3,UN1263,PGIII
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.
FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate. Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear

conductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation.
CONTACT: Can cause eye burns. Can cause skin burns.
INGESTION: May be fatal if swallowed.
NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: If you have a condition that could be aggravated by exposure to dust or organic vapors see a physician prior to use.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.
HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Monoxide, Nitrogen Oxides, and unid entified organic compounds. Under the effect of humidity, water, and protic agents, : Methanol can be formed. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting, or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, Sparks, Open Flames, and Moisture. Product reacts slowly with water to form methanol.
INCOMPATIBILITY: Reaction with water or other aqueous media, including humidity in the air, will result in the formation of methanol. The OSHA PEL and ACGIH TWA exposure limit for methanol is 200 ppm.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent

material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to ensure all personnel are below guidelines. If not sure, or not able to monitor, use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.
VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.
OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
PROPRIETARY	PROPRIETARY	40%
PROPRIETARY	PROPRIETARY	15%
PROPRIETARY	PROPRIETARY	10%
THICKENER	NE	5%

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

SECTION I - PRODUCT: CARBOXANE 2000 PART B (2000B1NL)
Date: 12/18/02 Replaces 11/06/02

CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
PROPRIETARY	PROPRIETARY	20%	NE	NE	NE
XYLENE	1330-20-7	20%	100 PPM	150 PPM	NE
PM SOLVENT	107-98-2	5%	100 PPM	150 PPM	NE
ETHYL BENZENE	100-41-4	4%	100 PPM	125 PPM	NE

CHEMICAL NAME	HAZARDOUS INGREDIENTS (F)	ADDITIONAL DATA (G)
PROPRIETARY	NOT AVAILABLE	NO/NO/1,2
XYLENE	4300MG/KG RAT,ORAL 15000 PPM/4HRS RAT,INHALATION	NO/YES/1,2,3/ 1000#/U239
PM SOLVENT	>5180 MG/KG, ORAL, RAT 10000 PPM/4HRS RAT,INHALATION	NO/NO/1,2,3
ETHYL BENZENE	NOT AVAILABLE	NO/YES/1,2,3/ 1000#

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B2 -- D2A -- D2B -- E
HMIS/NFPA CLASSIFICATION: HEALTH 3, FLAMMABILITY 3, REACTIVITY 2, PERSONAL PROTECTION CODE H, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 248F(120C)-284F(140C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 25 %. VOLATILE BY VOLUME: 28 %. PRODUCT WT/GAL: 8.4 LBS/U.S.GAL. 1.01 sp gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 75 F(23C) (Setaflash) LEL 1.0 % UEL 16.0 %.
OSHA-FLAMMABLE LIQUID,OSHA,CLASS 1C, DOT-FLAMMABLE LIQUID,CORROSIVE,NOS*,3,UN2924,PGIII(8), CANADIAN TDGA: FLAMMABLE LIQUID,CORROSIVE,NOS*,3,UN2924,PGIII(8)
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide. This material is reactive with water, but the reaction will not significantly increase the fire severity.
FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate.

PRODUCT: CARBOXANE 2000 PART B (2000B1NL)
Date: 12/18/02 Replaces 11/06/02

Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flame and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wearconductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation. High vapor concentrations may cause a burning sensation in the throat and nose, stinging and watering in the eyes. At concentrations which cause irritation, dizziness, faintness, drowsiness, nausea and vomiting may also occur.
CONTACT: Can cause eye burns. Prolonged or widespread contact may result in absorption of potentially harmful amounts of material. May lead to kidney damage. Can cause skin burns.
INGESTION: Toxic. Causes irritation or chemical burns of the mouth, throat, esophagus, and stomach. There may be discomfort or pain in the mouth, throat, chest, and abdomen, with difficulty in swallowing, nausea, vomiting, diarrhea, weakness, thirst, dizziness, faintness, drowsiness, headache, decreased awareness and responsiveness, euphoria, staggering gait, lack of coordination, shortness of breath, loss of consciousness and death.
NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: May aggravate an existing kidney disease, an existing liver disease. Skin contact may aggravate an existing dermatitis.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.
HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of Carbon, Oxides of Nitrogen, Oxides of Silicon. Consider all smoke and fumes from burning material as

very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, sparks, and open flames.
INCOMPATIBILITY: Reaction with water or other aqueous media, including humidity in the air, is rapid and exothermic. The addition of small amounts of water (in the range of 2 - 15%) can produce an exothermic reaction which generates ethanol, to the extent that the resulting solution can reach a temperature which exceeds the flashpoint of the new solution. If a water solution is desired, add the product to water, and not vice versa. The TLV for ethanol is 1000 PPM.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to ensure all personnel are below guidelines. If not sure, or not able to monitor, use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.
VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Do not swallow. Do not get in eyes, on skin or on clothing. Avoid breathing vapor and mist. Use with adequate ventilation. Wash thoroughly after handling. Keep away from heat, sparks, and open flame. Keep containers closed. Store in a cool, dry place

with adequate ventilation.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

CARBOLINE CO. MATERIAL SAFETY DATA SHEET
PRODUCT: CARBOXANE 2000 PART B (2000B1NL)
Date: 12/18/02 Replaces 11/06/02

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
PROPRIETARY	PROPRIETARY	60%

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

Interfine® 878

Polysiloxane

Surface Preparation

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:1992.

Primed Surfaces

Interfine 878 should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination, and Interfine 878 must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. SSPC-SP6 or Sa2½ (ISO 8501-1:1988), Abrasive Blasting, or SSPC-SP11, Power Tool Cleaning) and patch primed prior to the application of Interfine 878.

Application

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

5 parts : 1 part by volume

Working Pot Life

41°F (5°C)	59°F(15°C)	77°F (25°C)	104°F (40°C)
3½ hours	2½ hours	2 hours	1½ hours

Airless Spray

Recommended

- Tip range 11-17 thou (0.28-0.43 mm)
- Total output fluid pressure at spray tip not less than 2,200 p.s.i. (155 kg/cm^2)

Air Spray (Pressure Pot)

Recommended

Gun	DeVilbiss MBC or JGA
Air Cap	704 or 765
Fluid Tip	E

Brush

Suitable - Small Areas Only

Typically 1-2 mils (25-50 microns) can be achieved

Roller

Suitable

Typically 2-3 mils (50-75 microns) can be achieved

Thinner

International GTA007

Do not thin more than allowed by local environmental legislation.

Cleaner

International GTA007

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA007. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages, work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA007. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

Interfine® 878

Polysiloxane

Product Characteristics

The technology utilized in Interfine 878 is covered by patent (US 6,281,321 and EP 0 941290).

Level of sheen and surface finish is dependent on application method. Avoid using a mixture of application methods whenever possible. Best results in terms of gloss and appearance will always be obtained with conventional air spray application.

For brush and roller applications, and in some colors, two coats of Interfine 878 may be required to give uniform coverage, especially when applying over dark undercoats. Best practice is to use a color compatible intermediate or anti-corrosive coating under the Interfine 878.

This product must only be thinned using the recommended International thinners. The use of alternative thinners, particularly those containing alcohols and ketones, can severely inhibit the curing mechanism of the coating.

Pot life times must not be exceeded even though the material may be still liquid and appear useable. It is good working practice that application should commence with full unopened units of material. Due to the moisture sensitivity with partially filled units of the curing agent component, there is a danger of reaction with atmospheric moisture which could adversely affect the performance of the final coating film.

Surface temperature must always be a minimum of 5°F (3°C) above dew point.

When applying Interfine 878 in confined spaces ensure adequate ventilation.

Care must be taken when spray applying multiple coats of Interfine 878 to ensure that a continuous wet film is applied to ensure a satisfactory coalescence occurs. Failure to do so may downgrade appearance and performance.

Interfine 878 will cure satisfactorily at relative humidities between 40% and 85%. Curing will be slower at lower humidities and faster at higher humidities.

Condensation occurring during or immediately after application may result in a matte finish and an inferior film.

When overcoating after weathering, or ageing, ensure the coating is fully cleaned to remove all surface contamination such as oil, grease, and salt crystals, before application of a further coat of Interfine 878.

Premature exposure to ponding water will cause color change, especially in dark colors and at low temperatures.

This product is not recommended for use in continuous immersion conditions.

Where prolonged chemical or solvent splashing is likely to occur contact International Protective Coatings for information regarding suitability.

Systems Compatibility

Interfine 878 can be applied over a limited range of intermediates.

Absolute maximum overcoating intervals with Interfine 878 are dependent upon the primer / intermediate. Relevant primer/intermediate product data sheet and Interfine 878 Recommended Working Procedures should be consulted prior to use.

Suitable intermediates are:

- Intercure 200
- Intercure 200HS
- Intergard 475HS
- Interplus 356
- Interseal 670HS
- Interzone 505
- Interzone 954

For other suitable primer/intermediates, consult International Protective Coatings.

Interfine® 878

Polysiloxane

Additional Information

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following sections of the International Protective Coatings data manual:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Practical & Theoretical Coverage
- Interfine 878 Recommended Working Procedures

Individual copies of these information sections are available upon request.

Safety Precautions

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fume will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

Pack Size

5 gallon unit	Interfine 878 Base	4.17 gallons in a 5 gallon container
	Interfine 878 Curing Agent	0.83 gallon in a 1 gallon container
20 liter unit	Interfine 878 Base	16.67 liters in a 20 liter container
	Interfine 878 Curing Agent	3.33 liters in a 5 liter container

For availability of other pack sizes contact International Protective Coatings

Shipping Weight

U.N. Shipping No.	1263
5 gallon unit	54.6 lb (24.8 kg) Base (Part A) 7.6 lb (3.5 kg) Curing Agent (Part B)
20 liter unit	56.0 lb (25.4 kg) Base (Part A) 8.2 lb (3.7 kg) Curing Agent (Part B)

Storage

Shelf Life	12 months minimum at 77°F (25°C). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

Disclaimer

International Protective Coatings

Worldwide Availability

World Centre	Asia Region	Australasia Region	Europe Region	Middle East Region	North America Region	South America Region
P.O Box 20980 Oriel House 16 Connaught Place London, W2 2ZB England	3 Neythal Road Jurong Town Singapore 628570	115 Hyde Road Yeronga Brisbane Queensland Australia	P.O Box 20980 Oriel House 16 Connaught Place London, W2 2ZB England	PO Box 37 Dammam 31411 Saudi Arabia	6001 Antoine Drive Houston Texas 77091	Av Paiva 999, Neves, Sao Gonçalo, Rio de Janeiro Brazil
Tel: (44) 20 7479 6000 Fax: (44) 20 7479 6500	Tel: (65) 663 3066 Fax: (65) 266 5287	Tel: (61) 7 3892 8888 Fax: (61) 7 3892 4287 H&S (61) 1800 807 001	Tel: (44) 20 7479 6000 Fax: (44) 20 7479 6500	Tel: (966) 3 812 1044 Fax: (966) 3 812 1169	Tel: (1) 713 682 1711 Fax: (1) 713 684 1514	Tel: (55) 21 624 7100 Fax: (55) 21 624 7123

USA Toll Free Number (800) 589 1267
www.international-pc.com

MATERIAL SAFETY DATA SHEET

Sales Order:

INTERFINE 878 LIGHT BASE

MSDS Revision No: A0 -4
MSDS Revision Date: 01/30/2004

International Paint Inc.

6001 Antoine Drive

Houston, Texas 77091

EMERGENCY NUMBERS:

(800) 424-9300 CHEMTREC (USA)
(703) 527-3887 CHEMTREC (Intl)
(800) 854-6813 Poison Control Center (Non-Emergency)

CUSTOMER SERVICE:
(800) 589-1267 International Paint
(800) 631-7481 Interlux

1. GENERAL INFORMATION

Product Identity: INTERFINE 878 LIGHT BASE

Bulk Sales Reference No: SZA011

IMPORTANT: Read this MSDS before handling or disposing of this product, and provide this information to the employee, customers, and users of this product. PLEASE NOTE THE MSDS REVISION NUMBER AT THE TOP OF THIS PAGE. If the MSDS Revision Number posted at the top of this page does not match the MSDS Revision Number on the product label, please contact Customer Service at the phone number included above for the correct MSDS. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard.

NOTICE: OSHA hazardous chemicals are listed in Section 2 if present at 1% or more. Carcinogens and extraordinarily/special hazardous chemicals are listed in Section 2 if present at .1% or more. Additional regulatory information for specific chemical categories is included in Section 15.

2. HAZARDOUS INGREDIENT INFORMATION

CAS No.	Ingredient Name & %	Source	Exposure Data
000067-56-1	Methyl alcohol 1.0 - 10% by Weight	OSHA:	200 ppm TWA; 260 mg/m3 TWA250 ppm STEL; 325 mg/m3 STEL
		ACGIH:	200 ppm TWA250 ppm STEL
		NIOSH:	200 ppm TWA; 260 mg/m3 TWA250 ppm STEL; 325 mg/m3 STEL6000 ppm IDLH
		Supplier:	No Data Available
		OHSA, CAN:	200 ppm TWAEV; 260 mg/m3 TWAEV250 ppm STEV; 325 mg/m3 STEV
		Mexico:	200 ppm TWA; 260 mg/m3 TWA50 ppm STEL; 250 mg/m3 STEL
		Brazil:	156 ppm TWA; 200 mg/m3 TWA

Source	Health Data
NIOSH:	Blindness metabolic acidosis

Source	Carcinogen Data
OSHA:	Select Carcinogen: No
NTP:	Known Carcinogen: No; Suspected Carcinogen: No
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

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CAS No.	Ingredient Name & %	Source	Exposure Data
000067-63-0	Isopropyl alcohol 1.0 - 10% by Weight	OSHA:	400 ppm TWA; 980 mg/m3 TWA500 ppm STEL; 1225 mg/m3 STEL
		ACGIH:	200 ppm TWA400 ppm STEL
		NIOSH:	400 ppm TWA; 980 mg/m3 TWA500 ppm STEL; 1225 mg/m3 STEL2000 ppm IDLH
		Supplier:	No Data Available
		OHSA, CAN:	400 ppm TWAEV; 980 mg/m3 TWAEV500 ppm STEV; 1225 mg/m3 STEV
		Mexico:	400 ppm TWA; 980 mg/m3 TWA500 ppm STEL; 1225 mg/m3 STEL
		Brazil:	310 ppm TWA; 765 mg/m3 TWA

Source	Health Data
NIOSH:	Mucous membrane irritation; possible carcinogenic effects

Source	Carcinogen Data
OSHA:	Select Carcinogen: No
NTP:	Known Carcinogen: No; Suspected Carcinogen: No
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: Yes; Group 4: No

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CAS No.	Ingredient Name & %	Source	Exposure Data
000108-65-6	Propylene glycol monomethyl ether acetate 1.0 - 10% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	50 ppm TWAEV; 270 mg/m3 TWAEV
		Mexico:	No Data Available
		Brazil:	No Data Available

Source	Health Data

NIOSH:	No Data Available

Source	Carcinogen Data
OSHA:	Select Carcinogen: No
NTP:	Known Carcinogen: No; Suspected Carcinogen: No
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
001330-20-7	Xylenes (o-, m-, p- isomers) 1.0 - 10% by Weight	OSHA:	100 ppm TWA; 435 mg/m3 TWA150 ppm STEL; 655 mg/m3 STEL
		ACGIH:	100 ppm TWA150 ppm STEL
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	100 ppm TWAEV; 435 mg/m3 TWAEV150 ppm STEV; 650 mg/m3 STEV
		Mexico:	100 ppm TWA; 435 mg/m3 TWA150 ppm STEL; 655 mg/m3 STEL
		Brazil:	78 ppm TWA; 340 mg/m3 TWA
		Source	**Health Data**
		NIOSH:	Central nervous system depressant; respiratory and eye irritation
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: Yes; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
007727-43-7	Barium sulfate 10 - 25% by Weight	OSHA:	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
		ACGIH:	10 mg/m3 TWA
		NIOSH:	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust) 50 mg/m3 IDLH (as Ba, except barium sulfate)
		Supplier:	No Data Available
		OHSA, CAN:	10 mg/m3 TWAEV (total dust)
		Mexico:	0.5 mg/m3 TWA
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	Eye nose

Source	Carcinogen Data
OSHA:	Select Carcinogen: No
NTP:	Known Carcinogen: No; Suspected Carcinogen: No
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
013048-33-4	1,6-Hexanediol diacrylate 10 - 25% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
013463-67-7	Titanium dioxide 10 - 25% by Weight	OSHA:	15 mg/m3 TWA (total dust)
		ACGIH:	10 mg/m3 TWA
		NIOSH:	5000 mg/m3 IDLH
		Supplier:	No Data Available
		OHSA, CAN:	10 mg/m3 TWAEV (total dust)
		Mexico:	10 mg/m3 TWA (nuisance particulate)20 mg/m3 STEL
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	Lung tumors in animals
		Source	**Carcinogen Data**

	OSHA:	Select Carcinogen: No
	NTP:	Known Carcinogen: No; Suspected Carcinogen: No
	IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: Yes; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
068957-04-0	Siloxanes and Silicones, di-Me, methoxy Ph, polymers with Phsilsesquioxanes, methoxy-terminated 10 - 25% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
TS-KH6529	Acrylated Urethane Oligomer 10 - 25% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No

NTP:	Known Carcinogen: No; Suspected Carcinogen: No
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

3. HAZARD IDENTIFICATION

Overview:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing.
Inhalation:	May be harmful or fatal if inhaled. Causes lung irritation. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes:	May cause blindness. Do not get in eyes.
Skin:	Causes skin irritation. May cause allergic skin reaction. May be harmful if absorbed through the skin.
Ingestion:	Poison. Cannot be made non-poisonous. May be fatal or cause blindness if swallowed. Cannot be made non-poisonous.
Chronic Effects:	Contains an ingredient which can cause organ damage (See Section 2 and Section 15 for each ingredient). Birth defect hazard. Contains an ingredient which can cause birth defects (See Section 2 and Section 15 for each ingredient). Possible cancer hazard. Contains an ingredient which may cause cancer based on animal data (See Section 2 and Section 15 for each ingredient). Risk of cancer depends on duration and level of exposure.
HMIS Rating:	Health: 3 Flammability: 3 Reactivity: 0

4. FIRST AID MEASURES

General:	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin:	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion:	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

5. PROTECTIVE EQUIPMENT AND CONTROL MEASURES

Respiratory:	Select equipment to provide protection from the ingredients listed in Section 2 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U. S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes:	Do not get in eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin/Hand:	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls:	Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.
Other Work Practices:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

6. FIRE AND EXPLOSION INFORMATION

Flash Point:	F: 93 C: 34
Lower Explosive Limit (LEL):	1 (%vol in air) at Normal Atmospheric Temp and Pressure
Fire and Explosion Hazards:	Flammable liquid and vapor. FLAMMABLE/COMBUSTIBLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated.
Fire Fighting Procedures:	CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. SMALL FIRES: Use dry chemical, CO2, water spray or alcohol-resistant foam. LARGE FIRES: Use water spray, fog, or alcohol-resistant foam. Do not use straight streams. Move containers from fire area if you can do so without risk. Runoff from fire control may cause pollution. Dike fire control water for later disposal. Do not scatter the material. **Also Reference Emergency Response Guide Number:** 127

7. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
pH:	Not Determined
Specific Gravity:	1.438207
Boiling Point (F):	180
Vapor Density:	Heavier than air
VOC Content (lbs):	Refer to the Technical Data Sheet for this product.
Evaporation Rate:	Slower than ether

8. STABILITY AND REACTIVITY DATA

General:	This product is stable and hazardous polymerization will not occur.
Incompatible Materials:	Strong oxidizing agents.
Hazardous Decompostion:	May produce hazardous fumes when heated to decomposition as in welding. Fumes may produce Carbon Dioxide and Carbon Monoxide.

9. HANDLING AND STORAGE

Storage Temperature:	Store between 32 and 120 F
Handling and Storage Precautions:	Keep away from heat, sparks and flame. Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone. Vapors may cause flash fire or ignite explosively. Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation. Do not get in eyes, on skin or clothing. Close container after each use. Wash thoroughly after handling.

10. TOXICOLOGICAL DATA

General:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. No additional information provided for this product. See Section 2 for chemical specific data.

11. ECOLOGICAL DATA

General:	No additional information provided for this product. See Section 2 for chemical specific data.

12. ACCIDENTAL RELEASE MEASURES

Spill Response Procedures:	ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.
Public Safety:	CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet). **Also, Reference Emergency Response Guide Number: 127**

13. DISPOSAL CONSIDERATION

Waste Disposal:	Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. TRANSPORTATION INFORMATION

DOT (Domestic Surface Transportation)		**IMO / IMDG (Ocean Transportation)**	
DOT Proper Shipping Name: PAINT		**IMDG Proper Shipping Name:** PAINT	
DOT Hazard Class:	3	**IMDG Hazard Class:**	3.3 - High flashpoint flammable liquids
UN / NA Number:	UN 1263	**UN Number:**	UN 1263
DOT Packing Group:	III	**IMDG Packing Group:**	III
CERCLA/DOT RQ:	334 gal. / 4002 lbs.	**System Reference Code:**	2

15. REGULATORY INFORMATION

Regulatory Overview:	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory. **Note:** Any chemical ingredients listed in Section 15, that do not also appear in Section 2, are contained in the product at a concentration below the applicable OSHA threshold level of 1% or 0.1%.
WHMIS Classification:	B2; D2B; E

Regulatory List	**Product Ingredients on List**
DOT Marine Pollutants (10%):	
(No Product Ingredients Listed)	
DOT Severe Marine Pollutants (1%):	
(No Product Ingredients Listed)	
EPCRA 311/312 Chemicals and RQs (>.1%) :	
000100-41-4	Ethyl benzene : 1000 lb final RQ; 454 kg final RQ
000067-56-1	Methyl alcohol : 5000 lb final RQ; 2270 kg final RQ
001330-20-7	Xylenes (o-, m-, p- isomers) : 100 lb final RQ; 45.4 kg final RQ
EPCRA 302 Extremely Hazardous (>.1%) :	
(No Product Ingredients Listed)	
EPCRA 313 Toxic Chemicals (>.1%) :	
001344-28-1	Aluminum oxide
007727-43-7	Barium sulfate
000100-41-4	Ethyl benzene
000067-63-0	Isopropyl alcohol
000067-56-1	Methyl alcohol
000108-65-6	Propylene glycol monomethyl ether acetate
001330-20-7	Xylenes (o-, m-, p- isomers)
Mass RTK Substances (>1%) :	
007727-43-7	Barium sulfate
000067-63-0	Isopropyl alcohol
000067-56-1	Methyl alcohol
013463-67-7	Titanium dioxide
001330-20-7	Xylenes (o-, m-, p- isomers)
Mass Extraordinarily Haz Sub (>.01%) :	
(No Product Ingredients Listed)	
Penn RTK Substances (>1%) :	

007727-43-7	Barium sulfate
000067-63-0	Isopropyl alcohol
000067-56-1	Methyl alcohol
000108-65-6	Propylene glycol monomethyl ether acetate
013463-67-7	Titanium dioxide
001330-20-7	Xylenes (o-, m-, p- isomers)

Penn Special Hazardous Substances (>.01%) :

(No Product Ingredients Listed)

Rhode Island Hazardous Substances (>.1%) :

001344-28-1	Aluminum oxide
000100-41-4	Ethyl benzene
000067-63-0	Isopropyl alcohol
000067-56-1	Methyl alcohol
013463-67-7	Titanium dioxide
001330-20-7	Xylenes (o-, m-, p- isomers)

RCRA Status (>.01%) :

(No Product Ingredients Listed)

N.J. RTK Substances (>1%) :

000067-63-0	Isopropyl alcohol
000067-56-1	Methyl alcohol
013463-67-7	Titanium dioxide
001330-20-7	Xylenes (o-, m-, p- isomers)

N.J. Special Hazardous Substances (>.01%) :

000067-63-0	Isopropyl alcohol
000067-56-1	Methyl alcohol
001330-20-7	Xylenes (o-, m-, p- isomers)

N.J. Env. Hazardous Substances (>.1%) :

001344-28-1	Aluminum oxide
007727-43-7	Barium sulfate
000100-41-4	Ethyl benzene
000067-63-0	Isopropyl alcohol
000067-56-1	Methyl alcohol
000108-65-6	Propylene glycol monomethyl ether acetate
001330-20-7	Xylenes (o-, m-, p- isomers)

Proposition 65 - Carcinogens (>0%):

(No Product Ingredients Listed)

Proposition 65 - Female Repro Toxins (>0%):

(No Product Ingredients Listed)

Proposition 65 - Male Repro Toxins (>0%):
(No Product Ingredients Listed)
Proposition 65 - Developmental Toxins (>0%):
(No Product Ingredients Listed)

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16. OTHER INFORMATION

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

End Of Document

MATERIAL SAFETY DATA SHEET

Sales Order:

INTERFINE 878 CONVERTER

MSDS Revision No: A0 -4
MSDS Revision Date: 01/07/2004

International Paint Inc.
6001 Antoine Drive
Houston, Texas 77091

EMERGENCY NUMBERS:

(800) 424-9300 CHEMTREC (USA)
(703) 527-3887 CHEMTREC (Intl)
(800) 854-6813 Poison Control Center

CUSTOMER SERVICE: (Non-Emergency)
(800) 589-1267 International Paint
(800) 631-7481 Interlux

1. GENERAL INFORMATION

Product Identity: INTERFINE 878 CONVERTER

Bulk Sales Reference No: SZA056

IMPORTANT: Read this MSDS before handling or disposing of this product, and provide this information to the employee, customers, and users of this product. PLEASE NOTE THE MSDS REVISION NUMBER AT THE TOP OF THIS PAGE. If the MSDS Revision Number posted at the top of this page does not match the MSDS Revision Number on the product label, please contact Customer Service at the phone number included above for the correct MSDS. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard.

NOTICE: OSHA hazardous chemicals are listed in Section 2 if present at 1% or more. Carcinogens and extraordinarily/special hazardous chemicals are listed in Section 2 if present at .1% or more. Additional regulatory information for specific chemical categories is included in Section 15.

2. HAZARDOUS INGREDIENT INFORMATION

CAS No.	Ingredient Name & %	Source	Exposure Data
000919-30-2	TRIETHOXYSILYL) PROPYLAMINE 50 - 75% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**

		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
001067-33-0	Dibutyltin diacetate 1.0 - 10% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
013822-56-5	Gamma-Aminopropyltrimethoxysilane 10 - 25% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available

Source	Carcinogen Data
OSHA:	Select Carcinogen: No
NTP:	Known Carcinogen: No; Suspected Carcinogen: No
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

3. HAZARD IDENTIFICATION

Overview:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing. Overexposure may cause heart, liver and kidney damage.
Inhalation:	Harmful if inhaled. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes:	May cause blindness. Avoid contact with eyes.
Skin:	Causes skin burns. May be harmful if absorbed through the skin.
Ingestion:	May be fatal or cause blindness if swallowed. Cannot be made non-poisonous.
Chronic Effects:	Cancer hazard. Contains an ingredient which can cause cancer (See Section 2 and Section 15 for each ingredient). Risk of cancer depends on duration and level of exposure.
HMIS Rating:	Health: 3 Flammability: 2 Reactivity: 0

4. FIRST AID MEASURES

General:	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin:	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion:	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

5. PROTECTIVE EQUIPMENT AND CONTROL MEASURES

Respiratory:	Select equipment to provide protection from the ingredients listed in Section 2 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U. S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes:	Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin/Hand:	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls:	Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.
Other Work Practices:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

6. FIRE AND EXPLOSION INFORMATION

Flash Point:	F: 134 C: 57
Lower Explosive Limit (LEL):	1 (%vol in air) at Normal Atmospheric Temp and Pressure
Fire and Explosion Hazards:	Combustible liquid and vapor. FLAMMABLE/COMBUSTIBLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated.
Fire Fighting Procedures:	CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. SMALL FIRES: Use dry chemical, CO2, water spray or alcohol-resistant foam. LARGE FIRES: Use water spray, fog, or alcohol-resistant foam. Do not use straight streams. Move containers from fire area if you can do so without risk. Runoff from fire control may cause pollution. Dike fire control water for later disposal. Do not scatter the material. **Also Reference Emergency Response Guide Number:** 127

7. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
pH:	Not Determined
Specific Gravity:	0.976031
Boiling Point (F):	270
Vapor Density:	Heavier than air
VOC Content (lbs):	Refer to the Technical Data Sheet for this product.
Evaporation Rate:	Slower than ether

8. STABILITY AND REACTIVITY DATA

General:	This product is stable and hazardous polymerization will not occur.
Incompatible Materials:	Strong oxidizing agents.
Hazardous Decompostion:	May produce hazardous fumes when heated to decomposition as in welding. Fumes may produce Carbon Dioxide and Carbon Monoxide.

9. HANDLING AND STORAGE

Storage Temperature:	Store between 32 and 120 F
Handling and Storage Precautions:	Keep away from heat, sparks and flame. Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone. Vapors may cause flash fire or ignite explosively. Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation. Avoid contact with eyes, skin and clothing. Close container after each use. Wash thoroughly after handling.

10. TOXICOLOGICAL DATA

General:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. No additional information provided for this product. See Section 2 for chemical specific data.

11. ECOLOGICAL DATA

General:	No additional information provided for this product. See Section 2 for chemical specific data.

12. ACCIDENTAL RELEASE MEASURES

Spill Response Procedures:	ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.
Public Safety:	CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet). **Also, Reference Emergency Response Guide Number: 127**

13. DISPOSAL CONSIDERATION

Waste Disposal:	Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. TRANSPORTATION INFORMATION

DOT (Domestic Surface Transportation)		**IMO / IMDG (Ocean Transportation)**	
DOT Proper Shipping Name: PAINT		**IMDG Proper Shipping Name:** PAINT	
DOT Hazard Class:	3	**IMDG Hazard Class:**	3.3 - High flashpoint flammable liquids
UN / NA Number:	UN 1263	**UN Number:**	UN 1263
DOT Packing Group:	III	**IMDG Packing Group:**	III
CERCLA/DOT RQ:	Not Applicable gal. / Not Applicable lbs.	**System Reference Code:**	1

15. REGULATORY INFORMATION

Regulatory Overview:	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory. **Note:** Any chemical ingredients listed in Section 15, that do not also appear in Section 2, are contained in the product at a concentration below the applicable OSHA threshold level of 1% or 0.1%.
WHMIS Classification:	B3; D2; E

Regulatory List	**Product Ingredients on List**
DOT Marine Pollutants (10%):	
(No Product Ingredients Listed)	
DOT Severe Marine Pollutants (1%):	
(No Product Ingredients Listed)	
EPCRA 311/312 Chemicals and RQs (>.1%) :	
(No Product Ingredients Listed)	
EPCRA 302 Extremely Hazardous (>.1%) :	
(No Product Ingredients Listed)	
EPCRA 313 Toxic Chemicals (>.1%) :	
(No Product Ingredients Listed)	
Mass RTK Substances (>1%) :	
001067-33-0	Dibutyltin diacetate
Mass Extraordinarily Haz Sub (>.01%) :	
(No Product Ingredients Listed)	
Penn RTK Substances (>1%) :	
(No Product Ingredients Listed)	
Penn Special Hazardous Substances (>.01%) :	
(No Product Ingredients Listed)	
Rhode Island Hazardous Substances (>.1%) :	
000064-17-5	Ethyl alcohol

RCRA Status (>.01%) :
(No Product Ingredients Listed)
N.J. RTK Substances (>1%) :
(No Product Ingredients Listed)
N.J. Special Hazardous Substances (>.01%) :
(No Product Ingredients Listed)
000064-17-5 Ethyl alcohol
N.J. Env. Hazardous Substances (>.1%) :
(No Product Ingredients Listed)
Proposition 65 - Carcinogens (>0%):
(No Product Ingredients Listed)
Proposition 65 - Female Repro Toxins (>0%):
(No Product Ingredients Listed)
Proposition 65 - Male Repro Toxins (>0%):
(No Product Ingredients Listed)
Proposition 65 - Developmental Toxins (>0%):
000064-17-5 Ethyl alcohol

16. OTHER INFORMATION

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

End Of Document

Interfine 979

Polysiloxane

International Protective Coatings

WORLD WIDE PRODUCT RANGE

Product Description

A patented (US 6,281,321 and EP 0 941290), high performance, two component, high solids inorganic hybrid finish which offers compliance to all current VOC legislation, and is free from isocyanates.

Interfine 979 significantly improves upon the gloss and colour retention exhibited by typical polyurethane finishes as well as offering improvement in gloss and colour retention when compared to 1st generation epoxy modified polysiloxane finishes.

Interfine 979 also displays the same corrosion resistance and has enhanced mechanical properties when compared to traditional epoxy technology.

Intended Uses

Interfine 979 is part of International's premium range of polysiloxane finishes. It is designed to provide excellent long-term colour and gloss retention and provide extended lifetime to first maintenance when utilised as part of a high performance anti-corrosive system. Interfine 979 is intended for use in those market sectors where visual impact is important, and the need for a high standard of cosmetic appearance is required. These include high performance constructions such as bridges, offshore structures and tank farms in addition to general industrial and commercial steelwork where high levels of cosmetic performance are a key requirement.

The dual benefits of corrosion protection & high cosmetic appearance afforded by Interfine 979 means that as well as exhibiting superior durability, this product also serves as an effective barrier coat similar to a traditional epoxy intermediate, and as such, allows a reduction in the total number of coats required from a multi-coat high performance system - saving application costs, and improving productivity during application.

Practical Information for Interfine 979

Colour	Wide range available via Chromascan
Gloss Level	Gloss
Volume Solids	76%
Typical Thickness	100-150 microns (4-6 mils) dry equivalent to 132-197 microns (5.3-7.9 mils) wet
Theoretical Coverage	6.1 m^2/litre at 125 microns d.f.t and stated volume solids 244 sq.ft/US gallon at 5 mils d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless spray, Air spray, Brush, Roller

Drying Time†▲

Temperature	Touch Dry	Hard Dry	Overcoating Interval with Recommended Primers & Intermediates *Minimum*	*Maximum#*	Overcoating Interval with Interfine 979 *Minimum*	*Maximum*
5°C (41°F)	6 hours	8 hours	8 hours	7-28 days	8 hours	Extended*
15°C (59°F)	4½ hours	6 hours	6 hours	7-28 days	6 hours	Extended*
25°C (77°F)	3 hours	4 hours	4 hours	7-28 days	4 hours	Extended*
40°C (104°F)	1½ hours	2½ hours	2½ hours	2-28 days	2½ hours	Extended*

* See International Protective Coatings Definitions & Abbreviations

† The drying times quoted have been determined at the quoted temperature and 50% relative humidity.

Dependent upon primer/intermediate. Consult Interfine 979 Recommended Working Procedures for specific details

▲ In warmer climates (>25°C (77°F)) and / or those that have a tendency for high relative humidity (>60%), an alternative curing agent is available which will allow improved product workability. See Product Characteristics.

Regulatory Data

Flash Point	Base (Part A) 32°C (90°F)	C/A (Part B) 55°C (131°F)	Mixed 35°C (95°F)
Product Weight	1.25-1.35 kg/l (10.4-11.3 lb/gal)		
VOC	165 g/l	(1.38 lb/gal)	UK - PG6/23(92), Appendix 3
	1.44 lb/gal	(172 g/l)	USA - EPA Method 24

ECOTECH

Ecotech is an initiative by International Protective Coatings a world leader in coating technology to promote the use of environmentally sensitive products across the globe.

Interfine 979

Polysiloxane

Surface Preparation

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:1992.

Primed Surfaces

Interfine 979 should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination, and Interfine 979 must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. Sa2½ (ISO 8501-1:1988) or SSPC SP6, Abrasive Blasting, or SSPC SP11, Power Tool Cleaning) and patch primed prior to the application of Interfine 979.

Zinc Primed Surfaces

Ensure that the surface of the primer is clean, dry and free from contamination and zinc salts before application of Interfine 979. Ensure zinc primers are fully cured before overcoating.

Application

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

4 parts : 1 part by volume

Working Pot Life

5°C (41°F)	15°C (59°F)	25°C (77°F)	40°C (104°F)
3½ hours	2½ hours	2 hours	1½ hours

Note: Pot life times are applicable to both curing agent grades.

Airless Spray

Recommended

- Tip range 0.28-0.53 mm (11-21 thou)
- Total output fluid pressure at spray tip not less than 155 kg/cm^2 (2,200 p.s.i.)

Air Spray (Pressure Pot)

Recommended

Gun	DeVilbiss MBC or JGA
Air Cap	704 or 765
Fluid Tip	E

Brush

Suitable

Typically 50-75 microns (2-3 mils) can be achieved

Roller

Suitable

Typically 50-75 microns (2-3 mils) can be achieved

Thinner

International GTA007

Do not thin more than allowed by local environmental legislation.

Cleaner

International GTA007

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA007. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA007. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

Interfine 979

Polysiloxane

Product Characteristics

The detailed Interfine 979 Recommended Working Procedures should be consulted prior to use.

Level of sheen and surface finish is dependent on application method. Avoid using a mixture of application methods whenever possible. Best results in terms of gloss and appearance will always be obtained with conventional air spray application.

When applying Interfine 979 by brush or roller, it may be necessary to apply multiple coats to achieve the total specified system dry film thickness.

This product must only be thinned using the recommended International thinners. The use of alternative thinners, particularly those containing alcohols and ketones, can severely inhibit the curing mechanism of the coating.

Pot life times must not be exceeded even though the material may be still liquid and appear useable. It is good working practice that application should commence with full unopened units of material. Due to the moisture sensitivity with partially filled units of the curing agent component, there is a danger of reaction with atmospheric moisture which could adversely affect the performance of the final coating film. This phenomena will be more prominent in the faster drying grade of curing agent where mixed product surface skinning in the container may occur more readily, particularly in warmer climates and / or those with high humidity.

Surface temperature must always be a minimum of 3°C (5°F) above dew point.

When applying Interfine 979 in confined spaces ensure adequate ventilation.

Care must be taken when applying multiple coats of Interfine 979 to ensure that a continuous wet film is applied and a minimum dry film thickness of 100 microns (4 mils) is achieved. Failure to do so may result in pinholing which will detract from ultimate appearance and performance.

Interfine 979 will cure satisfactorily at relative humidities between 40% and 85%. Curing will be slower at lower humidities and faster at higher humidities.

Condensation occurring during or immediately after application may result in a matt finish and an inferior film.

When overcoating after weathering, or ageing, ensure the coating is fully cleaned to remove all surface contamination such as oil, grease, and salt crystals, before application of a further coat of Interfine 979.

Premature exposure to ponding water will cause colour change, especially in dark colours and at low temperatures.

Absolute measured adhesion of topcoats to aged Interfine 979 is less than that to fresh material, however, it is adequate for the specified end use.

This product is not recommended for use in immersion conditions. When severe chemical or solvent splashing is likely to occur contact International Protective Coatings for information regarding suitability.

▲ Alternative Curing Agent

For improved product workability in warmer climates and / or those with high relative humidity.

	Drying Time†		Overcoating Interval with Recommended Primers & Intermediates		Overcoating Interval with Interfine 979	
Temperature	Touch Dry	Hard Dry	*Minimum*	*Maximum*[#]	*Minimum*	*Maximum*
5°C (41°F)	10 hours	24 hours	24 hours	7-28 days	24 hours	Extended*
15°C (59°F)	6 hours	12 hours	12 hours	7-28 days	12 hours	Extended*
25°C (77°F)	4 hours	8 hours	8 hours	7-28 days	8 hours	Extended*
40°C (104°F)	2 hours	6 hours	6 hours	2-28 days	6 hours	Extended*

* See International Protective Coatings Definitions & Abbreviations

† The drying times quoted have been determined at the quoted temperature and 60% relative humidity.

[#] Dependent upon primer/intermediate. Consult Interfine 979 Recommended Working Procedures for specific details

Systems Compatibility

Interfine 979 can be applied over a limited range of primers and intermediates.

Suitable primers are:

Intercure 200
Intercure 200HS
Interplus 356
Interzinc 22
Interzinc 52
Interzinc 52HS
Interzinc 315

Suitable intermediates are:

Intergard 475HS
Interseal 670HS
Interzone 505
Interzone 954

Absolute maximum overcoating intervals with Interfine 979 is dependent upon primer / intermediate. Interfine 979 Recommended Working Procedures **must** be consulted prior to use.

Interfine 979

Polysiloxane

Additional Information

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following sections of the International Protective Coatings data manual:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage
- Interfine 979 Recommended Working Procedures

Individual copies of these information sections are available upon request.

Safety Precautions

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

Pack Size	20 litre unit	Interfine 979 Base Interfine 979 Curing Agent	16 litres in a 20 litre container 4 litres in a 5 litre container
	5 gallon unit	Interfine 979 Base Interfine 979 Curing Agent	4 gallons in a 5 gallon container 1 gallon in a 1 gallon container
	For availability of other pack sizes contact International Protective Coatings		
Shipping Weight	U.N. Shipping No.	1263	
	20 litre unit	24.3 kg (53.6 lb) Base (Part A) 4.4 kg (9.7 lb) Curing Agent (Part B)	
	5 gallon unit	22.5 kg (49.7 lb) Base (Part A) 4.0 kg (8.8 lb) Curing Agent (Part B)	
Storage	Shelf Life	12 months minimum at 25°C (77°F). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.	

International Protective Coatings

Worldwide Availability

World Centre	Asia Region	Australasia Region	Europe Region	Middle East Region	North America Region	South America Region
P.O Box 20980 Oriel House 16 Connaught Place London, W2 2ZB England	3 Neythal Road Jurong Town Singapore 628570	115 Hyde Road Yeronga Brisbane Queensland Australia	P.O Box 20980 Oriel House 16 Connaught Place London, W2 2ZB England	PO Box 37 Dammam 31411 Saudi Arabia	6001 Antoine Drive Houston Texas 77091	Av Paiva 999, Neves, Sao Gonçalo, Rio de Janeiro Brazil
Tel: (44) 20 7479 6000 Fax: (44) 20 7479 6500	Tel: (65) 663 3066 Fax: (65) 266 5287	Tel: (61) 7 3892 8888 Fax: (61) 7 3892 4287 H&S (61) 1800 807 001	Tel: (44) 20 7479 6000 Fax: (44) 20 7479 6500	Tel: (966) 3 812 1044 Fax: (966) 3 812 1169	Tel: (1) 713 682 1711 Fax: (1) 713 684 1514	Tel: (55) 21 624 7100 Fax: (55) 21 624 7123

Local Office:
Tel: 0191 469 6111 Fax: 0191 495 0676

MATERIAL SAFETY DATA SHEET

Sales Order: {SalesOrd}

INTERFINE 979 DEEP BASE

MSDS Revision No:	A0 -
MSDS Revision Date:	12/13/2001

International Paint Inc.

6001 Antoine Drive

Houston, Texas 77091

EMERGENCY NUMBERS:

(800) 424-9300	CHEMTREC (USA)
(703) 527-3887	CHEMTREC (Intl)
(800) 854-6813	Poison Control Center

CUSTOMER SERVICE: (Non-Emergency)

(800) 589-1267	International Paint
(800) 631-7481	Interlux

1. GENERAL INFORMATION

Product Identity: INTERFINE 979 DEEP BASE

Bulk Sales Reference No: SYA033

IMPORTANT: Read this MSDS before handling or disposing of this product, and provide this information to the employee, customers, and users of this product. PLEASE NOTE THE MSDS REVISION NUMBER AT THE TOP OF THIS PAGE. If the MSDS Revision Number posted at the top of this page does not match the MSDS Revision Number on the product label, please contact Customer Service at the phone number included above for the correct MSDS. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard.

2. HAZARDOUS INGREDIENT INFORMATION

CAS No.	Ingredient Name & %	Source	Exposure Data
000067-63-0	Isopropyl alcohol 1.0 - 10% by Weight	OSHA:	400 ppm TWA; 980 mg/m3 TWA500 ppm STEL; 1225 mg/m3 STEL
		ACGIH:	400 ppm TWA500 ppm STEL
		NIOSH:	400 ppm TWA; 980 mg/m3 TWA500 ppm STEL; 1225 mg/m3 STEL2000 ppm IDLH
		Supplier:	No Data Available
		OHSA, CAN:	400 ppm TWAEV; 980 mg/m3 TWAEV500 ppm STEV; 1225 mg/m3 STEV
		Mexico:	400 ppm TWA; 980 mg/m3 TWA500 ppm STEL; 1225 mg/m3 STEL
		Brazil:	310 ppm; 765 mg/m3; skin absorber; medium degree of harm
		Source	**Health Data**
		NIOSH:	Mucous membrane irritation; possible carcinogenic effects
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: Yes
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: Yes; Group 2A: No; Group 2b: No; Group 3: Yes; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data

001344-28-1	Aluminum oxide 0.10 - 1.0% by Weight	OSHA:	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
		ACGIH:	10 mg/m3 TWA (as Al, the value is for total dust containing no asbestos and < 1% crystalline silica)
		NIOSH:	no established RELs - see Appendix D
		Supplier:	No Data Available
		OHSA, CAN:	10 mg/m3 TWAEV (total dust)
		Mexico:	10 mg/m3 TWA (total dust, nuisance particulate)
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
007631-86-9	Silica, amorphous 0.10 - 1.0% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	6 mg/m3 TWA3000 mg/m3 IDLH
		Supplier:	No Data Available
		OHSA, CAN:	0.10 mg/m3 TWAEV (designated substance regulation)0.20 mg/m3 CEV (designated substance regulation)0.20 mg/m3 TWAEV; See Ontario Reg. 845 for full information
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: Yes
		NTP:	Known Carcinogen: Yes; Suspected Carcinogen: Yes
		IARC:	Group 1: Yes; Group 2A: No; Group 2b: No; Group 3: Yes; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
007727-43-7	Barium sulfate 10 - 25% by Weight	OSHA:	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
		ACGIH:	10 mg/m3 TWA (The value is for the total dust containing no asbestos and <1% crystalline silica)
		NIOSH:	10 mg/m3 (total); 5 mg/m3 (respirable dust)
		Supplier:	No Data Available
		OHSA, CAN:	10 mg/m3 TWAEV (total dust)
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	Eye nose
		Source	**Carcinogen Data**

OSHA:	Select Carcinogen: No	
NTP:	Known Carcinogen: No; Suspected Carcinogen: No	
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No	

CAS No.	Ingredient Name & %	Source	Exposure Data
013048-33-4	1,6-Hexanediol diacrylate 10 - 25% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
013463-67-7	Titanium dioxide 1.0 - 10% by Weight	OSHA:	15 mg/m3 TWA (total dust)
		ACGIH:	10 mg/m3 TWA
		NIOSH:	NIOSH Potential Occupational Carcinogen - see Appendix APotential NIOSH carcinogen.
		Supplier:	No Data Available
		OHSA, CAN:	10 mg/m3 TWAEV (total dust)
		Mexico:	10 mg/m3 TWA (nuisance particulate)20 mg/m3 STEL
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	Lung tumors in animals
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: Yes; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
TS-KH5170	Urethane resin 10 - 25% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**

NIOSH:	No Data Available

Source	Carcinogen Data
OSHA:	Select Carcinogen: No
NTP:	Known Carcinogen: No; Suspected Carcinogen: No
IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

3. HAZARD IDENTIFICATION

Overview:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing.
Inhalation:	May be harmful or fatal if inhaled. Causes lung irritation. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes:	Causes severe eye irritation. Avoid contact with eyes.
Skin:	Causes skin irritation. May cause allergic skin reaction. May be harmful if absorbed through the skin.
Ingestion:	Harmful if swallowed. May cause abdominal pain, nausea, vomiting, diarrhea, or drowsiness.
Chronic Effects:	Contains an ingredient which can cause organ damage (See Section 2 and Section 15 for each ingredient). Birth defect hazard. Contains an ingredient which can cause birth defects (See Section 2 and Section 15 for each ingredient). Possible cancer hazard. Contains an ingredient which may cause cancer based on animal data (See Section 2 and Section 15 for each ingredient). Risk of cancer depends on duration and level of exposure.
HMIS Rating:	Health: 2 Flammability: 3 Reactivity: 0

4. FIRST AID MEASURES

General:	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin:	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion:	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

5. PROTECTIVE EQUIPMENT AND CONTROL MEASURES

Respiratory:	Select equipment to provide protection from the ingredients listed in Section 2 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U.S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes:	Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin/Hand:	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls:	Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.
Other Work Practices:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

6. FIRE AND EXPLOSION INFORMATION

Flash Point:	F: 97 C: 36
Lower Explosive Limit (LEL):	1.5 (%vol in air) at Normal Atmospheric Temp and Pressure
Fire and Explosion Hazards:	Flammable liquid and vapor. FLAMMABLE/COMBUSTIBLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated.
Fire Fighting Procedures:	CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. SMALL FIRES: Use dry chemical, CO2, water spray or alcohol-resistant foam. LARGE FIRES: Use water spray, fog, or alcohol-resistant foam. Do not use straight streams. Move containers from fire area if you can do so without risk. Runoff from fire control may cause pollution. Dike fire control water for later disposal. Do not scatter the material. **Also Reference Emergency Response Guide Number:** 127

7. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
pH:	Not Determined
Specific Gravity:	1.379097
Boiling Point (F):	180
Vapor Density:	Heavier than air
VOC Content (lbs):	Refer to the Technical Data Sheet for this product
Evaporation Rate:	Slower than ether

8. STABILITY AND REACTIVITY DATA

General:	This product is stable and hazardous polymerization will not occur.
Incompatible Materials:	Strong oxidizing agents.
Hazardous Decompostion:	May produce hazardous fumes when heated to decomposition as in welding. Fumes may produce Carbon Dioxide and Carbon Monoxide.

9. HANDLING AND STORAGE

Storage Temperature:	Store between 32 and 120 F
Handling and Storage Precautions:	Keep away from heat, sparks and flame. Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone. Vapors may cause flash fire or ignite explosively. Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation. Avoid contact with eyes, skin and clothing. Close container after each use. Wash thoroughly after handling.

10. TOXICOLOGICAL DATA

General:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. No additional information provided for this product. See Section 2 for chemical specific data.

11. ECOLOGICAL DATA

General:	No additional information provided for this product. See Section 2 for chemical specific data.

12. ACCIDENTAL RELEASE MEASURES

Spill Response Procedures:	ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.
Public Safety:	CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet). **Also, Reference Emergency Response Guide Number: 127**

13. DISPOSAL CONSIDERATION

Waste Disposal:	Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. TRANSPORTATION INFORMATION

DOT (Domestic Surface Transportation)		**IMO / IMDG (Ocean Transportation)**	
DOT Proper Shipping Name:		**IMDG Proper Shipping Name:**	
PAINT		PAINT	
DOT Hazard Class:	3	**IMDG Hazard Class:**	3.3 - High flashpoint flammable liquids
UN / NA Number:	UN 1263	**UN Number:**	UN 1263
DOT Packing Group:	III	**IMDG Packing Group:**	III
CERCLA/DOT RQ:	Not Applicable gal. / Not Applicable lbs.	**System Reference Code:**	2

15. REGULATORY INFORMATION

Regulatory Overview:	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.
WHMIS Classification:	B2; D2B
Regulatory List	**Product Ingredients on List**
DOT Marine Pollutants (10%):	
(No Product Ingredients Listed)	
DOT Severe Marine Pollutants (1%):	
(No Product Ingredients Listed)	
EPCRA 311/312 Chemicals and RQs:	
(No Product Ingredients Listed)	
000108-65-6	Propylene glycol monomethyl ether acetate : (Includes mono- and di- ethers of ethylene glycol; diethylene glycol and triethylene glycol R-(OCH2CH2)n-OR" where n = 1 2 or 3; R = alkyl or aryl groups; R" = R h or groups which when removed yield glycol ethers with the structure R-(OCH2CH2)n-OH. Polymers are excluded from glycol category); Statutory RQ = 1 pound (.454 kg); no final RQ is being assigned to the generic or broad class
EPCRA 302 Extremely Hazardous:	
(No Product Ingredients Listed)	
EPCRA 313 Toxic Chemicals:	
001344-28-1	Aluminum oxide
007727-43-7	Barium sulfate
000067-63-0	Isopropyl alcohol
000108-65-6	Propylene glycol monomethyl ether acetate

Mass RTK Substances:

007727-43-7	Barium sulfate
000067-63-0	Isopropyl alcohol
013463-67-7	Titanium dioxide

Mass Extraordinarily Haz Substances:

(No Product Ingredients Listed)

Penn RTK Substances:

007727-43-7	Barium sulfate
000067-63-0	Isopropyl alcohol
013463-67-7	Titanium dioxide

Penn Special Hazardous Substances:

(No Product Ingredients Listed)

000067-63-0	Isopropyl alcohol

Rhode Island Hazardous Substance:

001344-28-1	Aluminum oxide
000067-63-0	Isopropyl alcohol
013463-67-7	Titanium dioxide

RCRA Status:

(No Product Ingredients Listed)

N.J. RTK Substances:

000067-63-0	Isopropyl alcohol
013463-67-7	Titanium dioxide

N.J. Special Hazardous Substances:

000067-63-0	Isopropyl alcohol

N.J. Env. Hazardous Substance

001344-28-1	Aluminum oxide
007727-43-7	Barium sulfate
000067-63-0	Isopropyl alcohol
000108-65-6	Propylene glycol monomethyl ether acetate

Proposition 65 - Carcinogens:

(No Product Ingredients Listed)

Proposition 65 - Female Reproductive Toxins:

(No Product Ingredients Listed)

Proposition 65 - Male Reproductive Toxins:

(No Product Ingredients Listed)

Proposition 65 - Developmental Toxins:

(No Product Ingredients Listed)

16. OTHER INFORMATION

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

End Of Document

MATERIAL SAFETY DATA SHEET

Sales Order: {SalesOrd}

INTERFINE 979 CONVERTER

MSDS Revision No:	A0 -
MSDS Revision Date:	08/05/2003

International Paint Inc.

6001 Antoine Drive

Houston, Texas 77091

EMERGENCY NUMBERS:	
(800) 424-9300	CHEMTREC (USA)
(703) 527-3887	CHEMTREC (Intl)
(800) 854-6813	Poison Control Center
CUSTOMER SERVICE:	(Non-Emergency)
(800) 589-1267	International Paint
(800) 631-7481	Interlux

1. GENERAL INFORMATION

Product Identity: INTERFINE 979 CONVERTER

Bulk Sales Reference No: SYA056

IMPORTANT: Read this MSDS before handling or disposing of this product, and provide this information to the employee, customers, and users of this product. PLEASE NOTE THE MSDS REVISION NUMBER AT THE TOP OF THIS PAGE. If the MSDS Revision Number posted at the top of this page does not match the MSDS Revision Number on the product label, please contact Customer Service at the phone number included above for the correct MSDS. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard.

2. HAZARDOUS INGREDIENT INFORMATION

CAS No.	Ingredient Name & %	Source	Exposure Data
000919-30-2	Gamma-Aminopropyltriethoxysilane 50 - 75% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data

001067-33-0	Dibutyltin diacetate 1.0 - 10% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

CAS No.	Ingredient Name & %	Source	Exposure Data
013822-56-5	Gamma-Aminopropyltrimethoxysilane 10 - 25% by Weight	OSHA:	No Data Available
		ACGIH:	No Data Available
		NIOSH:	No Data Available
		Supplier:	No Data Available
		OHSA, CAN:	No Data Available
		Mexico:	No Data Available
		Brazil:	No Data Available
		Source	**Health Data**
		NIOSH:	No Data Available
		Source	**Carcinogen Data**
		OSHA:	Select Carcinogen: No
		NTP:	Known Carcinogen: No; Suspected Carcinogen: No
		IARC:	Group 1: No; Group 2A: No; Group 2b: No; Group 3: No; Group 4: No

3. HAZARD IDENTIFICATION

Overview:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing. Overexposure may cause heart, liver and kidney damage.
Inhalation:	Harmful if inhaled. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes:	May cause blindness. Avoid contact with eyes.
Skin:	Causes skin burns. May be harmful if absorbed through the skin.
Ingestion:	May be fatal or cause blindness if swallowed. Cannot be made non-poisonous.
Chronic Effects:	Cancer hazard. Contains an ingredient which can cause cancer (See Section 2 and Section 15 for each ingredient). Risk of cancer depends on duration and level of exposure.
HMIS Rating:	Health: 3 Flammability: 2 Reactivity: 0

4. FIRST AID MEASURES

General:	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin:	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion:	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

5. PROTECTIVE EQUIPMENT AND CONTROL MEASURES

Respiratory:	Select equipment to provide protection from the ingredients listed in Section 2 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U.S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes:	Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin/Hand:	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 2 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls:	Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.
Other Work Practices:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

6. FIRE AND EXPLOSION INFORMATION

Flash Point:	F: 134 C: 57
Lower Explosive Limit (LEL):	1 (%vol in air) at Normal Atmospheric Temp and Pressure
Fire and Explosion Hazards:	Combustible liquid and vapor. FLAMMABLE/COMBUSTIBLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated.
Fire Fighting Procedures:	CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. SMALL FIRES: Use dry chemical, CO2, water spray or alcohol-resistant foam. LARGE FIRES: Use water spray, fog, or alcohol-resistant foam. Do not use straight streams. Move containers from fire area if you can do so without risk. Runoff from fire control may cause pollution. Dike fire control water for later disposal. Do not scatter the material. **Also Reference Emergency Response Guide Number:** 127

7. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
pH:	Not Determined
Specific Gravity:	0.976031
Boiling Point (F):	270

Vapor Density:	Heavier than air
VOC Content (lbs):	Refer to the Technical Data Sheet for this product
Evaporation Rate:	Slower than ether

8. STABILITY AND REACTIVITY DATA

General:	This product is stable and hazardous polymerization will not occur.
Incompatible Materials:	Strong oxidizing agents.
Hazardous Decompostion:	May produce hazardous fumes when heated to decomposition as in welding. Fumes may produce Carbon Dioxide and Carbon Monoxide.

9. HANDLING AND STORAGE

Storage Temperature:	Store between 32 and 120 F
Handling and Storage Precautions:	Keep away from heat, sparks and flame. Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone. Vapors may cause flash fire or ignite explosively. Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation. Avoid contact with eyes, skin and clothing. Close container after each use. Wash thoroughly after handling.

10. TOXICOLOGICAL DATA

General:	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. No additional information provided for this product. See Section 2 for chemical specific data.

11. ECOLOGICAL DATA

General:	No additional information provided for this product. See Section 2 for chemical specific data.

12. ACCIDENTAL RELEASE MEASURES

Spill Response Procedures:	ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.
Public Safety:	CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet). **Also, Reference Emergency Response Guide Number: 127**

13. DISPOSAL CONSIDERATION

Waste Disposal:	Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. TRANSPORTATION INFORMATION

DOT (Domestic Surface Transportation)		IMO / IMDG (Ocean Transportation)	
DOT Proper Shipping Name: PAINT		**IMDG Proper Shipping Name:** PAINT	
DOT Hazard Class:	3	**IMDG Hazard Class:**	3.3 - High flashpoint flammable liquids
UN / NA Number:	UN 1263	**UN Number:**	UN 1263
DOT Packing Group:	III	**IMDG Packing Group:**	III
CERCLA/DOT RQ:	Not Applicable gal. / Not Applicable lbs.	**System Reference Code:**	1

15. REGULATORY INFORMATION

Regulatory Overview:	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.
WHMIS Classification:	B3; D2; E
Regulatory List	**Product Ingredients on List**
DOT Marine Pollutants (10%):	
(No Product Ingredients Listed)	
DOT Severe Marine Pollutants (1%):	
(No Product Ingredients Listed)	
EPCRA 311/312 Chemicals and RQs:	
(No Product Ingredients Listed)	
EPCRA 302 Extremely Hazardous:	
(No Product Ingredients Listed)	
EPCRA 313 Toxic Chemicals:	
(No Product Ingredients Listed)	
Mass RTK Substances:	
001067-33-0	Dibutyltin diacetate
Mass Extraordinarily Haz Substances:	
(No Product Ingredients Listed)	
Penn RTK Substances:	
(No Product Ingredients Listed)	
Penn Special Hazardous Substances:	
(No Product Ingredients Listed)	
Rhode Island Hazardous Substances:	
000064-17-5	Ethyl alcohol
RCRA Status:	
(No Product Ingredients Listed)	
N.J. RTK Substances:	
(No Product Ingredients Listed)	
N.J. Special Hazardous Substances:	
(No Product Ingredients Listed)	
N.J. Env. Hazardous Substances:	
(No Product Ingredients Listed)	
Proposition 65 - Carcinogens:	
(No Product Ingredients Listed)	
Proposition 65 - Female Reproductive Toxins:	
(No Product Ingredients Listed)	
Proposition 65 - Male Reproductive Toxins:	
(No Product Ingredients Listed)	
Proposition 65 - Developmental Toxins:	
000064-17-5	Ethyl alcohol

16. OTHER INFORMATION

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

End Of Document

KIMETSAN D45-AMS PERFORMANCE AND TEST RESULTS

Resin system : Water borne two packed Color : White
Pack A (Component A) Acrylic modified Poly Urethane with oxygen activated PU true water borne
Pack B Performance Improver (Component B) (Isocyanurate FREE)

Aluminium plates treated first according to MIL-A- 8625 Type II B and the first 20-25 micrometers sprayed in 4-5 hrs after MIL-A-8625 treatment to balance thickness sprayed after 3 hours. Spraying carried out by Accuspray 24K at ultra low pressure in blowing mode with 97% spraying efficiency.

Three systems checked recently for a prime USA aircraft manufacturers (These are the most advanced Kimetsan ASTD 45 AMS systems)

SET I - KIMETSAN ASDD45 –AMS-80/86 : High Gloss (80-86 Gloss at 60°) total thicknesss 45-60 micrometers
SET II- KIMETSAN ASDD45 –AMS-30/35 Semi Gloss (30-35 Gloss at 60°) total thickness 60-75 micrometers
SET III- KIMETSAN ASDD45 –AMS-3.5/4.0 Matt (3.5-4.0 Gloss at 60°) total thickness 45-50 micrometers

The surface was degreased by using Kimetsan Decontaminator + warm Water (a biodegradeble detergent – pH c.a. 8.0. Safe for aluminium and aluminium alloys) . After that the surface is rinsed with tap water only. This is all required for the surface preperation.

Extra test carried out for PVC,Kevlar, composites, galvanised steel plates as well
Unless specified tets plates are

Aluminium plates	**: AA2024T3 cladded aluminium with thickness of 0.020 inch (0.51mm)**
PVC, Kevlar and Window glass	**: c.a. 2mm thickness**
Reinforced Composites	**: 2 mm thickness (both epoxy and polyester types)**
Galvanised steel	**: 0.51mm**

Surface preperation and paint stripping are different than MIL-F-85285D suggested methods . Kimetsan system offers a complete package and none of the steps contain toxic or resricted chemicals or corrosive chemicals. Resin system is also different than MIL-F-85285D class W and it is much safer and much lower VOC level and much lighter in weight. The component A and component B have two years shelf lifes. When Comp A and 6% Comp B(performance improver) mixed together ,the mixture can be used within 8 hrs . After 8 hrs , the same procedure of mixing can be carried out 2 times by adding 6% Comp B to Comp A without any problem. The component A may be used alone for less demanding performances. The mixture does not solidified unless thin film formed.

All sets passed the below given tests . All sets also passed ASTM D-1308 (50% Ethyl alcohol, 20% Acetic acid, 10% Sodium Hydroxide ,10 % Hydrochloric acid, 10% Sulphuric Acid, 10 % mild Soap Solution, 10% Mild detergent solutions , Lithium Grease, Calcium Grease , Organic Solvents (pentane, hexane, MEK, methanol , toluene etc) , Oils and Fat (margarine) ,Fruit Juices (Pears, apple, appricot, pineapple) . However, if superior chemicals resistance at high concentrations and high temperature is required and the gloss is not important we recommend SET III .

All sets have antigraffiti properties . For most applications ,the surface can be cleaned by cold water only.

WEATHERING	No change, blistering or peeling	Xenon Arc ASTM G-26 1000
	SALT spray 1000	ASTM G155-00
	QUV Accelerated Wheathering 1000 hrs.: Very good	
ADHESION	Rating : 5 B Taping : Cross-hatch method	ASTM D-3359-92A

Additional Special Tests Performed
On Aluminium Foils Rating : 5B
On PVC Plates Rating : 5B
On Glass Plates Rating : 5B
On Galvanized Steel Plates Rating : 5B
On Kevlar Plates Rating : 5B
On Composite Plates Rating : 5B

HOT/COLD CYCLING	10 Hot and Cold Cycles (-55 ºC to +60 ºC) at 100 % relative humidity. No cracking, blistering, or peeling	ASTM D-2246
	Tests also carried out for continuous working performaces at –70 °C and + 200 °C at 80 %RH No cracking ,blistring , peeling No performance failure observed	Field Tests for 2 years
CORROSION RESISTANCE	No blisters, no peeling 1000 hrs	ASTM B-117-02
IMPACT TEST	15 joules impact, no cracking or peeling	ASTM G14-88
ABRASION RESISTANCE	Taber abraser, 1000 g. load, CS-17 wheels, 100 cycles, Avg. Loss 0.017g.	ASTM D-4060
BENDING TEST	Up to 1mm. mandrel Both Cylindrical and conical mandrels Method A and B No cracking or peeling	ASTM D-522-93-A
	Addition tests for bending and flexibility: Tests also carried out on Aluminium Foils for spiral bending, twisting tests carried for 2000 times. No effects observed. Bending tests performed at –55°C and +100 °C and room temperatures.	
WATER VAPOR TRANSMISSION	5.37*10.7g./Pa*s*m^2 Perm rating : 9.4	ASTM E-96
WATER PENETRATION	800mm. water column No penetration after 4 hours	ASTM D-751-38
V.O.C. EMISSIONS	Clear Coat less than 190 g/Litre	ASTM D-3980 ASTM D50 87-91
	Colored Form Less than 150 g/litre	
ACCELERATED CORROSION WEATHERING	Hanau sun testing U.V./Salt-spray/Wet&Dry Very good	NATLAS CAA DOE
HOSPITAL HEALTH APPLICATIONS	Operating theatres and intensive Care units, Prematurated babies room	Turkish Min of Health Recommended for all hospital areas

RESISTANCE TO HYDRAULICS IMMERSIONS (Conforming MIL-PRF- 83282)	No effect	30 Hrs immerison at 65 °C
	Additional tests: SKYDROL 500B4 and LD4 And all portion mixtures Very Good /No effect	30 Days immersion at 25°C and 30 Hrs immersion at 65 °C
LUBRICATING OIL (conforming MIL-L-23699)	No effect	30 hrs immersion at 122 °C
Additional Tests		
RESISTANCE TO MINERAL OILS IMMERSION	Elf Perf XL20W50 and Shell Helix 15W50 Very good / No effect	**30** Hours immersion at 122 °C
RESISTANCE TO De-IONIZED WATER IMMERSION	De-Ionized and distilled water Very good / No effect	3 Days immersion every day first 10 hrs at 80 °C and 14 hrs at 25°C
RESISTANCE TO DE-IONIZED WATER IMMERSION	De-Ionized and distilled water Very good / No effect	30 Days immersion at room temperature
RESISTANCE TO 6% SODIUM CHLORIDE IMMERSION	6% NaCl in De-Ionized and distilled water (tests carried out on crossed and plain plates Very good / No effect	1000 hrs immersion at room temperature
RESISTANCE TO JET FUELS IMMERSION	Jet Fuels A1 , A4 Very good /No effect	7 Days immersion at room temperature
RESISTANCE TO JET FUELS IMMERSION	Jet Fuel JP-5 (Conforming MIL-DTL-5624) Very good/ No effect	7 Days immersion at room temperature
RESISTANCE TO	De-Icers Glycol based	

DE-ICERS IMMERSION	Very good / No effect	7 Days immersion at room temperature
RESISTANCE TO ATMOSPHERIC & ACID POLLUTANTS	Acetic Acid 10% vol. Hydrochloric acid 5% vol. Sulfuric acid 5% vol. No effect	ASTM D-1308 -87 (with addition of sulfuric acid testing)
FLASH POINT	Non-flammable / True water Borne	
FIRE RESISTANCE	When applied to material Class 0 or Class 1, will not loose	BS 476 Part 6 or part 7,
SCRATCH RESISTANCE	150/R-1518 SIS No 839117 Bearing Pressure 8/12/20N-5 30N-4	
General properties: **ELECTRICAL TRANSMISSION AND BORESIGHT LIMITS ON AIRCRAFT RADOMS**	TR_{Min} = 75% TR_{AVE} = 90% BR_{ERR} = ±4MR Passed all tests	Tested according to (Tech. Order No 1-1-24 Turkish Airforce) Radoms (Approved for usage by the Turkish Airforce
Lead ,Cadmium,Cobalt Chromium,Mercury,Arsenic content	Not Dedectable	ICP and AAS
Strippability	Kimetsan Non Toxic Stripper Contains no toxic or resricted chemicals Applicable by brush or spraying	At room temperature within 2 hrs /completed. Cleaned or rinsed with Water only
Temperature Resistance and Paint Oxidising	No Noticable Effect up to 250 °C	Monitored by TGA and DSC measurement (tested by Roketsan Inc and SAGE –Defence Industries Research Institute)

Kimetsan Quality Control Management

KIMETSAN AEROSPACE WATER BORNE COATINGS COMPONENT A

MATERIAL SAFETY DATA SHEET

Date of issue : 15.06.2000
Date of revision : 20.01.2003
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1.CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name : ***KIMETSAN D45+MODIFIED AEROSPACE WATER BORNE COATING COMPONENT A Colored and Clear coats***

Chemical or technical name :*Acrylic modified polyurethane combined with oxygen Activated polyurethane WB resin based aerospace coatings. Colored and clear coats*

Manufacturer : ***KIMETSAN LTD.***
Water Borne Industrial Paints Div.
Sehit Adem Yavuz Sokak No 11/5
Kizilay / ANKARA /TURKEY

Emergency Phone Number : *0090.312.418 23 91*

Packing and Size : *1/5/10/30 kg plastic bottles / drums*

Uses : *Aerospace coatings (interior and exterior)*

Phone : 00 90 312 417 49 77 *Fax : 00 90 312 418 56 17*

2.COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME	***CASnr***	***Weight %***	***Danger Symbol***	***OEL***
Adipates Esters	*Mixture*	*<4. 0*	*-*	*S24*
N-Methyl-2-Pyrrozolidone	*872-50-4*	*<1.5*	*Xi*	*R36/38, S41*
*Oxygen Activated PU resin **	*N/A*	*< 4.0*	*Xi*	*R36/38,S36*
*Acrylic co-polymer **	*N/A*	*<4.0*	*Xi*	*R36/38,S36*
*Acry modified PU resin**	*N/A*	*<75.0*	*Xi*	*R36/38,S36*

Contains less than 15 ppm preservatives as Chloro Methyl Isothiazoline (CAS # 26172-55-4) and Methyl Isothiazoline (CAS # 2682-20-4) both products are biodegredible.

** All products will be less irritant in formulation with water (Total water content > 10 %). These materials have very strong powers of adhesions.*

As the manufacture operates under Responsible Care Commitments, The main NON HAZARDOUS products are also given for records : (Concentration more than 0.7 %) Zinc Molybdate (CAS13767-32-3), Titanium Dioxide (CAS # 13463-67-7), Ethylene diglycol (CAS # 111-90-0), Diethylene glycol (CAS # 111-46-6), Water (CAS # 7732-18-5),

Polyethylene wax (CAS # 9002-88-4), Acryclic-PU modified Copolymer with oxygen activated PU with non toxic pigments to make desired color standard.

3.HAZARD IDENTIFICATION

Health Hazards : The product is not classified as dangerous to health.
Biological danger : The product is not judged as harmful to the environment.
Danger of fire : The product is not flammable.
Physical-chemical hazards : None Known.

4.FIRST AID IDENTIFICATION

Inhalation : Fresh air and rest.
Skin : Wash the skin with soap and water.
Eye : Rinse for a long time with soft water jet, separate eyelids.
Ingestion : Drink some water. When necessary seek medical advice.

5.FIRE FIGHTING MEASURES

In case of fire situation use water, foam, powder or carbon dioxide.
This product is not flammable.

6.ACCIDENTAL RELEASE MEASURES

Precautions : Not required
Environmental : Prevent discharging to sewage disposal system, protection water course or earth.
Methods for cleaning up : Absorb with saw dust, cloths, sand or other absorbing agent. Keep in suitable plastic container. Wipe up and rinse with water (see point 13). Spillage can be difficult to remove if the product is allowed to dry.

7.HANDLING AND STORAGE

Handling : By handling the product, always maintain a good working hygiene. Very strong WB adhesive characters

Storage : Do not allow to freeze.
Packing material/storage : Keep in plastic, glass or rustless material containers.

8.EXPOSURE CONTROL/PERSONAL PROTECTION

The product contains small amounts of volatile organic substances (see composition/information on ingredients). Do not work in extremely limited or badly ventilated areas, this may cause dizziness, indisposition and headache. Always work in well ventilated areas.
Protective Clothing : Overall covering body, arms and legs, rubber gloves.
Inhilation : During spraying wear respiratory mask
Eyes : During spraying wear gogles.

9.PHYSICAL AND CHEMICAL PROPERTIES

Appearance	*: White fluent liquid with a scent perfume for clear coat Colored form will be at specified color.*
Boiling Point	*: ca 100°C Flash point: None*
Density	*:1070-1300kg/m^3 pH : ca 8.0-9,5*
Solubility in water	*: Dilutable*
VOC	*: < 190 g/liter for clear coat < 150 g/liter for colored form*
Evaporation Rate	*: N/A*

10.STABILITY AND REACTIVITY

Stability	*: Stable*
Hazards reactions	*: None known*
Hazardous	*: No special decomposition products*

11.TOXICOLOGICAL INFORMATION

Inhalation	*: The product gives off volatile organic vapours. See point 8.*
Skin	*: Repeated skin contact may possibly cause irritation.*
Eye	*: Splash in the eyes may cause irritation*
Ingestion	*: Consumption may possibly cause indisposition.*

12.ECOLOGICAL INFORMATION

The product is not judged as harmful to the environment, based upon available information and prevailing criteria.

13.DISPOSAL CONSIDERATION

Residues of product and contaminated packing:
Dried product can be treated as normal industrial waste.
Handling of large quantities or cassation of liquid product, consult the local public cleansing department.

14.TRANSPORT INFORMATION

No dangerous goods. ***This product is not subjected to International Transport Regulations****.*

15.PRODUCT REGULATORY INFORMATION

Classification	*: No classification required*
EEC Symbol	*: -*
Risk (R) and Safety (S)	*: only very small amount of ingredients have R36/38 S 24/36 phrases*
Risk Phrases	*: R 36/38 Irritating to the skin and eyes*
Safety Phrases	*: S24 avoid skin contact S36 wear suitable protective clothing*
Inflammable	*: No*

These R and S phrases are much reduced when in water formulations. Comply with the

Regulations as the material has very strong powers of adhesion.

16.OTHER INFORMATION

This product should be stored, handled and used in accordance with good industrial hygiene pratices and confirmity with any legal regulations. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties

KIMETSAN AEROSPACE WATER BORNE COATINGS COMPONENT B

MATERIAL SAFETY DATA SHEET

Date of issue : 15.06.2000
Date of revision : 20.01.2003

1.CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name : ***KIMETSAN AIRCRAFT WATER BORNE COATINGS COMPONENT B***

Chemical or technical name :*Component B for KIMETSAN AEROSPACE COMPONENT A*

Usage : *Activator and chemical resistance improver forf KIMETSAN Aerospace Water Borne Paints Component A .*
Do not exceed a maximum ratio 1/10

Manufacturer/Supplier : ***KIMETSAN LTD***
Water Borne Industrial Paints Div.
Sehit Adem Yavuz Sokak No 11/5
Kizilay / ANKARA /TURKEY
Phone : 00 90 312 417 49 77 pbx *Fax : 00 90 312 418 56 17*

2.COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME *	***CAS nr***	***Weight %***	***Danger Symbol***	***OEL***
Dimethyl Glutarate	*1119-40-0*	*< 25%*	*-*	*-*
Dimethyl Adipate	*627-93-0*	*< 15%*	*-*	*S24*
Dimethyl Succinate	*106-65-0*	*< 25%*	*-*	*-*
*Self Activated PU resin ***	*-*	*< 8%*	*Xi*	*R36/38, S 36*

*** This ingredient is less irritant whendiluted with water*

THIS PRODUCT CONTAINS NO TOXIC OR HARMFUL CHEMICALS

***** As the manufacturer operates under Responsible Care Commitments , main components are given for information only although they are NON Hazardous products***

3.HAZARD IDENTIFICATION

Health Hazards	*: The product is not classified as a primary irritant but contact continuously with skin may cause irritation.*
Eye	*: Eye irritant*
Skin	*:May cause sensitization by skin contact*
Inhalation	*:In case of fire do not breathe fumes*
Ingestion	*: Remove from exposure . Induce vomiting. Obtain medical advice*
Biological danger	*: The product is not judged as harmful to the environment.*
Danger of fire	*: The product is not inflammable .*
Stability	*: Stable*
Hazardous Polymerisation	*: May occur if mixed with acidic materials*
Reactivitiy with water	*: Will not occur*

Hazardous decomposition products: Usual products of combustion. e.g. carbon dioxide and carbon monoxide.

Materials to be Avoided	*: Acidic materials, anhydrides and strong oxidisers*

4.FIRST AID IDENTIFICATION

General First Aid Procedures

Inhalation	*: Remove the person to fresh air and rest. Ask medical advise.*
Skin	*: Wash the skin with plenty of soap and water. Wash contaminated clothing and decontaminate footwear before re-use.*
Eye	*: Immediately flush the eyes with plenty of running water For inimum of 15 minutes. Obtain medical care as soon as possible. If no medical attention is available rinse the eye and lid for extra 15 minutes.*
Ingestion	*: Remove from exposure . Induce vomiting. When necessary seek medical advice.*

5.FIRE FIGHTING MEASURES

In case of fire situation use water fog , foam, dry chemical, carbon dioxide . Water may be used to cool closed containers to prevent pressure buildup.
This product is not flammable but combustable. Flush point is over 110° C

6.ACCIDENTAL RELEASE MEASURES

Precautions	*: Avoid inhalation vapor . Avoid contact with skin.*
Environmental	*: Prevent discharging to sewage disposal system, protection water course or earth.*
Methods for cleaning up	*: Wear skin, eye, and respiratory protection during cleaning. Absorb with saw dust, cloths, sand or other absorbing agent. Alternatively flush with water and react wit 10% Ammonium Thiosulphate or Sodium Thiosulphate. Then flush with water.*

7.HANDLING AND STORAGE

Handling	*: Use nitrile or butyl rubber gloves Use chemical goggles or splash shield*
Storage	*: Do not allow to freeze. Do not store at above 60°C Keep away from heat, acid and oxidands*
Packing material/storage	*: Keep in plastic, glass or rustless material containers. Do not use fiberglass containers*

8.EXPOSURE CONTROL/PERSONAL PROTECTION

No ACGIH TLV or OSHA PEL assigned to this product.
The product contains small amounts of volatile organic substances (see composition/information on ingredients). Do not work in extremely limited or badly ventilated areas. Always work in well ventilated areas.

Respiratory protection	*: If needed , use NIOSH certified respirators for organic vapors , mists and fumes.*
Protective Clothing	*: Take all precautions to prevent skin contact. Additional protection , such as full body suit and boots, may be required depending on the conditions.*
	Remove contaminated clothing and wash before re-wearing. Wash separately from other laundry.

Eye Protection *: Chemical tight goggles and full face shield*

9.PHYSICAL AND CHEMICAL PROPERTIES

Appearance *: Pale yellow liquid.*
Flash point *: > 100 °C (TTC)*
Density *: 1100-1200kg/m^3*
pH *: 6 - 7*
Viscosity (Ford Cup #4) *: min 20 sec*
Solubility in water *: Miscible*
Evaporation Rate *: N/A*

10.STABILITY AND REACTIVITY

Stability *: Stable*
Hazardous Polymerisation: Will not occur.
Hazardous Decomp. Products *: Carbon and nitrogen oxides.*

Contamination with acidic materials, heat, UV radiation, anhydrides, strong oxidazing conditions and freezing conditions must be avoided.

11.TOXICOLOGICAL INFORMATION

Inhalation *: High vapour concentration may be irritant to the respiratory organs.*

Skin *: Repeated skin contact may possibly cause irritation.*

Eye *: Splash in the eyes may cause irritation.*

Ingestion *:Low oral toxicity but because the stomach acid may cause gastro-intestinal irritation. Refer also to Section 3.*

This product contains NO components listed by IARC, OSHA, NTP or ACGIH as a carcinogen.
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12.ECOLOGICAL INFORMATION

The product is not judged as harmful to the environment, based upon available information and prevailing criteria.

13.DISPOSAL CONSIDERATION

Waste Disposal :

Dispose or incinirate in approved landfill . Dispose it as aqueous waste after reaction with ammonium thiosulphate or sodium thiosulphate with approval of local,state or federal organisation.

When handling large quantities consult the local environment authorities or cleansing company.

14.TRANSPORT INFORMATION

Not dangerous goods. This product is not regulated by U.S. DOT .

15.REGULATORY INFORMATION

Classification	*: Irritant Xi*
Risk Phrases	*R36/38 irritating to skin and eyes*
Safety Phrases	*S24 Avoid contact with skins* *S36 Wear suitable protective coating*

16.OTHER INFORMATION

This product should be stored, handled and used in accordance with good industrial hygiene practices and conformity with any legal regulations. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the safety requirements. It should be therefore be construed as guaranteeing specific properties.

Industrial & Marine Coatings

EXPRESSTECH™ Coatings Technology for improved productivity.

1.28

FAST CLAD® HB ACRYLIC

B66-410 SERIES

PRODUCT INFORMATION

Revised 4/05

PRODUCT DESCRIPTION

Fast Clad HB Acrylic is a one component, fast dry, high build finish designed for one coat application directly to organic or inorganic zinc-rich primers or other recommended primers. May also be applied directly to prepared steel.

- High film build in one coat
- Superior gloss and color retention
- Fast Dry
- Outstanding early moisture resistance
- Chemical resistant
- Low odor
- Corrosion resistant
- Suitable for use in USDA inspected facilities

RECOMMENDED USES

For use over prepared:

- Organic zinc rich primers
- Inorganic zinc rich primers
- Aluminum
- Primed Steel
- Galvanizing
- Masonry
- Concrete
- Wood
- Drywall

Examples:

- Buildings
- Machinery
- Power plants
- Select Marine Structures
- Stadiums
- Equipment
- Piping
- Structural Steel
- New Construction
- Storage Tank Exteriors
- Water treatment plants

Conforms to AWWA D102-03 OCS #3

Acceptable for use in high performance architectural applications.

PRODUCT CHARACTERISTICS

Finish: Semi-Gloss

Color: Wide range of colors available

Volume Solids: 41.5% ± 2%, may vary by color
Extra White

Weight Solids: 52.3% ± 2%, may vary by color
Extra White

VOC (EPA Method 24): <200 g/L; 1.66 lb/gal
Extra White

Recommended Spreading Rate per coat:

Wet mils:	12.0 - 19.0
Dry mils:	5.0 - 8.0
Coverage:	85 - 136 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 12.0 mils wet 50% RH:

	@ 40°F	@ 77°F	@ 110°F
To touch:	8 hours	1 hour	15 minutes
Tack free:	24 hours	5 hours	1 hour
To recoat:	24 hours	5 hours	1 hour
To cure:	30 days	30 days	30 days

Drying time is temperature, humidity, and film thickness dependent.

Shelf Life: 36 months, unopened
Store indoors at 40°F to 100°F.

Flash Point: >200°F, Seta

Reducer/Clean Up: Water

PERFORMANCE CHARACTERISTICS

System Tested: (unless otherwise indicated)
Substrate: Steel
Surface Preparation: SSPC-SP10
1 ct. Zinc Clad II HS @ 5.0 mils dft
1 ct. Fast Clad HB Acrylic @ 8 mils dft

Abrasion Resistance:
Method: ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load
Result: <158 mg loss

Adhesion:
Method: ASTM D4541
Result: 482 psi

Corrosion Weathering:
Method: ASTM D5894, 6 cycles, 2,016 hours
Result: Rating 10 per ASTM D714 for blistering
Rating 10 per ASTM D610 for rusting

Impact Resistance:
Method: ASTM D2794
Result: >160 in. lbs, direct and indirect

Dry Heat Resistance:
Method: ASTM D2485
Result: 200°F

Exterior Durability:
Method: 1 year, 45° South
Result: Excellent

Flexibility:
Method: ASTM D522, 180° bend, 1/8" mandrel
Result: Passes

Moisture Condensation Resistance:
Method: ASTM D4585, 100°F, 1000 hours
Result: Passes

Pencil Hardness:
Method: ASTM D3363
Result: 6B

Salt Fog Resistance:
Method: ASTM B117, 2000 hours
Result: Rating 10 per ASTM D714 for blistering
Rating 10 per ASTM D610 for rusting

continued on back

Industrial & Marine Coatings

EXPRESSTECH™
Coatings technology for improved productivity.

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FAST CLAD® HB ACRYLIC

B66-410 SERIES

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel:
1 ct. Zinc Clad II Plus @ 3.0 - 5.0 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Steel:
1 ct. Zinc Clad III HS @ 5.0 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Other acceptable zinc-rich primers:
Zinc Clad II
Zinc Clad VI
Zinc Clad XI
Fast Clad Zinc HS
Corothane I - GalvaPac Zinc

Steel:
1 ct. DTM Acrylic Primer/Finish @ 2.5 - 5.0 mils dft
or Kem Bond HS @ 2.0 - 5.0 mils dft
or ProCryl Primer @ 2.0 - 4.0 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Steel:
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Aluminum:
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Aluminum:
1 ct. DTM Wash Primer, @ 0.7 - 1.3 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Galvanizing:
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Concrete Block:
1 ct. Heavy Duty Block Filler @ 10.0 - 18.0 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Concrete/Masonry:
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Drywall:
1 ct. PrepRite 200 Latex Primer @ 1.0 - 1.5 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Prefinished Siding: (Baked-on finishes)
1 ct. DTM Bonding Primer @ 2.0 - 5.0 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Wood, exterior:
1 ct. A-100 Exterior Oil Wood Primer @ 1.5 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

Wood, interior:
1 ct. PrepRite Wall & Wood Primer @ 1.5 mils dft
1 ct. Fast Clad HB Acrylic @ 5.0 - 8.0 mils dft

The systems listed above are representative of the product's use, other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Do not use hydrocarbon solvents for cleaning.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel:	SSPC-SP2
Aluminum:	SSPC-SP1
Galvanizing:	SSPC-SP1
Concrete & Masonry:	SSPC-SP13/NACE 6 or ICRI 03732, CSP 1-3

TINTING

Tint with EnviroToner at 100% tint strength. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

Do not use Blend-A-Color Toners.

APPLICATION CONDITIONS

Temperature:	40°F minimum, 110°F maximum (air, surface, and material)
	At least 5°F above dew point
Relative humidity:	85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	1 and 5 gallon containers
Weight per gallon:	10.0 ± 0.2 lb, may vary by color

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

DISCLAIMER

WARRANTY

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

FAST CLAD® HB ACRYLIC

B66-410 SERIES

APPLICATION BULLETIN

Revised 1/03

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Do not use hydrocarbon solvents for cleaning.

Iron & Steel
Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Steam Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6.

Aluminum
Remove all oil and grease by Steam Cleaning per SSPC-SP1. Self-priming.

Galvanizing
The surface should be weathered for 6 months prior to painting. Remove all oil and grease by Steam Cleaning per SSPC-SP1. Self-priming.

Concrete and Masonry
For surface preparation, refer to SSPC-SP13/NACE 6. Surfaces should be thoroughly cleaned and dry. Surface temperatures must be at least 55°F before filling. Use Heavy Duty Block Filler. Filler must be thoroughly dry before topcoating per manufacturer's recommendations.

Wood
Surface must be clean, dry and sound. Prime with recommended primer. No painting should be done immediately after a rain or during foggy weather. Knots and pitch streaks must be scraped, sanded and spot primed before full coat of primer is applied. All nail holes or small openings must be properly caulked.

Previously Painted Surfaces
If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, additional abrasion of the surface and/or removal of the previous coating may be necessary. Retest surface for adhesion. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

APPLICATION CONDITIONS

Temperature:	40°F minimum, 110°F maximum (air, surface, and material) At least 5°F above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with existing environmental and application conditions.

Reducer/Clean Up ..... Water

Airless Spray
- Pressure ..... 3000 psi
- Hose ..... 1/4" ID
- Tip ..... .015" - .019"
- Filter ..... 60 mesh
- Reduction ..... Not recommended

Conventional Spray
- Gun ..... Binks 95
- Fluid Nozzle 63C
- Air Nozzle 63PB
- Atomization Pressure ... 50 psi
- Fluid Pressure ..... 15-20 psi
- Reduction ..... As needed up to 10% by volume

Brush
- Brush ..... Nylon / polyester
- Reduction ..... Not recommended

Roller
- Cover ..... 3/8" woven with phenolic core
- Reduction ..... Not recommended

If specific application equipment is listed above, equivalent equipment may be substituted.

continued on back

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

FAST CLAD® HB ACRYLIC

B66-410 SERIES

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mixing Instructions: Mix paint thoroughly by boxing and stirring before use.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

Wet mils:	12.0 - 19.0
Dry mils:	5.0 - 8.0
Coverage:	85 - 136 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 12.0 mils wet 50% RH:

	@ 40°F	@ 77°F	@ 110°F
To touch:	8 hours	1 hour	15 minutes
Tack free:	24 hours	5 hours	1 hour
To recoat:	24 hours	5 hours	1 hour
To cure:	30 days	30 days	30 days

Drying time is temperature, humidity, and film thickness dependent.

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

During the early stages of drying, the coating is sensitive to rain, dew, high humidity, and moisture condensation. If possible, plan painting schedules to avoid these influences during the first 16-24 hours of curing.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Application temperature above 95°F may cause dry spray, uneven sheen, and poor adhesion.

Fast Clad HB Acrylic is extremely sensitive to hydrocarbon containing solvents. When cleaning the surface per SSPC-SP1, use only an emulsifying industrial detergent followed by a water rinse.

Do not use hydrocarbon solvents for cleaning.

Refer to Product Information sheet for additional performance characteristics and properties.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with soap and warm water. Clean hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with Mineral Spirits to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using Mineral Spirits.
NOTE: If coating is allowed to "set-up", Reducer #54, R7K54, may be required for cleaning. Follow manufacturer's safety recommendations when using Reducer #54.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

ENVIRONMENTAL DATA SHEET
(Certified Product Data Sheet)

02 00 [3481]

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115
02-FEB-04

This document includes all data required by 40 CFR 63.801(a) for a Certified Product Data Sheet under criteria specified in 40 CFR 63.805(a)
All data given below are MAXIMUM THEORETICAL VALUES based on the product AS CURRENTLY FORMULATED. Variations may occur on individual batches due to adjustments made during production.

* Trade Mark

PRODUCT NUMBER
366W411

PRODUCT NAME
FAST-CLAD* HB Acrylic, Extra White

PRODUCT WEIGHT	SPECIFIC GRAVITY	FLASH POINT
10.00 lb/gal	1.20	N.A.

HAZARD CATEGORY (for SARA 311/312)
Acute

	SARA 302 EHS	CERC.	SARA 313 TC	HAPS 112	Pct by Wt	Pct by Vol
VOLATILE INGREDIENTS						
1-(2-Butoxymethylethoxy)-propanol 29911-28-2	N	N	N	N	3	3
2-(2-Butoxyethoxy)-ethanol 112-34-5	N	N	***	***	3	3
Propylene Glycol 57-55-6	N	N	N	N	1	2
Water 7732-18-5	N	N	N	N	41	50
REGULATED COMPOUNDS						
*** Glycol Ethers	N	N	Y	Y	3	

Continued on page 2

VOLATILE ORGANIC COMPOUNDS (follows U.S. EPA VOC Data Sheet)

A.	Coating Density	10.00 lb/gal	1198 g/l
B.	Total Volatiles	47.7 % by wt.	58.7 % by vol.
	Non organic volatiles: Ammonia	0.2 % by wt.	0.3 % by vol.
C.	Federally exempt solvents: Water	40.7 % by wt.	49.8 % by vol.
D.	Organic Volatiles	6.7 % by wt.	8.5 % by vol.
E.	Percent Non-Volatile	52.3 % by wt.	41.3 % by vol.
F.	VOC Content 0.67 lb/gal	80 g/l	total
	1. 1.34 lb/gal	161 g/l	less exempt solvents
	2. 1.63 lb/gal	195 g/l	solids
	0.12 lb/lb	0.12 kg/kg	solids

HAZARDOUS AIR POLLUTANTS (Clean Air Act, Section 112(b))

Volatile HAPS Pounds per Gallon	0.25 lbs/gal
Volatile HAPS Pounds per Gallon of Solids	0.61 lbs/gal
Volatile HAPS Pounds per Pound of Solids	0.04 lbs/lb

AIR QUALITY DATA

Density of Organic Solvent Blend	7.92 lbs/gal
Photochemically Reactive	NO
Maximum Incremental Reactivity (MIR) (per California Air Resources Board Method 310 proposed amendments for aerosol products)	0.18

WASTE DISPOSAL

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Addition of reducers or other additives to this product may substantially alter the above data. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

B66W411
03 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B66W411

HMIS CODES

Health	2
Flammability	0
Reactivity	0

PRODUCT NAME

FAST-CLAD* HB Acrylic, Extra White

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.

(216) 566-2917

DATE OF PREPARATION

29-MAY-05

INFORMATION TELEPHONE NO.

(216) 566-2902

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT	UNITS	VAPOR PRESSURE
3	29911-28-2	1-(2-Butoxymethylethoxy)-propanol		
		ACGIH TLV Not Available		0.06 mm
		OSHA PEL Not Available		
3	112-34-5	2-(2-Butoxyethoxy)-ethanol		
		ACGIH TLV Not Available		0.06 mm
		OSHA PEL Not Available		
14	13463-67-7	Titanium Dioxide		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	10 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
In a confined area vapors in high concentration may cause headache, nausea or dizziness.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Continued on page 2

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Not Applicable	N.A.	N.A.

FLAMMABILITY CLASSIFICATION
Not Applicable
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY
Not Applicable
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Continued on page 3

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	10.00 lb/gal	1198 g/l
SPECIFIC GRAVITY	1.20	
BOILING POINT	212 - 449 F	100 - 231 C
MELTING POINT	Not Available	
VOLATILE VOLUME	58 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	9.0	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

1.34 lb/gal	161 g/l	Less Water and Federally Exempt Solvents
0.67 lb/gal	80 g/l	Emitted VOC

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

Continued on page 4

HAZARDOUS POLYMERIZATION
Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS
No ingredient in this product is an IARC, NTP or OSHA listed carcinogen. Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

TOXICOLOGY DATA

CAS No.	Ingredient Name				
29911-28-2	1-(2-Butoxymethylethoxy)-propanol				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
112-34-5	2-(2-Butoxyethoxy)-ethanol				
		LC50	RAT	4HR	Not Available
		LD50	RAT		5660 mg/kg
13463-67-7	Titanium Dioxide				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
	Glycol Ethers	3	

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Continued on page 5

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

4.69

POLYSILOXANE XLE

EPOXY SILOXANE

PART A	B80W700	WHITE
PART B	B80V700	HARDENER

PRODUCT INFORMATION

1/04

PRODUCT DESCRIPTION

Polysiloxane XLE is a high performance, two-component, high solids epoxy siloxane that combines the properties of both a high performance epoxy and an polyurethane in one coat. Plus, it is free from isocyanates.

- Replaces a two coat epoxy/polyurethane system
- High-gloss, self-priming coating
- High solids, VOC compliant
- Long term color and gloss performance
- Corrosion and chemical resistant

RECOMMENDED USES

For use on prepared steel surfaces in industrial environments, including:

- Structural steel
- Tank exteriors
- Piping
- Industrial power plants
- Transportation
- Marine

Can be applied directly over inorganic zincs.

PRODUCT CHARACTERISTICS

Finish: Gloss

Color: White

Volume Solids: 90% ± 2%, mixed

Weight Solids: 92% ± 2%, mixed

VOC (EPA Method 24): 101 g/L; 0.84 lb/gal, mixed

Mix Ratio: 4:1 by volume

Recommended Spreading Rate per coat:

Wet mils:	3.5 - 8.0
Dry mils:	3.0 - 7.0
Coverage:	206 - 481 sq ft/gal, approximate

Drying Schedule 5.0 mils wet @ 50% RH:

	@50°F	@77°F	@100°F
To touch:	2 hours	1 hours	20 minutes
To handle:	16 hours	5 hours	2 hours
To recoat:			
minimum:	16 hours	4 hours	2 hours
maximum:	14 days	14 days	7 days
To cure:	7 days	7 days	7 days

If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity and film thickness dependent.

Pot Life: 4 hours @ 77°F

Note: Pot life will be shorter with higher temperatures and larger volumes of material.

Sweat-in Time: None required @ 77°F

Shelf Life: 12 months, unopened
Store indoors at 40°F to 100°F

Flash Point: 80°F, PMCC, mixed

Reducer: Not recommended

Clean Up: Xylene, R2K4

PERFORMANCE CHARACTERISTICS

System Tested: (unless otherwise indicated)
Substrate: Steel
Surface Preparation: SSPC-SP6
Finish: 2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Abrasion Resistance:
Method: ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load
Result: 124 mg loss

Adhesion:
Method: ASTM D4541
Result: 1190 psi
Method: ASTM D3359
Result: 5A

Corrosion Weathering:
Method: ASTM D5894, 6 cycles, 2016 hours
Result: Rating 10 per ASTM D714 for Blistering
Rating 10 per ASTM D610 for Rusting

Direct Impact Resistance:
Method: ASTM D2794
Result: 25 in. lb.

Dry Heat Resistance:
Method: ASTM D2485
Result: 250°F

Pencil Hardness:
Method: ASTM D3363
Result: 3H

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THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

4.69

POLYSILOXANE XLE

EPOXY SILOXANE

PART A	B80W700	WHITE
PART B	B80V700	HARDENER

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel:
1-2 cts.* Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Steel:
1 ct. Zinc Clad II Plus** @ 2.0 - 4.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

*One coat acceptable in "light" industrial environments at 5.0 - 7.0 mils dft

**Other acceptable primers:
Macropoxy 646
Recoatable Epoxy Primer
Zinc Clad II LV

Galvanized:
1 ct. Macropoxy 646 @ 5.0 - 7.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Aluminum:
1 ct. Macropoxy 646 @ 5.0 - 7.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Masonry:
1 ct. Kem cati-Coat @ 10.0 - 20.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

The systems listed above are representative of the product's use. Other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel	
Atmospheric:	SSPC-SP6 2.0 mil profile
Galvanized	SSPC-SP1 or blast lightly
Aluminum	SSPC-SP1 or blast lightly
Masonry	SSPC-SP13/NACE 6

TINTING

Do not tint.

APPLICATION CONDITIONS

Temperature (air, surface and material):
50°F minimum, 120°F maximum

At least 5°F above dew point

Relative humidity: 40% minimum, 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	5 gallons mixed
Part A:	1 gallon in a 1 gallon container
	4 gallons in a 5 gallon container
Part B:	1 quart and 1 gallon

Weight per gallon: 11.13 ± 0.2 lb, mixed

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

4.69A
POLYSILOXANE XLE
EPOXY SILOXANE

PART A	B80W700	WHITE
PART B	B80V700	HARDENER

APPLICATION BULLETIN

1/04

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Aluminum
Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1or blast lightly.

Galvanized Steel
Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1 (recommended solvent is VM&P Naphtha) or blast lightly. When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Concrete/Masonry, Atmospheric Service:

New
For surface preparation, refer to SSPC-SP13/NACE 6. Surface must be clean, dry, sound, and offer sufficient profile to achieve adequate adhesion. Minimum substrate cure is 28 days at 75°F. Remove all form release agents, curing compounds, salts, efflorescence, laitance, and other foreign matter by sandblasting, shotblasting, mechanical scarification, or suitable chemical means. Refer to ASTM D4260. Rinse thoroughly to achieve a final pH between 6.0 and 10.0. Allow to dry thoroughly prior to coating.

Old
Surface preparation is done in much the same manner as new concrete; however, if the concrete is contaminated with oils, grease, chemicals, etc., they must be removed by cleaning with a strong detergent. Refer to ASTM D4258. Form release agents, hardeners, etc. must be removed by sandblasting, shotblasting, mechanical scarification, or suitable chemical means. If surface deterioration presents an unacceptably rough surface, Kem Cati-Coat HS Epoxy Filler/Sealer is recommended to patch and resurface damaged concrete.

Always follow the industry standards listed below:
ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
SSPC-SP13/NACE 6 Surface Preparation of Concrete.

APPLICATION CONDITIONS

Temperature (air, surface and material):
50°F minimum, 120°F maximum

At least 5°F above dew point

Relative humidity: 40% minimum, 85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with the existing environmental and application conditions.

Reducer ..... Not recommended

Clean Up ..... Xylene, R2K4

Airless Spray
Unit ..... 30:1 pump
Pressure ..... 3000-3300 psi
Hose ..... 3/8" ID
Tip ..... .017" - .021"
Filter ..... 60 mesh

Conventional Spray
Gun ..... Binks 95
Tip and needle 66/65
Air cap ..... 65 PR
Atomization Pressure .. 75-95 psi
Fluid Pressure ..... 12-20 psi

Brush
Brush ..... Natural bristle

Roller
Cover ..... 3/8" woven with phenolic core

If specific application equipment is listed above, equivalent equipment may be substituted.

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THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

4.69A

POLYSILOXANE XLE

EPOXY SILOXANE

PART A	B80W700	WHITE
PART B	B80V700	HARDENER

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly with power agitation. Make certain no pigment remains on the bottom of the can. Then combine four parts by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation.

To ensure that no unmixed material remains on the sides or bottom of the cans after mixing, visually observe the container by pouring the material into a separate container.

Apply paint to the recommended film thickness and spreading rate as indicated below:

Drying Schedule 5.0 mils wet @ 50% RH:

	@50°F	@77°F	@100°F
To touch:	2 hours	1 hours	20 minutes
To handle:	16 hours	5 hours	2 hours
To recoat:			
minimum:	16 hours	4 hours	2 hours
maximum:	14 days	14 days	7 days
To cure:	7 days	7 days	7 days

If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity and film thickness dependent.

Pot Life: 4 hours @ 77°F

Note: Pot life will be shorter with higher temperatures and larger volumes of material.

Sweat-in Time: None required @ 77°F

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

No reduction of material is recommended as this can affect film build, appearance, and adhesion.

Do not apply the material beyond recommended pot life.

Do not mix previously catalyzed material with new.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Xylene, R2K4.

Refer to Product Information sheet for additional performance characteristics and properties.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Xylene, R2K4. Clean tools immediately after use with Xylene, R2K4. Follow manufacturer's safety recommendations when using any solvent.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

ENVIRONMENTAL DATA SHEET
(Certified Product Data Sheet)

01 00 [2773]

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115
02-FEB-04

This document includes all data required by 40 CFR 63.801(a) for a Certified Product Data Sheet under criteria specified in 40 CFR 63.805(a).
All data given below are MAXIMUM THEORETICAL VALUES based on the product AS CURRENTLY FORMULATED. Variations may occur on individual batches due to adjustments made during production.

* - Trade Mark

PRODUCT NUMBER
B60W700

PRODUCT NAME
Polysiloxane XLE Base (Part A), White

PRODUCT WEIGHT
11.71 lb/gal

SPECIFIC GRAVITY
1.41

FLASH POINT
138 F PMCC

HAZARD CATEGORY (for SARA 311/312)
Acute Chronic Fire

	SARA 302 EHS	CERC.	SARA 313 TC	HAPS 112	Pct by Wt	Pct by Vol

VOLATILE INGREDIENTS
Not Applicable

VOLATILE ORGANIC COMPOUNDS (follows U.S. EPA VOC Data Sheet)

A.	Coating Density	11.71 lb/gal	1402 g/l
B.	Total Volatiles	1.4 % by wt.	2.2 % by vol.
C.	Federally exempt solvents: Water	0.0 % by wt.	0.0 % by vol.
D.	Organic Volatiles	1.4 % by wt.	2.2 % by vol.
E.	Percent Non-Volatile	98.6 % by wt.	97.8 % by vol.
F.	VOC Content	0.15 lb/gal	18 g/l total
	1.	0.15 lb/gal	18 g/l less exempt solvents
	2.	0.16 lb/gal	19 g/l solids
		0.01 lb/lb	0.01 kg/kg solids

Continued on page 2

VOLATILE ORGANIC COMPOUNDS (follows U.S. EPA VOC Data Sheet)

A.	Coating Density	10.00 lb/gal	1198 g/l
B.	Total Volatiles	47.7 % by wt.	58.7 % by vol.
	Non organic volatiles: Ammonia	0.2 % by wt.	0.3 % by vol.
C.	Federally exempt solvents: Water	40.7 % by wt.	49.8 % by vol.
D.	Organic Volatiles	6.7 % by wt.	8.5 % by vol.
E.	Percent Non-Volatile	52.3 % by wt.	41.3 % by vol.
F.	VOC Content	0.67 lb/gal	80 g/l total
	1.	1.34 lb/gal	161 g/l less exempt solvents
	2.	1.63 lb/gal	195 g/l solids
		0.12 lb/lb	0.12 kg/kg solids

HAZARDOUS AIR POLLUTANTS (Clean Air Act, Section 112(b))

Volatile HAPS Pounds per Gallon	0.25 lbs/gal
Volatile HAPS Pounds per Gallon of Solids	0.61 lbs/gal
Volatile HAPS Pounds per Pound of Solids	0.04 lbs/lb

AIR QUALITY DATA

Density of Organic Solvent Blend	7.92 lbs/gal
Photochemically Reactive	NO
Maximum Incremental Reactivity (MIR) (per California Air Resources Board Method 310 proposed amendments for aerosol products)	0.18

WASTE DISPOSAL

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Addition of reducers or other additives to this product may substantially alter the above data. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

B80W700
01 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B80W700

HMIS CODES

Health	2*
Flammability	2
Reactivity	0

PRODUCT NAME

Polysiloxane XLE Base (Part A), White

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.

(216) 566-2917

DATE OF PREPARATION

14-JAN-04

INFORMATION TELEPHONE NO.

(216) 566-2902

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT	UNITS	VAPOR PRESSURE
68	Proprietary	Epoxy Polymer		
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	
25	13463-67-7	Titanium Dioxide		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	10 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

May cause allergic skin reaction in susceptible persons or skin sensitization.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Continued on page 2

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. If irritation persists or occurs later, get medical attention. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
138 F PMCC	N.A.	N.A.

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

DOL Storage Class II

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are COMBUSTIBLE. Keep away from heat and open flame.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Continued on page 3

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT

Use of barrier cream on exposed skin is recommended.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT		11.71 lb/gal	1402 g/l
SPECIFIC GRAVITY		1.41	
BOILING POINT		Not Applicable	
MELTING POINT		Not Available	
VOLATILE VOLUME		2 %	
EVAPORATION RATE		Slower than ether	
VAPOR DENSITY		Heavier than air	
SOLUBILITY IN WATER		N.A.	
VOLATILE ORGANIC COMPOUNDS		(VOC Theoretical)	
0.15 lb/gal	18 g/l	Less Water and Federally Exempt Solvents	
0.15 lb/gal	18 g/l	Emitted VOC	

Continued on page 4

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

CAS No.	Ingredient Name				
Proprietary	Epoxy Polymer				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
13463-67-7	Titanium Dioxide				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Continued on page 5

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element

No ingredients in this product are subject to SARA 313 (40 CFR 372.65C) Supplier Notification.

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liabilitv in connection with anv use of this information.

MATERIAL SAFETY DATA SHEET

B80V700
01 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B80V700

HMIS CODES

Health	3*
Flammability	2
Reactivity	1

PRODUCT NAME

Polysiloxane XLE Hardener (Part B)

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.

(216) 566-2917

DATE OF PREPARATION

14-JAN-04

INFORMATION TELEPHONE NO.

(216) 566-2902

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS	VAPOR PRESSURE
2	100-41-4	Ethylbenzene				
			ACGIH TLV	100	ppm	7.1 mm
			ACGIH TLV	125	ppm STEL	
			OSHA PEL	100	ppm	
			OSHA PEL	125	ppm STEL	
12	1330-20-7	Xylene				
			ACGIH TLV	100	ppm	5.9 mm
			ACGIH TLV	150	ppm STEL	
			OSHA PEL	100	ppm	
			OSHA PEL	150	ppm STEL	
42	Proprietary	Polyamine				
			ACGIH TLV	Not Available		
			OSHA PEL	Not Available		

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Causes burns.
SKIN: Causes burns.
INHALATION: Causes burns of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

Continued on page 2

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention IMMEDIATELY.

SKIN: Wash affected area thoroughly with soap and water. If irritation persists or occurs later, get medical attention. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
106 F PMCC	1.0	7.0

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

DOL Storage Class II

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are COMBUSTIBLE. Keep away from heat and open flame.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Continued on page 3

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Do not get in eyes, or on skin or clothing. Do not breathe vapor or spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

To prevent skin contact, wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

To prevent eye contact, wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT

Use barrier cream on exposed skin.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	7.86 lb/gal	941 g/l
SPECIFIC GRAVITY	0.95	
BOILING POINT	277 - 292 F	136 - 144 C
MELTING POINT	Not Available	
VOLATILE VOLUME	14 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

1.07 lb/gal	128 g/l	Less Water and Federally Exempt Solvents
1.07 lb/gal	128 g/l	Emitted VOC

Continued on page 4

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

CAS No.	Ingredient Name					
100-41-4	Ethylbenzene					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		3500	mg/kg
1330-20-7	Xylene					
		LC50	RAT	4HR	5000	ppm
		LD50	RAT		4300	mg/kg
Proprietary	Polyamine					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

Continued on page 5

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
100-41-4	Ethylbenzene	2	
1330-20-7	Xylene	12	

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

4.69

POLYSILOXANE XLE

EPOXY SILOXANE

PART A	B80W700	WHITE
PART B	B80V700	HARDENER

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel:
1-2 cts.* Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Steel:
1 ct. Zinc Clad II Plus** @ 2.0 - 4.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

*One coat acceptable in "light" industrial environments at 5.0 - 7.0 mils dft

**Other acceptable primers:
Macropoxy 646
Recoatable Epoxy Primer
Zinc Clad II LV

Galvanized:
1 ct. Macropoxy 646 @ 5.0 - 7.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Aluminum:
1 ct. Macropoxy 646 @ 5.0 - 7.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Masonry:
1 ct. Kem cati-Coat @ 10.0 - 20.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

The systems listed above are representative of the product's use. Other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel	
Atmospheric:	SSPC-SP6 2.0 mil profile
Galvanized	SSPC-SP1 or blast lightly
Aluminum	SSPC-SP1 or blast lightly
Masonry	SSPC-SP13/NACE 6

TINTING

Do not tint.

APPLICATION CONDITIONS

Temperature (air, surface and material):
50°F minimum, 120°F maximum

At least 5°F above dew point

Relative humidity: 40% minimum, 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	5 gallons mixed
Part A:	1 gallon in a 1 gallon container
	4 gallons in a 5 gallon container
Part B:	1 quart and 1 gallon

Weight per gallon: 11.13 ± 0.2 lb, mixed

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

4.69

POLYSILOXANE XLE

EPOXY SILOXANE

PART A	B80W700	WHITE
PART B	B80V700	HARDENER

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel:
1-2 cts.* Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Steel:
1 ct. Zinc Clad II Plus** @ 2.0 - 4.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

*One coat acceptable in "light" industrial environments at 5.0 - 7.0 mils dft

**Other acceptable primers:
Macropoxy 646
Recoatable Epoxy Primer
Zinc Clad II LV

Galvanized:
1 ct. Macropoxy 646 @ 5.0 - 7.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Aluminum:
1 ct. Macropoxy 646 @ 5.0 - 7.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

Masonry:
1 ct. Kem cati-Coat @ 10.0 - 20.0 mils dft
1-2 cts. Polysiloxane XLE @ 3.0 - 7.0 mils dft/ct

The systems listed above are representative of the product's use. Other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel	
Atmospheric:	SSPC-SP6 2.0 mil profile
Galvanized	SSPC-SP1 or blast lightly
Aluminum	SSPC-SP1 or blast lightly
Masonry	SSPC-SP13/NACE 6

TINTING

Do not tint.

APPLICATION CONDITIONS

Temperature (air, surface and material):
50°F minimum, 120°F maximum

At least 5°F above dew point

Relative humidity: 40% minimum, 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	5 gallons mixed
Part A:	1 gallon in a 1 gallon container
	4 gallons in a 5 gallon container
Part B:	1 quart and 1 gallon

Weight per gallon: 11.13 ± 0.2 lb, mixed

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

SHER-CRYL™ HPA

HIGH PERFORMANCE ACRYLIC

B66-300 SERIES GLOSS
B66-350 SERIES SEMI-GLOSS

APPLICATION BULLETIN

Revised 1/02

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Do not use hydrocarbon solvents for cleaning.

Iron & Steel

Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Steam Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6. Primer recommended for best performance.

Aluminum

Remove all oil, grease, dirt, oxide and other foreign material by Steam Cleaning per SSPC-SP1.

Galvanizing

The surface should be weathered for 6 months prior to painting. Remove all oil and grease by Steam Cleaning per SSPC-SP1. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2.

Concrete and Masonry

For surface preparation, refer to SSPC-SP13/NACE 6. Surfaces should be thoroughly cleaned and dry. Surface temperatures must be at least 55°F before filling. If required for a smoother finish, use Heavy Duty Block Filler, B42W46. Filler must be thoroughly dry before topcoating per manufacturer's recommendations.

Weathered masonry and soft or porous cement board must be brush blasted or power tool cleaned to remove loosely adhering contamination and to get to a hard, firm surface. Apply one coat ProMar Masonry Conditioner, following label recommendations.

Wood

Surface must be clean, dry and sound. Prime with recommended primer. No painting should be done immediately after a rain or during foggy weather. Knots and pitch streaks must be scraped, sanded and spot primed before full coat of primer is applied. All nail holes or small openings must be properly caulked.

Pre-Finished Siding:

Remove oil, grease, dirt, oxides, and other contaminants from the surface by cleaning per SSPC-SP1 or water blasting per NACE Standard RP-01-72. Always checks for compatibility of the previously painted surface with the new coating by applying a test patch of 2 - 3 square feet. Allow to dry thoroughly for 1 week before checking adhesion. DTM Bonding Primer is required.

Previously Painted Surfaces

If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, additional abrasion of the surface and/or removal of the previous coating may be necessary. Retest surface for adhesion. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

APPLICATION CONDITIONS

Temperature:	50°F minimum, 120°F maximum (air, surface, and material) At least 5°F above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with existing environmental and application conditions.

Reducer/Clean Up ..... Water

Airless Spray

Pressure	1500 psi
Hose	1/4" ID
Tip	.017" - .021"
Filter	60 mesh
Reduction	Not recommended

Conventional Spray

Gun	Binks 95
Fluid Nozzle	66
Air Nozzle	63PB
Atomization Pressure	50 psi
Fluid Pressure	15-20 psi
Reduction	As needed up to 12½%by volume

Brush

Brush	Nylon / polyester
Reduction	Not recommended

Roller

Cover	3/8" woven with phenolic core
Reduction	Not recommended

If specific application equipment is listed above, equivalent equipment may be substituted.

continued on back

THE SHERWIN-WILLIAMS COMPANY

Industrial and Marine Coatings

EnviroSpec™

INDUSTRIAL & MARINE COATINGS

SHER-CRYL™ HPA

HIGH PERFORMANCE ACRYLIC

B66-300 SERIES GLOSS
B66-350 SERIES SEMI-GLOSS

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mixing Instructions: Mix paint thoroughly by boxing and stirring before use.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

Wet mils:	6.0 - 10.0
Dry mils:	2.5 - 4.0
Coverage:	154 - 247 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 7.0 mils wet 50% RH:

	@ 50°F	@ 77°F	@ 120°F
To touch:	1 hours	30 minutes	5 minutes
Tack free:	8 hours	5 hours	15 minutes
To recoat:	8 hours	5 hours	15 minutes
To cure:	30 days	30 days	30 days

Drying time is temperature, humidity, and film thickness dependent.

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

During the early stages of drying, the coating is sensitive to rain, dew, high humidity, and moisture condensation. If possible, plan painting schedules to avoid these influences during the first 16-24 hours of curing.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Application temperature above 95°F may cause dry spray, uneven sheen, and poor adhesion.

Application temperature below 50°F may cause poor adhesion and lengthen the drying and curing time.

High Performance Acrylic is extremely sensitive to hydrocarbon containing solvents. When cleaning the surface per SSPC-SP1, use only an emulsifying industrial detergent, followed by a water rinse. Do not use hydrocarbon containing solvents.

Do not use hydrocarbon solvents for cleaning.

Refer to Product Information sheet for additional performance characteristics and properties.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with soap and warm water. Clean hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with Mineral Spirits to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using Mineral Spirits.
NOTE: If coating is allowed to "set-up", Reducer #54, R7K54, may be required for cleaning. Follow manufacturer's safety recommendations when using Reducer #54.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

ENVIRONMENTAL DATA SHEET
(Certified Product Data Sheet)

06 00 [1343]

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115
02-FEB-04

This document includes all data required by 40 CFR 63.801(a) for a Certified Product Data Sheet under criteria specified in 40 CFR 63.805(a).
All data given below are MAXIMUM THEORETICAL VALUES based on the product AS CURRENTLY FORMULATED. Variations may occur on individual batches due to adjustments made during production.

* - Trade Mark

PRODUCT NUMBER
B66W300

PRODUCT NAME
SHER-CRYL* HPA High Performance Acrylic Coating, Ultra White

PRODUCT WEIGHT	SPECIFIC GRAVITY	FLASH POINT
10.31 lb/gal	1.24	N.A.

HAZARD CATEGORY (for SARA 311/312)
Acute

	SARA 302 EHS	CERC.	SARA 313 TC	HAPS 112	Pct by Wt	Pct by Vol
VOLATILE INGREDIENTS						
2-(2-Methoxyethoxy)-ethanol 111-77-3	N	N	***	***	2	2
Propylene Glycol 57-55-6	N	N	N	N	1	1
Trimethylpentanediol Isobutyrate 25265-77-4	N	N	N	N	4	5
Water 7732-18-5	N	N	N	N	42	53
REGULATED COMPOUNDS						
*** Glycol Ethers	N	N	Y	Y	2	

Continued on page 2

VOLATILE ORGANIC COMPOUNDS (follows U.S. EPA VOC Data Sheet)

A.	Coating Density	10.31 lb/gal	1234 g/l
B.	Total Volatiles	49.7 % by wt.	52.4 % by vol.
	Non-organic volatiles: Ammonia	0.2 % by wt.	0.4 % by vol.
C.	Federally exempt solvents: Water	42.2 % by wt.	52.8 % by vol.
D.	Organic Volatiles	7.3 % by wt.	9.3 % by vol.
E.	Percent Non-Volatile	50.3 % by wt.	37.6 % by vol.
F.	VOC Content	0.74 lb/gal	89 g/l total
	1.	1.58 lb/gal	189 g/l less exempt solvents
	2.	1.99 lb/gal	238 g/l solids
		0.14 lb/lb	0.14 kg/kg solids

HAZARDOUS AIR POLLUTANTS (Clean Air Act, Section 112(b))

Volatile HAPS Pounds per Gallon	0.16 lbs/gal
Volatile HAPS Pounds per Gallon of Solids	0.44 lbs/gal
Volatile HAPS Pounds per Pound of Solids	0.03 lbs/lb

AIR QUALITY DATA

Density of Organic Solvent Blend	8.02 lbs/gal
Photochemically Reactive	NC
Maximum Incremental Reactivity (MIR) (per California Air Resources Board Method 310 proposed amendments for aerosol products)	0.12

WASTE DISPOSAL

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Addition of reducers or other additives to this product may substantially alter the above data. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER
B66W300

HMIS CODES
Health 2
Flammability 0
Reactivity 0

PRODUCT NAME
SHER-CRYL* HPA High Performance Acrylic Coating, Ultra White

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
29-MAY-05

INFORMATION TELEPHONE NO.
(216) 566-2902

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT	UNITS	VAPOR PRESSURE
2	111-77-3	2-(2-Methoxyethoxy)-ethanol		
		ACGIH TLV Not Available		1 mm
		OSHA PEL Not Available		
23	13463-67-7	Titanium Dioxide		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	10 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
In a confined area vapors in high concentration may cause headache, nausea or dizziness.

SIGNS AND SYMPTOMS OF OVEREXPOSURE
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.

CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

Continued on page 2

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Not Applicable	N.A.	N.A.

FLAMMABILITY CLASSIFICATION
Not Applicable
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY
Not Applicable
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Continued on page 3

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	10.31 lb/gal	1235 g/l
SPECIFIC GRAVITY	1.24	
BOILING POINT	212 - 500 F	100 - 260 C
MELTING POINT	Not Available	
VOLATILE VOLUME	62 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	9.0	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

1.58 lb/gal	189 g/l	Less Water and Federally Exempt Solvents
0.74 lb/gal	89 g/l	Emitted VOC

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

Continued on page 4

HAZARDOUS POLYMERIZATION
Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS
No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.
Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

TOXICOLOGY DATA

CAS No.	Ingredient Name				
111-77-3	2-(2-Methoxyethoxy)-ethanol				
		LC50	RAT	4HR	Not Available
		LD50	RAT		5500 mg/kg
13463-67-7	Titanium Dioxide				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
	Glycol Ethers	2	

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
TSCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Continued on page 5

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

APPENDIX C

Material Safety Data Sheets
For
Alternatives Removed from Further Consideration
Under this Project

AMERON INTERNATIONAL
Performance Coatings & Finishes

PSX® 700

Engineered Siloxane coating

PSX 700 Series
Patent Nos. 5,618,860 and 5,275,645

PSX® Advantage: *PSX ®700 is the world's first weatherable epoxy it embodies the properties of both a high-performance epoxy and an acrylic polyurethane in one coat. This multi-purpose coating offers "breakthrough" weather resistance and corrosion control.*

Product Data/ Application Instructions

- Unique, high-gloss, self-priming coating
- Can be applied directly over inorganic zinc
- Gloss and appearance retention exceeding the best polyurethane
- Significantly lower applied costs
- Excellent resistance to acid and corrosion
- High solids, low VOC
- Resists high humidity and moisture
- Applied by brush, roller or spray—without thinning
- Outstanding resistance to chemical splash and spill

Typical Uses

PSX 700 adheres strongly to bare steel, coated steel and inorganic zinc silicate coated surfaces on new construction, repair and field maintenance coating projects. It provides effective long-term corrosion control and weatherability.

- Structural steel
  - –Bridges
  - –Marine
- Tanks
- Piping
- Industrial power plants
  - – Power
  - – Wastewater treatment
  - – Pulp and paper
  - – Chemical and petrochemical
- Concrete walls and floors
- Transportation
  - – Rail car exterior
  - – Vehicle equipment–buses, trucks
- Marine
  - – Decks
  - – Topside and superstructures on ships
  - – Boottops
  - – Barges and offshore platforms

Physical Data

Finish	Gloss
Color	See color card

Yellow, red and orange colors will fade faster than other colors due to the replacement of lead-based pigments with lead-free pigments in these colors.

Components	2
Curing mechanism	Chemical reaction
Volume solids (calculated)	
PSX 700	90% ± 3%
PSX 700FD	90% ± 3%
Dry film thickness per coat	3 – 7 mils (75 – 175 microns)
Coats*	1 or 2

Theoretical coverage	ft^2/gal	m^2/L
1 mil (25 microns)	1444	35.5
3 mils (75 microns)	481	11.8
5 mils (125 microns)	289	7.1
7 mils (175 microns)	206	5.1

VOC**	lb/gal	g/L
700 & 700FD (EPA method 24)	1.0	120
700 & 700FD mixed/thinned (calculated) (1 pt/gal)	1.7	204

Temperature resistance, dry	°F	°C
continuous	200	93
intermittent	250	121

Flash point (SETA)	°F	°C
resin	207	97
cure	205	96
FD cure	180	82
Amercoat 12	2	-17
Amercoat 65	81	27
Amercoat 101	145	63

Qualifications

NFPA – Class A
USDA – Incidental food contact

** When applying more than one coat, it is recommended that total dry film thickness not exceed 10 mils.*

***The mixed and applied coating cure reaction will produce VOC of mixed alcohols.*

Typical Properties

Physical

Abrasion resistance (ASTM D4060)	
1 kg load/1000 cycles	weight loss
CS-17 wheel	53 mg
Adhesion, elcometer (ASTM D4541)	2700 psi
Elongation (ASTM D522)	14%

Performance

Salt spray (ASTM B117)	5500 hours
Face corrosion, blistering	None
Humidity (ASTM D2247)	5500 hours
Face corrosion, blistering	None
Gloss retention (ASTM G53) QUV-B bulb	
Greater than 50% gloss retention at 26 weeks	

Chemical Resistance Guide

Environment	Splash and Spillage	Fumes and Weather
Acidic	E	E
Alkaline	E	E
Salt solutions		
acidic	E	E
neutral	E	E
alkaline	E	E
Fresh water	E	E
Solvents	E	E
Petroleum products	E	E

F-Fair G-Good E-Excellent

This table is only a guide to show typical resistances of PSX® 700. For specific recommendations, contact your Ameron representative for your particular corrosion protection needs.

Systems Using PSX 700 or 700FD

Substrate	Coats	DFT per coat
Steel (blasted)	1 or 2	5-7
Intact coating	1	3
Dimetcote†	1	4-6
Amercoat 68HS†, 370 or 385	1	3-5
Amerlock Series	1	3-5
Concrete††	2	5-7
Amercoat 385, Amerlock Series	1	3-5
Masonry		
Amerlock 400BF	1	3-5
Nu-Klad 965	1	3-5

† *Mist-coat/full-coat application may be required. See special thinning instructions.*

†† *Fill voids with Nu-Klad 114A prior to applying Amercoat 385, Amerlock Series.*

Application Data

Applied over**	Prepared or primed steel, primed concrete, prepared galvanizing or aluminum
Surface preparation	
steel	SSPC-SP5, 6 or 10
concrete	ASTM D4259 or 4260
galvanizing	Galvaprep or blast lightly
aluminum	Alumiprep or blast lightly
aged coatings	Contact your Ameron representative
Primers	Nu-Klad® 105A, Dimetcote® 9 Series, Dimetcote® 21-5, Amerlock® Series, Amercoat 68HS, 351, 370, 385, 395FD
Method	Airless or conventional spray, brush or roller
Mixing ratio (by volume)	4 parts resin to 1 part cure

Pot life (hours)‡

	°F/°C		
	90/32	70/21	50/10
700 & 700FD	1½	4	6½

‡ *Thinning material with ½ pt/gal after 3 hours will extend pot life to 5 hours at 70°F.*

Environmental Conditions

Temperature	°F	°C
air	40 to 120	4 to 49
surface	40 to 120	4 to 49
Relative humidity	40% minimum	

Surface temperatures must be at least 5°F (3°C) above dew point to prevent condensation during application and initial dry through. Relative humidity lower than 40% will extend dry times.

Heat curing

Allow 700 or 700FD to dry to touch before exposing to curing temperatures above 140°F.

Drying time (ASTM D1640) (hours) @ 40% R.H. or above

	°F/°C			
	90/32	70/21	50/10	32/0
touch (700)	1½	3	6	12
touch (700FD)	1	2	4½	9
through (700)	4	6	11	38
through (700FD)	3	4½	8½	24

Recoat/topcoat time (hours) @ 40% R.H. or above

	°F/°C			
	90/32	70/21	50/10	32/0
minimum (700 over 700)	3	4½	9	32
minimum (700FD over 700FD)	2	3	7	18
maximum‡‡	None			
Thinner	Amercoat 65 or 101			
Equipment cleaner	Thinner or Amercoat 12			

‡‡ *See surface preparation for aged coatings.*

** *Appearance will vary depending on substrate and application method. Use two coats of PSX® 700 over bare concrete.*

Surface Preparation

Coating performance is, in general, proportional to the degree of surface preparation. Refer to specifications for the specific primer being used. Prior to coating, primed surface must be clean, dry, undamaged and free of all contaminants including salt deposits. Round off all rough welds and remove all weld spatter.

Steel – Remove all loose rust, dirt, grease or other contaminants by one of the following depending on the degree of cleanliness required: SSPC-SP6 or 10. The choice of surface preparation will depend on the system selected and end-use service conditions.

Concrete – Acid etching (ASTM D4260) or abrasive blast (ASTM D4259) new concrete before priming.

Aluminum – Remove oil, grease or soap film with neutral detergent or emulsion cleaner, treat with Alodine® 1200, Alumiprep® or equivalent or blast lightly with fine abrasive.

Galvanizing – Remove oil or soap film with detergent or emulsion cleaner, then use zinc treatment such as Galvaprep® or equivalent or blast lightly with fine abrasive.

Aged coatings – Contact your Ameron representative. A test patch of PSX® 700 over intact clean coating and observation for film defects over a period of time may be required, dependant upon the type of aged coating.

PSX® 700 is compatible over Amercoat 450HS and Amershield.

Repair – Prepare damaged areas to original surface preparation specifications, feathering edges of intact coating. Thoroughly remove dust or abrasive residue before touch up.

Application Equipment

The following is a guide; suitable equipment from other manufacturers may be used. Changes in pressure, hose and tip size may be needed for proper spray characteristics.

Airless spray – Standard equipment with a 30 to 1 pump ratio or larger with a 0.015- to 0.021-in. (0.38 to 0.53 mm) fluid tip.

Conventional spray – Industrial equipment such as DeVilbiss MBC or JGA spray gun with 78 or 765 air cap and "E" fluid tip, or Binks No. 18 or 62 gun with a 66 x 63 PB nozzle set up. Separate air and fluid pressure regulators, and a moisture and oil trap in the main air supply line are recommended.

Power mixer – Jiffy Mixer powered by an air or an explosion-proof electric motor.

Brush – Natural bristle. Maintain wet edge.

Roller – Use industrial roller. Level any air bubbles with bristle brush.

Environmental Conditions

Temperature	°F	°C
air	40 to 120	4 to 49
surface	40 to 120	4 to 49
Relative humidity	40% minimum	

Surface temperatures must be at least 5°F (3°C) above dew point to prevent condensation during application and initial dry through. Relative humidity lower than 40% will extend dry times.

Heat curing

Allow 700 to dry to touch before exposing to curing temperatures above 140°F.

Application Procedure

Adhere to all application instructions, precautions, conditions, and limitations to obtain the maximum performance. For conditions outside the requirements or limitations described, contact your Ameron representative.

1. Flush equipment with thinner or Amercoat®12 before use.
2. Mix to a uniform consistency.
3. Add PSX® 700 cure to 700 resin. Mix thoroughly until uniformly blended.

Pot life (hours)*

	°F/°C		
	90/32	70/21	50/10
700 & 700FD	1 ½	4	6 ½

4. If needed for workability, thin** with Amercoat 65 or 101 up to 1 pint per gallon PSX® 700.
5. Apply a wet coat in even, parallel passes, overlap each pass 50 percent to avoid holidays, bare areas and pinholes. If required, follow with a cross spray at right angles to first pass.

Drying time (ASTM D1640) (hours) @ 40% R.H. or above

	°F/°C			
	90/32	70/21	50/10	32/0
touch (700)	1½	3	6	12
touch (700FD)	1	2	4½	9
through (700)	4	6	11	38
through (700FD)	3	4½	8½	24

Recoat/topcoat time (hours) @ 40% R.H. or above

	°F/°C			
	90/32	70/21	50/10	32/0
minimum (700 over 700)	3	4½	9	32
minimum (700FD over 700FD)	2	3	7	18

6. Brush and/or roll applications will require 2 coats to achieve a 7 mil DFT. There will be some surface texture, which is typical for brush and roll applications.
7. When applying PSX® 700 directly over Dimetcote® or Amercoat 68HS see special thinning instructions.
8. Clean all equipment with thinner or Amercoat 12 cleaner immediately after use.

**Thinning material with ½ pt/gal after 3 hours will extend pot life to 5 hours at 70°F.*
***See special thinning for application over Dimetcote and Amercoat 68HS primers.*
****See surface preparation for aged coatings.*

Thinning for Application over Dimetcote

Thin PSX® 700 with Amercoat 65 or 101 up to 1 pint per gallon to assist in film thickness control and to minimize bubbling. This will depend on the age of the coating, surface roughness and conditions during curing. Based on conditions an interval between the mist-coat and full-coat may assist in the application.

Safety Precautions

Read each component's material safety data sheet before use. Mixed material has hazards of each component. Safety precautions must be strictly followed during storage, handling and use.

CAUTION – Improper use and handling of this product can be hazardous to health and cause fire or explosion.

Do not use this product without first taking all appropriate safety measures to prevent property damage and injuries. These measures may include, without limitation: implementation of proper ventilation, use of proper lamps, wearing of proper protective clothing and masks, tenting and proper separation of application areas. Consult your supervisor. Proper ventilation and protective measures must be provided during application and drying to keep spray mists and vapor concentrations within safe limits and to protect against toxic hazards. Necessary safety equipment must be used and ventilation requirements carefully observed, especially in confined or enclosed spaces, such as tank interiors and buildings.

This product is to be used by those knowledgeable about proper application methods. Ameron makes no recommendation about the types of safety measures that may need to be adopted because these depend on application environment and space, of which Ameron is unaware and over which it has no control.

If you do not fully understand these warnings and instructions or if you cannot strictly comply with them, do not use the product.

Note: Consult Code of Federal Regulations Title 29, Labor, parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable federal, state and local regulations on safe practices in coating operations.

This product is for industrial use only. Not for residential use.

Warranty

Ameron warrants its products to be free from defects in material and workmanship. Ameron's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at Ameron's option, to either replacement of products not conforming to this Warranty or credit to Buyer's account in the invoiced amount of the nonconforming products. Any claim under this Warranty must be made by Buyer to Ameron in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life, or one year from the delivery date, whichever is earlier. Buyer's failure to notify Ameron of such nonconformance as required herein shall bar Buyer from recovery under this Warranty.

Ameron makes no other warranties concerning the product. No other warranties, whether express, implied, or statutory, such as warranties of merchantability or fitness for a particular purpose, shall apply. In no event shall Ameron be liable for consequential or incidental damages.

Any recommendation or suggestion relating to the use of the products made by Ameron, whether in its technical literature, or in response to specific inquiry, or otherwise, is based on data believed to be reliable; however, the products and information are intended for use by Buyers having requisite skill and know-how in the industry, and therefore it is for Buyer to satisfy itself of the suitability of the products for its own particular use and it shall be deemed that Buyer has done so, at its sole discretion and risk. Variation in environment, changes in procedures of use, or extrapolation of data may cause unsatisfactory results.

Limitation of Liability

Ameron's liability on any claim of any kind, including claims based upon Ameron's negligence or strict liability, for any loss or damage arising out of, connected with, or resulting from the use of the products, shall in no case exceed the purchase price allocable to the products or part thereof which give rise to the claim. **In no event shall Ameron be liable for consequential or incidental damages.**

Shipping Data

Packaging unit	1-gal	5-gal
cure	0.20 gal in 1-qt can	1 gal in 1-gal can
FD cure	0.20 gal in 1-qt can	1 gal in 1-gal can
resin	0.80 gal in 1-gal can	4 gal in 5-gal can

Shipping weight (approx)	lb	kg
1-gal unit		
cure	2.0	0.9
FD cure	1.8	0.8
resin	10.3	4.7
5-gal unit		
cure	9.0	4.1
FD cure	8.9	4.0
resin	50	22.7

Shelf life when stored indoors at 40 to 100°F (4 to 38°C)

resin and cure	1 year from shipment date

Numerical values are subject to normal manufacturing tolerances, colors and testing variances. Allow for application losses and surface irregularities.

This product is photochemically reactive as defined by the South Coast Air Quality Management District's Rule 102 or equivalent regulations.

AMERON INTERNATIONAL

Ameron U.S.A. • 13010 Morris Rd, Suite 400, Alpharetta, GA 30004 • (678) 393-0653
Ameron B.V. • J.F. Kennedylaan 7, 4190 CA Geldermalsen, The Netherlands • (31) 345-587-587

AMERON
Coatings

M. S. D. S.
Material Safety Data Sheet

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : PSX 700 AAF PEARL GRAY RESIN
IDENTIFICATION NUMBER: 700B20946
PRODUCT CLASS : ENGINEERED SILOXANE; PATENTS -5,618,860 & 5,275,645
HEALTH : WARNING HMIS/NFPA : H2F1R0

Ameron International
Protective Coatings Group
201 North Berry St.
Brea, CA 92821

EMERGENCY:800-424-9300 (ChemTrec)
24 Hours Emergency Hotline

INFORMATION: William B. Dances, PHONE: 714-529-1951 PREPARE DATE: 05/09/02
PREVIOUS REVISION DATE: 05/09/02

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	PROPRIETARY (Methanol, hydrolysis generated, 250 ppm ceiling)	PROPRIETARY	40.0 %
02	PROPRIETARY (Epch**# <10ppm, DGE 130ppm, trace phenyl glycidyl ether**)	PROPRIETARY	35.0 %
03	+ TITANIUM DIOXIDE (As TiO2, trace impurities, <6% aluminum hydroxide, <10% amorphous silica)	13463-67-7	20.0 %

04	CALCIUM SILICATE	13983-17-0	10.0 %
05	UV ABSORBER	41556-26-7	5.0 %

(Mfg TWA 1mg/m3. Trace contaminants: dimethyl sebacate, 4-piperidinol)

06	SILICA (AMORPHOUS)	112926-00-8	5.0 %

(CAS # also 7631-86-9)

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

	EXPOSURE LIMITS						
	----- ACGIH ----		----- OSHA -----		VP	TOXICITY	
	TLV-TWA	TLV-TWA	PEL-TWA	PEL-TWA	mmHg	LD50	LC50
ITEM	ppm	Mg/M3	ppm	Mg/M3	@68F	g/kg	ppm
01	dna	dna	dna	dna	N.A.	dna	dna
02	dna	dna	dna	dna	N.A.	2.000	dna
03	dna	5.00	dna	5.000	N.A.	10.000	6820.000
04	dna	5.00	dna	5.000	N.A.	dna	dna
05	dna	dna	dna	dna	N.A.	dna	dna
06	dna	3.0	dna	5.0	N.A.	dna	dna

REGULATORY: + Pigment content is dependent on color. **CALIF.TITLE 26:22-12000 (PROP 65). WARNING: This product contains a chemical known to the State of California to cause cancer. #CALIF.TITLE 26:22-12000 (PROP 65). WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. All ingredients are on TSCA inventory or are exempt. Toxic chemicals marked (SARA, CERCLA, HAPs) are subject to reporting requirements of SARA (40CFR 355 and 372), CERCLA (40CFR 302), or HAPs (40CFR 63).

(S)=Skin; LD50=Dermal.rabbit; LC50=Inhalation,rat; dna=data not available; na=not applicable

SECTION 3 - HAZARDS IDENTIFICATION

EXPOSURE EFFECTS: Vapor or spray mist or spattered material can be harmful. Irritating to eyes, skin, and if inhaled; to nose and throat. Excessive or prolonged inhalation can cause headache, nausea or dizziness. Repeated and prolonged occupational overexposure to solvents is associated

with permanent brain and nervous system damage. Intentional abuse, misuse or other massive exposure to solvents may cause multiple organ damage and/or death.

OVER-EXPOSURE (prolonged or repeated use): CAN AGGRAVATE OR ACCENTUATE ANY
OF THESE EFFECTS.

SKIN: Irritant. Sensitization or allergic reaction, such as rash or hives. Can cause defatting and drying of skin.

INHALATION: Irritant. Lung injury. Respiratory sensitization and allergic reaction such as asthma.

EYES: Irritant.

INGESTION: Harmful if swallowed.

TARGET ORGANS: Lungs. Skin. Eyes. Stomach.

SECTION 3 - HAZARDS IDENTIFICATION

MEDICAL CONDITIONS AGGRAVATED: Skin. Eyes. Respiratory. Allergies.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INHALATION INGESTION EYE
CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID PROCEDURES: INHALATION: Remove to fresh air. Restore normal breathing. Treat symptomatically. See physician. SKIN: Wash thoroughly with soap and water. Remove contaminated clothing.Consult physician if irritation persists. EYES: Flush immediately with plenty of water for at least 15 minutes and get medical attention. INGESTION: Drink 1 or 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting. Consult physician or poison control center IMMEDIATELY. Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 207 F (SETA) LOWER EXPLOSIVE LIMIT: N.A.
UPPER EXPLOSIVE LIMIT: N.A.

FLAMMABILITY - OSHA: COMBUSTIBLE - CLASS IIIB
DOT: NOT REGULATED

EXTINGUISHING MEDIA: FOAM CO2 DRY CHEMICAL

LOWEST FLASHING SOLVENT:

UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may explode when exposed to extreme heat and pressure buildup. May produce a floating fire hazard. Isolate from electrical equipment, sparks, heat and open flame. Vapors may spread long distances, cause flash fire or ignite explosively.

FIREFIGHTING PROCEDURES: Wear full protective equipment, self-contained breathing apparatus. Water may be used to cool closed containers to prevent pressure build-up or explosion when exposed to extreme heat.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL, LEAKS: Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Use absorbent, inert cleanup materials. (DO NOT use sawdust.) Remove absorbent material with non-sparking tools. Place in separate container. Keep out of sewers and waterways. If entry is threatened or occurs, notify local authorities.

SECTION 7 - HANDLING AND STORAGE

HANDLING AND STORAGE: Keep container closed, upright when not in use. Store in cool, dry, well-ventilated area. Avoid prolonged storage temperatures above 100F. Use caution when pouring. Avoid breathing sanding dust. Do not weld or flame cut on empty container.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION: Implement administrative and engineering controls to reduce exposure. Provide sufficient ventilation in volume and pattern to keep air contaminant concentrations below the TLV limits. Remove welding or flame cutting decomposition products; follow current,ANSI Z49.1,"Safety in Welding and Cutting". Refer to 29 CFR parts 1910 and 1915, for coating operations; part 1910.146, Confined Spaces.

RESPIRATORY PROTECTION: Wear NIOSH/MSHA certified respirator designed to remove a combination of particulates (dust or spray mist) and vapor. When brushing, rolling or spreading; select the appropriate respiratory protection for the conditions. For specific conditions, refer to current "NIOSH Pocket Guide to Chemical Hazards". In confined or restricted ventilation areas use air-line respirators or hoods. Refer to 29 CFR, OSHA

parts 1910.134 and 1915 for coating operations;part 1910.146 Confined Spaces;ANSI Z88.2,Practices for Respiratory Protection; 42 CFR, part 84 Particulate Respirators.

PROTECTIVE CLOTHING AND EQUIPMENT: Dependent upon application method, wear resistant coveralls, gloves and shoe coverings to prevent skin contact. Wear solvent resistant glasses with splash guards or face shield to protect eyes from splash, spatter and/or spray mist.Consult 29 CFR 1910.132, 133, 136, 138; ANSI Z87.1, Z41. Use explosion and spark-proof equipment.

HYGIENIC PRACTICES: Wash thoroughly after handling and before eating, smoking or using toilet. Launder contaminated clothing before use. Destroy contaminated leather and absorbent shoes, which cannot be decontaminated, to prevent reuse.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE : 212 - 212 F VAPOR DENSITY : Is heavier than air
ODOR : SOLVENT WEIGHT PER GAL : 11.4679
APPEARANCE : LIQUID EVAPORATION RATE: Is slower than Butyl
SOLUBILITY IN H2O : NO Acetate
EPA MIXED VOC, G/L: 120 EPA MIXED THIN VOC, G/L : 204
THINNER : 900 @ 1.000 PINTSPHOTOCHEMICALLY REACTIVE: No
VOLATILE VOLUME % : 0.28

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Heat, open flame, arc or sparks. Water or moisture.

INCOMPATIBILITY: Strong oxidizers, acids and alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS: (BY FIRE, BURNING OR WELDING); CO, CO2.
NOx. Aldehydes. Phenols. Silicon oxide fumes. Methanol. Formaldehyde at temperatures above 300F (150C).

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

TOXICOLOGICAL PROPERTIES: See Section 2.

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

EPA Waste No.: None

DISPOSAL METHOD: Place in separate, appropriate, closed container in accordance with all applicable local, State, and Federal regulations. This material has NOT been tested by Toxicity Characteristic Leaching Procedure (TCLP).

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Paint

DOT HAZARD CLASS: NA HAZARD SUBCLASS: NA

DOT UN/NA NUMBER: N/A IMO: NA PACKING GROUP : NA

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

SECTION 15 - REGULATORY INFORMATION

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

NEW JERSEY RIGHT-TO-KNOW:
The following materials are non-hazardous, but are among the top five components in this product:

---------- CHEMICAL NAME ---------- CAS NUMBER
No non-hazardous materials are among the top five ingredients.

PENNSYLVANIA RIGHT-TO-KNOW:
The following non-hazardous ingredients are present in the product at greater than 3%:

---------- CHEMICAL NAME ---------- CAS NUMBER
No non-hazardous ingredients are present at greater than 3%.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

SECTION 16 - OTHER INFORMATION

NOTICE: Removal of old lead paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For additional information, contact the USEPA/Lead Information Hotline at 1-800-424-LEAD.

AMERON
Coatings

M. S. D. S.
Material Safety Data Sheet

700C00000

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : PSX 700 CURE
IDENTIFICATION NUMBER: 700C00000
PRODUCT CLASS : ENGINEERED SILOXANE; PATENTS - 5,618,860 & 5,275,645
HEALTH : DANGER HMIS/NFPA : H3F1R0

Ameron International
Protective Coatings Group
201 North Berry St.
Brea, CA 92821

EMERGENCY:800-424-9300 (ChemTrec)
24 Hours Emergency Hotline

INFORMATION: William B. Dances, PHONE: 714-529-1951 PREPARE DATE: 04/26/02
PREVIOUS REVISION DATE: 04/26/02

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	PROPRIETARY (Methyl alcohol exposure 200ppm (S), STEL 250ppm)	PROPRIETARY	55.0 %
02	PROPRIETARY (Can generate methanol on contact with water or humid air, STEL 250ppm)	PROPRIETARY	45.0 %
03	PROPRIETARY (As tin STEL 0.2mg/m3)	PROPRIETARY	10.0 %

	EXPOSURE LIMITS						
	----- ACGIH ----		----- OSHA -----		VP	TOXICITY	
	TLV-TWA	TLV-TWA	PEL-TWA	PEL-TWA	mmHg	LD50	LC50
ITEM	ppm	Mg/M3	ppm	Mg/M3	@68F	g/kg	ppm
01	dna	dna	dna	dna	N.A.	dna	dna
02	dna	dna	dna	dna	N.A.	dna	dna
03	dna	0.1	dna	0.1(S)	N.A.	2.300	dna

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

REGULATORY: All ingredients are on TSCA inventory or are exempt. Toxic chemicals marked (SARA, CERCLA, HAPs) are subject to reporting requirements of SARA (40CFR 355 and 372), CERCLA (40CFR 302), or HAPs (40CFR 63).

(S)=Skin; LD50=Dermal.rabbit; LC50=Inhalation,rat; dna=data not available; na=not applicable

SECTION 3 - HAZARDS IDENTIFICATION

EXPOSURE EFFECTS: Vapor or spray mist or spattered material can be harmful. Irritating to eyes, skin, and if inhaled; to nose and throat. Excessive or prolonged inhalation can cause headache, nausea or dizziness.

OVER-EXPOSURE (prolonged or repeated use): CAN AGGRAVATE OR ACCENTUATE ANY OF THESE EFFECTS.

SKIN: Severe irritant. Severe burns. Sensitization or allergic reaction, such as rash or hives. Can be absorbed through skin. Can cause defatting and drying of skin.

INHALATION: Severe irritant. Lung injury. Respiratory sensitization and allergic reaction such as asthma. High vapor concentrations may cause drowsiness.

EYES: Severe irritant. Corneal injury. Irreversible burns and damage. Methanol, if swallowed, can cause eye damage and blindness.

INGESTION: Can be fatal if swallowed.

TARGET ORGANS: Kidneys. Liver. Skin. Eyes. Stomach. Central nervous system.

MEDICAL CONDITIONS AGGRAVATED: Kidneys. Liver. Skin. Eyes. Respiratory. Allergies.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INHALATION INGESTION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID PROCEDURES: INHALATION: Remove to fresh air. Restore normal breathing. Treat symptomatically. See physician. SKIN: Wash thoroughly with soap and water. Remove contaminated clothing.Consult physician if irritation persists. EYES: Flush immediately with plenty of water for at least 15 minutes and get medical attention. INGESTION: Drink 1 or 2 glasses of water to dilute. Never give anything by mouth to an unconscious person.

SECTION 4 - FIRST AID MEASURES

Do not induce vomiting. Consult physician or poison control center IMMEDIATELY. Treat symptomatically. EYES: After flushing eyes for 15 minutes, get IMMEDIATE medical attention from an ophthalmologist.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 205 F (SETA) LOWER EXPLOSIVE LIMIT: N.A.
UPPER EXPLOSIVE LIMIT: N.A.

FLAMMABILITY - OSHA: COMBUSTIBLE - CLASS IIIB
DOT: NOT REGULATED

EXTINGUISHING MEDIA: FOAM CO2 DRY CHEMICAL

LOWEST FLASHING SOLVENT:

UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may explode when exposed to extreme heat and pressure buildup.

FIREFIGHTING PROCEDURES: Wear full protective equipment, self-contained breathing apparatus. Water may be used to cool closed containers to prevent

pressure build-up or explosion when exposed to extreme heat.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL, LEAKS: Ventilate area. Use inert, absorbent cleanup materials. (DO NOT use sawdust.) Place in separate container. Keep out of sewers and waterways. If entry is threatened or occurs, notify local authorities.

SECTION 7 - HANDLING AND STORAGE

HANDLING AND STORAGE: Keep container closed, upright when not in use. Store in cool, dry, well-ventilated area. Avoid prolonged storage temperatures above 100F. Use caution when pouring. Avoid breathing sanding dust. Do not weld or flame cut on empty container. Material is hygroscopic, keep containers tightly sealed.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION: Implement administrative and engineering controls to reduce exposure. Provide sufficient ventilation in volume and pattern to keep air contaminant concentrations below the TLV limits. Remove welding or flame cutting decomposition products; follow current,ANSI Z49.1,"Safety in

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Welding and Cutting". Refer to 29 CFR parts 1910 and 1915, for coating operations; part 1910.146, Confined Spaces.

RESPIRATORY PROTECTION: Wear NIOSH/MSHA certified respirator designed to remove a combination of particulates (dust or spray mist) and vapor. When brushing, rolling or spreading; select the appropriate respiratory protection for the conditions. For specific conditions, refer to current "NIOSH Pocket Guide to Chemical Hazards". In confined or restricted ventilation areas use air-line respirators or hoods. Refer to 29 CFR, OSHA parts 1910.134 and 1915 for coating operations;part 1910.146 Confined Spaces;ANSI Z88.2,Practices for Respiratory Protection; 42 CFR, part 84 Particulate Respirators.

PROTECTIVE CLOTHING AND EQUIPMENT: Dependent upon application method, wear
resistant coveralls, gloves and shoe coverings to prevent skin contact. Wear solvent resistant glasses with splash guards or face shield to protect eyes from splash, spatter and/or spray mist.Consult 29 CFR 1910.132, 133, 136, 138; ANSI Z87.1, Z41.

HYGIENIC PRACTICES: Wash thoroughly after handling and before eating,

smoking or using toilet. Launder contaminated clothing before use.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE : 212 - 212 F VAPOR DENSITY : Is heavier than air
ODOR : NA WEIGHT PER GAL : 9.1969
APPEARANCE : LIQUID EVAPORATION RATE: Is slower than Butyl
SOLUBILITY IN H2O : NO Acetate
EPA MIXED VOC, G/L: 120 EPA MIXED THIN VOC, G/L : 204
THINNER : @ 0.0 pints PHOTOCHEMICALLY REACTIVE: No
VOLATILE VOLUME % : 0.00

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Heat, open flame, arc or sparks. Water or moisture.

INCOMPATIBILITY: Strong oxidizers, acids and alkalies. Water.

HAZARDOUS DECOMPOSITION PRODUCTS: (BY FIRE, BURNING OR WELDING); CO, CO2.
NOx. Aldehydes. Silicon oxide fumes. Methanol. Toxic gases or fumes. Formaldehyde at temperatures above 300F (150C). Tin compound fumes.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

TOXICOLOGICAL PROPERTIES: See Section 2.

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

EPA Waste No.: None

DISPOSAL METHOD: Place in separate, appropriate, closed container in accordance with all applicable local, State, and Federal regulations. This material has NOT been tested by Toxicity Characteristic Leaching Procedure (TCLP).

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Paint

DOT HAZARD CLASS: 8 HAZARD SUBCLASS: MP

DOT UN/NA NUMBER: 3066 IMO: NA PACKING GROUP : II

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

NEW JERSEY RIGHT-TO-KNOW:
The following materials are non-hazardous, but are among the top five components in this product:

---------- CHEMICAL NAME ---------- CAS NUMBER
No non-hazardous materials are among the top five ingredients.

PENNSYLVANIA RIGHT-TO-KNOW:
The following non-hazardous ingredients are present in the product at greater than 3%:

---------- CHEMICAL NAME ---------- CAS NUMBER
No non-hazardous ingredients are present at greater than 3%.

SECTION 15 - REGULATORY INFORMATION

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

SECTION 16 - OTHER INFORMATION

NOTICE: Removal of old lead paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH

approved) and proper containment and cleanup. For additional information, contact the USEPA/Lead Information Hotline at 1-800-424-LEAD.

product data

carboline®

Carboxane® 950

(Formerly 2434 VOC Series)

Selection & Specification Data

Generic Type
Fluorourethane

Description
Premium, ultra-durable ambient cured finish meeting AAMA 605.2 performance requirements. 950 is a VOC-compliant coating that provides unparalleled color and gloss retention and exterior weathering characteristics. Available in gloss and satin finishes as well as metallic finishes with clear coats, 950 offers a level of durability for field application previously not available in the construction industry. Also can be applied directly to aged PVDF finishes.

Features
- Ambient temperature cure; no heat cure required
- Meets AAMA 605.2 requirements (industry standard for PVDF finishes)
- Exceptional weatherability
- Available in a variety of Carboline colors
- Excellent flow characteristics allow for application by spray or roller
- Excellent graffiti resistance
- VOC compliant to current AIM regulations

Color
Refer to Carboline Color Guide. Certain colors may require multiple coats for hiding.

Finish
950: Gloss or Satin
950 Clear: Gloss or Satin
950 Metallic:* Satin
* Color variations within a batch and batch-to-batch may occur due to the metallic pigments and variations in application techniques and conditions.

Primers
Refer to *Substrates & Surface Preparation*

Topcoats
950 Clear for metallic finishes and certain accent colors

Dry Film Thickness
2.0-3.0 mils (50-75 microns)
2.0 mils (50 microns) for Clear Coats and Metallics

Solids Content
By Volume: 38% ± 2% (950)
34% ± 2% (950 Clear)
35% ± 2% (950 Metallic)

Theoretical Coverage Rate
609 mil ft^2 (15.0 m^2/l at 25 microns)
Allow for loss in mixing and application.

VOC Values
As supplied:
2.5 lbs./gal (300 g/l) 950 and 950 Metallic
2.1 lbs./gal (250 g/l) 950 Clear Coat
EPA Method 24:
3.5 lbs./gal (420 g/l) 950 and 950 Metallic
3.3 lbs./gal (396 g/l) 950 Clear Coat
(Calculated minus water and exempt solvents.)
These are nominal values and may vary slightly with color. Solvents exempt from VOC reporting are in this product. For thinned VOC information please contact Carboline Technical Service.

Dry Temp. Resistance
Continuous: 200°F (93°C)
Non-Continuous: 250°F (121°C)
Slight discoloration and loss of gloss is observed above 200°F (93°F).

* The alignment of aluminum flakes in aluminum-filled finishes is very dependent on application conditions and techniques. Care must be taken to keep conditions as constant as possible to reduce variations in final appearance. It is also advisable to work from a single batch of material since variations can occur from batch to batch. For more information consult Carboline Technical Service Department.

Substrates & Surface Preparation

General
Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel
Prime with specific Carboline primers as recommended by your Carboline Sales Representative.

Galvanized Steel
Prime with specific Carboline primers as recommended by your Carboline Sales Representative.

Aluminum
Prime with specific Carboline primers as recommended by your Carboline Sales Representative.

Aged PVDF Finishes
SSPC-SP1
(A test patch adhesion check is recommended.)

Other Aged Finishes
Must attain a minimum 3B rating in accordance with ASTM D3359 “X-Scribe” adhesion test. Prime with specific Carboline primers as recommended by your Carboline Sales Representative.

Performance Data

Test Method	System	Results	Report #
AAMA 605.2 Paragrah 7.4 Adhesion	Blasted Steel 1 ct. Epoxy 1 ct. 950	Passes Wet, Dry and Boiling Water Adhesion Tests	03245
ASTM D4541 Adhesion	Blasted Steel 1 ct. Epoxy 1 ct. 950	1585 psi (Pneumatic)	08975
ASTM D3359 Adhesion	Aged Kynar 1 ct. 950	5A	09337
AAMA 605.2 Paragraph 7.7 Chemical Resistance	Blasted Steel 1 ct. Epoxy 1 ct. 950	Passes Tests for Muriatic Acid, Nitric Acid, Mortar Resistance and Detergent Resistance	03245
ASTM D4585 Humidity Resistance	Blasted Steel 1 ct. Zinc 1 ct. Epoxy 1 ct. 950	No effect on coated surface after 3000 hours exposure	03245
AAMA 605.2 Paragraph 7.3 Hardness	Blasted Steel 1 ct. Epoxy 1 ct. 950	Pass. 3H exceeds F hardness requirements. No rupture of film	03245
ASTM B117 Salt Fog	Blasted Steel 1 ct. Zinc 1 ct. Epoxy 1 ct. 950	No effect on plane area; less than 1/32" undercutting at scribe after 3000 hours	03245
AAMA 605.2 Paragraph 7.5 Impact Resistance	Aluminum 1 ct. 950	Pass. No delamination after tape pull following 0.1 inch minimum deformation	03245
Graffiti Resistance	Blasted Steel 1 ct. Zinc 1 ct. Epoxy 1 ct. 950	Complete removal and no stain from all spray paints, crayons, lipstick, shoe polish, and marker	03245
EMMAQUA	Blasted Steel 1 ct. Zinc 1 ct. Epoxy 1 ct. 950	Greater than 90% gloss retention after 1252 JM/m^2 UV exposure	09264

Test reports and additional data available upon written request.

April 2003 replaces July 2001

1335

Carboxane® 950

Application Equipment

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

General Guidelines:

Spray Application (General) The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.

Conventional Spray Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.

Airless Spray

Pump Ratio:	30:1 (min.)*
GPM Output:	3.0 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.013-.017"
Output PSI:	2000-2300
Filter Size:	60 mesh

*Teflon packings are recommended and available from the pump manufacturer.

Brush Recommended for touch-up only. Use a medium bristle brush. Do not use for metallic finishes.

Roller Consult Carboline Technical Service for specific recommendations. A minimum of two coats may be required to attain desired appearance, hiding and recommended dry film thickness.

Mixing & Thinning

Mixing Power mix Part A, then combine and power mix to a uniform consistency. DO NOT MIX PARTIAL KITS.

Ratio 3.2 Gal. Kit: (3 gal. Part A: 0.2 gal. Part B)
1 Gal Kit: (.94 gal. Part A: .06 Part B)

Thinning

Spray:	Up to 7 oz/gal (5.5%) w/ #25
Spray:	Up to 8 oz/gal (6%) w/ #214 for hot, windy conditions.
Roller:	Up to 8 oz/gal (6%) w/ #234. Shake Thinner #234 well before using. Do not exceed 6% by volume.

Refer to VOC data regarding thinning limitations for 950 Clear and Metallic. Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life 4 Hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating becomes too viscous to use. THIS PRODUCT IS MOISTURE SENSITIVE. AVOID MOISTURE CONTAMINATION.

Cleanup & Safety

Cleanup Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. In addition to ensuring proper ventilation, appropriate respirators must be used by all application personnel.

Cleanup & Safety Cont.

Caution This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Normal	60°-85°F (16°-29°C)	60°-85°F (16°-29°C)	60°-85°F (16°-29°C)	40-60%
Minimum	50°F (10°C)	40°F (4°C)	40°F (4°C)	0%
Maximum	100°F (38°C)	120°F (49°C)	95°F (35°C)	80%

Industry standards are for substrate temperatures to be above 5°F (3°C) the dew point. Special application techniques may be required above or below normal application conditions.

Caution: Product is moisture sensitive. Application and/or curing in humidifies above maximum, or exposure to moisture from rain or dew may result in a loss of gloss and/or microbubbling of the product.

Curing Schedule

Surface Temp. & 50% Relative Humidity	Dry to Handle	Dry to Recoat or Topcoat with 950 Clear Coat	Final Cure
50°F (10°C)	6 Hours	6 Hours	24 Hours
75°F (24°C)	3 Hours	3 Hours	20 Hours
90°F (32°C)	2 Hours	2 Hours	16 Hours

These times are based on a 2.0-3.0 mil (50-75 micron) dry film thickness for 950. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure.

Packaging, Handling & Storage

Shipping Weight (950)	1 Gallon Kit 13 lbs (6 kg)	3.2 Gallon Kit 38 lbs (17 kg)
Shipping Weight (950 Clear & Metallic)	1 Gallon Kit 12 lbs (5 kg)	3.2 Gallon Kit 35 lbs (16 kg)

Flash Point (Setaflash)

950 Part A:	87°F (31°C)
950 Clear Part A:	87°F (31°C)
950 Metallic Part A:	83°F (29°C)
Part B (for all):	106°F (41°C)

Storage (General) Store Indoors.

Storage Temperature & Humidity 40° – 110°F (4-43°C)
0°-80% Relative Humidity

Shelf Life:

950 Gloss/Satin	Part A: Min. 36 months at 75°F (24°C) Part B: Min. 24 months at 75°F (24°C)
950 Clear Gloss	Part A: Min. 36 months at 75°F (24°C) Part B: Min. 24 months at 75°F (24°C)
950 Clear Satin	Part A: 24 months at 75°F (24°C) Part B: Min. 24 months at 75°F (24°C)
950 Metallic	Part A: Min. 24 months at 75°F (24°C) Part B: Min. 24 months at 75°F (24°C)

***Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.**

carboline®

350 Hanley Industrial Court, St. Louis, MO 63144-1599
314/644-1000 314/644-4617 (fax) www.carboline.com

An RPM Company

April 2003 replaces July 2001

350 Hanley Industrial Court
St. Louis, MO 63144
(314) 644-1000 Phone
(314) 644-4617 Fax

Carboline Customer Service Department

1-888-Carboline Phone
(314) 644-4684 Fax

Technical Service Department

(314) 644-1000 Phone
(314) 644-6883 Fax

SECTION I - PRODUCT: CARBOXANE 950 PART A (1335A1NL)
Date: 12/14/99 Replaces 04/05/99
(aka CARBOLINE 2434 VOC PART A)
CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
PCBTF	98-56-6	30%	NE	NE	NE
COLOR PIGMENT	MIXTURE	20%	3.5MG/M3	NE	NE
XYLENE	1330-20-7	20%	100 PPM	150 PPM	NE
ETHYL BENZENE	100-41-4	10%	100 PPM	125 PPM	NE
METHYL N-AMYL KETONE	110-43-0	5%	50 PPM	100 PPM	NE

HAZARDOUS INGREDIENTS ADDITIONAL DATA

CHEMICAL NAME	(F)	(G)
PCBTF	>2.7 G/KG RABBIT 4479 PPM	NO/NO/2,3
COLOR PIGMENT	NOT AVAILABLE	NO/YES
XYLENE	4300MG/KG RAT,ORAL 15000 PPM/4HRS RAT,INHALATION	NO/YES/1,2,3/ 1000#/U239
ETHYL BENZENE	NOT AVAILABLE	NO/YES/1,2,3/ 1000#
METHYL N-AMYL KETONE	1670 MG/KG RAT ORAL 12.6 ML/KG RABBIT DERMAL	NO/NO/1,2,3

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B2 -- D2B
HMIS/NFPA CLASSIFICATION: HEALTH 2, FLAMMABILITY 3, REACTIVITY 1, PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 277F(136C)-300F(148C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 52 %. VOLATILE BY VOLUME: 66 %. PRODUCT WT/GAL: 11.3 LBS/U.S.GAL. 1.35 sp gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 87 F(30C) (Setaflash) LEL 0.9 % UEL 10.5 %.
OSHA-FLAMMABLE LIQUID/OSHA/CLASS/1C, DOT-PAINT,3,UN1263,PGIII, CANADIAN TDGA: PAINT,3,UN1263,PGIII
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.
FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate.

PRODUCT: CARBOXANE 950 PART A (1335A1NL)
Date: 12/14/99 Replaces 04/05/99

Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation.
CONTACT: May cause eye irritation. May cause skin irritation.
NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: If you have a condition that could be aggravated by exposure to dust or organic vapors see a physician prior to use.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.
HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, sparks, and open flames.
INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in Section VIII. Contain

and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.
VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.
OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
FLUOROPOLYMER	NA	30%

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

SECTION I - PRODUCT: URETHANE CONVERTER 811 (0856B1NL)
Date: 04/28/03 Replaces 02/28/01

CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
POLYMERIC HDI	28182-81-2	90%	NE	NE	NE
AROMATIC SOLVENT	64742-95-6	5%	25PPM	NE	NE
BUTYL ACETATE	123-86-4	5%	150 PPM	200 PPM	NE
HDI ISOCYANATE	822-06-0	1%	0.005PPM	0.02PPM	NE

HAZARDOUS INGREDIENTS ADDITIONAL DATA

CHEMICAL NAME	(F)	(G)
POLYMERIC HDI	>5,000 MG/KG RAT ORAL 137-1150 MG/M3 4 HOURS; RAT	NO/NO/1,2,3,5
AROMATIC SOLVENT	4700MG/KG RAT,ORAL 3670PPM/8HRS RAT,INHALATION	NO/YES/1/2/3
BUTYL ACETATE	7.4 G/KG RABBIT ORAL >1800 PPM/6H INHALATION	NO/NO/1,2,3
HDI ISOCYANATE	710MG/KG ORAL 570MG/KG DERMAL 23PPM 4 HRS	NO/NO

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B3 -- D2A -- D2B
HMIS/NFPA CLASSIFICATION: HEALTH 3, FLAMMABILITY 2, REACTIVITY 1, PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 252F(122C)-355F(179C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 10 %. VOLATILE BY VOLUME: 13 %. PRODUCT WT/GAL: 9.4 LBS/U.S.GAL. 1.12 sp gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 133 F(56C) (Setaflash) LEL 1.0 % UEL 10.4 %.
OSHA-COMBUSTIBLE/LIQUID/OSHA/CLASS/II, DOT-PAINT,3,UN1263,PGIII, CANADIAN TDGA: PAINT,3,UN1263,PGIII
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.
FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate. Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to

keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation. May cause lung irritation. Contains HEXAMETHYLENE DIISOCYANATE which may cause allergic respiratory reaction, effects may be permanent.
CONTACT: May cause eye irritation. May cause skin irritation. May cause allergic skin reaction.
NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: If sensitized to isocyanates or other chemicals do not use. See a physician if a medical condition exists.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.
HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, sparks, and open flames.
INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and

equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor, use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.
VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL) .
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates the skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.
OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
No materials meet this criteria		

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

SECTION I - PRODUCT: CARBOXANE 950 MIXED OXIDE PT A (1335A1YL)
Date: 12/27/99

CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
PCBTF	98-56-6	35%	NE	NE	NE
XYLENE	1330-20-7	20%	100 PPM	150 PPM	NE
ETHYL BENZENE	100-41-4	10%	100 PPM	125 PPM	NE
BARIUM SULFATE	7727-43-7	10%	10mg/m3	NE	NE
MIXED METAL OXIDES	MIXTURE	10%	0.5MG.M3	NE	NE
COLOR PIGMENT	MIXTURE	5%	3.5MG/M3	NE	NE
METHYL N-AMYL KETONE	110-43-0	5%	50 PPM	100 PPM	NE

HAZARDOUS INGREDIENTS ADDITIONAL DATA

CHEMICAL NAME	(F)	(G)
PCBTF	>2.7 G/KG RABBIT 4479 PPM	NO/NO/2,3
XYLENE	4300MG/KG RAT,ORAL 15000 PPM/4HRS RAT,INHALATION	NO/YES/1,2,3/ 1000#/U239
ETHYL BENZENE	NOT AVAILABLE	NO/YES/1,2,3/ 1000#
BARIUM SULFATE	NOT AVAILABLE	NO/NO
MIXED METAL OXIDES	>10,000MG/KG ORAL NE	NO/YES
COLOR PIGMENT	NOT AVAILABLE	NO/YES
METHYL N-AMYL KETONE	1670 MG/KG RAT ORAL 12.6 ML/KG RABBIT DERMAL	NO/NO/1,2,3

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B2 -- D2A -- D2B
HMIS/NFPA CLASSIFICATION: HEALTH 2, FLAMMABILITY 3, REACTIVITY 1, PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 277F(136C)-300F(148C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 55 %. VOLATILE BY VOLUME: 67 %. PRODUCT WT/GAL: 11.0 LBS/U.S.GAL. 1.32 sp gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 87 F(30C) (Setaflash) LEL 0.9 %

PRODUCT: CARBOXANE 950 MIXED OXIDE PT A (1335A1YL)
Date: 12/27/99

UEL 10.5 %.
OSHA-FLAMMABLE LIQUID/OSHA/CLASS/1C, DOT-PAINT,3,UN1263,PGIII, CANADIAN TDGA: PAINT,3,UN1263,PGIII
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.
FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate. Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation.
CONTACT: May cause eye irritation. May cause skin irritation.
NOTICE: Contains MIXED METAL OXIDE PIGMENTS which are the result of high temperature calcination of the component substances. Due to the resultant unique crystalline structure the properties of this finished pigment do not necessarily reflect the properties of the component metals or oxides. Some compounds of the metals used in the manufacturing of this pigment have demonstrated various toxic properties. However, there is no evidence that this pigment has these toxic characteristics. IARC considers nickel compounds to be carcinogenic to humans (Monograph #49). IARC has classified cobalt and cobalt compounds as possibly carcinogenic to humans (Class 2B Monograph #52) Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: If you have a condition that could be aggravated by exposure to dust or organic vapors see a physician prior to use.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.

PRODUCT: CARBOXANE 950 MIXED OXIDE PT A (1335A1YL)
Date: 12/27/99

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, sparks, and open flames.
INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.
VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.
OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

PRODUCT: CARBOXANE 950 MIXED OXIDE PT A (1335A1YL)
Date: 12/27/99

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

CARBOLINE CO. MATERIAL SAFETY DATA SHEET
PRODUCT: CARBOXANE 950 MIXED OXIDE PT A (1335A1YL)
Date: 12/27/99

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
FLUOROPOLYMER	NA	30%

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

SECTION I - PRODUCT: URETHANE CONVERTER 811 (0856B1NL)
Date: 04/28/03 Replaces 02/28/01

CHEMTREC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9300
PITTSBURGH POISON CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME	(A)	(B)	(C)	(D)	(E)
POLYMERIC HDI	28182-81-2	90%	NE	NE	NE
AROMATIC SOLVENT	64742-95-6	5%	25PPM	NE	NE
BUTYL ACETATE	123-86-4	5%	150 PPM	200 PPM	NE
HDI ISOCYANATE	822-06-0	1%	0.005PPM	0.02PPM	NE

HAZARDOUS INGREDIENTS ADDITIONAL DATA

CHEMICAL NAME	(F)	(G)
POLYMERIC HDI	>5,000 MG/KG RAT ORAL 137-1150 MG/M3 4 HOURS; RAT	NO/NO/1,2,3,5
AROMATIC SOLVENT	4700MG/KG RAT,ORAL 3670PPM/8HRS RAT,INHALATION	NO/YES/1/2/3
BUTYL ACETATE	7.4 G/KG RABBIT ORAL >1800 PPM/6H INHALATION	NO/NO/1,2,3
HDI ISOCYANATE	710MG/KG ORAL 570MG/KG DERMAL 23PPM 4 HRS	NO/NO

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-TWA (D) STEL (E) CEILING (F) TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 302/SARA 313/ SARA 311-312 CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.

WHMIS CLASSIFICATION: B3 -- D2A -- D2B
HMIS/NFPA CLASSIFICATION: HEALTH 3, FLAMMABILITY 2, REACTIVITY 1, PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: 252F(122C)-355F(179C). VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. VOLATILE BY WEIGHT 10 %. VOLATILE BY VOLUME: 13 %. PRODUCT WT/GAL: 9.4 LBS/U.S.GAL. 1.12 sp gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 133 F(56C) (Setaflash) LEL 1.0 % UEL 10.4 %.
OSHA-COMBUSTIBLE/LIQUID/OSHA/CLASS/II, DOT-PAINT,3,UN1263,PGIII, CANADIAN TDGA: PAINT,3,UN1263,PGIII
EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.
FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate. Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to

keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electric equipment and installations should be made and grounded in accordance with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a NIOSH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: Harmful if inhaled, may affect the brain or nervous system, causing dizziness, headache or nausea. May cause nose and throat irritation. May cause lung irritation. Contains HEXAMETHYLENE DIISOCYANATE which may cause allergic respiratory reaction, effects may be permanent.
CONTACT: May cause eye irritation. May cause skin irritation. May cause allergic skin reaction.
NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: If sensitized to isocyanates or other chemicals do not use. See a physician if a medical condition exists.
PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.
EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.
EYE CONTACT: Flush with water for 15 minutes.
SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.
INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.
IF SWALLOWED: DO NOT INDUCE VOMITING!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.
HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.
CONDITIONS TO AVOID: Heat, sparks, and open flames.
INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

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equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.

SECTION VIII - SAFE HANDLING AND USE INFORMATION:

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VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL) .
SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates the skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.
HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.
APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.
OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:

Name	CAS	Pct
No materials meet this criteria		

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.

HEMPAXANE® 55000

BASE 55009 with CURING AGENT 98000

Description:

HEMPAXANE 55000 is a two-component, high-solids, high-gloss, polysiloxane enamel with excellent gloss and colour retention.

Recommended use:

As an isocyanate free glossy decorative and protective finishing coat for new steel structures in severely corrosive atmospheric environment.
Minimum temperature for curing is 0°C/32°F.

Service temperatures:

Maximum, dry exposure only: 120°C/248°F

Availability:

Part of Group Assortment. Local availability subject to confirmation.

PHYSICAL CONSTANTS:

Colours/Shade nos:	White/10170*
Finish:	High-gloss
Volume solids, %:	85 ± 1
Theoretical spreading rate:	6.8 m²/litre - 125 micron 273 sq.ft./US gallon - 5 mils
Flash point:	35°C/95°F
Specific Gravity:	1.3 kg/litre - 10.8 lbs/US gallon
Surface dry:	2½ (approx.) hrs at 20°C/68°F *(ISO 1517)*
Dry to touch:	4 hours at 20°C/68°F
Fully cured:	7 days at 20°C/68°F
V.O.C.:	160 g/litre - 1.3 lbs/US gallon

**(Based on agreement, may also be supplied in other shades).*

The physical constants stated are nominal data according to the HEMPEL Group's approved formulas. They are subject to normal manufacturing tolerances and where stated, being standard deviation according to ISO 3534-1.

APPLICATION DETAILS:

Mixing ratio for 55000:	Base 55009 : Curing agent 98000 5.4:4.6 by volume	
Application method:	Airless spray	Brush
Thinner (max.vol.):	08080 (10%)	08080 (5%)
Pot life:	3 hours (20°C/68°F)	
Nozzle orifice:	.017"-.021"	
Nozzle pressure	100-125 bar /1450 -1800 psi *(Airless spray data are indicative and subject to adjustment)*	
Cleaning of tools:	HEMPEL'S TOOL CLEANER 99610	
Indicated film thickness, dry:	125 micron/5 mils	
Indicated film thickness, wet:	150 micron/6 mils	
Recoat interval, min:	4 hours (20°C/68°F)	
Recoat interval, max:	7 days (20°C/68°F) - See REMARKS overleaf	

Safety:

Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Material Safety Data Sheets and follow all local or national safety regulations. Avoid inhalation, avoid contact with skin and eyes, and do not swallow. Take precautions against possible risks of fire or explosions as well as protection of the environment. Apply only in well ventilated areas

HEMPAXANE 55000

APPLICATION AND CURING CONDITIONS:	The surface must be completely clean and dry at the time of application, and its temperature must be above the dew point to avoid condensation. Minimum temperature for curing is 0°C/32°F, minimum relative humidity 30%. In confined spaces provide adequate ventilation during application and drying.
PRECEDING COAT:	HEMPADUR-system or GALVOSIL according to specification.
SUBSEQUENT COAT:	None.
REMARKS:	
Service temperatures:	At service temperature above 100°C/212°F, slight discoloration may be expected
Film thicknesses:	May be specified in another film thickness than indicated depending on purpose and area of use. This will alter spreading rate and may influence drying time and recoating interval. Normal range is 100 - 125 micron/4 -5 mils. If the product is specified in lower filmthickness, more thinning will be needed for proper filmformation during spray application - additionally the colour in the preceding coat should be considered to reduce contrast.
Exposure to humidity:	HEMPAXANE 55000 will resist condensation and light rain after the dry to touch stage has been reached.
Recoating:	If the maximum recoating interval is exceeded, roughening of the surface is necessary to ensure intercoat adhesion.
Application onto zinc silicate:	It is recommended to apply HEMPAXANE 55000 by using a "mist-coat" procedure **provided** the paint temperature is approximately above 20°C/68°F: A thin, undiluted coat is applied (the mist coat) and after a few minutes, a second coat is applied in the full specified film thickness. If the paint temperature is below 20°C/68°F, thinning (max 15%) may be required. **HEMPAXANE 55000 is for professional use only.**
ISSUED BY:	HEMPEL A/S - 5500010170CR001

Material Safety Data Sheet

Protective Clothing	HCS	DOT
	Class: Flammable liquid having a flash point lower than 37.8°C (100°F).	

Section I. Product Identification and Uses

Common/Trade name	**HEMPAXANE 55009**
Color	**Off White 10170**
Multicomponent Paint Systems - Mixed Paint System Designation	Hempaxane 55000 = Hempaxane 55009 + Hempel's 98000
Chemical family	Two component product - base (Paint.)
Material uses	Coatings: Paint. Protective coatings for industrial uses in corrosive environments such as marine, railcar, petroleum, tank storage, chemical and construction applications.
Mixing Ratio	5.38 / 4.62 5509 / 9800
Supplier	**HEMPEL Coatings (USA), Inc. 600 Conroe Park North Drive Conroe, Texas 77303**

TSCA	**Unless otherwise noted, all ingredients are TSCA listed.**
CAS#	Mixture.
Code	5500910170CR003
Molecular weight	Not applicable.
Manufacturer	**HEMPEL Coatings (USA), Inc. 600 Conroe Park North Drive Conroe, Texas 77303**
Manufacturer Telephone:	**Toll free, if outside area codes 713,281,409,or 936: (800) 678-6641 Regular phone number: (936) - 523-6000**

Section IA. First Aid Measures

Eye contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin contact	Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.
Hazardous skin contact	Not available.
Slight inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.
Hazardous inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.
Slight ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.
Hazardous ingestion	Not available.

Section II. Hazardous Ingredients

Name	CAS #	% by Weight	TLV/PEL	LC_{50}/LD_{50}
Rx product bisphenol A w / epichlorhydrin Epoxy number avg MW less than 700	30583-72-3	30-60	Not available.	Not available.
petroleum distillates - either low aromatic or hydrodesulfurized heavy	64742-47-8 or 64742-82-1	0-5	Not available.	Not available.
titanium dioxide	13463-67-7	30-60	**OSHA (United States).** TWA: 15 mg/m^3 **ACGIH (United States).** TWA: 10 mg/m^3 **ACGIH TLV (United States, 2000).** TWA: 10 mg/m^3 **OSHA Final Rule (United States, 1989).** TWA: 10 mg/m^3 Form:	Not available.
methyl trimethoxy silane	1185-55-3	0-5	Not available.	Not available.

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para-xylene	106-42-3	0-5	**ACGIH (United States).** TWA: 100 ppm STEL: 150 ppm TWA: 434 mg/m^3 STEL: 651 mg/m^3 **ACGIH TLV (United States, 2000).** STEL: 651 mg/m^3 STEL: 150 ppm TWA: 434 mg/m^3 TWA: 100 ppm **NIOSH REL (United States, 2000).** STEL: 655 mg/m^3 STEL: 150 ppm TWA: 435 mg/m^3 Period: 10 hour(s). TWA: 100 ppm Period: 10 hour(s).	Not available.
ethylbenzene	100-41-4	0-5	**OSHA (United States).** TWA: 435 ppm **ACGIH (United States).** TWA: 100 ppm STEL: 125 ppm TWA: 434 mg/m^3 STEL: 543 mg/m^3 **ACGIH TLV (United States, 2000).** STEL: 543 mg/m^3 STEL: 125 ppm TWA: 434 mg/m^3 TWA: 100 ppm **NIOSH REL (United States, 2000).** STEL: 545 mg/m^3 STEL: 125 ppm TWA: 435 mg/m^3 Period: 10 hour(s). TWA: 100 ppm Period: 10 hour(s). **OSHA Final Rule (United States, 1989).** STEL: 545 mg/m^3 STEL: 125 ppm TWA: 435 mg/m^3 TWA: 100 ppm	ORAL (LD50): Acute: 3500 mg/kg [Rat].
butanol	71-36-3	0-5	**OSHA (United States).** TWA: 300 ppm **ACGIH (United States).** CEIL: 50 ppm CEIL: 152 mg/m^3 **ACGIH TLV (United States, 2000). Skin** CEIL: 152 mg/m^3 CEIL: 50 ppm **NIOSH REL (United States, 2000). Skin** CEIL: 150 mg/m^3 CEIL: 50 ppm **OSHA Final Rule (United States, 1989). Skin** CEIL: 150 mg/m^3 CEIL: 50 ppm	ORAL (LD50): Acute: 790 mg/kg [Rat]. 2680 mg/kg [Mouse]. 2500 mg/kg [wild bird species]. DERMAL (LD50): Acute: 4200 mg/kg [Rabbit].
n-butylacetate	123-86-4	5-15	**OSHA (United States).** TWA: 710 mg/m^3 **ACGIH (United States).** TWA: 150 ppm STEL: 200 ppm TWA: 713 mg/m^3 STEL: 950 mg/m^3 **ACGIH TLV (United States, 2000).** STEL: 200 ppm	ORAL (LD50): Acute: 14130 mg/kg [Rat]. 7100 mg/kg [Mouse]. 4300 mg/kg [Mammal]. DERMAL (LD50): Acute: >17600 mg/kg [Rabbit].

Continued on Next Page

			TWA: 150 ppm **NIOSH REL (United States, 2000).** STEL: 950 mg/m³ STEL: 200 ppm TWA: 710 mg/m³ Period: 10 hour(s). TWA: 150 ppm Period: 10 hour(s). **OSHA Final Rule (United States, 1989).** STEL: 950 mg/m³ STEL: 200 ppm TWA: 710 mg/m³ TWA: 150 ppm	

Section III. Physical Data

Physical state and appearance	Liquid.
pH (1% soln/water)	Neutral.
Odor threshold	The lowest known value is 0.31 ppm (n-butylacetate) Weighted average: 0.76 ppm
Volatility	24.17% (v/v). 14.51% (w/w).
Melting point	May start to solidify at 13.35°C (56°F) based on data for: para-xylene. Weighted average: -66.48°C (-87.7°F)
Boiling point	The lowest known value is 102.06°C (215.7°F) (methyl trimethoxy silane). Weighted average: 121.86°C (251.3°F)
Specific gravity	1.438 (Water = 1)
Vapor density	>1 (Air = 1)
Vapor pressure	The highest known value is 1.2 kPa (8.7 mmHg) (at 20°C) (n-butylacetate).
Evaporation rate	<1 compared to Butyl acetate.
VOC	209 (g/l).
Viscosity	Not available.
$LogK_{ow}$	The product is more soluble in octanol.
Ionicity (surface active agent)	Not available.
Instability temperature	Not available.
Conditions of instability	Not available.
Dispersion properties	Is not dispersed in cold water. See solubility in methanol, diethyl ether, n-octanol, acetone.
Solubility	Partially soluble in methanol, diethyl ether, n-octanol, acetone. Insoluble in cold water.

Odor	Not available.
Taste	Not available.
Color	Off White 10170

Section IV. Fire and Explosion Data

The product is:	Flammable.
Auto-ignition temperature	The lowest known value is 343°C (649.4°F) (butanol).
Fire degradation products	These products are carbon oxides (CO, CO2), halogenated compounds, hydrogen chloride. Some metallic oxides.
Flash points	The lowest known value is CLOSED CUP: 10.9°C (51.6°F). (methyl trimethoxy silane)
Flammable limits	LOWER: 1% UPPER: Less or equal to 13%
Fire extinguishing procedures	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Never direct a water jet in the container in order to prevent any splashing of the product which could cause spreading of the fire. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Continued on Next Page

Flammability	Highly flammable in presence of open flames, sparks and static discharge. Flammable in presence of heat.
	Remark Not available.
Risks of explosion	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
	Remark Not available.

Section V. Reactivity Data

Stability	The product is stable.
Hazardous decomp. products	These products are halogenated compounds, hydrogen chloride.
Degradability	Not available.
Products of degradation	These products are carbon oxides (CO, CO2) and water, halogenated compounds. Some metallic oxides. The products of degradation are as toxic as the product itself.
	Remark Not available.
Corrosivity	Not available.
	Remark Not available.
Reactivity	Not available.
	Remark Not available.

Section VI. Toxicological Properties

Routes of entry	Absorbed through skin. Eye contact. Inhalation. Ingestion
TLV	Not available.
Toxicity to animals	Acute oral toxicity (LD50): 790 mg/kg [Rat]. (butanol) Acute dermal toxicity (LD50): 4200 mg/kg [Rabbit]. (butanol)
	Remark Not available.
Chronic effects on humans	Slightly hazardous in case of inhalation (lung irritant). **CARCINOGENIC EFFECTS**: Classified 2A (Probable for human.) by IARC [hi-flash aliphatic hydrocarbons]. Classified None. by NIOSH [hi-flash aliphatic hydrocarbons]. Classified None. by NIOSH [titanium dioxide]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [titanium dioxide]. Classified None. by NIOSH [methyl trimethoxy silane]. Classified None. by NIOSH [meta-xylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH [meta-xylene]. Classified None. by NIOSH [para-xylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH [para-xylene]. Classified 2B (Possible for human.) by IARC [ethylbenzene]. Classified None. by NIOSH [ethylbenzene]. Classified None. by NIOSH [butanol]. Classified None. by NIOSH [n-butylacetate]. Classified A4 (Not classifiable for human or animal.) by ACGIH [n-butylacetate]. **MUTAGENIC EFFECTS** Not available. **TERATOGENIC EFFECTS** Not available. **DEVELOPMENTAL TOXICITY** Not available. The substance is toxic to blood, lungs, upper respiratory tract. The substance may be toxic to kidneys, the nervous system, liver, mucous membranes, heart, gastrointestinal tract, skin, , central nervous system (CNS), eye, lens or cornea. Repeated or prolonged exposure to the substance can produce target organs damage.
	Remark NIOSH- titanium dioxide -a potential carcinogen to lungs in rats due to inhalation of excessive dust and overwhelmed lung clearance mechanisms. The National Cancer Institute bioassay concluded that titanium dioxide did not effect mortality, and was not carcinogenic at dose levels of 25,000 or 50,000 ppm in rats or mice. (Referenced in Federal Register: March 25,1998. Vol 63; No. 571, Page 14361). (titanium dioxide)
Acute effects on humans	Hazardous in case of eye contact (irritant). Slightly hazardous in case of skin contact (irritant), of inhalation.

Continued on Next Page

Remark

NIOSH- titanium dioxide -a potential carcinogen to lungs in rats due to inhalation of excessive dust and overwhelmed lung clearance mechanisms. The National Cancer Institute bioassay concluded that titanium dioxide did not effect mortaility, and was not carcinogenic at dose levels of 25,000 or 50,000 ppm in rats or mice. (Referenced in Federal Register: March 25,1998. Vol 63; No. 571, Page 14361). (titanium dioxide)

Section VII. Preventive Measures

Waste information	Type: Hazardous chemical waste. Location: not available Classification: not available Disposal.: Waste must be disposed of in accordance with federal, state and local environmental control regulations. Storage: not available Recycling: not available
Waste stream	Not available.
Storage	Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).
Precautions	Keep locked up. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label.
Small spill and leak	Absorb with an inert material and put the spilled material in an appropriate waste disposal
Large spill and leak	Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.
Protective clothing in case of large spill	Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Section VIII. Classification

DOT

3

Paint, 3, 1263, III, Not pollutant., RQ (epichlorhydrin, methanol, ortho-xylene, meta-xylene, para-xylene, ethylbenzene, butanol, n-butylacetate)

Maritime transportation

Not pollutant.

Marine pollutant substance: epichlorhydrin

Remark

-

HCS

Class: Flammable liquid having a flash point lower than 37.8°C (100°F).

Remark

Potential sensitizer (ethylbenzene)

Federal and State Regulations

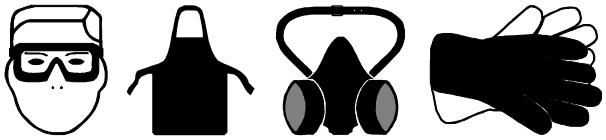
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: epichlorhydrin
California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: epichlorhydrin
California prop. 65 (no significant risk level): epichlorhydrin
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: epichlorhydrin

Continued on Next Page

Connecticut carcinogen reporting list.: ortho-xylene
Connecticut hazardous material survey.: Xylene(s)
Illinois toxic substances disclosure to employee act: Xylene(s)
Illinois chemical safety act: Xylene(s)
New York release reporting list: Xylene(s)
Rhode Island RTK hazardous substances: Xylene(s)
Pennsylvania RTK: epichlorhydrin: (special hazard, environmental hazard, generic environmental hazard); DIGLYCIDYL ETHER: (environmental hazard, generic environmental hazard); titanium dioxide: (generic environmental hazard); methanol: (environmental hazard, generic environmental hazard); Xylene(s): (environmental hazard, generic environmental hazard); ethylbenzene: (environmental hazard, generic environmental hazard); butanol: (environmental hazard, generic environmental hazard); n-butylacetate: (environmental hazard, generic environmental hazard)
Florida: epichlorhydrin; methanol; Xylene(s); ethylbenzene; butanol; n-butylacetate
Minnesota: epichlorhydrin; titanium dioxide; methanol; Xylene(s); ethylbenzene; butanol; n-butylacetate
Michigan critical material: epichlorhydrin; Xylene(s)
Massachusetts RTK: epichlorhydrin; DIGLYCIDYL ETHER; titanium dioxide; methanol; Xylene(s); ethylbenzene; butanol; n-butylacetate
Massachusetts spill list: DIGLYCIDYL ETHER
New Jersey: epichlorhydrin; DIGLYCIDYL ETHER; titanium dioxide; methanol; Xylene(s); ethylbenzene; butanol; n-butylacetate
New Jersey spill list: Xylene(s)
New Jersey toxic catastrophe prevention act: Xylene(s)
Louisiana RTK reporting list: Xylene(s)
Louisiana spill reporting: Xylene(s)
TSCA 4(a) final testing rules: n-butylacetate.
TSCA 5(e) substance consent order: n-butylacetate.
TSCA 8(a) PAIR: epichlorhydrin, meta-xylene, para-xylene, ethylbenzene.
TSCA 8(a) IUR: butanol, n-butylacetate.
TSCA 8(b) inventory: All substances are listed on the TSCA Inventory with the exception of: C13-C16 Alcohol mixture.
TSCA 12(b) one time export: n-butylacetate.
SARA 302/304/311/312 extremely hazardous substances: epichlorhydrin; DIGLYCIDYL ETHER
SARA 302/304 emergency planning and notification: epichlorhydrin; DIGLYCIDYL ETHER
SARA 302/304/311/312 hazardous chemicals: epichlorhydrin; DIGLYCIDYL ETHER; hi-flash aliphatic hydrocarbons; titanium dioxide; methanol; methyl trimethoxy silane; Xylene(s); ethylbenzene; butanol; n-butylacetate
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: CYCLOHEXANOL, 4,4'-(1-METHYLETHYLIDENE)BIS-, POLYMER WITH (CHLOROMETHYL)OXIRANE
Epoxy number average molecular weight less than 700: Delayed (Chronic) Health Hazard; epichlorhydrin: Fire Hazard, reactive, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; DIGLYCIDYL ETHER: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; hi-flash aliphatic hydrocarbons: Delayed (Chronic) Health Hazard; titanium dioxide: Immediate (Acute) Health Hazard; methanol: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; methyl trimethoxy silane: Fire Hazard, Immediate (Acute) Health Hazard; Xylene(s): Fire Hazard; ethylbenzene: Fire Hazard, Immediate (Acute) Health Hazard; butanol: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; n-butylacetate: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
CERCLA: Hazardous substances.: epichlorhydrin: 100 lbs. (45.36 kg); methanol: 5000 lbs. (2268 kg); Xylene(s): 100 lbs. (45.36 kg); ethylbenzene: 1000 lbs. (453.6 kg); butanol: 5000 lbs. (2268 kg); n-butylacetate: 5000 lbs. (2268 kg);

Section IX. Protective Clothing

Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Impervious gloves.



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Section X. Other Information

References Not available.

Note: In USA, consult Code of Federal Regulations, Title 29, Labor, Parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable Federal, State or local regulations that apply to safe practices in coating operations.

Validated by Algimantas Pliodzinskas on 12/17/2003.

Verified by Algimantas Pliodzinskas.

Printed 12/17/2003.

Emergency telephone number **For Transportation Emergencies, call CHEMTREC: (800) 424-9300. If outside USA/Canada, call: (703) 527-3887.**
For all other information call Hempel Coatings (USA), Inc. (936) 523-6000. Toll free [if outside area codes 713, 281,409,936]: (800) 678-6641

Material Safety Data Sheet

Protective Clothing	HCS	DOT
	Class: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).	

Section I. Product Identification and Uses

Common/Trade name	**HEMPEL'S 98000**
Color	**Clear 00000**
Multicomponent Paint Systems - Mixed Paint System Designation	Hempaxane 55000 = Hempaxane 55009 + Hempel's 98000
Chemical family	Two component product - cure (Polymer. Paint. Organic.)
Material uses	Coatings: Catalyst for epoxy resins. Hardener for resins. Paint.
Mixing Ratio	5.38: 4.62 55009 / 98000
Supplier	**HEMPEL Coatings (USA), Inc. 600 Conroe Park North Drive Conroe, Texas 77303**

TSCA	**Unless otherwise noted, all ingredients are TSCA listed.**
CAS#	Mixture.
Code	9800000000US001
Molecular weight	Not applicable.
Manufacturer	**HEMPEL Coatings (USA), Inc. 600 Conroe Park North Drive Conroe, Texas 77303**
Manufacturer Telephone:	**Toll free, if outside area codes 713,281,409,or 936: (800) 678-6641 Regular phone number: (936) - 523-6000**

Section IA. First Aid Measures

Eye contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin contact	Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.
Hazardous skin contact	Not available.
Slight inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.
Hazardous inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.
Slight ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.
Hazardous ingestion	Not available.

Section II. Hazardous Ingredients

Name	CAS #	% by Weight	TLV/PEL	LC_{50}/LD_{50}
aminoalkylfunctional polydimethylsiloxane [based on 3-(2-aminoethylamino)propyltrimethoxysila		60-80	Not available.	Not available.
3-(2-aminoethylamino)propyltrimethoxysila	1760-24-3	0-5	Not available.	Not available.
meta-xylene	108-38-3	0-5	**ACGIH (United States).** TWA: 100 ppm STEL: 150 ppm TWA: 434 mg/m^3 STEL: 651 mg/m^3 **ACGIH TLV (United States, 2000).** STEL: 651 mg/m^3 STEL: 150 ppm TWA: 434 mg/m^3 TWA: 100 ppm **NIOSH REL (United States,**	Not available.

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			2000). STEL: 655 mg/m³ STEL: 150 ppm TWA: 435 mg/m³ Period: 10 hour(s). TWA: 100 ppm Period: 10 hour(s).	
para-xylene	106-42-3	5-15	**ACGIH (United States).** TWA: 100 ppm STEL: 150 ppm TWA: 434 mg/m³ STEL: 651 mg/m³ **ACGIH TLV (United States, 2000).** STEL: 651 mg/m³ STEL: 150 ppm TWA: 434 mg/m³ TWA: 100 ppm **NIOSH REL (United States, 2000).** STEL: 655 mg/m³ STEL: 150 ppm TWA: 435 mg/m³ Period: 10 hour(s). TWA: 100 ppm Period: 10 hour(s).	Not available.
ethylbenzene	100-41-4	0-5	**OSHA (United States).** TWA: 435 ppm **ACGIH (United States).** TWA: 100 ppm STEL: 125 ppm TWA: 434 mg/m³ STEL: 543 mg/m³ **ACGIH TLV (United States, 2000).** STEL: 543 mg/m³ STEL: 125 ppm TWA: 434 mg/m³ TWA: 100 ppm **NIOSH REL (United States, 2000).** STEL: 545 mg/m³ STEL: 125 ppm TWA: 435 mg/m³ Period: 10 hour(s). TWA: 100 ppm Period: 10 hour(s). **OSHA Final Rule (United States, 1989).** STEL: 545 mg/m³ STEL: 125 ppm TWA: 435 mg/m³ TWA: 100 ppm	ORAL (LD50): Acute: 3500 mg/kg [Rat].

Section III. Physical Data

Physical state and appearance	Liquid.
pH (1% soln/water)	Not applicable.
Odor threshold	The lowest known value is 0.62 ppm (meta-xylene) Weighted average: 1.85 ppm
Volatility	11.6% (v/v). 10% (w/w).
Melting point	May start to solidify at 13.35°C (56°F) based on data for: para-xylene. Weighted average: 3.17°C (37.7°F)
Boiling point	140°C (284°F)
Specific gravity	1.12 (Water = 1)
Vapor density	>1 (Air = 1)

Odor	Not available.
Taste	Not available.
Color	Clear 00000

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Vapor pressure	The highest known value is 0.8 kPa (6 mmHg) (at 20°C) (meta-xylene).
Evaporation rate	<1
VOC	111 (g/l).
Viscosity	Not available.
LogK_{ow}	The product is more soluble in octanol.
Ionicity (surface active agent)	Not available.
Instability temperature	Not available.
Conditions of instability	Not available.
Dispersion properties	Easily dispersed in cold water. See solubility in methanol, diethyl ether, n-octanol, acetone.
Solubility	Partially soluble in methanol, diethyl ether, n-octanol, acetone. Insoluble in cold water.

Section IV. Fire and Explosion Data

The product is:	Flammable.
Auto-ignition temperature	The lowest known value is 524.75 to 528.06°C (976.5 to 982.5°F) (para-xylene).
Fire degradation products	These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...). Some metallic oxides.
Flash points	CLOSED CUP: 38°C (100.4°F).
Flammable limits	LOWER: 1.7% UPPER: 7.6%
Fire extinguishing procedures	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Never direct a water jet in the container in order to prevent any splashing of the product which could cause spreading of the fire. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.
Flammability	Flammable in presence of open flames, sparks and static discharge. Slightly flammable to flammable in presence of heat.
	Remark Not available.
Risks of explosion	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
	Remark Not available.

Section V. Reactivity Data

Stability	The product is stable.
Hazardous decomp. products	Not available.
Degradability	Not available.
Products of degradation	These products are carbon oxides (CO, CO2) and water, nitrogen oxides (NO, NO2...). Some metallic oxides. The product itself and its products of degradation are not toxic.
	Remark Not available.
Corrosivity	Not available.
	Remark Not available.
Reactivity	Slightly reactive to reactive with acids.
	Remark Not available.

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Section VI. Toxicological Properties

Routes of entry	Absorbed through skin. Eye contact. Inhalation. Ingestion
TLV	Not available.
Toxicity to animals	LD50: Not available. LC50: Not available. **Remark** Not available.
Chronic effects on humans	**CARCINOGENIC EFFECTS**: Classified None. by NIOSH [ortho-xylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH [ortho-xylene]. Classified None. by NIOSH [meta-xylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH [meta-xylene]. Classified None. by NIOSH [para-xylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH [para-xylene]. Classified 2B (Possible for human.) by IARC [ethylbenzene]. Classified None. by NIOSH [ethylbenzene]. Classified None. by NIOSH [toluene]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [toluene]. Classified None. by NIOSH [methanol]. **MUTAGENIC EFFECTS** Not available. **TERATOGENIC EFFECTS** Not available. **DEVELOPMENTAL TOXICITY** Not available. The substance may be toxic to blood, kidneys, lungs, the nervous system, liver, heart, gastrointestinal tract, upper respiratory tract, skin, , central nervous system (CNS), eye, lens or cornea. Repeated or prolonged exposure to the substance can produce target organs damage. **Remark** Caution: This product contains ethylbenzene. A draft report on a study conducted by the National Toxicology program states that lifetime inhalation exposure of rats and mice to concentrations of ethylbenzene (750 ppm) resulted in increases in certain types of cancer, including kidney tumors in rats and lung and kidney tumors in mice. These effects were not observed in animals exposed to lower concentrations of ethylbenzene (75 ppm and 250 ppm). The draft report does not address the relevance of these results to humans. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as a possible human carcinogen (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. (ethylbenzene)
Acute effects on humans	Hazardous in case of eye contact (irritant). Slightly hazardous in case of skin contact (irritant), of inhalation. **Remark** Caution: This product contains ethylbenzene. A draft report on a study conducted by the National Toxicology program states that lifetime inhalation exposure of rats and mice to concentrations of ethylbenzene (750 ppm) resulted in increases in certain types of cancer, including kidney tumors in rats and lung and kidney tumors in mice. These effects were not observed in animals exposed to lower concentrations of ethylbenzene (75 ppm and 250 ppm). The draft report does not address the relevance of these results to humans. (ethylbenzene)

Section VII. Preventive Measures

Waste information	Type: Hazardous chemical waste. Location: not available Classification: not available Disposal.: Waste must be disposed of in accordance with federal, state and local environmental control regulations. Storage: not available Recycling: not available
Waste stream	Not available.
Storage	Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).
Precautions	Keep locked up. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label.
Small spill and leak	Absorb with an inert material and put the spilled material in an appropriate waste disposal
Large spill and leak	Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed.

Continued on Next Page

Protective clothing in case of large spill	Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Section VIII. Classification

DOT 3

PAINT, 3, 1263, III, Not pollutant., RQ (ortho-xylene, meta-xylene, para-xylene, ethylbenzene, toluene, methanol, Benzene)

Maritime transportation Not pollutant.

Remark
-

HCS Class: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).

Remark

Potential sensitizer (ethylbenzene)

Federal and State Regulations

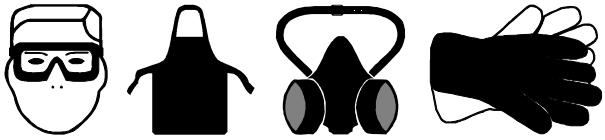
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: toluene; Benzene
California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Benzene
California prop. 65 (no significant risk level): Benzene
California prop. 65 (acceptable daily intake level): toluene: 7000 mg/day (value), 13000 mg/day (inhalation)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: toluene; Benzene
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Benzene
Connecticut carcinogen reporting list.: ortho-xylene
Connecticut hazardous material survey.: Xylene(s)
Illinois toxic substances disclosure to employee act: Xylene(s)
Illinois chemical safety act: Xylene(s)
New York release reporting list: Xylene(s)
Rhode Island RTK hazardous substances: Xylene(s)
Pennsylvania RTK: Xylene(s): (environmental hazard, generic environmental hazard); ethylbenzene: (environmental hazard, generic environmental hazard); toluene: (environmental hazard, generic environmental hazard); methanol: (environmental hazard, generic environmental hazard); Benzene: (special hazard, environmental hazard, generic environmental hazard)
Florida: Xylene(s); ethylbenzene; toluene; methanol; Benzene
Minnesota: Xylene(s); ethylbenzene; toluene; methanol; Benzene
Michigan critical material: Xylene(s); toluene; Benzene
Massachusetts RTK: Xylene(s); ethylbenzene; toluene; methanol; Benzene
New Jersey: Xylene(s); ethylbenzene; toluene; methanol; Benzene
New Jersey spill list: Xylene(s)
New Jersey toxic catastrophe prevention act: Xylene(s)
Louisiana RTK reporting list: Xylene(s)
Louisiana spill reporting: Xylene(s)
TSCA 8(a) PAIR: meta-xylene, para-xylene, ethylbenzene, toluene.
TSCA 8(b) inventory: All substances are listed on the TSCA Inventory.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Xylene(s); ethylbenzene; toluene; methanol; Benzene
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Xylene(s): Fire Hazard; ethylbenzene: Fire Hazard, Immediate (Acute) Health Hazard; toluene: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; methanol: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; Benzene: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

Continued on Next Page

CERCLA: Hazardous substances.: Xylene(s): 100 lbs. (45.36 kg); ethylbenzene: 1000 lbs. (453.6 kg); toluene: 1000 lbs. (453.6 kg); methanol: 5000 lbs. (2268 kg); Benzene: 10 lbs. (4.536 kg);

Section IX. Protective Clothing

Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Impervious gloves.



Section X. Other Information

References Not available.

Note: In USA, consult Code of Federal Regulations, Title 29, Labor, Parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable Federal, State or local regulations that apply to safe practices in coating operations.

Validated by Algimantas Pliodzinskas on 12/17/2003.

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3029 South Harbor Blvd, Santa Ana, CA 92704-6448 USA
Tel: 714/434-0800 ext 13
Fax: 714/434-0888
E-Mail: IntegratedPolymerIndustries@msn.com

Integrated Polymer Industries, Inc

BE SAFE! READ OUR PRODUCT SAFETY INFORMATION…AND PASS IT ON. PRODUCT LIABILITY LAW REQUIRES IT.

IPN-FlexFair 166501

Engineering Data Bulletin

1. Material Description

Two-component, stiff paste, designed as a structural multi-purpose fairing compound with superior LO properties. An IPN-based tough, flexible, thermally conductive, and chemical resistant material for aerospace use.

Features & Benefits	• Zero VOC; contains no solvent; environmentally friendly
	• IPN- based technology adapted to low observable materials
	• Passed all tests conducted by Northrop Grumman for the U.S. Air Force
	• Qualified for and currently in use on B-2 Stealth Bombers
	• Cure at ambient temperature without requiring autoclaves or ovens
	• Sandable within 6 hours
	• UV resistant
	• Effective against high or low temperatures and rapid temperature changes
	• Goes on composite, steel, aluminum, fiberglass, wood, and most elastomers
	• Protects external parts against corrosion, erosion, rain, wind, and other elements
	• Provides long service life, without frequently coming off the plane
	• 2 component, easy to mix and apply with a spatula
	• Designed for surface smoothness applications
	• Repairs itself easily; saves time and labor; virtually eliminates downtime
	• Single material replaces multiple products
	• Improved application (can apply under high humidity, dew, even rain conditions)
	• Insensitive to moisture or condensation during storage, application, or cure
	• Unaffected by moisture, condensation, humidity, dew, or water during service.

3. Physical Properties

IPN-166501	Base Ref:11/35	Solidifier Ref: 10/80	Mixed	Comments
Color	Amber	Black	Gray	Other colors possible with minimum order
Weight, grams	59	61	120	4 0z kit (120 cc)
Mix ratio , by weight	1	1.034	N/A	
Mix ratio, by volume	1	1.186	N/A	
Density, g/cc	1.1617	1.0128	1.0970	
Potlife, min @ 25°C	N/A	N/A	50	
Application tools	Spatula	Spatula	Spatula	
Touch dry time @ 25°C,	N/A	N/A	4h	
Sandable @ 25°C,	N/A	N/A	6h	
Mechanical cure @ 25°C,	N/A	N/A	24h	

Chemical Cure @ 25°C	N/A	N/A	72h	
Coverage of 1-kit at 3mm thickness	N/A	N/A	375 cm^2	
Slump at 25mm thickness @ 25°C	Zero	Zero	zero	Nonsag pastes; vertical/overhead use OK
Adhesion, psi @ 25°C, flat tensile	N/A	N/A	1,500	Al/steel, Elcometer pull-off
Flexibility, pass Mandrel	N/A	N/A	1cm	Outside diameter
Salt Spray ASTM B-117	N/A	N/A	No effect	10cm x 15cm panels, 3000hrs
Weather-o-Meter, ASTM G26 (CAM 47)	N/A	N/A	No effect	10cm x 15cm panels, 500hrs
UV Exposure @ 63°C	N/A	N/A	No effect	10cm x 15cm panels, 7 days
Thermal Cycling, -40°C + 82°C, 24 cycles, 20 min soak and ramp	N/A	N/A	No effect	2.5cm x 30cm strips;
Elongation	N/A	N/A	20+%	
Flexibility, 100 cycles	N/A	N/A	No effect	180 degree bending
Cure time, h / peel values, ppiw	N/A	N/A	6 / 15.4	At 18°C to 29°C
Tensile Strength, ASTM D 412			>1500 psi	
Shore A hardness in 1h, 6h , 24h			60, 80, 90	
Shore D hardness in 6h, 24h			40, 60	
Peel Strength, 24hrs, ppiw			>30	
Lap Shear, psi			2,100	
Gardner Impact, 2lb/40inch drop			No effect	10 cycles

4. Chemical Resistance		
Fluids & Test Specifications: Northrop Grumman Environmental Labs Tests, 8 Overlaps, 6 Coupons, 10cm x 15cm; 24hrs Fluid Exposures	**Test Result**	**Comments**
MIL-L-7808 @ 25°C	No effect	No Adhesion Loss or Hardness Reduction
MIL-H-83282 @ 25°C	No effect	No Adhesion Loss or Hardness Reduction
JP-8 Fuel @ 25°C	No effect	No Adhesion Loss or Hardness Reduction
Deicer @ 25°C	No effect	No Adhesion Loss or Hardness Reduction
MIL-L-7808 @ 71°C	No effect	No Adhesion Loss or Hardness Reduction
MIL-H-83282 @ 71°C	No effect	No Adhesion Loss or Hardness Reduction
JP-8 Fuel @ 71°C	No effect	No Adhesion Loss or Hardness Reduction
Deicer @ 71°C	No effect	No Adhesion Loss or Hardness Reduction

5. Theory of IPNs	
Background	• IPNs ***(inter-penetrating-networks)*** is the next frontier in the high performance materials technology. Academic research work on IPNs dates back to early 1970s, when the founder of IPI was one of the investigators. Application of the IPNs to the coatings technology was solely pioneered by IPI in mid 1980s. Maturing of IPNs into proven industrial alternatives and emergence of IPNs as commercial success took place in the 1990s.

Fundamental Principles	• IPNs are super high performance, hybrid polymers, complex in structure, but simple in principle. IPNs aim to build on the desirable properties of commercial polymers like epoxies, urethanes, acrylics, silicones, etc., while leaving out their poor, undesirable properties. For example, epoxies are good in adhesion and chemical resistance, but poor in UV resistance and they are mostly brittle. Urethanes, on the other hand, are flexible and tough, but they suffer the draw back of hydrolysis, which allows water ingression over time to cause blisters. Acrylics are great against UV but they can not bond to wet surfaces well and they have shrinkage, flammability, and odor problems. IPNs, therefore, aim to build a polymeric backbone which gets its adhesion and chemical resistance from epoxies, flexibility and toughness from urethanes, and UV resistance from acrylics, among other things, while leaving out the poor properties of these polymers. • Topics like what kind of polymers are used as starting materials, what kind of IPNs are built from them, and how this whole process really works, etc. are closely guarded trade secrets. IPI formulates and manufactures many different kinds of materials using IPNs, including but not limited to adhesives, sealants, caulks, mastics, composites, primers, and coatings.

Additional Information	• For more information and/or samples, please contact us. • Thank you for your interest in our unique IPN products!

Integrated Polymer Industries, Inc.
3029 South Harbor Blvd, Santa Ana, CA 92704 USA
Tel: 714/434-0800 ext 11
Fax: 714/434-0888
Web: **I**ntegrated**P**olymer.com

integrated polymer ® industries, inc.

Be Safe! Read Our Product Safety Information And Pass It On. Product Liability Law Requires It. Before Handling, Please ReadAnd Follow All Instructions Per The Technical Data, Material Safety Data Sheets, and Labels, Which Are Inseparable For Safe Use And Physical And Health Hazard Information. For Industrial Use Only. Not For Sale To General Public. For Professional Application By Trained, Qualified, And Experienced Applicators. This Product Should Not Be Used By Untrained Or Non-Professional Personnel. All Technical Data Subject To Change Without Notice. The Values Shown Are Not Intended For Use In Preparing Specification. Calculated Values Are Shown And May Vary Slightly *From The Actual Manufactured Material. Please Contact IPI For Further Information.*

IPI-FlexFair™

Material Safety Data Sheet

HAZARDOUS MATERIAL INFORMATION SYSTEM (HMIS)					NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	
	Base	Solidifier	Mixed	Cured		
Fire	**1**	**1**	**1**	**0**	Health	**NDA**
Toxicity	**1**	**2**	**2**	**0**	Flammability	**NDA**
Reactivity	**0**	**0**	**2**	**0**	Reactivity	**NDA**
Special	**0**	**0**	**0**	**0**		
Target Organs	**Eyes, Skin and Respiratory Systems**					

Legend: 4 - Extreme, 3 - High, 2 - Moderate, 1 - Slight, 0 - Insignificant

Note: HMIS and NFPA ratings involve data and interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

	BASE	SOLIDIFIER
1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION		
Material Identity		
Product Trade Name	**IPI-FlexFair™**	
Product Code	**AE-166501**	
Number Of Components	**2**	
Chemical Name	**IPN (interpenetrating polymer network) subassembly containing select reactive sites, built into the pre-polymer backbone, nature and identity of which are trade secrets. Dominant reactive site resembles: Modified 4,4'-Isopropylidenediphenol Epichlorohydrin**	**IPN (interpenetrating polymer network) subassembly containing select reactive sites, built into the pre-polymer backbone, nature and identity of which are trade secrets. Dominant reactive site resembles: Modified Aliphatic Polyamine**
Synonyms	**NDA**	**NDA**
Empirical Formula	**Proprietary Mixture**	**Proprietary Mixture**
Manufacturer		
Company	**Integrated Polymer Industries, Inc (IPI)**	
Address	**3029 South Harbor Blvd, Santa Ana, CA 92704-6448 USA**	
IPI Emergency Number	**714/434-0800**	
24 Hour Emergency Assistance	**800/424-9300 CHEMTREC**	
MSDS Prepared By	**Polymer Engineering Department**	
MSDS Effective Date	**February 01, 2001**	

2. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS		
Ingredient 1		
Common Name	**NDA**	**NDA**
Chemical Identity	**4,4'-Isopropylidenediphenol Epichlorohydrin**	**Phenol**
CAS Registry No.	**25068-38-6**	**108-95-2**

Concentrations % By Weight	**< 30**				**<1**			
OSHA Hazardous Ingredient	**NDA**				**NDA**			
Exposure Limits	Component				Component			
	OSHA, ppm	STEL	PEL		OSHA, ppm	STEL	PEL	
		NDA	**NDA**			**NDA**	**NDA**	
	ACGIH, ppm, TLV	STEL	TWA		ACGIH, ppm, TLV	STEL	TWA	
		NDA	**NDA**			**NDA**	**NDA**	
	Comment	**Irritant by skin contact.**			Comment	**Irritant by skin contact; toxic by ingestion; biologically corrosive. Locked into the molecular network; not free for reaction.**		
Carcinogen Status	OSHA	ACGIH	NTP	IARC	OSHA	ACGIH	NTP	IARC
	NDA	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**

Ingredient 2

Common Name	**Non-Hazardous Ingredients**				**Noon-Hazardous Ingredients**			
Chemical Identity	**Information concerning non-hazardous ingredients is considered a Trade Secret.**							
CAS Registry No.	**NA**				**NA**			
Concentrations % By Weight	**NA**				**NA**			
OSHA Hazardous Ingredient	**NA**				**NA**			
Exposure Limits	Component	**NA**			Component	**NA**		
	OSHA, ppm	STEL	PEL		OSHA, ppm	STEL	PEL	
		NA	**NA**			**NA**	**NA**	
	ACGIH, ppm, TLV	STEL	TWA		ACGIH, ppm, TLV	STEL	TWA	
		NA	**NA**			**NA**	**NA**	
	Comment	**NA**			Comment	**NA**		
Carcinogen Status	OSHA	ACGIH	NTP	IARC	OSHA	ACGIH	NTP	IARC
	NA	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING: Prolonged or repeated exposure may cause skin sensitization, nose and throat irritation, and/or other allergic response. Ingestion may cause nausea, vomiting, pain, upset stomach, and diarrhea.

Appearance and Odor	*Black, stiff paste*	***Yellowish, stiff paste***
Flammability	***Nonflammable***	***Nonflammable***
Environmental	***May be harmful to aquatic organisms. As a precaution, do not allow it to enter a body of water.***	
Health	***May be a skin sensitizer. Avoid skin contact.***	

Effects of Overexposures

Primary Route(s) of Entry		**skin contact, eye contact.**	
Eye		**Contact may cause sensitization, irritation, or burn.**	
Skin		**Repeated exposure may cause irritation, skin sensitization, and/or other allergic responses.**	
Inhalation		**NDA**	**High concentration of vapors may cause irritation.**
Ingestion		**NDA**	**NDA**
Systemic (OtherTarget Organ) Effects		**NDA**	**NDA**
Signs and Symptoms of Exposure	**Acute Effects**	**Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: gastrointestinal irritation (nausea, vomiting, diarrhea), irritation (nose, throat, respiratory tract), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache).**	

	Possible Longer Term Effects	Repeated and/or prolonged exposure may cause allergic reaction/sensitization, adverse respiratory effects (such as cough, shortness of breath), adverse eye effects (such as conjunctivitis or corneal damage). Effects from inhalation of vapors may be delayed. Repeated and/or prolonged exposure to low concentrations of vapor may cause sore throat, eye irritation.	
Medical Conditions Generally Aggravated by Exposure		Asthma, chronic respiratory disease (e.g. bronchitis, emphysema), eye disease.	
Developmental Information		NDA	NDA
Teratology (Birth Defects)		NDA	NDA
Reproductive Effects		NDA	NDA
Other Health Effects		NDA	NDA
Chronic		Prolonged or repeated exposure may cause asthma, skin sensitization, and/or other allergic response.	Solidifier will cause burns. Prolonged or repeated exposure may cause asthma, skin sensitization, and/or other allergic response.
Carcinogenicity		This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.	

4. FIRST AID

Eye	Immediately flush eyes with water and continue washing for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.
Skin	Immediately wash skin with soap and water. Remove contaminated clothing. Obtain medical attention if irritation persists.
Inhalation	Remove to fresh air. Obtain medical attention if symptoms persist.
Ingestion	Seek immediate medical attention. If individual is drowsy or unconscious, do not give anything by mouth. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.
Overexposure Effects	Overexposure to this material can cause moderate skin and severe eye irritation. Can be harmful if ingested.
Medical Conditions generally Aggravated by Exposure	Asthma, chronic respiratory disease (e.g. bronchitis, emphysema), eye disease.
Note to Physicians	Treatment based on judgment of the physician in response to reactions of the patient. No incidents of overexposure by any route have ever been reported since 1985, establishment of the manufacturer, which leads manufacturer to believe that, when used properly by generally accepted good industrial practices, there should not be any threat to health of any enduser. All information presented here are precautionary, not based on real life incidents. While possibility of an accident is always there, probability due to small size of product and its paste form, is quite low.
Additional Information	Promptly remove and discard contaminated clothing.

5. FIRE & EXPLOSION DATA

Flammable Properties	Flash Point	>199°F/93°C	>199°F/93°C
	Method	Setaflash	Pensky-Martens Closed Cup (ASTM D-93)
	Autoignition Temp.	NDA	NDA
Flammability Limit/ % Volume in Air	Lower (LFL)	NDA	NDA
	Upper (UFL)	NDA	NDA
Explosive Limit	Lower (LEL)	NDA	NDA
	Upper (UEL)	NDA	NDA
Fire Hazard Classification (OSHA/NFPA)		NDA	NDA
Fire and Explosion Hazards		No unusual hazards. Base will not burn unless preheated.	Heavy smoke and toxic fumes will evolve when in fire.
Hazardous Combustion and Decomposition Products		NDA	NO, NO_2
Extinguishing Media		Foam, CO_2, Dry Chemicals, Water	
Fire Fighting Procedures		To extinguish combustible residues of this product use carbon dioxide, dry chemical, or foam.	
Protective Equipment for Firefighters		Self-contained breathing apparatus (SCBA) and protective fire fighting clothing (fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.	
NFPA Hazard Codes		See Chart Page 1.	

HMIS Hazard Codes	**See Chart Page 1.**
Unusual Hazards	**There are no known unusual fire or explosion hazards. May generate toxic or irritating combustion products.**

6. ACCIDENTAL RELEASE MEASURES (*see Section 15 for Regulatory Information*)

Not applicable due to small size (4oz) and paste form of this product.

Evacuation	**NA**
Containment Techniques	**NA**
Clean-Up Procedures	**NA**
Steps To Be Taken In Case Material Is Released Or Spilled	**NA**
Reporting	**NA**

7. HANDLING AND STORAGE

Shelf Life	**24 months from date of shipment by manufacturer in tightly sealed, original, unopened containers when stored between 60°F to 90°F (16°C to 32°C) indoors. Base component will get hard due to a built in safety mechanism, which ensures uniformity of the formula. Use a hot air blower a minute (or hot water bath for 3-4 minutes), to re-liquefy the base component. This storage hardening / heat softening mechanism is by design and it has nothing to do with product being bad. If hardening occurs, simply warm to re-liquefy base component and mix it with solidifier component. If microwave oven is used to warm the base component, avoid overheating or making the product very hot or runny like water and do not mix with food items.**
Storage Conditions	**Keep original containers tightly sealed when not in use. Store between 60°F to 90°F (16°C to 32°C) indoors, out of direct sunshine, in dry place, protected and isolated from weather, heat and cold, sparks, open flame, and other damage. Store with adequate ventilation. Segregate from foodstuffs. KEEP AWAY FROM CHILDREN. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal. FOR INDUSTRIAL USE ONLY.**
Handling And Safety Precautions	**If cured material is sanded, use proper precautions and wear adequate protective equipment to prevent overexposure to nuisance particulates. Do not consume food, drink, or tobacco in areas where they may become contaminated with product. Refer to Exposure Control/Personal Protection, Section 8, of this MSDS. Do not reuse empty containers for food, clothing or products for human or animal consumption or skin contact. Reseal part used containers and store away properly. Ensure that all containers are properly labeled to prevent accidental ingestion. Do not get in eyes, on skin, or clothing. Do not breathe dust, vapor, mist, or gas. Wash with soap and water before eating, drinking, smoking or using toilet facilities. Remove contaminated clothing and protective gear and launder before reuse. Destroy contaminated leather articles.**
Empty Container Precautions	**Attention! Since empty containers may contain hazardous residues, all hazard precautions given in this MSDS must be observed. Do not reuse empty containers.**
RCRA Class	**NDA**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Industrial Hygiene		**Follow standard industrial hygiene practices when using this material. Wash thoroughly with soap and water before eating, drinking or smoking.**					
Personal Protective Equipment	**Eye/Face**	**Safety glasses/goggles with side shield in compliance with OSHA regulations recommended.**					
	Skin	**Protective gloves and impervious clothing recommended to prevent skin contact and absorption of this material through the skin. Wear protective equipment as necessary to prevent exposure and personal contact.**					
	Respiratory	**Due to small size (4 oz) and paste form of this product, a special respiratory program is not warranted. A simple dust mask is always a good idea, in case particulates from sanding of cured products nearby become airborne pollute the air operators breathe. Use of good ventilation is also recommended.**					
Exposure Guidelines		Component			Component		
		OSHA, ppm	STEL	PEL	OSHA, ppm	STEL	PEL
			NDA	**NDA**		**NDA**	**NDA**
		ACGIH, ppm, TLV	STEL	TWA	ACGIH, ppm, TLV	STEL	TWA
			NDA	**NDA**		**NDA**	**NDA**
		Comment	**NA**		Comment	**NA**	

Airborne Exposure Guidelines	Component			Component			
	OSHA, ppm	STEL	PEL	OSHA, ppm	STEL	PEL	
		NDA	**NDA**		**NDA**	**NDA**	
	ACGIH, ppm, TLV	STEL	TWA	ACGIH, ppm, TLV	STEL	TWA	
		NDA	**NDA**		**NDA**	**NDA**	
	Comment	**NA**		Comment	**NA**		
Engineering Controls/Ventilation	**Use process enclosures, local exhaust ventilation or other engineering controls to control airborne levels below the TLV; general ventilation for normal use. If exposure does exceed occupational exposure limits, use a NIOSH/MSHA approved respiratory mask to prevent overexposure.**						
Medical Surveillance	**Although not warranted by the use of this product, due to its small size (4oz) and its paste form, medical monitoring of health of employees is a generally good industrial practice, and therefore, recommended.**						
Other Work Practices	**Emergency eye wash fountains, in case of an accident, is the first line of defense. Material spilled on hard surface can be a slipping/falling hazard.**						

9. PHYSICAL AND CHEMICAL PROPERTIES @ 75°F/24°C , Typical

NOTICE: ***This physical and chemical data represents typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.***

Appearance	**Form**	**Paste**	**Paste**
	Color	**Black**	**Yellowish**
	Odor	**No Discernable Odor**	**Faint**
Viscosity, poise		**NDA**	**NDA**
pH In 5% Wt In H_2O		**NDA**	**NDA**
Freezing Point		**NDA**	**NDA**
Solubility In H_2O		**Slight**	**NDA**
Density, g/cc		**1.41**	**1.12**
Boiling Point @ 760 mm Hg		**NDA**	**NDA**
Melting Point		**NDA**	**NDA**
Vapor Pressure, mm Hg		**NDA**	**NDA**
Vapor Density, 1.00 @ Air = 1		**NDA**	**NDA**
Specific Gravity, H_2O=1 @60-90°F		**1.4**	**1.1**
Bulk Density		**NDA**	**NDA**
% Volatiles	**Weight**	**0**	**0**
	Volume	**0**	**0**
Volatile Organic Compounds, g/cc		**None -** *This is a ZERO VOC product*	**None -** *This is a ZERO VOC product*
Evaporation Rate, BuAc = 1		**NDA**	**NDA**
Decomposition Temperature, °C/°F		**NDA**	**NDA**
Ignition, °C/°F		**NDA**	**NDA**

10. STABILITY AND REACTIVITY

Stability	**Chemical**		**This product is stable under recommended storage conditions and normal conditions of use.**	
	Avoid Temperature	**Below**	**50°F/10°C indoors.**	
		Above	**90°F/32°C indoors.**	
	ConditionsTo Avoid		**Contact with excessive temperatures, open flame, sparks, or ignition sources**	
Incompatible Materials To Avoid			**Can react with strong oxidizing agents and mineral acids.**	
Hazardous Combustion Or Decomposition Products			**Carbon monoxide, aldehydes, and acids may be formed during incomplete combustion.**	**Carbon monoxide, carbon dioxide, and oxides of nitrogen.**
			Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant. Hazardous decomposition products depend on temperature, air supply, and the presence of other materials.	
Hazardous Polymerization			**Will not occur under normal conditions.**	**Will not occur under normal conditions.**
Other			**Some heat is generated when Base is mixed with Solidifier. Use caution when mixing large quantities.**	

11. TOXICOLOGICAL PROPERTIES

Dermal (acute), Rabbit, LD_{50}		NDA	NDA
Oral (acute), Rat, LD_{50}		NDA	NDA
Inhalation (acute) Rat, LC_{50}		NDA	NDA
Irritation	Eye	NDA	NDA
	Skin	NDA	NDA
Sensitization		NDA	NDA
Carcinogenicity		NDA	NDA
Mutagenicity (Effects on Genetic Material)		NDA	NDA
Developmental Toxicity		NDA	NDA
Teratogenicity/Reproductive Toxicity		NDA	NDA
Subchronic Toxicity		NDA	NDA
Other Toxicity		NDA	NDA

12. ECOLOGICAL INFORMATION

This Environmental Effects Summary is written to assist in addressing emergencies created by an accidental spill which might occur during the shipment of this material, and, in general, it is not mean to address discharges to sanitary sewers or publicly owned treatment works. Data for this material have been used to estimate its environmental impact. It has the following properties: When diluted with a large amount of water, this material released directly or indirectly into the environmental is not expected to have a significant impact.

Acute Toxicity	Fish	NDA	NDA
	Invertebrates	NDA	NDA
	Algae	NDA	NDA
	Plants	NDA	NDA
	Sewage Bacteria	NDA	NDA
Bioconcentration		NDA	NDA
Biodegradability		NDA	NDA
Chemical Oxygen Demand		NDA	NDA
Environmental Fate	Movement and Partitioning	NDA	NDA
	Degradation and Persistence	NDA	NDA
	Ecotoxicity	NDA	NDA

13. DISPOSAL CONSIDERATIONS

Disposal	DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws, and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. INTEGRATED POLYMER INDUSTRIES HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS "PRODUCT INFORMATION".
Unused and Uncontaminated Product	Mix Base and Solidifier components and allow overnight cure into a harmless solid. Preferred options include sending to a licensed, permitted, recycler, reclaimer, incinerator, or other thermal destruction device.
Empty Container Precautions	Attention! Since empty containers may contain hazardous residues, all hazard precautions given in this MSDS must be observed. Do not reuse empty containers.
Special Instructions	Be sure to contact the appropriate government agencies if further guidance is required.

14. TRANSPORT INFORMATION

US DOT, 49CFR 172.101

Hazardous Material Proper Shipping Name/Description		**Non-Regulated / Non-Hazardous**	
Primary Hazard Class/Division #		**NDA**	**NDA**
UN/NA ID No		**NDA**	**NDA**
Packaging Group		**NDA**	**NDA**
Technical Names		**NDA**	**NDA**
Marine Pollutant		**NDA**	**NDA**
Hazardous Substance		**NDA**	**NDA**
Reportable Quantity	**CERCLA**	**NDA**	**NDA**
	Substance	**NDA**	**NDA**
	Lb/g	**NDA**	**NDA**
NOS Component		**NDA**	**NDA**
Subsidiary Risk		**NDA**	**NDA**
Hazard Label(s)		**NDA**	**NDA**
Hazard Placard(s)		**NDA**	**NDA**
Emergency Contact		**IPI: 714/434-0800 or CHEMTREC 800/424-9300**	

IMO / IMDG CODE (OCEAN)

Primary Hazard Class/Division #		**NDA**	**NDA**

ICAO / IATA (AIR)

Primary Hazard Class/Division #		**NDA**	**NDA**
Passenger Aircraft	**Pkg. Instr.**	**NDA**	**NDA**
	Max. Net Qty/Pkg	**NDA**	**NDA**
	Actual Net Qty/Pkg	**NDA**	**NDA**
Cargo Aircraft Only	**Pkg. Instr.**	**NDA**	**NDA**
	Max. Net Qty/Pkg	**NDA**	**NDA**
	Actual Net Qty/Pkg	**NDA**	**NDA**
Special Provisions		**NDA**	**A3**

Canada

TDG	**NDA**	**NDA**

European Union

	NDA	**NDA**

15. REGULATORY INFORMATION (*not represented as all-inclusive; selected regulations represented*)

NOTICE: **The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that its activities comply with Federal, State/Provincial, and local laws and regulations. For details on your regulatory requirements, you should contact the appropriate agency in your State, Province, or Country.**

US Federal

		Base	Solidifier
Toxic Substances Control Act (TSCA) Chemical Substance Inventory	**4 Test Rules**	**NDA**	**NDA**
	5(A)(2) SNUR	**This product is not subject to a Significant New Use Rule (SNUR)**	
	5(E) Consent Order	**This product is not subject to a Section 5(e) Consent Order**	
	5 (H)(3) R&D Exempt	**NDA**	**NDA**
	6 Regulation of Existing Chemicals	**NDA**	**NDA**
	7 Imminent Hazards	**NDA**	**NDA**
	8(B) Inventory Status	**All chemicals comprising this product are listed on the TSCA Inventory or are not required to be listed on the TSCA Inventory.**	
	State Right-to-Know	**This product is not known to contain any substances subject to the disclosure requirements of: Calif9rnia, New Jersey, Pennsylvania**	
	12(B) Export Notification	**This product does not contain any chemicals subject to Section 12(b) export notification.**	
Comprehensive	**Chemical Name**	**NDA**	**NDA**

Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 40 CFR 302.4(a)		CAS Registry No.	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Reportable Quantity, lb/g	NDA	NDA
		Threshold Planning Qty, lb/g	NDA	NDA
		Category	NDA	NDA
Superfund Amendment and Reauthorization Act of 1986 (SARA), Title III (Emergency Planning Community Right-to-Know (EPCRA))	Section 302, 40 CFR 355 Appendix A, Extremely Hazardous Substances (EHS)	Chemical Name	This product contains no chemicals regulated under Section 302 as extremely hazardous substances	
		CAS Registry No.	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Reportable Quantity, lb/g	NDA	NDA
		Threshold Planning Qty, lb/g	NDA	NDA
		Category	NDA	NDA
	Section 304, CERCLA	Chemical Name	This product contains no chemicals regulated under Section 304 as extremely hazardous chemicals for emergency release notification	This product contains no chemicals regulated under Section 304 as extremely hazardous chemicals for emergency release notification
		CAS Registry No.	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Reportable Quantity, lb/g	NDA	NDA
		Threshold Planning Qty, lb/g	NDA	NDA
		Category	NDA	NDA
		P-5 Reactive	NDA	NDA
	SARA 311/312, 40 CFR 370.2 Hazard Communication Standard (HCS)	Chemical Name		
		CAS Registry No.	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Reportable Quantity, lb/g	NDA	NDA
		Threshold Planning Qty, lb/g	NDA	NDA
		Category	NDA	NDA
	SARA 313, 40 CFR 372.65, Toxic Chemicals List (TCL), Supplier Notification	Chemical Name	IPN-subassembly	IPN-subassembly
		CAS Registry No.	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Reportable Quantity, lb/g	NDA	NDA
		Threshold Planning Qty, lb/g	NDA	NDA
		Category	NDA	NDA
Clean Air Act Amendments of 1980, Section 611 (Protection of Stratospheric Ozone)	Non-Volatile	100%; Method: ASTM D1644-88, Method B, 30 min @ 149°C		
	HAP	This product *does* not contain hazardous air pollutants (HAP), as defined by the US Clean Air Act.		
	ODS	This product *does* not contain any Class I or Class II ozone-depleting substances (ODS) as per 40 CFR Part 82.		
Clean Water Act - Priority Pollutants (PP)		This product *does not* contain chemicals listed under the US Clean Water Act Priority Pollutant List.		
Food & Drug Administration: Food Packaging Status		This product has not been cleared by the FDA for use in food packaging and/or other applications as an indirect food additive.		

OSHA	**Hazard Communication Standard 29 CFR 1910.1200**	**This MSDS has been prepared in compliance with this US Federal OSHA standard. This product *IS NOT* considered a hazardous chemical under that standard. Its hazards are:** • **Immediate (acute) health hazard** • **Delayed (chronic) health hazard** • **Fire hazard**	
	Process Safety Management 20CFR 1910	**NDA**	
Resource Conservation and Recovery Act (RCRA), 40 CFR 261, Status		**Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. This product is not considered to be a hazardous waste.**	
EPA	**Hazard Categories**	**NDA**	**NDA**
	Accidental Release Prevention 40 CFR 68	**NDA**	**NDA**
Food, Drugs & Cosmetics Act - Indirect Food Additives (21CFR)		**Not Applicable**	**Not Applicable**
CONEG		**NDA**	**NDA**
CEPA-NPRI		**NDA**	**NDA**
Additional Federal Information		**This product is not subject to a Section 5(f)/6(a) rule**	**This product is not subject to a Section 5(f)/6(a) rule**

US States

General		**The following chemicals are specifically listed by individual states. Other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your location.**		
		Chemical Name	**NDA**	**NDA**
		CAS Registry No.	**NDA**	**NDA**
		Concentration	**NDA**	**NDA**
		States	**NDA**	
California	**Safe Drinking Water and Toxic Enforcement Act of 1988 – Prop.65**	The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986		
		This product contains the following substance(s) currently on the list of Known Carcinogens and Reproductive Toxins, and known to the State of California, USA to cause cancer, birth defects, and/or other reproductive harm:		
		No Proposition 65 chemicals exist in this product.		
	SCAQMD) Rule 443.1 (VOCs)	**This is a ZERO VOC material.**		
	Substance List	**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	
		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**
		Trade Secret Registry #s	**NDA**	**NDA**
		Comment	**NDA**	**NDA**
Florida **Substance List**		**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	
		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**
		Trade Secret Registry #s	**NDA**	**NDA**
		Comment	**NDA**	**NDA**
Illinois **Toxic Substances List**		**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	

		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**
		Trade Secret Registry #s	**NDA**	**NDA**
		Comment	**NDA**	**NDA**
Massachusetts **Right to Know Hazardous Substance List (MSL) (105CMR 670.000)**		**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	
		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**
		Trade Secret Registry #s	**NDA**	**NDA**
		Comment	**NDA**	**NDA**
Minnesota **Hazardous Substance List**		**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	
		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**
		Trade Secret Registry #s	**NDA**	**NDA**
		Comment	**NDA**	**NDA**
New Jersey	**Worker & Community Right-To-Know Act**	**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	
		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**
		Trade Secret Registry #s	**NDA**	**NDA**
		Comment	**NDA**	**NDA**
	Hazardous Substance List	**NJ1, NJ2, NJ3**	**NDA**	
		NJ1 = NJ Special Health Hazard Substance present at greater than or equal to 0.1% **NJ2 = NJ Environmental Hazardous Substance present at greater than or equal to 1.0%** **NJ3 = NJ Workplace Hazardous Substance present at greater than or equal to 1.0%**		
Pennsylvania **Right to Know Hazardous Substance List**		**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	
		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**
		Trade Secret Registry #s	**NDA**	**NDA**
		Comment	**Not on Pennsylvania Hazardous Substance List**	**NDA**
		PA1, PA2, PA3	**NDA**	
		PA 1 = PA Hazardous Substance present at greater than or equal to 1.0% **PA 2 = PA Special Hazardous Substance present at greater than or equal to 0.01%** **PA 3 = PA Environmental Hazardous Substance present at greater than or equal to 1.0%**		
Rhode Island **List of Designated Substances**		**Chemical Name**	**This product does not contain any chemicals that are subject to the disclosure requirement**	
		CAS Registry No.	**NDA**	**NDA**
		Common Name	**NDA**	**NDA**
		Upper Bound Concentration %	**NDA**	**NDA**

	Trade Secret Registry #s	**NDA**	**NDA**
	Comment	**NDA**	**NDA**

16. SUPPLEMENTARY

General Comments	**A Material Safety Data Sheet ("MSDS") such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions, in addition to those described herein, are required. INTEGRATED POLYMER INDUSTRIES, INC. must rely on the user to utilize the information we have supplied to develop work practice guidelines and employee instructional programs for the individual operation and regulations. Any health hazard and safety information contained herein should be passed on to your employees. The data in this MSDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. If the material is used as a component in another material, this MSDS information may not be applicable.**
Compliance with All Government Regulations	**It is the user's responsibility to comply with all national, state, and local codes pertaining to the use, handling, dispensing, storage, transportation, and disposal. IPI does not assume responsibility and expressly disclaims liability for any non-compliance.**
Disclaimer of Liability	**The following supercedes buyer's documents. The information in this MSDS was obtained from sources which we believe are reliable and is believed to be accurate but is not warranted to be whether originating with the company or not. No warranties of any kind, either express or implied, including warranties of merchantability or fitness for a particular purpose, are made regarding products described or designs, data or information set forth. The conditions or methods of use, handling, dispensing, storage, transportation, disposal, and compliance with regulations of various government agencies of the material are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the use, handling, dispensing, storage, transportation, disposal, and compliance with government regulations of the material. Further, buyer and/or enduser expressly understand and agree that the descriptions, designs, data and information furnished by IPI hereunder are given gratis and IPI assumes no obligation or liability for the description, designs, data and information given or results obtained, all such being given and accepted at your risk. This document is generated for the purpose of distributing health, safety, and environmental data. It is not a specification sheet nor should any displayed data be construed as a specification. Some of the information presented and conclusions drawn herein are from sources other than direct test data on the material itself. Nothing herein shall be construed as a recommendation for uses that infringe valid patents or as extending a license for valid patents.**
Label Statement	WARNING! FOR INDUSTRIAL USE BY TRAINED PERSONNEL ONLY! KEEP AWAY FROM CHILDREN. KEEP CONTAINER TIGHTLY CLOSED. KEEP AWAY FROM HEAT, SPARKS, AND FLAME. AVOID BREATHING HIGH VAPOR CONCENTRATIONS. USE ONLY WITH ADEQUATE VENTILATION. PLEASE REFER TO MSDS AND TECHNICAL DATA FOR ADDITIONAL INFORMATION NECESSARY FOR PROPER USE, STORAGE, AND DISPOSAL.
Acronyms	2. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS

CAS REGISTRY NUMBER	**Chemical Abstract Service Registry number and name as it appears in the US Federal EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.**
OSHA	**The Occupational Safety & Health Administration.**
ACGIH	**The American Conference of Governmental Industrial Hygienists.**
PPM	**Parts per Million, 1x 10^{-6}**
PEL	**Permissible Exposure Limit for a chemical in the air as established by The Occupational Safety & Health Administration (OSHA).**
TLV	**Threshold Limit Value for a chemical in the air as established by The American Conference of Government Industrial Hygienists (ACGIH).**
(PEL)TLV:TWA	**The Time-Weighted Average exposure for a normal 8-hour workday and a 40-hour workweek to which nearly all workers may be repeatedly exposed without adverse effect.**

TLV:STEL	**The Short-Term Exposure Limit is 15-minute time-weighted average exposure that should not be exceeded at any time during a workday, even if it the 8-hour TWA is within the TLV.**
TLV:C	**The Ceiling Concentration that should not be exceeded even instantaneously.**
PEL:ACCEPTABLE CEILING CONCENTRATION	**The Concentration not to be exceeded during an 8-hour shift, except for a given time period, and not exceeding the concentration given as the acceptable maximum peak.**
CARCINOGENIC REFERENCES	**Will indicate whether the ingredient has been found to be a (potential) carcinogen by** • **ACGIH (American Conference of Governmental Industrial Hygienists** • **IARC (International Agency for Research on Cancer);** • **NTP (National Toxicology Program) or** • **OSHA (Occupational Safety & Health Administration).**
5. FIRE & EXPLOSION DATA	
FLASH POINT	**Designated by method: CC-Closed Cup, OC-Open Cup.**
NFPA HAZARD CODES	**The US National Fire Protection Association's Hazard Identification System intended to indicate inherent hazards of a chemical under emergency conditions such as fire. The degree of each of three hazards (Health/Flammability/ Reactivity) is rated by a numerical designation ranging from low to high of 0 to 4.**
HMIS HAZARD CODE	**The US National Paint & Coatings Association's Hazard Materials Identification System intended to estimate the inherent hazards of a chemical under normal workplace situations. The degree of each of three hazards (Health/Flammability/Reactivity) is rated by a numerical designation ranging from low to high of 0 to 4.**
7. HANDLING AND STORAGE	
RCRA	**US Resource Conservation and Recovery Act**
11. TOXICOLOGICAL PROPERTIES	
ACUTE LD_{50}/LC_{50}	**The Lethal Dose/Concentration required to kill 50% of a population of test animals by the route of administration indicated.**
14. TRANSPORT INFORMATION	
DOT	**US Department of Transportation**
UN Number	**United Nations Number**
CERCLA	**Comprehensive Environmental Response, Compensation and Liability Act of 1980**
NOS	**Not Otherwise Specified**
NAERG	**North American Emergency Response Guide**
IMO/IMDG	**International Maritime Organization/International Maritime Dangerous Goods**
ICAO/IATA	**International Civil Aviation Organization/International Air Transport Association**
TDG	**Transportation of Dangerous Goods**
MISCELLANEOUS	
NA	**Not Applicable**
NDA	**No Data Available**
NE	**Not Established**
Other	**This MSDS is subject to change without notice, as new information becomes available.**

Thank you for using IPI products and welcome to our growing family of satisfied customers.

3029 South Harbor Blvd, Santa Ana, CA 92704-6448 USA
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Integrated Polymer Industries, Inc

BE SAFE! READ OUR PRODUCT SAFETY INFORMATION…AND PASS IT ON. PRODUCT LIABILITY LAW REQUIRES IT.

CO-120 IPI-SuperBarrier™

Zero VOC, IPN-based, ambient cure, brushable, sprayable, corrosion resistant coating

Engineering Data Bulletin 157603 1209003

1. Material Description

- Two component liquid; mixed and applied on demand at jobsite, on properly prepared surfaces
- Goes on metal, concrete, fiberglass, PVC, masonry, brick, wood, and other materials
- Increases fluid flow in pumps, valves, pipes, tanks, and others subjected to erosion-corrosion
- Goes on buildings and structures with equal ease for long lasting high performance
- Excellent bond strength, water and corrosion resistance
- Continuous service: 400F dry ; 200F wet.
- Repairs easily and instantly all fluid handling equipment in place, without requiring complete disassembly, transfer, cranes, forklifts, or extended shutdowns.
- Saves production time, application labor, and materials
- Seamless, tough, and durable
- Normally applied at 16 mils, sometimes even thicker depending on the project requirements

2. Physical & Mechanical Properties

Property	*Unit*	*Value*	*Comments*
Base component, fill weight	g	333	
Solidifier component, fill weight	g	167	
Density	g/cc	1.3	
Base/Solidifier mix ratio, by weight		2/1	
Base/Solidifier mix ratio, by volume		1.6/1	
Coverage per kit, at 16 mils	sf	12	
Potlife, at 75F	minutes	30	Longer when applied on a colder day; Shorter when applied on a warmer day.
Tacky Cure For Recoating , at 75F	Hours	2	
Tack-free Cure, at 75F	Hours	8	
Final Cure, at 75F	Hours 24	24	
Chemical Immersion Cure, at 75F	Days	5	
Adhesion strength , ASTM D1002	psi	2,400	steel / steel

3. Mixing Instructions

Mixing & Application Instructions:
Components are factory proportioned. Mix all of base with all of solidifier. For partial mixes, use the mix ratios for base/solidifier in table below. Transfer solidifier into the base and power mix for 1 minute. Then transfer this mix into a clean container and power mix again for another minute. This "double mixing" insures perfect mix all the time. Apply the mix onto properly prepared metal or concrete surfaces by stiff bristle brush or proper spray equipment.
Allow cure to a sticky stage (minimum 2 hours at 75F), before recoating IPI-SuperBarrier™ with itself or other IPI-Coatings. Observe cure times in the chart above for re-opening the area to service. If in doubt, please contact technical service at 714-434-0800 with any questions or comments.

4. Theory of IPNs

Background	• IPNs ***(inter-penetrating-networks)*** is the next frontier in the high performance materials technology. Academic research work on IPNs dates back to early 1970s, when the founder of IPI was one of the investigators. Application of the IPNs to the coatings technology was solely pioneered by IPI in mid 1980s. Maturing of IPNs into proven industrial alternatives and emergence of IPNs as commercial success took place in the 1990s.
Fundamental Principles	• IPNs are super high performance, hybrid polymers, complex in structure, but simple in principle. IPNs aim to build on the desirable properties of commercial polymers like epoxies, urethanes, acrylics, silicones, etc., while leaving out their poor, undesirable properties. • For example, epoxies are good in adhesion and chemical resistance, but poor in UV resistance and they are mostly brittle. Urethanes, on the other hand, are flexible and tough, but they suffer the draw back of hydrolysis, which allows water ingression over time to cause blisters. Acrylics are great against UV but they can not bond to wet surfaces well and they have shrinkage, flammability, and odor problems. IPNs, therefore, aim to build a polymeric backbone which gets its adhesion and chemical resistance from epoxies, flexibility and toughness from urethanes, and UV resistance from acrylics, among other things, while leaving out the poor properties of these polymers. Topics like what kind of polymers are used as starting materials, what kind of IPNs are built from them, and how this whole process really works, etc. are closely guarded trade secrets. IPI formulates and manufactures many different kinds of materials using IPNs, including but not limited to adhesives, sealants, caulks, mastics, composites, primers, and coatings.

Thank you for your interest in our unique IPN products! For more information and/or samples, please contact us.	• 3029 South Harbor Blvd, Santa Ana, CA 92704-6448 USA • Tel: 714/434-0800 ext 13 • Fax: 714/434-0888 • E-Mail: IntegratedPolymerIndustries@msn.com

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integrated polymer industries, inc.

Be Safe! Read Our Product Safety Information And Pass It On. Product Liability Law Requires It. Before Handling, Please Read And Follow All Instructions Per The Technical Data, Material Safety Data Sheets, and Labels which Are Specifically Incorporated Herein And Are Inseparable For Safe Use, Physical And Health Hazard Information. For Industrial and Commercial Use Only. Not For Sale To General Public. For Professional Application By Trained, Qualified, And Experienced Applicators. This Product Should Not Be Used By Untrained Or Non-Professional Personnel. All Technical Data Subject To Change Without Notice. The Values Shown Are Not Intended For Use In Preparing Specification. Calculated Values Are Shown And May Vary Slightly From The Actual Manufactured Material. Please note that both base and solidifier components are covered in this MSDS. Please contact PTI if you have any questions. Thank you.

MATERIAL SAFETY DATA SHEET

IPI-SuperBarrier™

IPN Based, Zero-VOC, 2-Component, Room-Temperature-Cure, Brushable, Sprayable, Advanced Polymer System, Designed For Coating Aerospace Vehicles & Equipment Subjected To Erosion, Corrosion, Impact, And Heavy Duty Service

VOC = zero (100% solids; no solvents)

Base / Solidifier Mix Ratio, wt: 1.35 / 1 for 242022 (white); 1.18 / 1 for 242044 (blue)

HAZARDOUS MATERIAL INFORMATION SYSTEM (HMIS)					NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	
	Base	Solidifier	Mixed	Cured		
Fire	1	1	1	0	Health	NDA
Toxicity	1	2	2	0	Flammability	NDA
Reactivity	0	0	2	0	Reactivity	NDA
Special	0	0	0	0		
Target Organs	Eyes, Skin and Respiratory Systems					

Legend: 4 - Extreme, 3 - High, 2 - Moderate, 1 - Slight, 0 - Insignificant

Note: HMIS and NFPA ratings involve data and interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

	BASE	SOLIDIFIER
1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION		
Material Identity		
Product Trade Name	**IPI-SuperBarrier™**	
Product Codes	**242022 White and 242044 Blue**	
Number Of Components	**2**	
Chemical Name	IPN (interpenetrating polymer network) subassembly containing select reactive sites, built into the pre-polymer backbone, nature and identity of which are trade secrets. Dominant reactive site resembles: Modified 4,4'-Isopropylidenediphenol Epichlorohydrin	IPN (interpenetrating polymer network) subassembly containing select reactive sites, built into the pre-polymer backbone, nature and identity of which are trade secrets. Dominant reactive site resembles: Modified Aliphatic Polyamine
Synonyms	NDA	NDA
Empirical Formula	Proprietary Mixture	Proprietary Mixture
Manufacturer		
Company	Integrated Polymer Industries, Inc.	
Address	3029 South Harbor Blvd., Santa Ana, CA 92704, USA	
IPI Emergency Number	714-434-0800	
24 Hour Emergency Phone	800-424-9300 CHEMTREC	

2. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS

Ingredient 1

Common Name	NDA				NDA			
Chemical Identity	4,4'-Isopropylidenediphenol Epichlorohydrin				2,4,6 Tri(Dimethyaminomethyl)Phenol			
CAS Registry No.	25068-38-6				90-72-2			
Concentrations % By Weight	< 70				<80			
OSHA Hazardous Ingredient	NDA				NDA			
Exposure Limits	Component				Component			
	OSHA, ppm	STEL	PEL		OSHA, ppm	STEL	PEL	
		NDA	NDA			NDA	NDA	
	ACGIH, ppm, TLV	STEL	TWA		ACGIH, ppm, TLV	STEL	TWA	
		NDA	NDA			NDA	NDA	
	Comment	Irritant by skin contact.			Comment	Irritant by skin contact; toxic by ingestion; biologically corrosive. Locked into the molecular network; not free for reaction.		
Carcinogen Status	OSHA	ACGIH	NTP	IARC	OSHA	ACGIH	NTP	IARC
	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA

Ingredient 2

Common Name	Non-Hazardous Ingredients				Non-Hazardous Ingredients			
Chemical Identity	Information concerning non-hazardous ingredients is considered trade secret.							
CAS Registry No.	NA				NA			
Concentrations % By Weight	NA				NA			
OSHA Hazardous Ingredient	NA				NA			
Exposure Limits	Component	NA			Component	NA		
	OSHA, ppm	STEL	PEL		OSHA, ppm	STEL	PEL	
		NA	NA			NA	NA	
	ACGIH, ppm, TLV	STEL	TWA		ACGIH, ppm, TLV	STEL	TWA	
		NA	NA			NA	NA	
	Comment	NA			Comment	NA		
Carcinogen Status	OSHA	ACGIH	NTP	IARC	OSHA	ACGIH	NTP	IARC
	NA	NA	NA	NA	NA	NA	NA	NA

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING: Prolonged or repeated exposure may cause skin sensitization, nose and throat irritation, and/or other allergic response. Ingestion may cause nausea, vomiting, pain, upset stomach, and diarrhea.

Appearance and Odor	Clear, Amber Liquid with faint odor	242022 White or 242044 Blue, both with faint odor
Flammability	Nonflammable	Nonflammable
Health	May be a skin sensitizer. Avoid skin contact.	
Effects of Overexposures		
Primary Route(s) of Entry	Skin contact, eye contact.	
Eye	Contact may cause sensitization, irritation, or burn.	
Skin	Repeated exposure may cause irritation, skin sensitization, and/or other allergic responses.	
Inhalation	NDA	High concentration of vapors may cause irritation.
Ingestion	NDA	NDA
Systemic (OtherTarget Organ) Effects	NDA	NDA

Signs and Symptoms of Exposure	Acute Effects	Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: gastrointestinal irritation (nausea, vomiting, diarrhea), irritation (nose, throat, respiratory tract), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache).	
	Possible Longer Term Effects	Repeated and/or prolonged exposure may cause allergic reaction/sensitization, adverse respiratory effects (such as cough, shortness of breath), adverse eye effects (such as conjunctivitis or corneal damage). Effects from inhalation of vapors may be delayed. Repeated and/or prolonged exposure to low concentrations of vapor may cause sore throat, eye irritation.	
Medical Conditions Generally Aggravated by Exposure		Asthma, chronic respiratory disease (e.g. bronchitis, emphysema), eye disease.	
Developmental Information		NDA	NDA
Teratology (Birth Defects)		NDA	NDA
Reproductive Effects		NDA	NDA
Other Health Effects		NDA	NDA
Chronic		Prolonged or repeated exposure may cause asthma, skin sensitization, and/or other allergic response.	Solidifier will cause burns. Prolonged or repeated exposure may cause asthma, skin sensitization, and/or other allergic response.
Carcinogenicity		This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.	

4. FIRST AID	
Eye	Immediately flush eyes with water and continue washing for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.
Skin	Immediately wash skin with soap and water. Remove contaminated clothing. Obtain medical attention if irritation persists.
Inhalation	Remove to fresh air. Obtain medical attention if symptoms persist.
Ingestion	Seek immediate medical attention. If individual is drowsy or unconscious, do not give anything by mouth. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.
Overexposure Effects	Overexposure to this material can cause moderate skin and severe eye irritation. Can be harmful if ingested.
Medical Conditions generally Aggravated by Exposure	Asthma, chronic respiratory disease (e.g. bronchitis, emphysema), eye disease.
Note to Physicians	Treatment based on judgment of the physician in response to reactions of the patient. No incidents of overexposure by any route have ever been reported since 1985, establishment of the manufacturer, which leads manufacturer to believe that, when used properly by generally accepted good industrial practices, there should not be any threat to health of any enduser. All information presented here are precautionary, not based on real life incidents. While possibility of an accident is always there, probability due to small size of product and its paste form, is quite low.
Additional Information	Promptly remove and discard contaminated clothing.

5. FIRE & EXPLOSION DATA				
Flammable Properties	Flash Point		>400°F/204°C	>277°F/136°C
	Method		Pensky-Martens Closed Cup (ASTM D-93)	Pensky-Martens Closed Cup (ASTM D-93)
	Autoignition Temp.		NDA	NDA
Flammability Limit/ % Volume in Air		Lower (LFL)	NDA	NDA
		Upper (UFL)	NDA	NDA
Explosive Limit		Lower (LEL)	NDA	NDA
		Upper (UEL)	NDA	NDA
Fire Hazard Classification (OSHA/NFPA)			NDA	NDA
Fire and Explosion Hazards			No unusual hazards. Base will not burn unless preheated.	Heavy smoke and toxic fumes will evolve when in fire.
Hazardous Combustion and Decomposition Products			NDA	NO, NO_2
Extinguishing Media			Foam, CO_2, Dry Chemicals, Water	
Fire Fighting Procedures			To extinguish combustible residues of this product use carbon dioxide, dry chemical, or foam.	

Protective Equipment for Firefighters	Self-contained breathing apparatus (SCBA) and protective fire fighting clothing (fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.
NFPA Hazard Codes	See Chart Page 1.
HMIS Hazard Codes	See Chart Page 1.
Unusual Hazards	There are no known unusual fire or explosion hazards. May generate toxic or irritating combustion products.

6. ACCIDENTAL RELEASE MEASURES (*see Section 15 for Regulatory Information*)	
Evacuation	Isolate hazard area. Keep unnecessary and unprotected personnel from entering.
Containment Techniques	Stop the leak/spill, if possible. Remove source of heat, flame, impact, or electricity. Ventilate the space involved. Construct a dike to prevent spreading. May be a slipping hazard.
Clean-Up Procedures	Spills should be contained, solidified, and placed in suitable containers for disposal in a licensed facility. Soak up small spills with absorbent material. React Base with Solidifier or vice versa into harmless solid.
Steps To Be Taken In Case Material Is Released Or Spilled	Protect People! Protect the Environment! Wear suitable protective equipment. Avoid contact with eyes and skin. Wear respirator and protective clothing as appropriate. Breathing of vapors must be avoided. Remove and discard contaminated clothing. Avoid discharge to natural waters. Prevent run-off to sewer/public waters. If run-off occurs, notify proper authorities as required that a spill has occurred. Follow confined space entry procedures: ASTM D-4276 and OSHA (29 CFR 1910.146)
Reporting	Kits too small for RQ to be applicable.

7. HANDLING AND STORAGE	
Shelf Life	1 year, cool and dry
Storage Conditions	Cool and dry
Handling And Safety Precautions	Wear gloves
Empty Container Precautions	Wipe containers with paper towel before discarding them. Paper towel with base and paper towel with solidifier are placed together before discarding.
RCRA Class	NDA

8. EXPOSURE CONTROLS / PERSONAL PROTECTION							
Industrial Hygiene		Follow standard industrial hygiene practices when using this material. Wash thoroughly with soap and water before eating, drinking or smoking.					
Personal Protective Equipment	Eye/Face	Safety glasses/goggles with side shield in compliance with OSHA regulations recommended.					
	Skin	Protective gloves and impervious clothing recommended to prevent skin contact and absorption of this material through the skin. Wear protective equipment as necessary to prevent exposure and personal contact.					
	Respiratory	Due to small size and paste form of this product, a special respiratory program is not warranted. A dust mask is always a good idea, in case particulates from sanding of cured products nearby become airborne and pollute the air operators breathe. Use of good ventilation is also recommended.					
Exposure Guidelines		Component			Component		
		OSHA, ppm	STEL	PEL	OSHA, ppm	STEL	PEL
			NDA	NDA		NDA	NDA
		ACGIH, ppm, TLV	STEL	TWA	ACGIH, ppm, TLV	STEL	TWA
			NDA	NDA		NDA	NDA
		Comment	NA		Comment	NA	
Airborne Exposure Guidelines		Component			Component		
		OSHA, ppm	STEL	PEL	OSHA, ppm	STEL	PEL
			NDA	NDA		NDA	NDA
		ACGIH, ppm, TLV	STEL	TWA	ACGIH, ppm, TLV	STEL	TWA
			NDA	NDA		NDA	NDA
		Comment	NA		Comment	NA	
Engineering Controls/Ventilation		Use process enclosures, local exhaust ventilation or other engineering controls to control airborne levels below the TLV; general ventilation for normal use. If exposure does exceed occupational exposure limits, use a NIOSH/MSHA approved respiratory mask to prevent overexposure.					
Medical Surveillance		Although not warranted by the use of this product, due to its small size (4oz) and its paste form, medical monitoring of health of employees is a generally good industrial practice, and therefore, recommended.					
Other Work Practices		Emergency eye wash fountains, in case of an accident, is the first line of defense. Material spilled on hard surface can be a slipping/falling hazard.					

9. PHYSICAL AND CHEMICAL PROPERTIES @ 75°F/24°C , Typical				
NOTICE: This physical and chemical data represents typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.				
Appearance	Form		Clear Liquid	Clear Liquid
	Color		Amber	Amber
	Odor		Faint	Faint
Viscosity, poise			NDA	NDA
Ph In 5% Wt In H_2O			7.0	9.5-10.0
Freezing Point			NDA	NDA
Solubility In H_2O			Nil	Moderate
Density, g/cc			1.12	1.16
Boiling Point @ 760 mm Hg			NDA	>350°F/177°C
Melting Point			NDA	NDA
Vapor Pressure, mm Hg			Nil @ 78°F/26°C	<1 @ 104°F/40°C
Vapor Density, 1.00 @ Air = 1			>1	NDA
Specific Gravity, H_2O=1 @60-90°F			1.12	1.16
Bulk Density			NDA	NDA
% Volatiles	Weight		0	0
	Volume		0	0
Volatile Organic Compounds, g/cc			None -*This is a ZERO VOC product*	None -*This is a ZERO VOC product*
Evaporation Rate, BuAc = 1			NDA	NDA
Decomposition Temperature, °C/°F			NDA	NDA
Ignition, °C/°F			NDA	NDA

10. STABILITY AND REACTIVITY				
Stability	Chemical		This product is stable under recommended storage conditions and normal conditions of use.	
	Avoid Temperature	Below	50°F/10°C indoors.	
		Above	90°F/32°C indoors.	
	ConditionsTo Avoid		Contact with excessive temperatures, open flame, sparks, or ignition sources	
Incompatible Materials To Avoid			Can react with strong oxidizing agents and mineral acids.	
Hazardous Combustion Or Decomposition Products			Carbon monoxide, aldehydes, and acids may be formed during incomplete combustion.	Carbon monoxide, carbon dioxide, and oxides of nitrogen.
			Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant. Hazardous decomposition products depend on temperature, air supply, and the presence of other materials.	
Hazardous Polymerization			Will not occur under normal conditions.	Will not occur under normal conditions.
Other			Some heat is generated when Base is mixed with Solidifier. Use caution when mixing large quantities.	

11. TOXICOLOGICAL PROPERTIES			
Dermal (acute), Rabbit, LD_{50}		>20g/Kg	669mg/Kg
Oral (acute), Rat, LD_{50}		11.4g/Kg	414mg/Kg
Inhalation (acute) Rat, LC_{50}		No deaths in saturated air for eight hours	NDA
Irritation	Eye	NDA	NDA
	Skin	NDA	NDA
Sensitization		Prolonged or repeated exposure may cause skin sensitization, nose and throat irritation, and/or other allergic response. Ingestion may cause nausea, vomiting, pain, upset stomach, and diarrhea.	
Carcinogenicity		NDA	NDA
Mutagenicity (Effects on Genetic Material)		NDA	NDA
Developmental Toxicity		NDA	NDA
Teratogenicity/Reproductive Toxicity		NDA	NDA
Subchronic Toxicity		NDA	NDA
Other Toxicity		NDA	NDA

12. ECOLOGICAL INFORMATION

This Environmental Effects Summary is written to assist in addressing emergencies created by an accidental spill which might occur during the shipment of this material, and, in general, it is not mean to address discharges to sanitary sewers or publicly owned treatment works. Data for this material have been used to estimate its environmental impact. It has the following properties: When diluted with a large amount of water, this material released directly or indirectly into the environmental is not expected to have a significant impact.

Acute Toxicity	Fish	NDA	NDA
	Invertebrates	NDA	NDA
	Algae	NDA	NDA
	Plants	NDA	NDA
	Sewage Bacteria	NDA	NDA
Bioconcentration		NDA	NDA
Biodegradability		NDA	NDA
Chemical Oxygen Demand		NDA	NDA
Environmental Fate	Movement and Partitioning	NDA	NDA
	Degradation and Persistence	NDA	NDA
	Ecotoxicity	NDA	NDA

13. DISPOSAL CONSIDERATIONS

Disposal	DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws, and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. INTEGRATED POLYMER INDUSTRIES HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS "PRODUCT INFORMATION".
Unused and Uncontaminated Product	Mix Base and Solidifier components and allow overnight cure into a harmless solid. Preferred options include sending to a licensed, permitted, recycler, reclaimer, incinerator, or other thermal destruction device.
Empty Container Precautions	Attention! Since empty containers may contain hazardous residues, all hazard precautions given in this MSDS must be observed. Do not reuse empty containers.
Special Instructions	Be sure to contact the appropriate government agencies if further guidance is required.

14. TRANSPORT INFORMATION

US DOT, 49CFR 172.101

Hazardous Material Proper Shipping Name/Description		Non-Regulated / Non-Hazardous	
Reportable Quantity	CERCLA	NDA	NDA
	Substance	NDA	NDA
	Lb/g	NDA	NDA
NOS Component		NDA	NDA
Subsidiary Risk		NDA	NDA
Hazard Label(s)		NDA	NDA
Hazard Placard(s)		NDA	NDA
Emergency Contact		CHEMTREC 800/424-9300	

15. REGULATORY INFORMATION (*not represented as all-inclusive; selected regulations represented*)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that its activities comply with Federal, State/Provincial, and local laws and regulations. For details on your regulatory requirements, you should contact the appropriate agency in your State, Province, or Country.

US Federal

			Base	Solidifier
Toxic Substances Control Act (TSCA) Chemical Substance Inventory		4 Test Rules	NDA	NDA
		5(A)(2) SNUR	This product is not subject to a Significant New Use Rule (SNUR)	
		5(E) Consent Order	This product is not subject to a Section 5(e) Consent Order	
		5 (H)(3) R&D Exempt	NDA	NDA
		6 Regulation of Existing Chemicals	NDA	NDA
		7 Imminent Hazards	NDA	NDA
		8(B) Inventory Status	All chemicals comprising this product are listed on the TSCA Inventory or are not required to be listed on the TSCA Inventory.	
		State Right-to-Know	This product is not known to contain any substances subject to the disclosure requirements of: California, New Jersey, Pennsylvania	
		12(B) Export Notification	This product does not contain any chemicals subject to Section 12(b) export notification.	
Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 40 CFR 302.4(a)		Chemical Name	NDA	NDA
		CAS Registry No.	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Reportable Quantity, lb/g	NDA	NDA
		Threshold Planning Qty, lb/g	NDA	NDA
		Category	NDA	NDA
Superfund Amendment and Reauthorization Act of 1986 (SARA), Title III (Emergency Planning Community Right-to-Know (EPCRA))	Section 302, 40 CFR 355 Appendix A, Extremely Hazardous Substances (EHS)	Chemical Name	This product contains no chemicals regulated under Section 302 as extremely hazardous substances	
		CAS Registry No.	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Reportable Quantity, lb/g	NDA	NDA
		Threshold Planning Qty, lb/g	NDA	NDA
		Category	NDA	NDA
Clean Air Act Amendments of 1980, Section 611 (Protection of Stratospheric Ozone)	Non-Volatile	100%; Method: ASTM D1644-88, Method B, 30 min @ 149°C		
	HAP	This product *does* not contain hazardous air pollutants (HAP), as defined by the US Clean Air Act.		
	ODS	This product *does* not contain any Class I or Class II ozone-depleting substances (ODS) as per 40 CFR Part 82.		
Clean Water Act - Priority Pollutants (PP)		This product *does not* contain chemicals listed under the US Clean Water Act Priority Pollutant List.		
Food & Drug Administration: Food Packaging Status		This product has not been cleared by the FDA for use in food packaging and/or other applications as an indirect food additive.		

OSHA	Hazard Communication Standard 29 CFR 1910.1200	This MSDS has been prepared in compliance with this US Federal OSHA standard. This product IS NOT considered a hazardous chemical under that standard.		
	Process Safety Management 20CFR 1910	NDA		
Resource Conservation and Recovery Act (RCRA), 40 CFR 261, Status		Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. This product is not considered to be a hazardous waste.		
EPA	Hazard Categories	NDA	NDA	
	Accidental Release Prevention 40 CFR 68	NDA	NDA	
Additional Federal Information		This product is not subject to a Section 5(f)/6(a) rule	This product is not subject to a Section 5(f)/6(a) rule	
US States				
General		The following chemicals are specifically listed by individual states. Other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your location.		
		Chemical Name	NDA	NDA
		CAS Registry No.	NDA	NDA
		Concentration	NDA	NDA
		States	NDA	
California	Safe Drinking Water and Toxic Enforcement Act of 1988 – Prop.65	The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986		
		This product contains the following substance(s) currently on the list of Known Carcinogens and Reproductive Toxins, and known to the State of California, USA to cause cancer, birth defects, and/or other reproductive harm:		
		No Proposition 65 chemicals exist in this product.		
	SCAQMD) Rule 443.1 (VOCs)	This is a ZERO VOC material.		
	Substance List	Chemical Name	This product does not contain any chemicals that are subject to the disclosure requirement	
		CAS Registry No.	NDA	NDA
		Common Name	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Trade Secret Registry #s	NDA	NDA
		Comment	NDA	NDA
		CAS Registry No.	NDA	NDA
		Common Name	NDA	NDA
		Upper Bound Concentration %	NDA	NDA
		Trade Secret Registry #s	NDA	NDA
		Comment	NDA	NDA

16. SUPPLEMENTARY		
General Comments	A Material Safety Data Sheet ("MSDS") such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions, in addition to those described herein, are required. INTEGRATED POLYMER INDUSTRIES, INC. must rely on the user to utilize the information we have supplied to develop work practice guidelines and employee instructional programs for the individual operation and regulations. Any health hazard and safety information contained herein should be passed on to your employees. The data in this MSDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. If the material is used as a component in another material, this MSDS information may not be applicable.	
Compliance with All Government Regulations	It is the user's responsibility to comply with all national, state, and local codes pertaining to the use, handling, dispensing, storage, transportation, and disposal. IPI does not assume responsibility and expressly disclaims liability for any non-compliance.	
Disclaimer of Liability	The following supercedes buyer's documents. The information in this MSDS was obtained from sources which we believe are reliable and is believed to be accurate but is not warranted to be whether originating with the company or not. No warranties of any kind, either express or implied, including warranties of merchantability or fitness for a particular purpose, are made regarding products described or designs, data or information set forth. The conditions or methods of use, handling, dispensing, storage, transportation, disposal, and compliance with regulations of various government agencies of the material are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the use, handling, dispensing, storage, transportation, disposal, and compliance with government regulations of the material. Further, buyer and/or enduser expressly understand and agree that the descriptions, designs, data and information furnished by IPI hereunder are given gratis and IPI assumes no obligation or liability for the description, designs, data and information given or results obtained, all such being given and accepted at your risk. This document is generated for the purpose of distributing health, safety, and environmental data. It is not a specification sheet nor should any displayed data be construed as a specification. Some of the information presented and conclusions drawn herein are from sources other than direct test data on the material itself. Nothing herein shall be construed as a recommendation for uses that infringe valid patents or as extending a license for valid patents.	
Label Statement	WARNING! FOR INDUSTRIAL USE BY TRAINED PERSONNEL ONLY! KEEP AWAY FROM CHILDREN. KEEP CONTAINER TIGHTLY CLOSED. KEEP AWAY FROM HEAT, SPARKS, AND FLAME. AVOID BREATHING HIGH VAPOR CONCENTRATIONS. USE ONLY WITH ADEQUATE VENTILATION. PLEASE REFER TO MSDS AND TECHNICAL DATA FOR ADDITIONAL INFORMATION NECESSARY FOR PROPER USE, STORAGE, AND DISPOSAL.	
Acronyms	2. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS	
	CAS REGISTRY NUMBER	Chemical Abstract Service Registry number and name as it appears in the US Federal EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
	OSHA	The Occupational Safety & Health Administration.
	ACGIH	The American Conference of Governmental Industrial Hygienists.
	PPM	Parts per Million, $1x\ 10^{-6}$
	PEL	Permissible Exposure Limit for a chemical in the air as established by The Occupational Safety & Health Administration (OSHA).
	TLV	Threshold Limit Value for a chemical in the air as established by The American Conference of Government Industrial Hygienists (ACGIH).
	(PEL)TLV:TWA	The Time-Weighted Average exposure for a normal 8-hour workday and a 40-hour workweek to which nearly all workers may be repeatedly exposed without adverse effect.
	TLV:STEL	The Short-Term Exposure Limit is 15-minute time-weighted average exposure that should not be exceeded at any time during a workday, even if it the 8-hour TWA is within the TLV.
	TLV:C	The Ceiling Concentration that should not be exceeded even instantaneously.
	PEL:ACCEPTABLE CEILING CONCENTRATION	The Concentration not to be exceeded during an 8-hour shift, except for a given time period, and not exceeding the concentration given as the acceptable maximum peak.

	CARCINOGENIC REFERENCES	Will indicate whether the ingredient has been found to be a (potential) carcinogen by • ACGIH (American Conference of Governmental Industrial Hygienists • IARC (International Agency for Research on Cancer); • NTP (National Toxicology Program) or • OSHA (Occupational Safety & Health Administration).
	5. FIRE & EXPLOSION DATA	
	FLASH POINT	Designated by method: CC-Closed Cup, OC-Open Cup.
	NFPA HAZARD CODES	The US National Fire Protection Association's Hazard Identification System intended to indicate inherent hazards of a chemical under emergency conditions such as fire. The degree of each of three hazards (Health/Flammability/ Reactivity) is rated by a numerical designation ranging from low to high of 0 to 4.
	HMIS HAZARD CODE	The US National Paint & Coatings Association's Hazard Materials Identification System intended to estimate the inherent hazards of a chemical under normal workplace situations. The degree of each of three hazards (Health/Flammability/Reactivity) is rated by a numerical designation ranging from low to high of 0 to 4.
	7. HANDLING AND STORAGE	
	RCRA	US Resource Conservation and Recovery Act
	11. TOXICOLOGICAL PROPERTIES	
	ACUTE LD_{50}/LC_{50}	The Lethal Dose/Concentration required to kill 50% of a population of test animals by the route of administration indicated.
	14. TRANSPORT INFORMATION	
	DOT	US Department of Transportation
	UN Number	United Nations Number
	CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
	NOS	Not Otherwise Specified
	NAERG	North American Emergency Response Guide
	IMO/IMDG	International Maritime Organization/International Maritime Dangerous Goods
	ICAO/IATA	International Civil Aviation Organization/International Air Transport Association
	TDG	Transportation of Dangerous Goods
	MISCELLANEOUS	
	NA	Not Applicable
	NDA	No Data Available
	NE	Not Established
Other	This MSDS is subject to change without notice, as new information becomes available.	
MSDS Prepared By	Ergun Kirlikovali	
MSDS Effective Date	January 2002	

Technical Data
JOTACOTE PSO

Product description
Jotacote PSO is a two-pack polysiloxane topcoat with excellent gloss and colour retention.

Recommended use
As topcoat over an epoxy system where a durable, high gloss finish is required in aggressive atmospheric exposure.

Film thickness and spreading rate

	Minimum	Maximum	Typical
Film thickness, dry (µm)	60	200	75
Film thickness, wet (µm)	85	275	105
Theoretical spreading rate (m^2/l)	11,8	3,6	9,5

Physical properties

Colour	According to colour card and Multicolor tinting system (MCI)
Solids (vol %)*	72 ± 2
Flash point	30°C ± 2 (Setaflash)
Gloss	Glossy
Gloss retention	Excellent
Water resistance	Very good
Abrasion resistance	Very good
Solvent resistance	Very good
Chemical resistance	Very good
Flexibility	Very good

*Measured according to ISO 3233:1998 (E)

Surface preparation

All surfaces should be clean, dry and free from contamination. The surface should be assessed and treated in accordance with ISO 8504.

Coated surfaces
Clean, dry and undamaged compatible primer. Contact your local Jotun office for more information.

Other surfaces
The coating may be used on other substrates. Please contact your local Jotun office for more information.

Condition during application
The temperature of the substrate should be minimum 5°C and at least 3°C above the dew point of the air, temperature and relative humidity measured in the vicinity of the substrate. Good ventilation is usually required in confined areas to ensure proper drying. The coating should not be exposed to oil, chemicals or mechanical stress until fully cured.

Application methods

Spray	Use airless spray
Brush	Recommended for stripe coating and small areas, care must be taken to achieve the specified dry film thickness.

Application data

Mixing ratio (volume)	1,8 parts of Comp. A (base) to be mixed thoroughly with 1 part Comp. B (curing agent).
Pot life (23°C)	6 hours (Reduced at higher temp.).
Thinner/Cleaner	Jotun Thinner No. 26
Guiding data airless spray	
Pressure at nozzle	15 MPa (150 kp/cm² 2100 psi).
Nozzle tip	0.33-0.46 mm (0.013-0.018").
Spray angle	40-80°
Filter	Check to ensure that filters are clean.

Drying time

Drying times are generally related to air circulation, temperature, film thickness and number of coats, and will be affected correspondingly. The figures given in the table are typical with:

* Good ventilation (Outdoor exposure or free circulation of air)
* Typical film thickness
* One coat on top of inert substrate

Substrate temperature	**5°C**	**10°C**	**23°C**	**40°C**
Surface dry	6 h	5 h	3,5 h	2 h
Through dry	8 h	7 h	4 h	3 h
Cured	15 d	10 d	5 d	3 d
Dry to recoat, minimum	8 h	7 h	4 h	3 h
Dry to recoat, maximum [1]				

1. The surface must be free from any chalking or any other contamination and if necessary, sufficiently roughened prior to application.

The given data must be considered as guidelines only. The actual drying time/times before recoating may be shorter or longer, depending on film thickness, ventilation, humidity, underlying paint system, requirement for early handling and mechanical strength etc. A complete system can be described on a system sheet, where all parameters and special conditions could be included.

Typical paint system

Resist 86 or Barrier	1 x 75 µm	(Dry Film Thickness)
Jotamastic Plus	1 x 250 µm	(Dry Film Thickness)
Jotacote PSO	**1 x 75 µm**	**(Dry Film Thickness)**

Other systems may be specified, depending on area of use

Storage

The product must be stored in accordance with national regulations. Storage conditions are to keep the containers in a dry, cool, well ventilated space and away from source of heat and ignition. Containers must be kept tightly closed.
Shelf Life Comp. A: 2 years
Shelf LIfe Comp. B: 1 year

Handling

Handle with care. Stir well before use.

Packing size

20 litre unit: 12,8 litres Comp. A (base) in a 20 litre container and 7,2 litres Comp. B (curing agent) in a 10 litre container
or
5 litre unit: 3,2 litres Comp. A (base) in a 5 litre container and 1,8 litres Comp. B (curing agent) in a 3 litre container.

Packing may vary from country to country according to local requirements.

Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not breathe or inhale mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

For detailed information on the health and safety hazards and precautions for use of this product, we refer to the Material Safety Data Sheet.

DISCLAIMER

The information in this data sheet is given to the best of our knowledge based on laboratory testing and practical experience. However, as the product is often used under conditions beyond our control, we cannot guarantee anything but the quality of the product itself. We reserve the right to change the given data without notice.

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Jotun is a World Wide company with factories, sales offices and stocks in more than 50 countries. For your nearest local Jotun address please contact the nearest regional office or visit our website at www.jotun.com

ISSUED 1 APRIL 2003 BY JOTUN PAINTS
THIS DATA SHEET SUPERSEDES THOSE PREVIOUSLY ISSUED

PDF Version :

SAFETY DATA SHEET

Jotacote PSO - Comp. A

1. Identification of the substance/preparation and of the company/undertaking

Product Name and/or Code : **Jotacote PSO - Comp. A**

Label No. : 3357

Supplier/Manufacturer : Jotun Paints (Europe) Ltd.
Stather Road
Flixborough, Scunthorpe
North Lincolnshire
DN15 8RR
England

Tel: +44 17 24 40 00 00
Fax: +44 17 24 40 01 00

Emergency telephone number : Office phone/national poison centre. Office phone: +44 191 28 64 488

Product Use : Coatings: Solvent-borne.

2. Composition/information on ingredients

Chemical name*	CAS no.	EC Number	%	Classification
siloxanes and silicones, di-me, methoxy ph, polymers with ph silsesquioxanes, methoxy-terminated	68957-04-0		10-25	Xn; R22
n-butyl acetate	123-86-4	204-658-1	2.5-10	R10 R66, 67
Solvent naphtha (petroleum), light arom.	64742-95-6	265-199-0	2.5-10	R10 Xn; R65 Xi; R37 R66, 67 N; R51/53
decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester	41556-26-7	255-437-1	0-1	R43 N; R50/53
poly(oxy-1,2-ethanediyl), .alpha.-[3-[3-(2h-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]-1-o	104810-48-2	400-830-7	0-1	R43 N; R51/53
decanedioic acid, methyl 1,2,2,6,6-pentamethyl-4-piperidinyl ester	82919-37-7	280-060-4	0-1	R43 N; R50/53
White spirit, reg.(17-22% aromates)	64742-82-1	265-185-4	0-1	R10 Xn; R65 R66, 67 N; R51/53
See Section 16 for the full text of the R Phrases declared above.				

*** Occupational Exposure Limit(s), if available, are listed in Section 8.**

3. Hazards identification

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Flammable.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4. First-aid measures

First-Aid measures

General : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Give nothing by mouth. If unconscious place in recovery position and seek medical advice.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Do NOT use solvents or thinners.

Eye Contact : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open.

Ingestion : If swallowed, seek medical advice immediately and show the container or label. Keep person warm and at rest. Do not induce vomiting.

5. Fire-fighting measures

Extinguishing Media : Recommended: alcohol resistant foam, CO2, powders, water spray.
Not to be used : waterjet.

Recommendations : Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. Appropriate breathing apparatus may be required. Cool closed containers exposed to fire with water. Do not release runoff from fire to sewers or waterways.

6. Accidental release measures

Personal Precautions : Exclude sources of ignition and ventilate the area. Avoid breathing vapour or mist. Refer to protective measures listed in sections 7 and 8.

Spill : Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13). Do not allow to enter drains or watercourses. Clean preferably with a detergent; avoid use of solvents. If the product contaminates lakes, rivers or sewage, inform appropriate authorities in accordance with local regulations.

Note: See section 8 for personal protective equipment and section 13 for waste disposal.

7. Handling and storage

Handling : Vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits.

In addition, the product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard.

To dissipate static electricity during transfer, earth drum and connect to receiving container with bonding strap. Operators should wear anti-static footwear and clothing and floors should be of the conducting type.

Keep container tightly closed. Keep away from heat, sparks and flame. No sparking tools should be used.

Avoid contact with skin and eyes. Avoid the inhalation of dust, particulates and spray mist arising from the application of this preparation. Avoid inhalation of dust from sanding.

Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking.

Put on appropriate personal protective equipment (see Section 8).

Never use pressure to empty : container is not a pressure vessel. Always keep in containers of same material as the original one.

Comply with the health and safety at work laws.

When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process and until such time as the particulates and solvent vapour concentration has fallen below the exposure limits.

Storage : Store in accordance with local regulations. Observe label precautions. Store in a cool, well-ventilated area away from incompatible materials and ignition sources.

Keep away from: oxidizing agents, strong alkalis, strong acids.
No smoking. Prevent unauthorised access. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Do not empty into drains..

8. Exposure controls/personal protection

Engineering measures : Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

Ingredient Name	Occupational Exposure Limits
siloxanes and silicones, di-me, methoxy ph, polymers with ph silsesquioxanes, methoxy-terminated	Not available.
n-butyl acetate	**EH40-OES (United Kingdom (UK), 2002). Notes: OES** STEL: 966 mg/m^3 15 minute(s). STEL: 200 ppm 15 minute(s). TWA: 724 mg/m^3 8 hour(s). TWA: 150 ppm 8 hour(s).
Solvent naphtha (petroleum), light arom.	**EH40-MEL (United Kingdom (UK), 2001).** TWA: 25 ppm 8 hour(s). TWA: 120 mg/m^3 8 hour(s).
decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester	Not available.
poly(oxy-1,2-ethanediyl), .alpha.-[3-[3-(2h-benzotriazol-2-yl)-5-(1,1-dimeth	Not available.
decanedioic acid, methyl 1,2,2,6,6-pentamethyl-4-piperidinyl ester	Not available.

White spirit, reg.(17-22% aromates) **EH40-MEL (United Kingdom (UK), 2001).**
TWA: 100 ppm 8 hour(s).
TWA: 566 mg/m^3 8 hour(s).
STEL: 150 ppm 15 minute(s).
STEL: 850 mg/m^3 15 minute(s).

Personal protective equipment

Respiratory system : If workers are exposed to concentrations above the exposure limit they must use appropriate, certified respirators. Use respiratory mask with charcoal and dust filter when spraying this product (as filter combination A2-P2). In confined spaces use compressed air or fresh air respiratory equipment. When use of roller or brush, consider use of charcoalfilter (A2).

Skin and body : Personnel should wear anti-static clothing made of natural fibre or of high temperature resistant synthetic fibre.

Hands : For prolonged or repeated handling, use gloves: polyvinyl alcohol or neoprene.

Barrier creams may help to protect the exposed areas of the skin, they should however not be applied once exposure has occurred.

Eyes : Use safety eyewear designed to protect against splash of liquids.

9. Physical and chemical properties

Physical state : Liquid.

Odour : Characteristic.

Colour : Various colours.

Flash point : Closed cup: 31°C (87.8°F).

pH : Not applicable.

Density : 1.5 g/cm^3

Vapour density : The highest known value is 4 (Air = 1) (n-butyl acetate).

Solubility : Insoluble in cold water.

10. Stability and reactivity

Stable under recommended storage and handling conditions (see section 7).

Hazardous Decomposition Products: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.

Keep away from the following materials in order to avoid strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

11. Toxicological information

There are no data available on the preparation itself.

Exposure to component solvents vapours concentration in excess of the stated occupational exposure limit may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on kidney, liver and central nervous system. Solvents may cause some of the above effects by absorption through the skin. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin. The liquid splashed in the eyes may cause irritation and reversible damage.

Contains (decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester, decanedioic acid, methyl 1,2,2,6,6-pentamethyl-4-piperidinyl ester, poly(oxy-1,2-ethanediyl), .alpha.-[3-[3-(2h-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]-1-oxopropyl]-.omega.-hydroxy-). May produce an allergic reaction.

12. Ecological information

There are no data available on the preparation itself.
Do not allow to enter drains or watercourses.

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is not classified as dangerous for the environment, but contains substance(s) dangerous for the environment. See section 2 for details.

Ecotoxicity Data

Ingredient Name	Species	Period	Result
n-butyl acetate	Pimephales promelas (EC50)	48 hours	19 mg/l
	Pimephales promelas (LC50)	96 hours	18 mg/l
	Lepomis macrochirus (LC50)	96 hours	100 mg/l
Solvent naphtha (petroleum), light arom.	Fish (LC50)	96 hours	<10 mg/l
	Daphnia (EC50)	48 hours	<10 mg/l
	Algae (IC50)	72 hours	<10 mg/l
decanedioic acid,	Fish (LC50)	96 hours	<1 mg/l
bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester	Daphnia (EC50)	48 hours	<100 mg/l
poly(oxy-1,2-ethanediyl),	Fish (LC50)	96 hours	2.8 mg/l
.alpha.-[3-[3-(2h-benzotriazol-2-yl)-5-(1,1-dimetl	Daphnia (EC50)	48 hours	3.8 mg/l
	Algae (IC50)	72 hours	>9 mg/l
decanedioic acid, methyl	Fish (LC50)	96 hours	<1 mg/l
1,2,2,6,6-pentamethyl-4-piperidinyl ester	Daphnia (EC50)	48 hours	<100 mg/l
White spirit, reg.(17-22% aromates)	Fish (LC50)	96 hours	<10 mg/l
	Daphnia (EC50)	48 hours	<10 mg/l
	Algae (IC50)	72 hours	<10 mg/l

Ecological information

Ingredient Name	Persistence/degradability						Bioaccumulative potential		
	BOD_5	COD	ThOD	Aquatic Half-life	Photolysis	Biodegradability	$LogP_{ow}$	BCF	Potential
Solvent naphtha (petroleum), light arom.						Not readily			
decanedioic acid, bis(1,2,2,6,6-pentameth ester						Not readily			
poly(oxy-1,2-ethanediyl), .alpha.-[3-[3-(2h-benzot						Not readily			
decanedioic acid, methyl 1,2,2,6,6-pentamethyl-4 ester						Not readily			
White spirit, reg.(17-22% aromates)						Readily			

13. Disposal considerations

Do not allow to enter drains or watercourses. Material and/or container must be disposed of as hazardous waste.

European Waste Catalogue (EWC) : 08 00 00 WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS

14. Transport information

International transport regulations

Regulatory Information	UN number	Proper shipping name	Class	Packing group	Label	Additional Information
ADR/RID Class	1263	Paint	3	III		**Hazard identification number** **30**
IMDG Class	1263	Paint.	3	III		**Emergency Schedules (EmS)** **F-E, S-E** **Marine pollutant** **No.**
IATA-DGR Class	1263	Paint	3	III		-

Transport in accordance with ADR/RID, IMDG/IMO and ICAO/IATA and national regulation.

15. Regulatory information

EU Regulations : The product is labelled as follows, in accordance with local regulations:

Indication of Danger : R10- Flammable.
Risk Phrases R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases : S23- Do not breathe vapor / spray.
S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

Additional Warning Phrases : Contains (decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester, decanedioic acid, methyl 1,2,2,6,6-pentamethyl-4-piperidinyl ester, poly(oxy-1,2-ethanediyl), .alpha.-[3-[3-(2h-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]-1-oxopropyl]-.omega.-hydroxy-). May produce an allergic reaction.

National regulations

16. Other information

CEPE Classification : 1

Full text of R-Phrases with no. appearing in Section 2 - United Kingdom (UK) :
R10- Flammable.
R22- Harmful if swallowed.
R65- Harmful: may cause lung damage if swallowed.
R37- Irritating to respiratory system.
R43- May cause sensitization by skin contact.
R66- Repeated exposure may cause skin dryness or cracking.
R67- Vapours may cause drowsiness and dizziness.
R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

HISTORY

Date of printing	:	**24.03.2003.**
Date of issue	:	**03.03.2003.**
Date of previous issue	:	**No Previous Validation.**
Version	:	**1**
Prepared by	:	

Notice to Reader

The information of this SDS is based on the present state of our knowledge and on current EU and national laws. The product is not to be used for other purposes than those specified under section 1 without first obtaining written handling instruction. It is always the responsibility of the user to take all necessary steps in order to fulfil the demand laid down in the local rules and legislation. The information in this SDS is meant as a description of the safety requirements of our product : it is not to be considered as a guarantee of the products properties.

Indicates information that has changed from previously issued version.

Changes have been made in international and national regulations that influences the following information in the Safety datasheets: Environmental labelling, sensitizers, carcinogenic effects and effects from solvents.

SAFETY DATA SHEET

Jotacote PSO - Comp. B

1. Identification of the substance/preparation and of the company/undertaking

Product Name and/or Code : **Jotacote PSO - Comp. B**

Label No. : 3358

Supplier/Manufacturer : Jotun Paints (Europe) Ltd.
Stather Road
Flixborough, Scunthorpe
North Lincolnshire
DN15 8RR
England

Tel: +44 17 24 40 00 00
Fax: +44 17 24 40 01 00

Emergency telephone number : Office phone/national poison centre. Office phone: +44 191 28 64 488

Product Use : Coatings: Hardener / Solvent-borne.

2. Composition/information on ingredients

Chemical name*	CAS no.	EC Number	%	Classification
Xylene	1330-20-7	215-535-7	10-25	R10 Xn; R20/21 Xi; R38
3-Aminopropyltriethoxysilane	919-30-2	213-048-4	10-25	Xn; R22 C; R34
Butan-1-ol	71-36-3	200-751-6	2.5-10	R10 Xn; R22 Xi; R37/38, 41 R67
Ethylbenzene	100-41-4	202-849-4	2.5-10	F; R11 Xn; R20
n-Butyl methacrylate	97-88-1	202-615-1	0-1	R10 Xi; R36/37/38 R43
2-Hydroxyethyl acrylate	818-61-1	212-454-9	0-1	T; R24 C; R34 R43 N; R50
See Section 16 for the full text of the R Phrases declared above.				

*** Occupational Exposure Limit(s), if available, are listed in Section 8.**

3. Hazards identification

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Flammable.
Harmful by inhalation and in contact with skin.
Causes burns.

Corrosive

4. First-aid measures

First-Aid measures

General : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Give nothing by mouth. If unconscious place in recovery position and seek medical advice.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Do NOT use solvents or thinners.

Eye Contact : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open.

Ingestion : If swallowed, seek medical advice immediately and show the container or label. Keep person warm and at rest. Do not induce vomiting.

5. Fire-fighting measures

Extinguishing Media : Recommended: alcohol resistant foam, CO2, powders, water spray.
Not to be used : waterjet.

Recommendations : Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. Appropriate breathing apparatus may be required. Cool closed containers exposed to fire with water. Do not release runoff from fire to sewers or waterways.

6. Accidental release measures

Personal Precautions : Exclude sources of ignition and ventilate the area. Avoid breathing vapour or mist. Refer to protective measures listed in sections 7 and 8.

Spill : Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13). Do not allow to enter drains or watercourses. Clean preferably with a detergent; avoid use of solvents. If the product contaminates lakes, rivers or sewage, inform appropriate authorities in accordance with local regulations.

Note: See section 8 for personal protective equipment and section 13 for waste disposal.

7. Handling and storage

Handling : Vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits.

In addition, the product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard.

To dissipate static electricity during transfer, earth drum and connect to receiving container with bonding strap. Operators should wear anti-static footwear and clothing and floors should be of the conducting type.

Keep container tightly closed. Keep away from heat, sparks and flame. No sparking tools should be used.

Avoid contact with skin and eyes. Avoid the inhalation of dust, particulates and spray mist arising from the application of this preparation. Avoid inhalation of dust from sanding.

Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking.

Put on appropriate personal protective equipment (see Section 8).

Never use pressure to empty : container is not a pressure vessel. Always keep in containers of same material as the original one.

Comply with the health and safety at work laws.

When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process and until such time as the particulates and solvent vapour concentration has fallen below the exposure limits.

Storage : Store in accordance with local regulations. Observe label precautions. Store in a cool, well-ventilated area away from incompatible materials and ignition sources.

Keep away from: oxidizing agents, strong alkalis, strong acids.
No smoking. Prevent unauthorised access. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Do not empty into drains..

8. Exposure controls/personal protection

Engineering measures : Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

Ingredient Name	Occupational Exposure Limits
Xylene	**EH40-OES (United Kingdom (UK), 2002). Skin Notes: OES** STEL: 441 mg/m^3 15 minute(s). STEL: 100 ppm 15 minute(s). TWA: 220 mg/m^3 8 hour(s). TWA: 50 ppm 8 hour(s).
3-Aminopropyltriethoxysilane	Not available.
Butan-1-ol	**EH40-OES (United Kingdom (UK), 2002). Skin Notes: OES** STEL: 154 mg/m^3 15 minute(s). STEL: 50 ppm 15 minute(s).
Ethylbenzene	**EH40-OES (United Kingdom (UK), 2002). Skin Notes: OES** STEL: 552 mg/m^3 15 minute(s). STEL: 125 ppm 15 minute(s). TWA: 441 mg/m^3 8 hour(s). TWA: 100 ppm 8 hour(s).
n-Butyl methacrylate	Not available.
2-Hydroxyethyl acrylate	Not available.

Personal protective equipment

Respiratory system : If workers are exposed to concentrations above the exposure limit they must use appropriate, certified respirators. Use respiratory mask with charcoal and dust filter when spraying this product (as filter combination A2-P2). In confined spaces use compressed air or fresh air respiratory equipment. When use of roller or brush, consider use of charcoalfilter (A2).

Skin and body : Personnel should wear anti-static clothing made of natural fibre or of high temperature resistant synthetic fibre.

Hands : For prolonged or repeated handling, use gloves: polyvinyl alcohol or nitrile.

Barrier creams may help to protect the exposed areas of the skin, they should however not be applied once exposure has occurred.

Eyes : Use safety eyewear designed to protect against splash of liquids.

9. Physical and chemical properties

Physical state : Liquid.

Odour : Characteristic.

Colour : Various colours.

Flash point : Closed cup: 29°C (84.2°F).

pH : Not applicable.

Density : 1 g/cm^3

Vapour density : The highest known value is 3.7 (Air = 1) (Ethylbenzene). Weighted average: 3.48 (Air = 1)

Solubility : Insoluble in cold water.

10. Stability and reactivity

Stable under recommended storage and handling conditions (see section 7).

Hazardous Decomposition Products: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.

Keep away from the following materials in order to avoid strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

11. Toxicological information

There are no data available on the preparation itself.

Exposure to component solvents vapours concentration in excess of the stated occupational exposure limit may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on kidney, liver and central nervous system. Solvents may cause some of the above effects by absorption through the skin. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin. The liquid splashed in the eyes may cause irritation and reversible damage.

Contains (2-Hydroxyethyl acrylate, n-Butyl methacrylate). May produce an allergic reaction.

12. Ecological information

There are no data available on the preparation itself.
Do not allow to enter drains or watercourses.

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is not classified as dangerous for the environment, but contains substance(s) dangerous for the environment. See section 2 for details.

Ecotoxicity Data

Ingredient Name	Species	Period	Result
Xylene	Oncorhynchus mykiss (LC50)	96 hours	3.3 mg/l
	Oncorhynchus mykiss (LC50)	96 hours	8.2 mg/l
	Lepomis macrochirus (LC50)	96 hours	8.6 mg/l
	Lepomis macrochirus (LC50)	96 hours	12 mg/l
	Lepomis macrochirus (LC50)	96 hours	13.3 mg/l
	Pimephales promelas (LC50)	96 hours	13.4 mg/l
Butan-1-ol	Daphnia magna (EC50)	48 hours	1983 mg/l
	Lepomis macrochirus (LC50)	96 hours	100 mg/l
	Pimephales promelas (LC50)	96 hours	1730 mg/l
	Pimephales promelas (LC50)	96 hours	1910 mg/l
	Pimephales promelas (LC50)	96 hours	1940 mg/l
Ethylbenzene	Daphnia magna (EC50)	48 hours	2.93 mg/l
	Daphnia magna (EC50)	48 hours	2.97 mg/l
	Selenastrum capricornutum (EC50)	48 hours	7.2 mg/l
	Oncorhynchus mykiss (LC50)	96 hours	4.2 mg/l
	Pimephales promelas (LC50)	96 hours	9.09 mg/l
	Poecilia reticulata (LC50)	96 hours	9.6 mg/l
2-Hydroxyethyl acrylate	Pimephales promelas (LC50)	96 hours	4.8 mg/l

13. Disposal considerations

Do not allow to enter drains or watercourses. Material and/or container must be disposed of as hazardous waste.

European Waste Catalogue (EWC) : 08 00 00 WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS

14. Transport information

International transport regulations

Regulatory Information	UN number	Proper shipping name	Class	Packing group	Label	Additional Information
ADR/RID Class	2734	Polyamines, liquid, corrosive, flammable, n.o.s. (3-Aminopropyltriethoxysilane)	8	II		**Hazard identification number** **83**
IMDG Class	2734	Polyamines, liquid, corrosive, flammable, n.o.s. (3-Aminopropyltriethoxysilane)	8	II		**Emergency Schedules (EmS)** **F-E, S-C** **Marine pollutant** **No.**
IATA-DGR Class	2734	Polyamines, liquid, corrosive, flammable, n.o.s. (3-Aminopropyltriethoxysilane)	8	II		-

Transport in accordance with ADR/RID, IMDG/IMO and ICAO/IATA and national regulation.

15. Regulatory information

EU Regulations : The product is labelled as follows, in accordance with local regulations:

Indication of Danger : Corrosive

Hazard symbol(s) :

Corrosive

Contains : 3-Aminopropyltriethoxysilane
Xylene

Risk Phrases : R10- Flammable.
R20/21- Harmful by inhalation and in contact with skin.
R34- Causes burns.

Safety Phrases : S16- Keep away from sources of ignition - No smoking.
S23- Do not breathe vapor / spray.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S51- Use only in well-ventilated areas.

Additional Warning Phrases : Contains (2-Hydroxyethyl acrylate, n-Butyl methacrylate). May produce an allergic reaction.

National regulations

16. Other information

CEPE Classification : 1

Full text of R-Phrases with no. appearing in Section 2 - United Kingdom (UK) :
R11- Highly flammable.
R10- Flammable.
R24- Toxic in contact with skin.
R20- Harmful by inhalation.
R20/21- Harmful by inhalation and in contact with skin.
R22- Harmful if swallowed.
R34- Causes burns.
R36/37/38- Irritating to eyes, respiratory system and skin.
R37/38- Irritating to respiratory system and skin.
R38- Irritating to skin.
R41- Risk of serious damage to eyes.
R43- May cause sensitization by skin contact.
R67- Vapours may cause drowsiness and dizziness.
R50- Very toxic to aquatic organisms.

HISTORY

Date of issue : **03.03.2003.**

Date of printing	:	**24.03.2003.**
Date of issue	:	**03.03.2003.**
Date of previous issue	:	**No Previous Validation.**
Version	:	**1**
Prepared by	:	

Notice to Reader

The information of this SDS is based on the present state of our knowledge and on current EU and national laws. The product is not to be used for other purposes than those specified under section 1 without first obtaining written handling instruction. It is always the responsibility of the user to take all necessary steps in order to fulfil the demand laid down in the local rules and legislation. The information in this SDS is meant as a description of the safety requirements of our product : it is not to be considered as a guarantee of the products properties.

Indicates information that has changed from previously issued version.

Changes have been made in international and national regulations that influences the following information in the Safety datasheets: Environmental labelling, sensitizers, carcinogenic effects and effects from solvents.

MATERIAL SAFETY DATA SHEET
KEELER & LONG/PPG INDUSTRIES, INC.

SECTION 1 - CHEMICAL, PRODUCT, AND COMPANY INFORMATION

PRODUCT CODE/IDENTITY: UMS1000030

PRODUCT TRADE NAME: *MEGAFLON MS CLEARCOAT 30

REVISION DATE: 04/19/02 (000) 0874

CUSTOMER PART #/NAME: Not applicable

CHEMICAL FAMILY: Fluoropolymer

EMERGENCY MEDICAL/SPILL INFO: (304) 843-1300 (U.S.) 91-800-00-214 (MEXICO)

TECHNICAL INFORMATION: 1-800-238-8596

PRODUCT SAFETY/MSDS INFORMATION: 4325 ROSANNA DRIVE, P.O. BOX 9 ALLISON PARK, PA 15101 (412) 492-5555

DATE OF MSDS PREPARATION: 05/22/02

PRIMARY HAZARD WARNING

Flammable. Keep away from heat, sparks, flames, and other sources of ignition. Do not smoke. Extinguish all flames and pilot lights. Turn off stoves, heaters, electrical motors, and other sources of ignition during use and until all vapors/odors are gone. Harmful if swallowed. May be corrosive. This product contains a material which causes skin burns. This product contains a material which causes irreversible eye damage. Vapor and/or spray mist may be harmful if inhaled. Vapor irritates eyes, nose, and throat.

THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED IN ACCORDANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200), THE SUPPLIER NOTIFICATION REQUIREMENTS OF SARA TITLE III, SECTION 313, AND OTHER APPLICABLE RIGHT-TO-KNOW REGULATIONS.

TRANSPORTATION OF DANGEROUS GOODS

PROPER SHIPPING NAME: Paint

NOS TECHNICAL NAME: None

HAZARD CLASS: 3

SUBSIDIARY CLASS: None

UN NUMBER: UN1263

PACKING GROUP: III

MARINE POLLUTANT: None

USA-RQ, HAZARDOUS SUBSTANCE: Xylenes

USA-RQ, HAZARDOUS SUBSTANCE THRESHOLD SHIP WEIGHT: Xylenes>413.18 Pounds

CANADA SCHEDULE XIII, 9.2:

CANADA SCHEDULE XIII,9.2 THRESHOLD SHIP WEIGHT:

USA Shipments Only - RQ Threshold Ship Weight: This is the total weight of this

product that must be shipped to exceed the RQ quantity.
Canada Shipments Only - Canada Schedule XIII Threshold Ship Weight: This is the total weight of this product that must be shipped to exceed the Canadian Schedule XIII Regulated Limit quantity.

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

REF	HAZARDOUS INGREDIENTS	PERCENT	CAS NUMBER	CARCINOGEN*
01	1-METHOXY-2-PROPYL ACETATE	10- <20	108-65-6	
02	XYLENES	20- <30	1330-20-7	
03	AROMATIC NAPHTHA	10- <20	64742-95-6	
04	SILICA	1 - <5	7631-86-9	
05	DODECYLPYRROLIDINEDIONE	1 - <5	79720-19-7	
06	1,2,4-TRIMETHYL BENZENE	5 - <10	95-63-6	

* Carcinogens: O=OSHA; A=ACGIH; N=NTP; I=IARC

SARA TITLE III & CERCLA CLASSIFICATIONS

REF	SARA 102 RQ (LBS)	SARA 302 TPQ (LBS)	SARA 313	SARA 311/312 AC	CH	FL	PR	RE
01	NOT ESTAB	NOT ESTAB	N	Y	N	Y	N	N
01	NOT ESTAB	NOT ESTAB	N					
02	100 lbs	NOT ESTAB	Y	Y	N	Y	N	N
03	NOT ESTAB	NOT ESTAB	N	Y	N	Y	N	N
03	NOT ESTAB	NOT ESTAB	N					
04	NOT ESTAB	NOT ESTAB	N	N	N	N	N	N
05	NOT ESTAB	NOT ESTAB	N	Y	N	N	N	N
06	NOT ESTAB	NOT ESTAB	Y	Y	N	Y	N	N

SARA 311/312 CATEGORIES FOR THIS PRODUCT: ACUTE= Y, CHRONIC= N, FLAMMABILITY= Y, PRESSURE= N, REACTIVITY= N

OCCUPATIONAL EXPOSURE LIMITS HAVE BEEN ESTABLISHED FOR THE FOLLOWING MATERIALS:

REF	ACGIH TLV-TWA	ACGIH TLV-STEL	U.S. OSHA PEL-TWA	U.S. OSHA PEL-STEL
01	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB
01	IPEL-TWA: 100 ppm		IPEL-STEL: NOT ESTAB	
01	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB
02	100 ppm	150 ppm	100 ppm	150 ppm
03	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB
03	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB
04	10 mg/m3	NOT ESTAB	6 mg/m3	NOT ESTAB
05	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB
06	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB

[C- Ceiling Limit; S- Potential Skin Absorption; R- Respirable Dust]

REF	ACGIH TLV - BASIS - CRITICAL EFFECT(S)
01	NOT ESTAB.
01	NOT ESTAB.
02	irritation
03	NOT ESTAB.
03	NOT ESTAB.
04	NOT ESTAB.
05	NOT ESTAB.
06	NOT ESTAB.

[ACGIH TLV BASIS - CRITICAL EFFECT(S): CNS-CENTRAL NERVOUS SYSTEM; CVS-CARDIOVASCULAR SYSTEM; CWP-COAL WORKER'S PNEUMOCONIOSIS; GI-GASTROINTESTINAL] [NOT ESTAB.= NOT ESTABLISHED = NOT APPLICABLE] [NOT ESTAB.

= NOT ESTABLISHED = NOT APPLICABLE]
PRODUCT STATUS RELATIVE TO THE U.S. EPA TOXIC SUBSTANCES CONTROL ACT

All chemical substances in this product are listed on the U.S. TSCA Inventory or are otherwise exempt from TSCA Inventory reporting requirements.

SECTION 3 - HAZARDS IDENTIFICATION

EFFECTS OF OVEREXPOSURE FROM:

INGESTION: Harmful if swallowed.

EYE CONTACT: This product contains a material which causes irreversible eye damage.

SKIN CONTACT: May be corrosive. This product contains a material which causes skin burns.

INHALATION: Vapor and/or spray mist may be harmful if inhaled. Vapor irritates eyes, nose, and throat. Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage.

CHRONIC OVEREXPOSURE: Avoid long-term and repeated contact. High exposures to xylenes in some animal studies have been reported to cause health effects on the developing embryo and fetus. These effects were often at levels toxic to the mother. The significance of these findings to humans has not been determined.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Eye watering, headaches, nausea, dizziness, and loss of coordination are indications that solvent levels are too high. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. Redness, itching, burning sensation and visual disturbances may indicate excessive eye contact. Dryness, itching, cracking, burning, redness, and swelling are conditions associated with excessive skin contact.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Not applicable.

SECTION 4 - FIRST AID MEASURES

IMPORTANT FIRST AID INFORMATION: If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available.

INGESTION: Gently wipe or rinse the inside of the mouth with water. Sips of water may be given if person is fully conscious. Never give anything by mouth to an unconscious or convulsing person. Do Not induce vomiting. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

EYE CONTACT: Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

SKIN CONTACT: Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

INHALATION: Remove from area to fresh air. If symptomatic, contact a poison control center, emergency room or physician for treatment information.

SECTION 5 - FIRE FIGHTING MEASURES

FLASHPOINT: 78 Degrees F (25 Degrees C) (PENSKY-MARTENS CLOSED CUP)

FLAMMABLE LIMITS: Lower explosion limit (LEL): 1.1

Upper explosion limit (UEL): Not available

EXTINGUISHING MEDIA: Use National Fire Protection Association (NFPA) Class B extinguishers (carbon dioxide, dry chemical, or universal aqueous film forming foam) designed to extinguish NFPA Class IC flammable liquid fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep this product away from heat, sparks, flame, and other sources of ignition (i.e., pilot lights, electric motors, static electricity). Invisible vapors can travel to a source of ignition and flash back. Do not smoke while using this product. Keep containers tightly closed when not in use. Closed containers may explode when overheated. Do not apply to hot surfaces. Toxic gases may form when this product comes in contact with extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water spray may be ineffective. Water spray may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat. If water is used, fog nozzles are preferable. Fire-fighters should wear self-contained breathing apparatus and full protective clothing.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Provide maximum ventilation. Only personnel equipped with proper respiratory, skin, and eye protection should be permitted in the area. Remove all sources of ignition. Take up spilled material with sand, vermiculite, or other noncombustible absorbent material and place in clean, empty containers for disposal. Only the spilled material and the absorbant should be placed in this container.

WASTE DISPOSAL METHOD: Waste material must be disposed of in accordance with federal, state, provincial, and local environmental control regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

SECTION 7 - HANDLING AND STORAGE

HANDLING AND STORAGE PRECAUTIONS: Do not store above 120 degrees F.(48 degrees C.). Store large quantities in buildings designed and protected for storage of NFPA Class IC flammable liquids.

OTHER PRECAUTIONS: Vapors may collect in low areas. If this material is part of a multiple component system, read the Material Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts. Containers should be grounded when pouring. Avoid free fall of liquids in excess of a few inches.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT FOR:

EYE PROTECTION: Wear chemical-type splash goggles or full face shield when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapors.

SKIN PROTECTION: Wear protective clothing sufficient to cover exposed skin surfaces. For applications where skin contact is likely and impermeable clothing is necessary, select clothing constructed of: neoprene rubber or nitrile rubber. No specific permeation/degradation testing have been done on protective clothing for this product. Recommendations for skin protection are based on infrequent contact with this product. For frequent contact or total immersion, contact a manufacturer of protective clothing for appropriate chemical impervious equipment.

RESPIRATORY PROTECTION: Overexposure to vapors may be prevented by ensuring proper ventilation controls, vapor exhaust or fresh air entry. A NIOSH- approved air purifying respirator with the appropriate chemical cartridges or a positive-pressure, air-supplied respirator may also reduce exposure. Read the respirator manufacturer's instructions and literature carefully to determine the type of airborne contaminants against which the respirator is effective, its limitations, and how it is to be properly fitted and used.

OTHER EQUIPMENT: Clean contaminated clothing and shoes.

VENTILATION REQUIREMENTS: Provide general dilution or local exhaust ventilation in volume and pattern to keep the concentration of ingredients listed in Section 2 below the lowest suggested exposure limits, the LEL below the stated limit, and to remove decomposition products during welding or flame cutting.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

[FORMULA VALUES, NOT SALES SPECIFICATIONS]

BOILING RANGE: 239- 379Degrees F

SOLUBILITY IN WATER: 3.6 %

VAPOR PRESSURE: 4.1 mmHg

WEIGHT/GALLON (LBS): 8.78 (U.S.)

VAPOR DENSITY: Heavier than air

pH: Not determined

% VOLATILE/VOLUME: 68.620

% SOLIDS BY WEIGHT: 41.71

SPECIFIC GRAVITY: 1.054

EVAPORATION RATE(BuOAc=100): 44

ODOR/APPEARANCE: Viscous liquid with an odor characteristic of the solvents listed in Section 2.

SECTION 10 - STABILITY AND REACTIVITY

This product is normally stable and will not undergo hazardous reactions.

INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID): Avoid contact with strong alkalies, strong mineral acids, or strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: May produce the following hazardous decomposition products when exposed to extreme heat: carbon monoxide ; carbon dioxide ; lower molecular weight polymer fractions; Extreme heat includes, but is not limited to, flame cutting, brazing, and welding.

Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) Ratings:

HMIS Rating		NFPA Rating	
HEALTH	3	HEALTH	3
FLAMMABILITY	3	FLAMMABILITY	3
REACTIVITY	0	INSTABILITY	0

Rating System:0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe, *=Chronic Effects.

Safe handling of this product requires that all of the information on the MSDS be evaluated for specific work environments and conditions of use.

THIS IS THE END OF THE MSDS FOR: UMS1000030 (00233291.001UMS1000030)

Manufactured and Supplied by:

KEELER & LONG/PPG INDUSTRIES, INC.

856 ECHO LAKE ROAD

WATERTOWN, CT 06795

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MATERIAL SAFETY DATA SHEET
KEELER & LONG/PPG INDUSTRIES, INC.

SECTION 1 - CHEMICAL, PRODUCT, AND COMPANY INFORMATION

PRODUCT CODE/IDENTITY: UMS2001030

PRODUCT TRADE NAME: *MEGAFLON MS K&L OFF-WHITE

REVISION DATE: 06/29/01 (000) 0874

CUSTOMER PART #/NAME: Not applicable

CHEMICAL FAMILY: Fluoropolymer

EMERGENCY MEDICAL/SPILL INFO: (304) 843-1300 (U.S.) 01-800-00-21-400 (MEXICO)

TECHNICAL INFORMATION: 1-800-238-8596

PRODUCT SAFETY/MSDS INFORMATION: 4325 ROSANNA DRIVE, P.O. BOX 9

DATE OF MSDS PREPARATION: 12/05/02

PRIMARY HAZARD WARNING

Flammable. Keep away from heat, sparks, flames, and other sources of ignition. Do not smoke. Extinguish all flames and pilot lights. Turn off stoves, heaters, electrical motors, and other sources of ignition during use and until all vapors/odors are gone. Harmful if swallowed. May cause moderate skin irritation. Causes eye irritation. Vapor and/or spray mist may be harmful if inhaled. Vapor irritates eyes, nose, and throat.

THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED IN ACCORDANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200), THE SUPPLIER NOTIFICATION REQUIREMENTS OF SARA TITLE III, SECTION 313, AND OTHER APPLICABLE RIGHT-TO-KNOW REGULATIONS.

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

REF	HAZARDOUS INGREDIENTS	PERCENT	CAS NUMBER	CARCINOGEN*
01	ETHYL BENZENE	0.1- <1	100-41-4	I
02	1-METHOXY-2-PROPYL ACETATE	10- <20	108-65-6	
03	XYLENES	10- <20	1330-20-7	
04	TITANIUM DIOXIDE	20- <30	13463-67-7	
05	AROMATIC NAPHTHA	5 - <10	64742-95-6	
06	SILICA	1 - <5	7631-86-9	
07	1,2,4-TRIMETHYL BENZENE	1 - <5	95-63-6	

* Carcinogens: O=OSHA; A=ACGIH; N=NTP; I=IARC

SARA TITLE III & CERCLA CLASSIFICATIONS

REF	CERCLA HAZARDOUS SUBSTANCE RQ(LBS)	SARA EXTREMELY HAZ SUBSTANCE TPQ(LBS)	SARA 313	SARA 311/312 AC	CH	FL	PR	RE
01	1000 lbs	NOT ESTAB	Y	Y	Y	Y	N	N
02	NOT ESTAB	NOT ESTAB	N	Y	N	Y	N	N
02	NOT ESTAB	NOT ESTAB	N	(ONTARIO)				
03	100 lbs	NOT ESTAB	Y	Y	N	Y	N	N
04	NOT ESTAB	NOT ESTAB	N	N	N	N	N	N
04	NOT ESTAB	NOT ESTAB	N	(TI COMPDS)				
04	NOT ESTAB	NOT ESTAB	N	(AS TI)				
05	NOT ESTAB	NOT ESTAB	N	Y	N	Y	N	N
05	NOT ESTAB	NOT ESTAB	N	(ONTARIO)				
06	NOT ESTAB	NOT ESTAB	N	N	N	N	N	N

07 NOT ESTAB NOT ESTAB Y Y N Y N N
SARA 311/312 CATEGORIES FOR THIS PRODUCT: ACUTE= Y, CHRONIC= Y, FLAMMABILITY= Y, PRESSURE= N, REACTIVITY= N

OCCUPATIONAL EXPOSURE LIMITS HAVE BEEN ESTABLISHED FOR THE FOLLOWING MATERIALS:

	ACGIH		U.S. OSHA		
REF	TLV-TWA	TLV-STEL	PEL-TWA	PEL-STEL	
01	100 ppm	125 ppm	100 ppm	125 ppm	
02	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB	
02	IPEL-TWA: 100 ppm		IPEL-STEL: NOT ESTAB		
02	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB	(ONTARIO)
03	100 ppm	150 ppm	100 ppm	150 ppm	
04	10 mg/m3	NOT ESTAB	10 mg/m3	NOT ESTAB	
04	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB	(TI COMPDS)
04	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB	(AS TI)
05	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB	
05	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB	(ONTARIO)
06	10 mg/m3	NOT ESTAB	6 mg/m3	NOT ESTAB	
07	NOT ESTAB	NOT ESTAB	NOT ESTAB	NOT ESTAB	

[C- Ceiling Limit; S- Potential Skin Absorption; R- Respirable Dust]

REF	ACGIH TLV - BASIS - CRITICAL EFFECT(S)
01	irritation; CNS
02	NOT ESTAB.
02	(ONTARIO) ...NOT ESTAB.
03	irritation
04	lung
04	(TI COMPDS) ...NOT ESTAB.
04	(AS TI) ...NOT ESTAB.
05	NOT ESTAB.
05	(ONTARIO) ...NOT ESTAB.
06	NOT ESTAB.
07	NOT ESTAB.

[ACGIH TLV BASIS - CRITICAL EFFECT(S): CNS-CENTRAL NERVOUS SYSTEM; CVS-CARDIOVASCULAR SYSTEM; CWP-COAL WORKER'S PNEUMOCONIOSIS; GI-GASTROINTESTINAL] [NOT ESTAB.= NOT ESTABLISHED = NOT APPLICABLE] [NOT ESTAB. = NOT ESTABLISHED = NOT APPLICABLE]

PRODUCT STATUS RELATIVE TO THE U.S. EPA TOXIC SUBSTANCES CONTROL ACT

All chemical substances in this product are listed on the U.S. TSCA Inventory or are otherwise exempt from TSCA Inventory reporting requirements.

SECTION 3 - HAZARDS IDENTIFICATION

EFFECTS OF OVEREXPOSURE FROM:

INGESTION: Harmful if swallowed.

EYE CONTACT: Causes eye irritation.

SKIN CONTACT: May cause moderate skin irritation.

INHALATION: Vapor and/or spray mist may be harmful if inhaled. Vapor irritates eyes, nose, and throat. Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage.

CHRONIC OVEREXPOSURE: Avoid long-term and repeated contact. This product

contains titanium dioxide. Animals inhaling massive quantities of titanium dioxide dust in a long-term study developed lung tumors. Studies with humans involved in manufacture of this pigment indicate no increased risk of cancer from exposure. Potential for inhalation of titanium dioxide dusts from coatings is very limited. Since overexposures are not expected, there is no significant hazard for man. Ethylbenzene has been reported by NTP to cause cancer in laboratory animals following a chronic (2 year) inhalation exposure. Carcinogenicity was found in the kidneys of rats and the lung and liver of mice at the 750 ppm dose level. The No Observed Effect Level (NOEL) was 75 ppm. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as a possible human carcinogen (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. High exposures to xylenes in some animal studies have been reported to cause health effects on the developing embryo and fetus. These effects were often at levels toxic to the mother. The significance of these findings to humans has not been determined.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Eye watering, headaches, nausea, dizziness, and loss of coordination are indications that solvent levels are too high. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. Redness, itching, burning sensation and visual disturbances may indicate excessive eye contact. Dryness, itching, cracking, burning, redness, and swelling are conditions associated with excessive skin contact.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Not applicable.

SECTION 4 - FIRST AID MEASURES

IMPORTANT FIRST AID INFORMATION: If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available.

INGESTION: Gently wipe or rinse the inside of the mouth with water. Sips of water may be given. Never give anything by mouth to an unconscious person. Contact a poison control center, emergency room or physician right away as further treatment may be necessary.

EYE CONTACT: Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. If irritation persists, contact a poison control center, emergency room, or physician as further treatment may be necessary.

SKIN CONTACT: Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. If any symptoms persist, contact a poison control center, emergency room, or physician as further treatment may be necessary.

INHALATION: Remove from area to fresh air. If symptomatic, contact a poison control center, emergency room or physician for treatment information.

SECTION 5 - FIRE FIGHTING MEASURES

FLASHPOINT: 78 Degrees F (25 Degrees C) (PENSKY-MARTENS CLOSED CUP)

FLAMMABLE LIMITS: Lower explosion limit (LEL): 1.1

Upper explosion limit (UEL): Not available

EXTINGUISHING MEDIA: Use National Fire Protection Association (NFPA) Class B extinguishers (carbon dioxide, dry chemical, or universal aqueous film forming foam) designed to extinguish NFPA Class IC flammable liquid fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep this product away from heat, sparks, flame, and other sources of ignition (i.e., pilot lights, electric motors,

static electricity). Invisible vapors can travel to a source of ignition and flash back. Do not smoke while using this product. Keep containers tightly closed when not in use. Closed containers may explode when overheated. Do not apply to hot surfaces. Toxic gases may form when this product comes in contact with extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water spray may be ineffective. Water spray may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat. If water is used, fog nozzles are preferable. Fire-fighters should wear self-contained breathing apparatus and full protective clothing.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Provide maximum ventilation. Only personnel equipped with proper respiratory, skin, and eye protection should be permitted in the area. Remove all sources of ignition. Take up spilled material with sand, vermiculite, or other noncombustible absorbent material and place in clean, empty containers for disposal. Only the spilled material and the absorbant should be placed in this container.

WASTE DISPOSAL METHOD: Waste material must be disposed of in accordance with federal, state, provincial, and local environmental control regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

SECTION 7 - HANDLING AND STORAGE

HANDLING AND STORAGE PRECAUTIONS: Do not store above 120 degrees F.(48 degrees C.). Store large quantities in buildings designed and protected for storage of NFPA Class IC flammable liquids.

OTHER PRECAUTIONS: Vapors may collect in low areas. If this material is part of a multiple component system, read the Material Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts. Containers should be grounded when pouring. Avoid free fall of liquids in excess of a few inches.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT FOR:

EYE PROTECTION: Wear chemical-type splash goggles when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapors.

SKIN PROTECTION: Wear protective clothing to prevent skin contact. Apron and gloves should be constructed of: neoprene rubber or nitrile rubber. No specific permeation/degradation testing have been done on protective clothing for this product. Recommendations for skin protection are based on infrequent contact with this product. For frequent contact or total immersion, contact a manufacturer of protective clothing for appropriate chemical impervious equipment.

RESPIRATORY PROTECTION: Overexposure to vapors may be prevented by ensuring proper ventilation controls, vapor exhaust or fresh air entry. A NIOSH- approved air purifying respirator with the appropriate chemical cartridges or a positive-pressure, air-supplied respirator may also reduce exposure. Read the respirator manufacturer's instructions and literature carefully to determine the type of airborne contaminants against which the respirator is effective, its limitations, and how it is to be properly fitted and used.

OTHER EQUIPMENT: Clean contaminated clothing and shoes.

VENTILATION REQUIREMENTS: Provide general dilution or local exhaust ventilation in volume and pattern to keep the concentration of ingredients listed in Section

2 below the lowest suggested exposure limits, the LEL below the stated limit, and to remove decomposition products during welding or flame cutting.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

[FORMULA VALUES, NOT SALES SPECIFICATIONS]

BOILING RANGE: 239- 379Degrees F

SOLUBILITY IN WATER: 2.3 %

VAPOR PRESSURE: 4.2 mmHg

WEIGHT/GALLON (LBS): 10.91 (U.S.)

VAPOR DENSITY: Heavier than air

pH: Not determined

% VOLATILE/VOLUME: 59.420

% SOLIDS BY WEIGHT: 59.49

SPECIFIC GRAVITY: 1.309

EVAPORATION RATE(BuOAc=100): 48

ODOR/APPEARANCE: Viscous liquid with an odor characteristic of the solvents listed in Section 2.

SECTION 10 - STABILITY AND REACTIVITY

This product is normally stable and will not undergo hazardous reactions.

INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID): Avoid contact with strong alkalies, strong mineral acids, or strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: May produce the following hazardous decomposition products when exposed to extreme heat: carbon monoxide ; carbon dioxide ; lower molecular weight polymer fractions; Extreme heat includes, but is not limited to, flame cutting, brazing, and welding.

Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) Ratings:

HMIS Rating		NFPA Rating	
HEALTH	2*	HEALTH	2
FLAMMABILITY	3	FLAMMABILITY	3
REACTIVITY	0	INSTABILITY	0

Rating System:0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe, *=Chronic Effects.

Safe handling of this product requires that all of the information on the MSDS be evaluated for specific work environments and conditions of use.

TRANSPORTATION OF DANGEROUS GOODS

PROPER SHIPPING NAME: Paint

NOS TECHNICAL NAME: None

HAZARD CLASS: 3

SUBSIDIARY CLASS: None

UN NUMBER: UN1263

PACKING GROUP: III

MARINE POLLUTANT: None

USA-RQ, HAZARDOUS SUBSTANCE: Xylenes

USA-RQ, HAZARDOUS SUBSTANCE THRESHOLD SHIP WEIGHT: Xylenes>516.74 Pounds

USA Shipments Only - RQ Threshold Ship Weight: This is the total weight of this product that must be shipped to exceed the RQ quantity.

THIS IS THE END OF THE MSDS FOR: UMS2001030 (00222897.002UMS2001030)

Manufactured and Supplied by:

PPG INDUSTRIES, INC.

856 ECHO LAKE ROAD

WATERTOWN, CT 06795

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MATERIAL SAFETY DATA SHEET
KEELER & LONG/PPG INDUSTRIES, INC.

SECTION 1 - CHEMICAL, PRODUCT, AND COMPANY INFORMATION

PRODUCT CODE/IDENTITY: KLMS21B

PRODUCT TRADE NAME: MEGAFLON SPRAY PART B

REVISION DATE: 01/05/01 (000) 0874

CUSTOMER PART #/NAME: Not applicable

CHEMICAL FAMILY: ISOCYANATE

EMERGENCY MEDICAL/SPILL INFO: (304) 843-1300 (U.S.) 91-800-00-214 (MEXICO)

TECHNICAL INFORMATION: 1-800-238-8596

PRODUCT SAFETY/MSDS INFORMATION: 4325 ROSANNA DRIVE, P.O. BOX 9 ALLISON PARK, PA 15101 (412) 492-5555

DATE OF MSDS PREPARATION: 10/17/02

PRIMARY HAZARD WARNING

Combustible. Keep away from heat, sparks, flames, and other sources of ignition. Do not smoke. Harmful if swallowed. May cause moderate skin irritation. Causes severe eye irritation. May be absorbed through the skin. Prolonged or repeated contact may cause an allergic skin reaction. Vapor and/or spray mist may be harmful if inhaled. May cause irritation and/or allergic respiratory reaction in lungs. Vapor irritates eyes, nose, and throat.

THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED IN ACCORDANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200), THE SUPPLIER NOTIFICATION REQUIREMENTS OF SARA TITLE III, SECTION 313, AND OTHER APPLICABLE RIGHT-TO-KNOW REGULATIONS.

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

REF	HAZARDOUS INGREDIENTS	PERCENT	CAS NUMBER	CARCINOGEN*
01	N-BUTYL ACETATE	5 - <10	123-86-4	
02	HEXANE-1,6-DI-ISOCYANATE POLYMER	90- 100	28182-81-2	
03	AROMATIC NAPHTHA	1 - <5	64742-95-6	

* Carcinogens: O=OSHA; A=ACGIH; N=NTP; I=IARC

SARA TITLE III & CERCLA CLASSIFICATIONS

REF	CERCLA HAZARDOUS SUBSTANCE RQ(LBS)	SARA EXTREMELY HAZ SUBSTANCE TPQ(LBS)	SARA 313	SARA 311/312 AC	CH	FL	PR	RE
01	5000 lbs	NOT ESTAB	N	Y	N	Y	N	N
02	NOT ESTAB	NOT ESTAB	N	Y	Y	N	N	N
03	NOT ESTAB	NOT ESTAB	N	Y	N	Y	N	N
03	NOT ESTAB	NOT ESTAB	N			(ONTARIO)		

SARA 311/312 CATEGORIES FOR THIS PRODUCT: ACUTE= Y, CHRONIC= Y, FLAMMABILITY= Y, PRESSURE= N, REACTIVITY= N

OCCUPATIONAL EXPOSURE LIMITS HAVE BEEN ESTABLISHED FOR THE FOLLOWING MATERIALS:

REF	ACGIH TLV-TWA	ACGIH TLV-STEL	U.S. OSHA PEL-TWA	U.S. OSHA PEL-STEL
01	150 PPM	200 ppm	150 ppm	200 ppm

02 NOT ESTAB NOT ESTAB NOT ESTAB NOT ESTAB
02 IPEL-TWA: 0.5 mg/m3 IPEL-STEL: 1 mg/m3
03 NOT ESTAB NOT ESTAB NOT ESTAB NOT ESTAB
03 NOT ESTAB NOT ESTAB NOT ESTAB NOT ESTAB (ONTARIO)

[C- Ceiling Limit; S- Potential Skin Absorption; R- Respirable Dust]

REF ACGIH TLV - BASIS - CRITICAL EFFECT(S)

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01 irritation
02 NOT ESTAB.
03 NOT ESTAB.
03 (ONTARIO) ...NOT ESTAB.

[ACGIH TLV BASIS - CRITICAL EFFECT(S): CNS-CENTRAL NERVOUS SYSTEM; CVS-CARDIOVASCULAR SYSTEM; CWP-COAL WORKER'S PNEUMOCONIOSIS; GI-GASTROINTESTINAL] [NOT ESTAB.= NOT ESTABLISHED = NOT APPLICABLE] [NOT ESTAB. = NOT ESTABLISHED = NOT APPLICABLE]

PRODUCT STATUS RELATIVE TO THE U.S. EPA TOXIC SUBSTANCES CONTROL ACT

All chemical substances in this product are listed on the U.S. TSCA Inventory or are otherwise exempt from TSCA Inventory reporting requirements.

SECTION 3 - HAZARDS IDENTIFICATION

EFFECTS OF OVEREXPOSURE FROM:

INGESTION: Harmful if swallowed.

EYE CONTACT: Causes severe eye irritation.

SKIN CONTACT: May cause moderate skin irritation. May be absorbed through the skin. Prolonged or repeated contact may cause an allergic skin reaction.

INHALATION: Vapor and/or spray mist may be harmful if inhaled. May cause irritation and/or allergic respiratory reaction in lungs. Vapor irritates eyes, nose, and throat. Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage. Do not use if you have chronic (long-term) lung or breathing problems, or if you have ever had a reaction to isocyanates.

CHRONIC OVEREXPOSURE: Avoid long-term and repeated contact. This product contains isocyanates. Inhalation may cause a burning sensation in the nose, throat and lungs. Prolonged inhalation may cause lung damage and/or allergic respiratory reaction. Allergic respiratory reactions to isocyanates are characterized by asthma-like symptoms such as chest tightness, wheezing, shortness of breath and coughing. These symptoms may follow repeated exposure or a single massive exposure and may be delayed. Chronic overexposure to isocyanates has been reported to cause lung damage, including a decrease in lung function, which may be permanent.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Eye watering, headaches, nausea, dizziness, and loss of coordination are indications that solvent levels are too high. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. Redness, itching, burning sensation and visual disturbances may indicate excessive eye contact. Dryness, itching, cracking, burning, redness, and swelling are conditions associated with excessive skin contact.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Do not use if you have chronic (long-term) lung or breathing problems, or if you have ever had a reaction to isocyanates.

SECTION 4 - FIRST AID MEASURES

IMPORTANT FIRST AID INFORMATION: If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available.

INGESTION: Gently wipe or rinse the inside of the mouth with water. Sips of water may be given. Never give anything by mouth to an unconscious person. Contact a poison control center, emergency room or physician right away as further treatment may be necessary.

EYE CONTACT: Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. If irritation persists, contact a poison control center, emergency room, or physician as further treatment may be necessary.

SKIN CONTACT: Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. If any symptoms persist, contact a poison control center, emergency room, or physician as further treatment may be necessary.

INHALATION: Remove from area to fresh air. If symptomatic, contact a poison control center, emergency room or physician for treatment information.

SECTION 5 - FIRE FIGHTING MEASURES

FLASHPOINT: 117 Degrees F (47 Degrees C) (PENSKY-MARTENS CLOSED CUP)

FLAMMABLE LIMITS: Lower explosion limit (LEL): 1.4

Upper explosion limit (UEL): Not available

EXTINGUISHING MEDIA: Use National Fire Protection Association (NFPA) Class B extinguishers (carbon dioxide, dry chemical, or universal aqueous film forming foam) designed to extinguish NFPA Class II combustible liquid fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep this product away from heat, sparks, flame, and other sources of ignition (i.e., pilot lights, electric motors, static electricity). Invisible vapors can travel to a source of ignition and flash back. Do not smoke while using this product. Keep containers tightly closed when not in use. Closed containers may explode when overheated. Do not apply to hot surfaces. Toxic gases may form when this product comes in contact with extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water spray may be ineffective. Water spray may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat. If water is used, fog nozzles are preferable. Fire-fighters should wear self-contained breathing apparatus and full protective clothing.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Provide maximum ventilation. Only personnel equipped with proper respiratory, skin, and eye protection should be permitted in the area. Remove all sources of ignition. Take up spilled material with sand, vermiculite, or other noncombustible absorbent material and place in clean, empty containers for disposal. Only the spilled material and the absorbant should be placed in this container.

WASTE DISPOSAL METHOD: Waste material must be disposed of in accordance with federal, state, provincial, and local environmental control regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

SECTION 7 - HANDLING AND STORAGE

HANDLING AND STORAGE PRECAUTIONS: Do not store above 120 degrees F.(48 degrees C.). Store large quantities in buildings designed and protected for storage of NFPA Class II combustible liquids.

OTHER PRECAUTIONS: Vapors may collect in low areas. If this material is part of a multiple component system, read the Material Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts. Containers should be grounded when pouring. Avoid free fall of liquids in excess of a few inches.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT FOR:

EYE PROTECTION: Wear chemical-type splash goggles or full face shield when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapors.

SKIN PROTECTION: Wear protective clothing sufficient to cover exposed skin surfaces. For applications where skin contact is likely and impermeable clothing is necessary, select clothing constructed of: impermeable material. No specific permeation/degradation testing have been done on protective clothing for this product. Recommendations for skin protection are based on infrequent contact with this product. For frequent contact or total immersion, contact a manufacturer of protective clothing for appropriate chemical impervious equipment.

RESPIRATORY PROTECTION: Where vapors or overspray are present, use a NIOSH approved, positive-pressure, air- supplied respirator for the entire time of spraying and until all vapors and mists are gone. Follow the respirator manufacturer's directions for respirator use.

OTHER EQUIPMENT: The decision whether to clean or discard contaminated clothing should be based on the chemicals contaminating them. Some chemicals can cause skin irritation, sensitization or other health effects if the cleaning process does not remove all traces of them. Consult a safety professional to determine whether clothing contaminated with this product can be safely cleaned and reused.

VENTILATION REQUIREMENTS: Provide general dilution or local exhaust ventilation in volume and pattern to keep the concentration of ingredients listed in Section 2 below the lowest suggested exposure limits, the LEL below the stated limit, and to remove decomposition products during welding or flame cutting.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

[FORMULA VALUES, NOT SALES SPECIFICATIONS]

BOILING RANGE: 255- 351Degrees F

SOLUBILITY IN WATER: .0 %

VAPOR PRESSURE: 5.5 mmHg

WEIGHT/GALLON (LBS): 9.45 (U.S.)

VAPOR DENSITY: Heavier than air

pH: Not determined

% VOLATILE/VOLUME: 12.930

% SOLIDS BY WEIGHT: 90.00

SPECIFIC GRAVITY: 1.134
EVAPORATION RATE(BuOAc=100): 63

ODOR/APPEARANCE: Viscous liquid with an odor characteristic of the solvents listed in Section 2.

SECTION 10 - STABILITY AND REACTIVITY

This product is normally stable but may undergo hazardous reactions at extremely high temperatures and pressures.

INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID): Avoid contact with strong alkalies, strong mineral acids, or strong oxidizing agents. Avoid water and alcohols.

HAZARDOUS DECOMPOSITION PRODUCTS: May produce the following hazardous decomposition products when exposed to extreme heat: carbon monoxide ; carbon dioxide ; hydrogen cyanide ; lower molecular weight polymer fractions; traces of isocyanate ; oxides of nitrogen ; Extreme heat includes, but is not limited to, flame cutting, brazing, and welding.

Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) Ratings:

HMIS Rating		NFPA Rating	
HEALTH	3*	HEALTH	3
FLAMMABILITY	2	FLAMMABILITY	2
REACTIVITY	1	INSTABILITY	1

Rating System:0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe, *=Chronic Effects.

Safe handling of this product requires that all of the information on the MSDS be evaluated for specific work environments and conditions of use.

TRANSPORTATION OF DANGEROUS GOODS

PROPER SHIPPING NAME: Paint

NOS TECHNICAL NAME: None

HAZARD CLASS: 3

SUBSIDIARY CLASS: None

UN NUMBER: UN1263

PACKING GROUP: III

MARINE POLLUTANT: None

USA-RQ, HAZARDOUS SUBSTANCE: None

USA-RQ, HAZARDOUS SUBSTANCE THRESHOLD SHIP WEIGHT: None

USA and Canada Shipments Only- Combustible Liquid Exception: Non-bulk (<=119 Gallons/450 L) ground shipments can be reclassified to "not regulated" for transportation. Bulk shipments - USA Only (> 119 Gallons/450 L) can be reclassified to a Combustible Liquid.

THIS IS THE END OF THE MSDS FOR: KLMS21B (00195530.008KLN1000)

Manufactured and Supplied by:

KEELER & LONG/PPG INDUSTRIES, INC.
856 ECHO LAKE ROAD

WATERTOWN, CT 06795

,Y

Revodyne Industrial Coatings
3700 Campus Drive, Suite 105
Newport Beach, CA 92660

January 12, 2004

ITB Southern Regional Office
Attention: Pattie L. Lewis, Nasa AP2 Office
2460 N. Courtenay Parkway, Suite 101
Merritt Island, FL 32953

Re: Revodyne Industrial Coating

Dear Ms. Lewis:

As you requested, we hereby supply you with the Safety Data Sheets.

Our formulation for the coating is a complex polymer polyester resin. The catalyst used is a Witco Co. #90 high point catalyst, which can be purchased on the open market. One percent (1%) is used to catalyze our coating.

Please note: Section IX Special Precautions (yellow flag) is the reason we used this chemical (resin).

If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

Walter Gutierrez
949-581-8897

WG/rsm
Enclosures

cc: Martin Helcl

E N V I R O N M E N T A L D A T A S H E E T

***** MUST NOT BE DETACHED FROM MATERIAL SAFETY DATA SHEET *****

*** IF MSDS IS COPIED AND REDISTRIBUTED, THIS NOTICE MUST BE ATTACHED ***

MANUFACTURED BY: McWhorter Technologies
400 East Cottage Place
Carpentersville, IL. 60110

DATE OF LAST CHANGE: 95/06/01

PRODUCT NAME: 716 5141
PRODUCT CLASS: UNSATURATED POLYESTER RESIN

SECTION I. PRODUCT IDENTIFICATION/COMPOSITION

PROD	COMPONENT	CAS NUMBER	PERCENT
P	UNSATURATED POLYESTER RESIN	MIXTURE	100
	---TYPICAL DISTRIBUTION OF HAZARDOUS COMPONENTS--		
1	STYRENE	100-42-5	34.1

SECTION II. SARA TITLE III INFORMATION

PROD	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	311/312 CATEGORIES (*4)
P	33,333,333			1 3 4 5
1			YES	1 3 4 5

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SARA SEC.302/304
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SARA SEC.302
*3 = TOXIC CHEMICAL, SARA SEC 313
*4 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
1 = FIRE HAZARD
2 = SUDDEN RELEASE OF PRESSURE HAZARD
3 = REACTIVE HAZARD
4 = IMMEDIATE (ACUTE) HEALTH HAZARD
5 = DELAYED (CHRONIC) HEALTH HAZARD

SECTION III. DOT/CERCLA INFORMATION

THE CERCLA REPORTABLE QUANTITY (RQ) FOR THIS MIXTURE IS 2,935 LBS.
WHICH IS BASED ON THE RQ OF EACH INGREDIENT AND ITS PERCENT IN MIXTURE.

SECTION IV. ADDITIONAL REGULATORY INFORMATION

THE POLYMER AND ALL COMPONENTS OF THIS PRODUCT ARE PRESENT ON THE UNITED STATES TOXIC SUBSTANCES CONTROL ACT (TSCA) CHEMICAL SUBSTANCES INVENTORY.

SECTION V.	DISCLAIMER	716 5141(CONT.)

THE INFORMATION IN THIS MSDS AND ENVIRONMENTAL DATA SHEET WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS 'ROVIDED WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, REGARDING ITS ACCURACY OR COMPLETENESS.

M A T E R I A L S A F E T Y D A T A S H E E T
COATINGS, RESINS, AND RELATED MATERIALS

MANUFACTURED BY:
McWhorter Technologies, Inc. EMERGENCY CONTACT: CHEMTREC 1-800-424-9300
400 East Cottage Place
arpentersville, IL. 60110
INFORMATION CONTACT:1-800-882-1371 (DURING NORMAL BUSINESS HOURS)
DATE OF PREP: 3/21/97 SUPERSEDES DATE: 12/05/95 DATE OF PRINT: 5/09/97

SECTION I. PRODUCT IDENTIFICATION

PRODUCT CODE: (INTERNAL REF.#162)
716 5141
PRODUCT NAME :
UNSATURATED POLYESTER RESIN
SHIPPING DESCRIPTION:
RESIN SOLUTION,
3, UN 1866, PG III
MARINE POLLUTANT, CONTAINS:
STYRENE
1,2,4-TRIMETHYLBENZENE

SECTION II. HAZARDOUS INGREDIENTS

* WARNING * THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, OR BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

* THIS PRODUCT IS LESS THAN 35% MONOMER (OR IS A VAPOR * SUPPRESSED RESIN). PLEASE REFER TO LOCAL AREA * REGULATIONS FOR ADDITIONAL SPECIFICS. *

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM
HEALTH: 2 * FLAMMABILITY: 3
REACTIVITY: 1

INGREDIENT / CAS NO.	WT. PERCENT	TLV ppm	TLV mg/m3	SOURCE	IDLH ppm	VAPOR PRESSURE (mm Hg @68F)	LEL
STYRENE 100-42-5	34.1						
		50.0000	215.00	TWA/ACGIH	700	4.30	1.10
		100.0000	425.00	FEDERAL PEL			
		100.0000	425.00	STEL/ACGIH			

SECTION III. PHYSICAL DATA

BOILING RANGE: 148-410 F PERCENT VOLATILE BY VOL: 42.41
SPECIFIC GRAVITY 1.116 EVAPORATION RATE (n-Bu Ac=1): 0.44
VAPOR DENSITY (AIR=1): 2.924 VAPOR PRESSURE (mm Hg@68F): 3.63
VOLATILE ORGANIC CONTENT (VOC): N/A
APPEARANCE AND ODOR: light straw colored solution - styrene odor
SOLUBILITY IN WATER: negligible

SECTION IV. FIRE AND EXPLOSION HAZARD DATA 716 5141(CONT.)

FLASH POINT: 86 DEG. F SETAFLASH OSHA CLASSIFICATION: IC
FLAMMABLE LIMITS % BY VOLUME IN AIR AT 212 DEG. F:
LOWER EXPLOSION LIMIT: 2.00
UPPER EXPLOSION LIMIT: 12.00

EXTINGUISHING MEDIA:
Use foam, carbon dioxide or chemical fire fighting apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES
The use of self-contained breathing apparatus is recommended for fire fighters. Water spray may be used for cooling containers to prevent possible pressure build-up and auto-ignition or explosion when exposed to extreme heat.
Avoid spreading burning liquid with water used for cooling.

SECTION V. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE:
See Section II.

EFFECTS OF OVEREXPOSURE:
--- EYES CONTACT:
Severe irritation, redness, tearing and blurred vision.
--- SKIN CONTACT:
Prolonged or repeated exposure can cause moderate irritation, defatting, dermatitis and sensitization.
--- INHALATION:
Excessive inhalation of vapors can cause nasal and respiratory irritation, dizziness, weakness, fatigue, nausea and headache. High concentrations may result in narcosis. (Central Nervous System depression)
--- INGESTION:
Can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration of material into lungs can cause chemical pneumonitis which can be fatal.

Chronic exposure may cause damage to the Central Nervous System, Respiratory System, Lungs, Eyes, Skin, Gastrointestinal Tract, Liver, Spleen and Kidneys.

OTHER HEALTH EFFECTS:
Based upon a re-evaluation of previous negative and equivocal data and an increased incidence of lung tumors after oral administration in young adult mice, the International Agency for Research on Cancer (IARC) has listed styrene among those materials for which there is limited evidence for carcinogenicity in animals.

EMERGENCY AND FIRST AID PROCEDURES

--- EYES CONTACT:
Flush with clean, lukewarm water for at least 15 minutes, occasionally lifting the eyelids. Obtain medical attention.

--- SKIN CONTACT:
Remove contaminated clothing. Wash affected skin areas thoroughly with soap and water. Wash contaminated clothing thoroughly before re-use.

--- INHALATION:
Remove to fresh air. Apply artificial respiration or administer oxygen, if necessary. Call a physician immediately.

--- INGESTION:
Keep person warm, quiet and get immediate medical attention. Do not induce vomiting, because aspiration of material into the lungs from vomiting can cause chemical pneumonitis which can be fatal.

SECTION VI. REACTIVITY DATA

STABILITY:
Stable under normal conditions. Avoid exposure to excessive heat.

INCOMPATIBILITY:
Avoid contact with strong mineral acids, peroxides and polymerization catalysts.

HAZARDOUS POLYMERIZATION:
Can Occur.

HAZARDOUS DECOMPOSITION PRODUCTS:
Thermal decomposition may yield carbon dioxide and/or monoxide.

CALIFORNIA SCAQMD RULE 443.1:
This product contains photochemically reactive volatile organic compound(s). Refer to Section II and III.

SECTION VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Evacuate all non-essential personnel. Remove all sources of ignition. Ventilate the area. Equip employees with appropriate protection equipment (See Section VIII). Dike around spilled material. Cover spill with inert absorbent material and shovel with non-sparking tools into container. Remove containers to a safe area and seal.

WASTE DISPOSAL METHOD:
Waste material must be disposed of in accordance with federal, state, and local environmental regulatory controls.

SECTION VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
Avoid breathing vapor or mist. If exposure may or does exceed occupational exposure limits (SEC.IV) use a NIOSH-approved respirator to prevent overexposure. In accord with 29CFR 1910.134 use either a full-face, atmosphere-supplying respirator or air-purifying respirator for organic vapors.

VENTILATION:
Local exhaust must be sufficient to keep airborne vapor concentrations below the TLV limit. Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination.

PROTECTIVE GLOVES:
Polyvinyl alcohol gloves.

EYE PROTECTION:
Splash goggles.

OTHER PROTECTIVE EQUIPMENT:
Polyvinyl alcohol apron. Eye bath and safety shower. To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM:
See first page of MSDS.

SECTION IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Drums: Protect against physical damage. Outside or detached storage preferred.
Bulk: Storage should be in standard flammable liquid storage tanks.

OTHER PRECAUTIONS:
All equipment should be grounded and bonded to reduce static electricity hazard. Use non-sparking tools.

Overexposure to material has apparently been found to cause the following effects in laboratory animals: liver abnormalities, kidney damage, lung damage.

RECENT DATA DOES NOT SUPPORT THE CHANGE IN THE CLASSIFICATION BY IARC OF STYRENE TO BE A SUSPECTED CARCINOGEN.

At the conclusion of a major notice and comment

rulemaking revising its air contaminants regulations, OSHA concluded that the "current evidence on styrene's carcinogenicity does not support its classification in the final rule as a carcinogen." 54 Fed. Reg. 2430 (Jan. 19, 1989); see also 54 Fed. Reg. at 2364. In the same rulemaking, the National Institute for Occupational Safety and Health (NIOSH) commented that there "seems to be little basis from the experimental animal investigations or epidemiologic studies to conclude at this time that styrene is carcinogenic." Moreover, other scientists have independently concluded that styrene does not present a carcinogenic risk to humans. I. C. Munro, et al. "A Review of Styrene Pharmacokinetics and Carcinogenicity" (July 21, 1989)(CanTox Inc.)(U.S. EPA Safe Drinking Water Docket No. IID, Document III J2.86, Attachment C).

OTHER COMMENTS

We recommend that containers be either professionally reconditioned for reuse by certified firms or properly disposed of by certified firms to help reduce the possibility of an accident. Disposal of containers should be in accordance with applicable federal, state and local laws and regulations. "Empty" drums should not be given to individuals.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied, regarding its accuracy or completeness.

The conditions of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

INDUSTRIAL COATING

Our coating is a unique corrosion resistant coating, without ; epoxy, urethan, isocyanat, that is unaffected by salt water, acid and ultraviolet sunlight. Application of such a coating, when applied to metal surfaces, would result in the savings of thousands of manhours, which, in the past, have been wasted on scraping and chipping paint from corroded and rusted surfaces.

An independent testing laboratory, in their Salt Spray Test Report reported the following:

1. The coated test panel was scribed and exposed to 5% salt spray [per ASTM B-117]. After 100 and 500 hours exposure, the panel was examined.
2. There was definite rusting at the scribe marks on both sides, but there was no visable undercutting or creeping of the corrosion past the scribe.
3. There was also rusting at the cut edges where coating was incomplete. Under the coating adjacent to the edges, the metal was shiny, with no indication of rust.
4. The panel was then returned to the exposure chamber for completion of the test.
5. After a total exposure of **1000** hours, the panel was removed and re-examined. Rusting continued at the scribe marks and the cut edges, but the coating contained the rust, with no **undercutting** or corrosion under the coating.

Year-long in-service tests on the hulls of ocean-going ships. After being exposed to actual salt water sea conditions for 6 months, our coating panels were intact, displaying no changes whatever from their original condition when first applied. Several adjacent panels were coated with other available "rust- proofing" coatings for comparison. These competitive coatings had nearly disappeared after the same 6 months exposure! the significance of this particular in-service test by a prospective customer is immediately apparent.

Another extremely significant test was conducted by a major oil company in one of their geothermal operations. The particular significance of their tests is the temperature and concentration of the brine encountered in the geothermal operation [above 400°F]! once again, after lengthy exposure [over 1,000 hours] our coatings displayed no deterioration whatever! in addition, scribe marks down to the bare steel were made in the coatings on the test slabs prior to submersion in the hot brine. After **1,000** hours of immersion, **no oxidation** penetrated beyond the scribes! The value of such a coating to all areas of industry [especially the petroleum & marine industries] in nothing short of phenomenal.

Our coating is ideally suited for ship hulls & superstructures, auto- motive bodies [primer coats], bridges, communication towers, off- shore platforms, etc., etc. Other applications are also suitable, depending on the material being coated and the severity of the environmental conditions to which the coating would be subjected. An additional monetary advantage is the fact that our coating is such that color pigment can be added, thereby negating the necessity of a "finish" coat, in many applications, such as bridges, ship hulls, etc. Also on wood & concrete.

OCM Test Laboratory, Inc., 1997 :

"Overall the material is a durable and resistant hard coating that may be suitable for many industrial uses hat currently used painted or powder coated polymer finishes. For specific applications, it would be advisable to perform comparative tests on the specific substrate and coating thickness as the competition. It is expected that this coating will out perform many currently used finishes in applications that see moderately severe combinations of environments."

In all comparisons, our product*s* provide more features and have superior performance than to competitive products. In most cases, the number of differences is substantial. Our products perform in virtually all situations. Enhanced materials have been created that are far superior to any coatings available today. Our breakthrough allows the user to require less coating product and less product application time, with better corrosion protection than available from any competitor. Additionally, our Industrial Coating is applied using the standard two-part equipment (plural system), but can be regulated to react with a rapid set-up time of as little as five to ten minutes. The combination oft these two unique features lowers the customers overall investment and increases the retum on their investment significantly. This ability is unique to this product, and our research indicates its performance is superior to anything.

The corrosion prevention and control industry grew from the need to abate the invasive and devastating effects of corrosion. Corrosion control products, if deployed, can stem the damaging effects of corrosion whether it is keeping bridges from deteriorating, preventing pipelines and metal tanks from eroding or preserving other industrial infrastructure.

The result of this need allows for the corrosion prevention and control market to remain a steady growth industry. In the United States alone, the market for this type of product was projected to be in excess of $300 billion in 1997 (source: NACE international). While we do not have definitive market research that establishes the worldwide market size, it can easily exceed $1 trillion based on the United States market estimates.

PRODUCT DATA	
	Fast cure thermoset complex co-polymeric material
Color	Gray, Blue, Green
Typical Uses	To protect all metal, steel structures, concrete, wood forms on structures Pipelines
Vehicles / Pigments	Complex co-polymer titanium dioxide and reinfolain pigments
Additives	Organic and non-organic materials
Weight / Gallon	12 lbs / gallon 1.44 kg / L
Flash point	N/a
V.O.C. Contents	Zero (0)
% Volume Solids	100
Dry film thickness	3.5 mils 90 [m
Coverage (theroetical)	640 square feet per gallon at 1 mil thickness 15.7 m² / 26 [m 200 square feet per gallon at 2.5 mil thickness 4.9 m² / 64 [m
Packaging	Available in 5 gallon pail and 55 gallon drum
Storage Temperature	50° - 90° F in a cool area 10 – 32 ° C
Safety Information	Consult safety data sheet for hazard & safety information
Temp. Const.	350 – 400° C

NON-HAZARADOUS, NON-DECOPOSITION MATERIALS	
Additives	All Additives are stable non-reactive, non-hazardous decomposition organic and non-organic materials.
Toxic	Non-toxic materials Non-flamable and will not support composition.
Odor	Odorless Odor threshold (ppm) not applicaple Specific gravity 2.50 to 2.80 Vapor pressure (mm) not applicable Boiling point °F: greater than 1000°F / 538°C Solubility in water : nil % Volatile (by weight): not applicaple Volatile organic content (voc): n/a

SILIKOFTAL® ED

binder for the manufacture of specific gloss siloxane-coatings

Special properties

- extraordinary gloss retention and weather resistance
- excellent corrosion resistance
- very good antigraffiti-effect

Examples of application

Corrosion resistance coatings with excellent weather resistance for

- structural steel
- industrial plants
- power plants
- offshore-industry
- wastewater treatment plants
- wood and paper industry
- maritime area: decks, topsides and boattops on ships and barges
- concrete walls and floors
- exterior coating for rail cars, busses and trucks

Processing instructions

- All weather stabile pigments can be used.
- Apply by spray (also electrostatic) or brushing.

Dilution

- SILIKOFTAL® ED can be diluted by alcohol, ketones, glycol and glycol ethers.

Chemical description

epoxy-siloxane resin

Technical information

• solid		97.5 - 99.5 %
• epoxy-equivalent weight	DIN 16945	420 - 480 g
• density at 25 °C	DIN 51757	1.14 - 1.16 g/ml
• viscosity at 25 °C	DIN 53019	1000 - 2000 mPas

Stoving conditions

After the coating is tack free, it can be stoved for a quicker crosslinking at temperatures over 60 °C.

Properties

Excellent stability of a coating based on our guiding formulation against acidity and alkaline attacks as well as outstanding water and solvent resistance.

Registration status

The active ingredient of SILIKOFTAL® ED is listed in the following chemical inventories: EINECS.
TSCA, MITI and DSL are pending.

Packaging

steel can	50 kg
steel container with bung	200 kg

Storage stability

In general at least 12 months in closed containers. But contact with tin (e. g. with metal containers) will shorten storage stability.

Tego Chemie Service GmbH · Goldschmidtstrasse 100 · D-45127 Essen · Tel.: +49 (0)201/173-2222 · Fax: +49 (0)201/173-1939 · www.tego.de

Material Safety Data Sheet

Version: 1.5

Revision Date : 08/08/2003
Date Issued : 01/09/2004

SILIKOFTAL ED

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Trade name	:	SILIKOFTAL ED
PRODUCT CODE	:	205505
CHEMICAL FAMILY	:	Siliconeepoxide resin, solvent-free
Information on manufacturer/supplier	:	Tego Chemie Service GmbH Goldschmidtstr. 100 Essen, 05 45127

Emergency telephone number (24h)	:		Telephone:
		CHEMTREC	(800) 424-9300
		CANUTEC	(613) 996-6666
		Non-Emergency Phone Number:	(800) 732-5616

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Concentration [%]
All Ingredients Are Proprietary		

3. HAZARDS IDENTIFICATION

Emergency Overview

Physical Appearance

Form	:	Liquid
Colour	:	yellow
Odour	:	characteristic
Water solubility	:	insoluble
pH	:	not applicable

Potential health effects

Immediate concerns	:	No particular hazards are known.
Eyes	:	No harmful effects have been reported upon contact with the eyes.
Skin	:	No harmful effects have been reported upon contact with skin.

Ingestion	:	No harmful effects have been reported upon ingestion.
Inhalation	:	No harmful effects have been reported upon inhalation.
Primary routes of entry	:	None
Target organs	:	None
Carcinogenicity	:	Not listed by NTP, IARC, ACGIH, or OSHA as a carcinogen.

4. FIRST AID MEASURES

Eyes	:	Flush eye immediately and thoroughly while protecting the unhurt eye. If symptoms persist, seek medical attention.
Skin	:	Immediately and thoroughly, wash off with soap and water.
Ingestion	:	If swallowed, seek medical attention and show MSDS.
Inhalation	:	Ensure supply of fresh air.
General advice	:	Remove contaminated clothing.

5. FIRE-FIGHTING MEASURES

Flash point	:	248 °F
Autoignition temperature	:	not measured
Upper Explosion limits	:	not measured
Lower explosion limit	:	not measured
Suitable extinguishing media	:	foam, carbon dioxide, dry powder, water spray.
Extinguishing media which must not be used for safety reasons	:	not applicable
Products in case of fire	:	In the event of fire the following can be released: - Carbon monoxide, carbon dioxide, silicon dioxide Under certain conditions of combustion traces of other toxic substances cannot be excluded

Special protective equipment for firefighters	:	As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.
Hazardous decomposition products	:	None with proper storage and handling.
OSHA flammable class	:	Combustible Liquid, Class IIIB

6. ACCIDENTAL RELEASE MEASURES

Methods for cleaning up / taking up : Small spills :
Use personal protective equipment. Do not allow to enter drains or waterways. Do not discharge into the subsoil/soil. Take up with absorbent material (e.g. sand, kieselguhr, universal binder).

Release Notes :

US regulations require reporting spills of this material that could reach any surface waters
The toll free number for the US Coast Guard National Response Center is (800) 424-8802

In case of accident or road spill notify :

	Telephone:
CHEMTREC USA	(800) 424-9300
CANUTEC Canada	(613) 996-6666
CHEMTREC (other countries)	(International code)+1-202-483-7616

7. HANDLING AND STORAGE

General Procedures Handling

Advice on safe handling	:	Wear respiratory protection when spraying. Ensure adequate ventilation.
Advice on protection against fire and explosion	:	No special measures required.

Storage

Further information	:	Keep container tightly closed

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protection equipment

Hygiene measures	:	No smoking, eating or drinking allowed when using this product. Wash hands before breaks and at end of work shift.
Respiratory protection	:	In case of formation of vapors/aerosols: respiratory protective equipment, cartridge for organic gases and vapors.
Hand protection	:	PVC gloves
Eye protection	:	Use chemical resistant goggles.
Protective clothing	:	Light protective clothing is required.
Engineering controls	:	Good general (mechanical) ventilation should be sufficient to control airborne levels.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	:	Liquid
Colour	:	yellow
Odour	:	characteristic
Melting temperature	:	not measured
Boiling temperature	:	not measured
Vapour pressure	:	not measured
Density	:	1.135 - 1.15 g/cm3 at 77.00 °F Method: DIN 51757
Weight per volume	:	9.53 Lb/Gal
Water solubility	:	insoluble
pH	:	not applicable
Viscosity, dynamic	:	1,000 - 2,000 mPa.s at 25 °C Method: DIN 53019
Volatile organic compound	:	volatile in water: 0.001 %

10. STABILITY AND REACTIVITY

Conditions to avoid	:	None with proper storing and handling.
Thermal decomposition	:	Not measured
Hazardous reactions	:	No hazardous reactions with proper storage and handling.
Hazardous polymerisation	:	No
Stability	:	Yes
Hazardous decomposition products	:	None with proper storage and handling.

11. TOXICOLOGICAL INFORMATION

Note	:	Proper use provided, no adverse health effects have been observed or have been come to our knowledge.

12. ECOLOGICAL INFORMATION

Further ecological information

Ecological notes	:	The product is considered to be a weak water pollutant (German law). Do not allow to enter soil, waterways or waste water canal.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state, and federal regulations.

Product disposal and disposal requirements	:	In accordance with local authority regulations, take to special waste incineration plant
Contaminated packaging	:	If empty contaminated containers are recycled or disposed of, the receiver must be informed about possible hazards.

14. TRANSPORT INFORMATION

Sea transport

IMDG:

Not regulated

Air transport

ICAO/IATA:
Not regulated

DOT (Department of Transportation)

CFR Road:
Not regulated
CFR Rail:
Not regulated

CANADA Transport of Dangerous goods

TDG Road:
Not regulated
TDG Rail:
Not regulated

15. REGULATORY INFORMATION

United States

SARA Section 311/312 : Fire: No
Pressure generating: No
Reactivity: No
Acute: No
Chronic: No

SARA Sections : SECTION 313
Notification : Yes

Components	CAS-No.	Concentration [%]
methanol	67-56-1	0.099

butanol; butyl alcohol	71-36-3	0.002

TSCA (Toxic Substance Control Act) : SECTION 12(B)
Notification : Yes

Components	CAS-No.	Concentration [%]
butanol; butyl alcohol	71-36-3	0.002

TSCA (Toxic Substance Control Act) : TSCA Inventory
Notification : Yes
All intentional ingredients are listed in the TSCA Inventory or comply with TSCA Polymer Exemption critieria per 40 CFR 723.

TSCA (Toxic Substance Control Act) : SECTION 13
Notification : Yes

California Proposition 65 Statement : Notification : No
This product does not contain any substance(s) which are defined by the state of California to cause cancer, birth defects, or other reproductive effects.

CERCLA : CAS 71-36-3 : 500 lb

Canada : WHMIS CLASSIFICATION
Non-WMHIS

Canadian Environmental Protection Act
All intentional ingredients are listed on the DSL (Domestic Substance List) or have been notified pursuant to the NSN regulations.

16. OTHER INFORMATION

Material Safety Data Sheet

Version: 1.5

Revision Date : 08/08/2003
Date Issued : 01/09/2004

SILIKOFTAL ED

HMIS Codes : Fire : 1
Health : 1
Physical Hazard : 0
Protection : X

Manufacturer disclaimer : While the information and recommendations contained herein are believed to be accurate, we make no warranty with respect hereto and disclaim all liability from reliance thereon