

ULTRA-FLEX™

INDUSTRIAL APPLICATIONS MANUAL

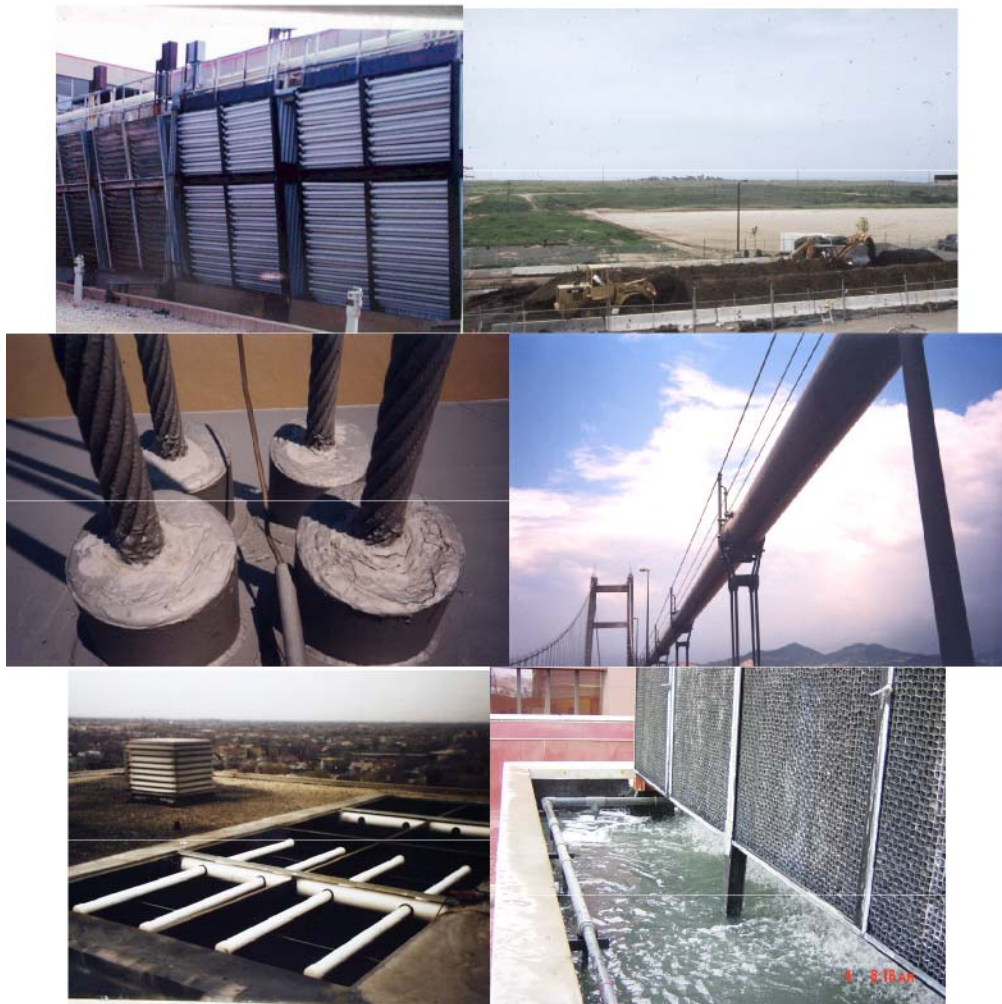


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Product Overview

Introduction: ULTRA-FLEX™ Family of Products

The **ULTRA-FLEX** line of **specialized coatings** and **surface preparation materials** are known for the highest performance and durability in protective applications. Individually tailored, ULTRA-FLEX products solve the toughest coating protection and waterproofing applications ranging from construction and industrial equipment to wastewater treatment.

ULTRA-FLEX coatings and surface preparations produce superior **coating “systems”** that provide a level of uniform protection and durability that stand-alone coatings cannot. ULTRA-FLEX products provide fabrication, installation and maintenance professionals the solutions they need for coating and protecting most material systems against moisture, corrosion, abrasion, and aqueous chemicals. These include applications for ferrous and non-ferrous metals, concrete, wood, PVC, EPDM, plastics, fiberglass and other synthetic materials.

ULTRA-FLEX products are specified by customers and their engineering firms because they meet the needs of the most demanding coating applications both in the U.S. and internationally.

ULTRA-FLEX products have been tested and qualified according to applicable ASTM, DIN, NSF, EPA, NFPAA, UL and UBC standards and are manufactured in accordance to rigorous internal quality control standards. Having served demanding applications such as bridges and cooling towers for over 15 years is a testimonial to the durability and lasting protection of ULTRA-FLEX coatings. ULTRA-FLEX products provide outstanding performance in a vast variety of uses if selected appropriately and applied with recommended equipment and methods cited in this manual.

ULTRA-FLEX products have been developed to surpass all current Federal and State environmental requirements for limiting volatile organic compounds (VOCs). Please check your local and Federal State regulatory requirements for changes or updates that might apply.

Following is an overview of the individual products and suggested uses.

ULTRA-FLEX™ Product Overview Part 1: Coatings

ULTRA-FLEX™ 5000

The most general purpose coating product is ULTRA-FLEX 5000. It is a two component, industrial organic polyurethane that cures to form an elastomeric membrane which is impermeable to water and many aqueous alkaline or acid compositions.¹ ULTRA-FLEX 5000 will guard against corrosion, prevent the intrusion of water, can qualify for containment of potable water and is extremely effective in many, if not all, industrial requirements for a flexible barrier against vapor or moisture.

Applications of ULTRA-FLEX 5000 span the range from reservoir and sewage treatment, pipeline protection, coatings for the wire and cable industry, potting for electrical connections, and cooling tower and evaporative cooling equipment rehabilitation and preservation. Its remarkable flexibility and adhesion give it outstanding performance and durability especially when paired with ULTRA-FLEX surface preparations.

ULTRA-FLEX 5000 is black in color and is sold in one gallon size containers and five gallon metal pails with activator provided in proportionately sized containers. ULTRA-FLEX 5000 can be delivered in 55 gallon drum quantities for large plural component spray applications and insitu spray booths.

ULTRA-FLEX™ 5000 FR (Fire Rated Coating)

ULTRA-FLEX 5000 FR has all the superior water and chemical resistant properties of the ULTRA-FLEX 5000 coating but has been specifically formulated to provide fire protective properties. Like ULTRA-FLEX 5000, the 5000 FR is a two component, industrial polyurethane that cures to form an elastomeric membrane that is impermeable to water and many aqueous alkaline or acid compositions. It has been tested to UL 174 and UBC 64 standards and is not only highly fire resistant to direct flame, but is also self extinguishing once the flame is removed.

ULTRA-FLEX 5000 FR is available in one gallon size containers and five gallon metal pails with activator provided in proportionately sized containers.

ULTRA RAY-FLEX™

ULTRA RAY-FLEX is a white single component, polyurethane/acrylic hybrid coating for applications where it is imperative to reduce the rate of heat transfer from solar reflectance (i.e. reducing solar heat gain). It can be used to coat over ULTRA-FLEX 5000 or as a stand-alone coating in less demanding applications such as sloped roofing, containers and storage tanks.

ULTRA RAY-FLEX is available in five gallon plastic pails.

¹ See Chemical Resistance Chart for specific compositions and containment requirements or limitations

ULTRA-FLEX™ EP-990

ULTRA-FLEX EP-990 is a two-component, flexible epoxy with 100% solids for coating applications where a broad range of chemical resistance is required. EP-990 is highly effective against fuel oil, high end solvents, oxidizing chemical combinations and severe caustic and acidic environments. EP-990 has a pot life after being mixed (activated) of approximately 30 minutes and a cure time of 24-48 hours depending on surface temperature and surrounding atmosphere.

ULTRA-FLEX EP-990 is available in 1/2 gallon kits and one gallon kits that contain both components. Larger sized components can be provided for plural component industrial spray applications upon request.

ULTRA-FLEX™ Product Overview Part 2: Surface Preparations Metal and Inorganic Surfaces

ULTRA-FLEX™ AP (Adhesion Promoter)

ULTRA-FLEX AP is a highly effective surface preparation specifically formulated to create a chemical adhesion between the ULTRA-FLEX 5000 coating and a metal or inorganic based substrate. This is accomplished through unique siloxane chemistry using bifunctional molecules to form a cross link between organic and inorganic materials.

ULTRA-FLEX AP is sold in 1 gallon cans, 5 gallon pails and 55 gallon drums.

ULTRA-FLEX™ RCI (Ferrous Metal Surface Pre- treatment)

ULTRA-FLEX RCI is a rust converting primer for metal substrates. ULTRA-FLEX RCI not only provides a priming base for surfaces that have been cleaned or sand blasted but converts and protects surface areas that remain slightly oxidized or can not be completely ground or cleaned to a white metal surface. This is particularly true during rehabilitation of industrial equipment like cooling towers containing surfaces that are not easily accessed, such as joints or welds on conjoined metal parts near overhangs or other obstructions. ULTRA-FLEX RCI easily flows onto metal surfaces and into cracks and corners not accessible by sanding, grinding or blasting to clear the surface of rust converting it to a non-reacting film.

ULTRA-FLEX RCI is also an excellent pretreatment for large metal roofs and metal surfaces where sand blasting is not practical. ULTRA-FLEX RCI will provide pretreatment protection for a period of up to 15 days without top coating or pretreatment.

ULTRA-FLEX RCI is sold in 1 gallon and 5 gallon containers or may be ordered in tote quantities by special order.

***ULTRA-FLEX*[™] Product Overview Part 2: Surface Preparations, cont**

***ULTRA-FLEX*[™] AP-RCI (Ferrous Metal Adhesion Promoter)**

ULTRA-FLEX AP-RCI (Adhesion Promoter) is a product developed for metal fabrication applications. It combines the bifunctionality of siloxane chemistry of ULTRA-FLEX AP with the metal etching and rust conversion technologies of ULTRAFLEX-RCI. It is a product that not only increases adhesion to a metal substrate but allows a significant increase in the time between preparing and primer coating metal surfaces. Without ULTRA-FLEX AP-RCI, a metal substrate that has been cleaned by sand blasting or grinding (exposing the bare metal surface to environmental moisture) rose (flash) rust immediately begins to form and is trapped below any coatings. Even if this is not obvious or visually evident, the metal itself begins the process of oxidation. By treating the cleaned metal surface with ULTRA-FLEX AP-RCI, any surface rust that is formed will be converted to a non-reactive material AMD the surface etched and hardened. It is also bonded with a bifunctional organosilane molecule providing chemical attachment to the organic polyurethane or primer coating. The subsequent coating or priming can take place as soon as 30 minutes or the coatings applicator can wait up to three days before coating the surface. When used with ULTRA-FLEX 5000, no further priming is necessary to protect the metal surface and increase adhesion. ULTRA-FLEX AP-RCI is sold in 5 gallon pails and 55 gallon drums.

Synthetic Surfaces

***ULTRA-FLEX*[™] AP-174 (Adhesion Promoter 174)**

ULTRA-FLEX AP-174 is a custom manufactured product for creating a chemical adhesive bond between ULTRA-FLEX polyurethane coating and substrates such as ABS Plastics, Nylon, Plexiglas, Polycarbonate, PVC, Polyethylene or Polypropylene. These surfaces are notorious for the inability to coat, rehabilitate or paint over. Many of these substrates are used to line ponds, reservoirs, roofs or other large surfaces and until ULTRA-FLEX AP174, the ability to repair or rehabilitate was severely limited. In most instances such materials previously had to be removed and replaced. Now their service life can be extended using ULTRA-FLEX AP-174 and coating with ULTRA-FLEX 5000. ULTRA-FLEX AP-174 is sold only in 55 gallon drums.

Concrete

***ULTRA-FLEX*[™] EP-990C**

ULTRA-FLEX EP-990C is a medium solids, two component, epoxy designed to penetrate concrete surfaces to prohibit moisture from reacting with isocyanate components of various urethane and urea based coatings and prevent interference with the chemical curing of urethane and polyurea. ULTRA-FLEX EP-990C will seal the surface of porous concrete and aid in the reduction of out gassing due to entrainment of air. Applied in a thin coat, ULTRA-FLEX EP-990C will add integrity to deteriorating surfaces and reduce raveling of aging concrete. It is the ideal surface preparation to eliminate cold wall blistering due to thermal variances between opposing surfaces of a concrete wall. ULTRA-FLEX EP-990C is mixed in a ratio of two Parts A to one Part B(2:1).

ULTRA-FLEX EP-990C is sold in pre-measured three and fifteen gallon kits and can be provided in 150 gallon kits for large plural component spray applications. Due to the extended pot life, this material can be mixed insitu and can be applied by airless as well.

ULTRA-FLEX™ CWG (Concrete Water Guard)

ULTRA-FLEX CWG is an organic solvent based silicon solution applied as a penetrating treatment and repellent thereby producing a barrier against water for concrete and other cementitious surfaces. The resinous substance that is formed is very hard and hydrophobic. ULTRA-FLEX CWG acts by forming hydroxyl bonds with the alkaline surfaces modifying the capillaries in the cement so that they are smaller than a molecule of water.

Benefits of ULTRA-FLEX CWG are:

- Reduced spalling and cracking due expansion and contraction from temperature fluctuations and freeze-thaw cycles.
- Reduced oxidation of rebar and metal supports.
- Reduced leaching and efflorescence.
- Increased wet and dry compressive strength.
- Reduced chloride absorption.
- Increased life of the concrete substrate.

ULTRA-FLEX CWG also provides an improved surface for coating with ULTRA-FLEX 5000. Ultra Flex CWG is sold in 5 gallon pails and 55 gallon drums.

Product Overview Part 3: Recommended Product Uses

Coatings Systems with ULTRA-FLEX™ 5000, ULTRA RAY-FLEX™ & ULTRA-FLEX™ EP-990C

APPLICATIONS	RECOMMENDED SURFACE TREATMENT	COATING
Steel pipe, metal girders, cables, cooling towers	ULTRA-FLEX RCI	ULTRA-FLEX 5000 ULTRA-FLEX 5000 FR
Steel Fabrication	ULTRA-FLEX AP-RCI	
Metal Roofs & Decks	ULTRA-FLEX RCI	ULTRA-FLEX 5000 ULTRA RAY-FLEX ULTRA-FLEX 5000 FR
Steel Tanks / Containers (Exterior)	ULTRA-FLEX RCI	ULTRA RAY-FLEX
Concrete Surfaces	ULTRA-FLEX EP-990C	ULTRA-FLEX 5000
Concrete Containment (Internal)	ULTRA-FLEX EP-990C	ULTRA-FLEX 5000
Synthetic Surfaces (e.g. PVC, EPDM, etc.)	ULTRA-FLEX AP-174	ULTRA-FLEX 5000 ULTRA RAY-FLEX
Chemical Containment	ASTM D 4259-88 Or Equivalent	ULTRA-FLEX EP-990
Non Ferrous Metals (e.g. Aluminum)	ULTRA-FLEX AP	ULTRA-FLEX 5000

SAFE HANDLING PROCEDURES FOR ULTRA-FLEX COATINGS AND SURFACE PREPARATIONS

GENERAL:

Although each job and worksite has its peculiarities, particular safety precautions that must be followed in the application of ULTRA-FLEX 4000/5000/5000FR include but are not necessarily limited to the following:

MSDS (MATERIAL SAFETY DATA SHEETS)

Material Safety Data Sheets on all products must be maintained at the work site for reference. Each individual who will be working with the following materials are responsible for reading and becoming familiar with the safety precautions indicated in these important data sheets.

ULTRA -FLEX 4000/5000/5000FR PART A:

ULTRA-FLEX Part A is a combination of asphalt, petroleum distillates, polymer resins and pigments. This black, viscous material is combustible but not as volatile as a flammable liquid such as the Cold Weather Catalyst or the Adhesion Promoter. Gloves should be worn as well as protective eye glasses when handling this material.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask if eye contact is likely.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: There are only 81g/l to 108 g/l total VOCs in these materials mostly arising from the evaporation of mineral spirits during the curing process. Mineral spirits will not present a significant threat if proper ventilation procedures are followed. The OSHA PEL limits for exposure to mineral spirits, a Stoddard Solvent, is 500ppm and it is highly unlikely that in general application and in reasonably ventilated spaces, the exposure limits for this will be exceeded. If exposure is expected to exceed the OSHA PEL limits, wear a NIOSH-approved respirator for organic vapors to prevent overexposure. If this material is being applied in a confined space, either artificial ventilation with a very large flow of fresh air must be provided to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors in confined spaces. Air-dry contaminated clothing in a well ventilated area before laundering.

Work & Hygiene Practices: Wash hands with solvent to remove residue and thoroughly with soap and water before eating and/or smoking.

Handling & Storage: Store pails or drums outside or inside in accordance with applicable government regulations. Metal containers are closed and exposure to high heat may create vapors and potential for container rupture with explosive force. Avoid heat, flame, sparks and ignition sources.

ULTRA -FLEX PART B:

ULTRA-FLEX Part B is a modified diisocyanate that is formulated to cross link with ULTRA-FLEX Part A. Modified diisocyanate (MDI) were developed to avoid the carcinogenic attributes of toluene diisocyanate (TDI) as well as to reduce the potential for allergic reactions associated with prolonged exposure to isocyanate. Isocyanate reacts very readily with the hydrogen in the prepolymer of Part A and will also react with moisture releasing CO₂ and will foam when in contact with water. Free isocyanate in the air can be avoided by not spraying the unmixed product into the air. Inhalation of the free isocyanate material in the air can cause serious breathing problems. This product should first be reacted with Part A before application. When mixed with the Part A, no free isocyanate is present as an immediate reaction begins and the isocyanate is integrated into polyurethane. Spraying after reaction has begun will not result in the release of free isocyanate into the air and present a hazardous potential for inhalation of these substances. Prolonged exposure to ULTRA-FLEX Part B whether by skin contact or breathing should be avoided and proper clothing and proper ventilation will limit exposure to this substance. ULTRA-FLEX Part B is temperature sensitive and will degrade when exposed to temperatures below 60° F but this product can sustain a short exposure to low temperatures for very short periods of time without substantial degradation.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask if eye contact is likely.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: If exposure is expected to exceed the OSHA PEL limits, wear a NIOSH approved respirator for organic vapors to prevent over-exposure. If this material is being applied in a confined space, either artificial ventilation with a very large flow of fresh air must be provided to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors.

Ventilation: Use ventilation to control vapor concentrations as required.

Work & Hygiene Practices: Wash hands with thoroughly with soap and water before eating and/or smoking.

Handling & Storage: Store bottles or pails indoors in accordance with applicable government regulations. Maintain storage temperature above 60° F.

ADHESION PROMOTERS

ULTRA-FLEX Adhesion Promoters are a mixture of Organosilanes (<01% -10%) which are dispersed in a base of Isopropanol (90% ->99%) (Industrial, isopropyl alcohol). This material is a poison and can not be made nonpoisonous. It is also flammable and precautions must be taken to avoid concentration of fumes which might come in contact with flames or ignition sources. Gloves should be worn when handling this product and eye protection should be worn when using this material. Avoid exposing this material to heat to prevent the formation of fumes which increase the potential for ignition and for inhalation. Ventilation must be good and explosion proof.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask if eye contact is likely.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: If exposure is expected to exceed the OSHA PEL limits, wear a NIOSH approved respirator for organic vapors to prevent over-exposure. If this material is being applied in a confined space, either artificial ventilation with a very large flow of fresh air must be provided to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors.

Ventilation: Use explosion-proof ventilation to control vapor concentrations as required. Air-dry contaminated clothing in a well ventilated area before laundering.

Work & Hygiene Practices: Wash hands before eating and smoking.

Handling & Storage: Store outside or inside in accordance with applicable government regulations. Avoid flame, sparks and ignition sources.

COLD WEATHER CATALYST:

ULTRA-FLEX Cold Weather Catalyst is a combination of an organotin catalyst and mineral spirits. This product is added to the ULTRA-FLEX 4000/5000/5000FR Part A (black prepolymer) to increase the speed with which the cross linking occurs after being combined with the Part B(modified diisocyanate). This material is poisonous and is a flammable liquid. Chemical goggles or a face plate should be worn to avoid splashing into eyes. Gloves should be worn when handling this product and eye protection should be worn when pouring the product to mix with the Part A. Precautions must be taken to avoid contact with flames or ignition sources. Do not use this material for cleaning hands or for any purpose other than as a catalyst for the ULTRA-FLEX 4000/5000/5000FR curing process. Avoid exposing this material to heat to prevent the formation of fumes which increase the potential for ignition and for inhalation. Avoid prolonged breathing of vapors.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask if eye contact is likely.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: If exposure is expected to exceed the OSHA PEL limits, wear a NIOSH approved respirator for organic vapors to prevent over-exposure. If this material is being applied in a confined space, either artificial ventilation with a very large flow of fresh air must be provided to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors.

Ventilation: Use explosion-proof ventilation to control vapor concentrations as required. Air-dry contaminated clothing in a well ventilated area before laundering.

Work & Hygiene Practices: Wash hands before eating and smoking.

Handling & Storage: Store outside or inside in accordance with applicable government regulations. Avoid flame, sparks and ignition sources.

ULTRA-FLEX EP-990 (FLEXIBLE EPOXY)

ULTRA-FLEX EP-990 is a two component, flexible epoxy resin suited to impart high chemical resistance to many substrates including steel, concrete, fiberglass and even lesser epoxies. ULTRA-FLEX EP-990's high chemical resistance and lack of solvent make it the

ideal coating for pulp and paper, petroleum, and chemical producer industries. Part B is considered corrosive by OSHA and appropriate protective measures for handling corrosive materials must be followed when handling this material. Part A is considered an irritant.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask if eye contact is likely.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Under normal conditions, exposure is not expected to exceed the OSHA PEL limits. If this material is being applied in a confined space, wear a NIOSH-approved respirator for organic vapors to prevent over-exposure or provide artificial ventilation with a very large flow of fresh air to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors.

Ventilation: If this material is being applied in a confined space, wear a NIOSH approved respirator for organic vapors to prevent over-exposure or provide artificial ventilation with a very large flow of fresh air to the area to avoid inhalation. **Work &**

Hygiene Practices: Wash hands before eating and smoking.

Handling & Storage: Store in a cool dry environment. Do not store at elevated temperatures. This material may settle during storage and it should be mixed well prior to use.

ULTRA-FLEX CWG (Concrete Water Guard)

ULTRA-FLEX CWG (Concrete Water Guard) is a mixture of Organosilanes (<01 %-20%) which are dispersed in an organic solvent (80% ->99%). This material is a poison and can not be made nonpoisonous. It is also flammable and precautions must be taken to avoid concentration of fumes which might come in contact with flames or ignition sources. Gloves should be worn when handling this product and eye protection should be worn when using this material. Avoid exposing this material to heat to prevent the formation of fumes which increase the potential for ignition and for inhalation. Ventilation must be good and explosion proof.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask if eye contact is likely.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: If exposure is expected to exceed the OSHA PEL limits, wear a NIOSH approved respirator for organic vapors to prevent over-exposure. If this material is being applied in a confined space, either artificial ventilation with a very large flow of fresh air must be provided to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors.

Ventilation: Use explosion-proof ventilation to control vapor concentrations as required. Air-dry contaminated clothing in a well ventilated area before laundering.

Work & Hygiene Practices: Wash hands before eating and smoking.

Handling & Storage: Store outside or inside in accordance with applicable government regulations. Avoid flame, sparks and ignition sources.

ULTRA -FLEX RCI

ULTRA-FLEX RCI is a combination of proprietary, weak acids in a latex carrier. This pink colored liquid can cause skin burns with direct contact for an extended period. Wear protective gloves, clothing and goggles when handling this product. Do not atomize during application and prevent breathing the vapors or mist. Cover all surfaces not intended to be coated with this product to avoid etching, including glass and metal surfaces. Do not allow this material to freeze.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask when handling this product.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: If this material is atomized during application, wear a NIOSH-approved respirator for organic vapors to prevent exposure. If this material is being applied in a confined space, either artificial ventilation with a very large flow of fresh air must be provided to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors or mist.

Ventilation: Use ventilation to control vapor concentrations as required. Launder contaminated clothing with soap and water.

Work & Hygiene Practices: Wash hands before eating and smoking or after contact with this product.

Handling & Storage: Store indoors and do not allow to freeze. Keep containers tightly closed.

ULTRA -FLEX EP-990C (CONCRETE PENETRATING EPOXY)

ULTRA-FLEX EP-990C is a two component, epoxy resin suited to impart strength, and moisture resistance concrete substrates. ULTRA-FLEX EP-990C is a solvent borne epoxy with a slow cure time to allow a deep penetration into the surface of concrete to prevent out gassing and moisture from interfering in the curing process of polyurethane membrane overcoats. Ventilation must be good and explosion proof.

Personal Protective Equipment

Eyes: Wear chemical goggles or face mask if eye contact is likely.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Under normal conditions, exposure is not expected to exceed the OSHA PEL limits. If this material is being applied in a confined space, wear a NIOSH-approved respirator for organic vapors to prevent over-exposure or provide artificial ventilation with a very large flow of fresh air to the area to avoid inhalation, or if this is not possible, a respiratory protection program that meets OSHA's 29 CFR § 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant. Avoid prolonged or repeated breathing of vapors.

Ventilation: If this material is being applied in a confined space, wear a NIOSH approved respirator for organic vapors to prevent over-exposure or provide artificial ventilation with a very large flow of fresh air to the area to avoid inhalation. **Work &**

Hygiene Practices: Wash hands before eating and smoking.

Handling & Storage: Store in a cool dry environment. Do not store at elevated temperatures. This material may settle during storage and it should be mixed well prior to use.

ADDITIONAL SAFETY CONSIDERATIONS

1. Construction should be done with equipment and procedures designed to minimize danger to personnel and materials.
2. Protective equipment including safety glasses should be worn when pouring, mixing or applying liquid products to prevent accidental splash or spray into the eyes.
3. Smoking, welding or metal grinding should not be allowed on or near the pouring, mixing or application of ULTRA-FLEX products to avoid potential flashing or ignition during the application process.

GENERAL APPLICATION SPECIFICATIONS – ULTRA-FLEX™ 5000 & ULTRA-FLEX™ 5000 FR

Description

1. ULTRA-FLEX 5000 can be applied as a waterproofing, damp proofing or vapor barrier membrane over new or existing, flat concrete surfaces, concrete block construction, Celotex, polystyrene insulation, Dens Glass® sheathing or Dens Deck®, metal decking and most clean construction surfaces.
2. ULTRA-FLEX 5000 is a cold applied, two-component, liquid urethane. It cures to form a tough, durable, seamless, water impermeable barrier. ULTRA-FLEX 5000 may be applied by spray, squeegee roller or brush and retains its flexibility in hot or cold environments. (165°F to -60 °F)
3. ULTRA-FLEX 5000 is self-flashing and adheres to most clean construction materials.
4. ULTRA-FLEX 5000 may be used to bridge hairline cracks (up to 1/8 ” or 3mm) in the substrate without compromising the integrity of the membrane when fully cured.

Safety

1. Construction should be done with equipment and procedures designed to minimize danger to personnel and materials.
2. Protective equipment including safety glasses should be worn when applying liquid products to prevent accidental splash or spray into the eyes.
3. Smoking, welding or metal grinding should not be allowed on or near the spray application of ULTRA-FLEX to avoid potential flashing or ignition during the application process.

Surface Preparation

SPECIAL SURFACES

All surfaces are different and require specific attention to details that are not covered in a general application instruction. Please read the sections following this section for the type of surface you intend coating.

1. Coating Concrete Surfaces
2. Coating Synthetic Surfaces (e.g. EPDM, PVC, Fiberglass, etc)
3. Coating Metal Surfaces

General

1. ULTRA-FLEX 5000 is applied on a clean, dry, and structurally sound substrate. Any oil and/or grease spots must be thoroughly cleaned. If paint or a previous coating has been applied, the surface must be lightly sanded. All release agents, previous paint or coatings that are loose or flaking must be removed.
2. The following is a list of normal practices used in surface preparation:
 - a. Inspect and clean the surface thoroughly.
 - b. Correct water drainage as necessary.
 - c. Repair structural defects (i.e., cut out blisters, secure any loose sections).
 - d. Repair or replace vents, drains, protrusions, tie-backs, hooks, loose nuts, bolts, eyes, supports, etc.
 - e. Mask and protect surrounding structures which are not to be covered with ULTRA-FLEX 5000.
3. Surface Pretreatments
Individual surfaces have performance characteristics that may require a specific pretreatment. For individual substrate solutions, please refer to the section on the specific substrate described later.

Vertical or Sloping Surfaces

Vertical or sloping surfaces should be coated in two applications. Each application will be approximately 20 mils thick to prevent running and an uneven surface coating. A second coat should be applied after 30 minutes and within 4 hours and only when the surface of the first coat is tacky but not completely cured.

Horizontal Surfaces

ULTRA-FLEX 5000 is self-leveling, and therefore, horizontal surfaces can be rolled, squeegeed, brushed or sprayed. Single coat applications are possible where the surface is level and the chance for run off is minimal.

Materials

ULTRA-FLEX Part A(Black Prepolymer in a 1 or 5-gallon metal bucket.)

ULTRA-FLEX Part B(Light brown to golden liquid in a ½ gallon or 16 ounce plastic jug.)

Surface Pretreatment as set forth in the section on a specific substrate described below.

MANUAL APPLICATION AND MIXING

Equipment

½ inch Drill (Milwaukee ½” D Handle Drill 500 RPM ’s or equivalent.)



Polyester Fabric (Woven, non -woven or stitch bonded.)

Plaster mixer



Miscellaneous Materials

1. Disposable Short-Nap Rollers (nap of ¼” or less) and/or paint brushes
2. Clean Up and Masking Materials
3. Mineral Spirits or solvent
4. Rags
5. 2-3 empty ea. - 5 gallon HDPE or metal buckets
6. Wall Clock or timed electrical outlet or watch
7. Cleaning / Solvent brushes
8. Razor knife for cutting fabric
9. Inexpensive Poly/plastic sheeting
10. Masking tape - 2 inch or wider
11. Vacuum or air nozzle
12. Absorbent paper towels, shop rags or clean cloth rags

Manual & Hot Pot Mixing

ULTRA -FLEX™ 5000 IS MIXED IN THE FOLLOWING MANNER:

1. Open the 5-gallon Prepolymer Part A can. This will contain 4.5 gallons of material and when mixed with the Part B will provide 5 mixed gallons and a liner approximately 40 mils thick for a 140 square foot area when cured (Approximately 45 wet mils).
2. Pour the ½ gallon of Part B activator into the Part A and begin to mix immediately with the paddle mixer for a minimum of 3.5 minutes to insure a homogenous mix.

3. Prevent air bubbles from forming by mixing at approximately 500 rpm and do not fold or force the system to entrap air by causing a deep vortex in the can while mixing.
4. Once the Part A and Part B are mixed, it has a pot life of approximately 30 to 45 minutes within which the application can take place without substantial hardening of the mixture making it impossible to obtain an adequate coat to the substrate.
5. The premixed ULTRA-FLEX will begin to set immediately. When spraying, keep a 5 gallon bucket of mineral sprits or other solvent on hand to purge the pump and spray lines at least every 2-3 five gallon cans used. Do not allow ULTRA-FLEX to remain in the lines or the pump for more than 5 minutes without continued spraying or cleaning the lines with solvent.

Brush or Roller Application

Due to the pot life of ULTRA-FLEX of only 40-60 minutes for workability, it is suggested that once a five-gallon can is mixed, two or three persons should be used to apply the product.

When rollers are used, they can be dipped directly into the can and applied. Avoid excessive back rolling of the material as it will tend to create bubbles and fish eyes that can remain in the ULTRA-FLEX and will undermine the impermeability of the membrane.

When brushes are used, it is preferable to pour the contents in the five-gallon bucket into smaller one-gallon containers. These are more easily handled by an applicator and can be less problematic for the application. Again, try not to back brush excessively as it will cause bubbles and fisheyes that will be hard to eliminate and can effect the impermeability of the membrane when cured.

When the brush or roller become thick, stiff and will not hold much material, discard the brush and begin with a new brush.

Spraying

Hot Pot Spray Application:

Hot pot spraying is defined by the pre-mixing of the two components in the general manner prior to application using air assisted spray equipment. The following equipment is used to spray apply ULTRA-FLEX after mixing: Binks Sprayer Model 98-943 or GRACO Bulldog or Equivalent pumps capable of handling high viscosity material and maintaining a 40:1 pressure ratio. Example is shown below:



Binks Model 7E2 Spray Gun or equivalent

Typical equipment can be obtained from companies on the internet or listed on sites such as <http://www.paintsprayerslv.com/>.

The stand, base or trolley is fabricated to insure stability for the pump and 5 gallon container assembly. There are pump assemblies that will fit directly over a 5-gallon metal can and pump directly from the can.

HOT POT Spraying

To set up the spray equipment, set the air pressure to 35 pounds for the air dispersion portion of the nozzle. The product pressure should be set at approximately 70 pounds per square inch.

Follow all recommended procedures as are provided by the spray equipment manufacturer or representative. Of particular importance is to make sure that the air assist dispersion line is the first line to have air pressure applied when preparing to startup the equipment and the last one to be turned off at the shut-down of the equipment. This will avoid any back flushing of mixed material into the gun and air dispersion lines. We recommend that you first spray coat the vertical surfaces first with a light (25 - 30 mils) coat of ULTRA-FLEX. Thicker coating in one pass will increase the possibility of runs in the material. After completing the first passes on vertical surfaces, a second coat can then be applied to obtain the desired thickness. This coat should then be applied approximately ½ hour to 4 hours after the application of the prior coat. This will help to insure that inter-coat adhesion will be accomplished and that the finished coat is monolithic.

During the spraying of ULTRA-FLEX, the material will begin to set up chemically. As you continue to apply the material, it will have a tendency to set up in the hoses and in the pump. It is suggested that you maintain a 5-gallon bucket near the pump that is about ½ full of mineral spirits or solvent and that the entire system be flushed after every 10 or 15 gallons of material has been sprayed. When the temperature is 75°F or above, the increased ambient temperature can cause ULTRA-FLEX to set up more rapidly and you may have to flush more often. You can flush by placing the pump into the mineral spirits in the can and then spraying the nozzle directly back into the can. This will avoid waste and the waste material can be used several times for flushing before having to be discarded.

Once you have completed the spraying of each coat you should immediately follow the recommended procedures for cleaning the pump, hose and gun assemblies with mineral spirits, solvent or MEK.

Upon completion of the above procedure, you should proceed to the touch-up process of areas which have been incompletely or improperly covered during the initial spraying and to smooth any areas sagging due to excessive coverage on vertical surfaces. This stage of the operation is critical as the ULTRA-FLEX will begin to set up rapidly and any imperfections not corrected will remain on the finished product.

Plural Component Spraying:

ULTRA-FLEX has identified a plural component spray machine that is compatible with the spraying of ULTRA-FLEX 2 component products. The Xtreme® spray machine has been tested and used by ULTRA-FLEX at the International Technology Center in Minneapolis, MN. This equipment is recommended by ULTRA-FLEX for any spray application that requires the ability to spray a product on a vertical surface and maintain a minimum thickness and fast setting material that has been designed by ULTRA-FLEX to meet the demanding needs of spraying anti corrosion materials and waterproof membranes. You can view the equipment by visiting the GRACO website at: http://www.graco.com/Internet/T_PDB.nsf/SearchView/XtremeMix/.

The Xtreme equipment will result in added savings in time, reduced product waste and ease of application. The two components are kept separate until mixed in line within a static mixer. The proportions are easily set and all controls are electronic and digitally viewed. No mixing is required when using this machine and therefore pot life is also not an issue.



PATCHING AND REPAIRING ULTRA-FLEX™ 5000

1. When it is necessary to repair or patch ULTRA-FLEX the procedure for surface preparation should be followed as is set forth above. Additional steps should be taken before applying a new coat to the exposed surface to be repaired.
2. Clean the surface with mineral spirits or solvent.
3. Rough up the ULTRA-FLEX surface surrounding the breach or area to be repaired by about 2 inches beyond the area to be patched with 60-80 grit sand paper or a clean, oil free wire brush.
4. Wipe the roughened surface again with mineral spirits (naphtha solvent) to clean all of the debris that will form from sanding leaving the surface clean and dry.
5. Apply ULTRA-FLEX AP (Adhesion Promoter) to the roughened surface and allow to dry for about 15 minutes.
6. Apply a freshly mixed coat of ULTRA-FLEX 5000 to the area to be treated and all the way around the roughened area surrounding the surface to be coated.

COATING CONCRETE SURFACES

Cured Surfaces:

A curing period is necessary for all concrete surfaces to be coated with ULTRA-FLEX 5000. Portland Cement Concrete shall be dry and cured at the time of application of ULTRA-FLEX 5000. This curing period is needed for the concrete to attain proper hardness and for evaporation of excess water to prevent blistering which could be caused by vapor pressure underneath the applied coating membrane. Recommended curing of concrete varies from 28 days to six months depending upon service conditions and coating used.

Recommended procedure for new concrete is to moisture cure, using plastic film, wet burlap or water spray; pre-coat with a float finish to Class "B" tolerances and then surface with ULTRA-FLEX 5000.

If the concrete is not sufficiently cured or contains water, it is recommended to prepare the surface of the concrete with ULTRA-FLEX EP-990C (concrete Penetrating Epoxy). Ultra Flex EP-990C will bond concrete surface to form a water proof and solid surface to which ULTRA-FLEX can adhere. ULTRA-FLEX EP-990C will render a surface that is hardened and dried providing superior adhesion and less likelihood of bubble defects in the top coating (see following section on Out-Gassing).

Clean and Dry

All concrete, whether new or old must be clean and dry, and free of loose powder, release agents, curing compounds, laitance or debris. It is highly recommended to remove the existing cement paste on the surface and expose the tops of the underlying aggregate.

Determining Presence of Moisture in Concrete

You should always perform a test to determine the moisture content of the concrete surface before application of Ultra Flex coatings. The following are some of the methods that are used to determine the presence of moisture in the surface of concrete that could affect the

application of ULTRA-FLEX coatings.

The Plastic Sheet Test

Clean a square area of the concrete about 20 inches square. Tape a sheet of polyethylene or plastic sheet such as a plastic trash bag to the surface being sure to seal the edges thoroughly. Do this in about three random spots on the surface that will be coated. Let the sheets stay untouched for approximately 16-24 hours. Preferably over night. Check the surface of the concrete and the underside of the plastic surface mat should be dry. If moisture is present on either surface, you should wait for the concrete to dry fully.

Moisture Meter Test

The use of a moisture meter to measure resistance or impedance can be used to measure moisture. The resistance meters are not very reliable.

Gravimetric Test

Take a chip of concrete from the surface to be coated and weigh it on a good scale. Place the concrete chip in an oven for a period of time until the weight is constant. Calculate the moisture percentage as a fraction of the original weight. If the weight is less than 3-4% then the concrete is ready to cure.

Anhydrous Calcium Chloride Test

A measured amount of anhydrous calcium chloride is placed in a sealed area on the surface of the concrete and the amount of moisture that is absorbed by the salt in 72 hours is used to calculate the moisture vapor transmission rate. The maximum limits of moisture per 1000 square feet per 24 hours should not be greater than 3 to 5 pounds. The salt must be dried prior to running this test.

Relative Humidity

By using a hygrometer to test the relative humidity you can determine whether the concrete is dry enough to coat. First seal off an area of the surface of the concrete with an airtight, waterproof enclosure then wait for approximately 4 hours. Then check the humidity of the pocket of air entrapped. The coating can be installed if the relative humidity of the air in the pocket is less than 75%.

Test Strip

This old tried and true test relies on running a small test patch or strip of the coating on the surface and allowing to cure for 24 hours to predict behavior. Anomalies in the coating such as bubbles, craters or fish eyes should be reason not to proceed until the surface has dried further.

Surface Preparation

1. The surface should be prepared using the following methods:
2. Abrasive blasting (ASTM D 4259-88)
3. Water blasting (generally at 2500 psi minimum), allow concrete to dry (ASTM D 4259-88)
4. Shot blast (ASTM D 4259-88), horizontal surfaces
5. Pretreated with ULTRA-FLEX EP-990C (Concrete Penetrating Epoxy)

Out-Gassing

1. If the concrete surface is porous, or wet, a surface curing agent or sealer may be required to prevent out-gassing or the formation of bubbles as a result of entrapped air or moisture. See the use of ULTRA -FLEX EP-990C for moisture curing and sealing.
2. Out-gassing is generally the result of retained moisture or the result of expansion of entrapped air on the surface of porous concrete.
3. Out-gassing from moisture can be prevented by making sure that the surface to be coated is dry and there is no moisture retained below the immediate surface that can react with the ULTRA-FLEX coating as it is applied.
4. Out-gassing from entrapped air can be prevented in most instances by coating the surface with ULTRA-FLEX when the temperature of the surface to be coated is in a temperature declining mode. ULTRA-FLEX is black, and as such acts as an absorber of solar energy. The accumulation of heat under a dark surface can increase the temperature of the concrete by as much as 90°F. This absorbing effect causes the air trapped within the concrete's pores to heat and expand. The air expands and tries to push its way out of the concrete (out-gassing), creating hundreds of bubbles in the surface of the ULTRA-FLEX, as it cures. As a result, it is common that out-gassing will occur when concrete is coated in direct sunlight.

Methods of Preventing Out-Gassing

Out-gassing can be minimized or prevented by using ULTRA-FLEX EP-990C.. The method to be followed is to pre-coat the surface with the epoxy primer to prevent the out gassing from having an effect on the surface while being coated with ULTRA-FLEX. The use of ULTRA-FLEX EP-990C seals the surface with a hard and impenetrable barrier that prevents problem arising from cold wall blistering downstream.

Precautions

Application of ULTRA-FLEX 5000 over concrete surfaces should not take place if:

1. Material temperature is below 60°F at time of application.
2. Surface temperature is below 50°F.
3. Surface moisture is present or rain is imminent and will affect area to be coated.
4. Surface temperature drops below the dew point.
5. Concrete is curing or in a temperature rising mode.
6. Other conditions are obviously unsuitable.
7. CONSULT TEMP-COAT, LTD TECHNICAL PERSONNEL IF APPLICATION SURFACE TEMPERATURES ARE EXPECTED TO BE BELOW 40°F and the use of ULTRA-FLEX COLD WEATHER CATALYST.

COATING SYNTHETIC SURFACES

PREPARATION FOR ULTRA-FLEX™ CHEMICALLY BONDED COATINGS

ULTRA-FLEX AP

Over the years, Ultra Flex has been used to coat many different surfaces. Although well known for its ability to physically bond to metal surfaces, concrete and wood, the use of ULTRA-FLEX AP (Adhesion Promoter) will provide a chemical bond between ULTRA-FLEX and the substrate. The following surfaces are compatible with ULTRA-FLEX AP.

Fiberglass

1. New Fiberglass: Degrease with mineral spirits, MEK solvent or TSP
2. Old Fiberglass: Power wash and scrub thoroughly with a solution of TSP and water. Rinse thoroughly and let dry
3. Abrade smooth surfaces with sandpaper or other abrasive medium.
4. Remove dust with tack rag.
5. Spray a fog coat or wipe with a very light coat of ULTRA-FLEX AP.

Glass, Ceramics

1. Degrease with solvent-type degreaser or TSP
2. If possible, frost with wet / dry sandpaper and water
3. Rinse and allow to dry.
4. Spray a fog coat or wipe with a very light coat of ULTRA-FLEX AP

ULTRA-FLEX AP-174

The following synthetic surfaces require the judicious application of ULTRA-FLEX AP-174, a new adhesion promotion material which has been developed that forms a chemical bond with an application of ULTRA-FLEX 5000.

ABS Plastics, Nylon, Plexiglas, Polycarbonate, PVC, Polyethylene or Polypropylene

1. Degrease with mineral spirits. Or wash and scrub thoroughly with a solution of TSP and water. Rinse thoroughly and let dry.
2. If possible, abrade with emery cloth or Scotchbrite® pad.
3. Spray a fog coat or wipe with a very light coat of ULTRA-FLEX AP-174
4. Wait ½ hour before coating with ULTRA-FLEX 5000.

Natural Rubber (Latex), Synthetic or Vulcanized Rubber

1. Treat the surface for 5 – 10 minutes with concentrated sulfuric acid.
2. Rinse with clean cold water followed by clean hot water.
3. Dry thoroughly.
4. Spray a fog coat or wipe with a very light coat of ULTRA-FLEX AP-174.
5. Wait ½ hour before coating with ULTRA-FLEX 5000.

Note: Flex the rubber – the appearance of small hairline cracks indicates the rubber is ready for bonding.

WARNING! SOME OF THE CHEMICALS SUGGESTED IN THE ABOVE PROCEDURES ARE HAZARDOUS! THE ORDER OF MIXING OF SOME FORMULAS IS CRITICAL.

WHEN MIXING ACIDS AND WATER, ALWAYS ADD ACID TO WATER AND NEVER POUR OR MIX WATER INTO ACID.

COATING METAL SURFACES

When coating any metal surface it is important that an applicator take into consideration all of the following circumstances.

Surface Preparation

All surfaces must be clean and dry. All oil, paint, scale, oxidation (rust), dirt, and grease must be removed. Surfaces should be cleaned with pressure washing and the use of an industrial cleaner or acid etching agent and thoroughly rinsed before application to the surface. All ULTRA-FLEX products are self-flashing. However, in certain circumstances it may be advisable to prime and or pre-treat the surface in a more effective manner to prepare for coating. Specific applications of surface pretreatments are described below.

Acid Etching

New metal surfaces are generally precoated at the manufacturing facility with fine oil or other protective grease or light paint that will inhibit water and moisture from penetrating and resulting in corrosion. This coating must first be removed prior to applying any coating or surface treatment. Depending upon the type of oil or protective coating, the method for removing the film will vary. Acid etching with a dilute solution (approx 2% acid in water) muriatic acid will clean most surfaces and etch the metal to provide a clean surface to which most coatings will adhere. **Not to be used for galvanized metal (see galvanized metal section below).** Vinegar, citric acid, oxalic and phosphoric acids are other acids that are effective cleaners, however, some should be avoided unless applied by trained personnel. Vinegar in many cases is a good, safe cleaner to remove oils and grease residue and will easily rinse off. It is not as reactive as other acids are with certain metals and is generally not harmful to the environment.

Another very safe method for removing grease and oil is the use of TSP (trisodium phosphate). Depending on the extent of the oil or grease coating, one of the above methods will prepare the surface for obtaining a proper surface to which you can apply ULTRA-FLEX™ RCI. You should test the above to determine which best suits your particular surface.

Oils and grease removed by etching or by washing should be contained and removed in a safe manner consistent with good practices and in accordance with Federal, State and local ordinances.

Sand Blasting

In coating a metal surface, the greater the surface area that is covered, the greater the adhesion. If possible, it will usually be best to sand blast a metal surface prior to coating. Sand blasting increases the surface area to which a coating can adhere. The surface must be

either blown clean using a compressed air or wiped down using a non-greasy volatile solvent. After sand blasting the surface of metal, some types may be subject to immediate oxidation (i.e. mild steel). You should not leave the surface exposed to the atmosphere without a coating for any lengthy period to avoid the condensation of moisture or flash rusting to occur. Therefore, if the surface is not to be coated within a reasonably short period of time, it is recommended that the metal that has been blasted be coated with a primer, preferably ULTRA-FLEX AP-RCI.

Abrading

Any number of methods may accomplish manual or mechanical roughening of the surface. The use of sand/emery paper, wire brushes sander, grinder or other mechanical device can be used to aid in cleaning and abrading the surface. As in above, after the surface has been abraded, the residual dust and metal filings should be removed either by using compressed air or by wiping the surface with a highly volatile solvent prior to coating.

Mechanical scoring or acid etching are but two methods for preparing a surface prior to coating. Both mechanical and chemical cleaning processes increase the surface area to which a coating may attach.

Chemical Bridging

ULTRA-FLEX AP (Adhesion Promoter) AP -RCI (Rust Inhibiting)

Maximizing the adhesion of a coating is extremely important to increase the duration during which a coating will remain effective and protective against corrosion and oxidation. In addition to mechanical scouring and etching, it is recommended that an additional step to create a chemical bond between metal and the ULTRA-FLEX 5000 be taken. This is accomplished through the judicious application of adhesion promoters as discussed below.

Adhesion promoters function similarly and are comprised of an application medium, i.e. solvent or alcohol and a bi-functional molecule. The molecules that are applied to a surface have bifunctional compounds. One of the compounds is an organofunctional group which will react with the polymer binder in a coating. The other end is an inorganic based group (often metal) that becomes attached to the metal substrate. A chemical bridge is thus formed between the coating and the metal substrate when the adhesion promoter is used. The effects of the adhesion promoter are even more pronounced when combined with the pre-treatment of a metal surface by chemical or mechanical etching prior to the application of an adhesion promoter.

If the surface is clean and dry and coating will take place within 3 hours of the blasting to a white or near white metal surface, then ULTRA-FLEX AP is the recommended primer. ULTRA-FLEX AP will prevent the formation of rose rust for up to 3 hours.

When the surface has been braided to a white metal conditions or near white metal condition and the surface is not to be coated for up to several days, the surface after blasting or abrading should immediately be coated with ULTRA-FLEX AP-RCI. ULTRA-

FLEX AP-RCI will prevent the formation of rose (flash) rust or convert any rust that has formed to a non reactive substance and will enable the surface to stand without deterioration for up to 15 days without additional priming. ULTRA-FLEX 5000 can then be applied as the final protective membrane.

Surface Preparation (Rust Conversion) using ULTRA-FLEX RCI

It may not be practical to sand blast a metal surface and therefore priming the surface will provide a clean and dry substrate for subsequent coating application. ULTRA-FLEX RCI is the recommended primer for a metal to be coated with ULTRA-FLEX 5000 when the surface can not be adequately cleaned by abrasion or sand blasting. ULTRA-FLEX RCI should not be used on any surface that is coated with any substance containing silicon or any coating that will leave an oily or greasy residue. Wire brushing or abrading the surface is required only if there is a need for a smoother finished appearance. However, the surface should be in a condition called "Tight Rust." Tight Rust is a condition where the surface has been cleaned fairly well, with all loose rust scraped off, and maybe even sanded, although not sanded down to bare clean steel.

If the primed surface is left exposed for several days, it is wise to wipe down the surface to remove any condensation or dust particles that may have accumulated on the surface.

Galvanealed (galvanized) Metal Surfaces

Galvanized surfaces, when new, generally have a light oil coverage which is applied during the manufacturing process. This surface may wear off with time and open-air exposure. However, it is always safe to assume that not all of the surface is clean and dry. Therefore, galvanealed metal can be cleaned with any typical alkaline or acid cleaner. **Caution: The use of hydrochloric or muriatic acid is not recommended due to the formation of hydrogen gas and potentially harmful fumes that may cause respiratory distress.** One of the best methods for pre-treating large metal areas is by using a spray wand and manually pressurized system to apply a combination of an acid cleaner/iron phosphate solution. Rinse with hot water. You may use compressed air to aid in the dry off. Immediately follow the procedures for priming above and apply ULTRA-FLEX 5000 as soon as possible after the area is completely dry.

Anodized Aluminum

Anodizing produces an oxide layer on the surface of the metal. That oxide layer can pick up moisture from the air from just standing. It also has a tendency to pick up microscopic dust particles that will interfere with proper adhesion. It is recommended that any anodized surface be pre-treated by wiping down with ULTRA-FLEX AP. Caution, wiping with ULTRA-FLEX AP, a fast evaporating organic solvent, can cause some additional problems and concerns. When the atmospheric conditions are at or near the dew point or freezing conditions exist, wiping the surface with a fast evaporating solvent may chill the surface and cause moisture to quickly condense on the surface. Heating the parts for a while then wiping them with ULTRA-FLEX AP can help avoid problems in freezing conditions. As long as the parts are clean and dry, the interval between anodizing and coating is not critical.

APPLICATION SPECIFICATION FOR ADHESION PROMOTERS: ULTRA-FLEX™ AP, ULTRA-FLEX™ APRCI, ULTRA-FLEX™ AP-174

GENERAL

The ULTRA-FLEX[®] adhesion promoters increase adhesion of ULTRA-FLEX[®]5000 and 5000-FR to metal and other surfaces by creating a chemical bond between the coating and the coated surface as well as a mechanical bond. The ULTRA-FLEX[®] adhesion promoters achieve chemical bonds with special organosiloxane molecules which form unique bonds between the substrate and the surface of the coating. The molecules are bi-functional molecules. Each molecule has a part that attaches to an inorganic surface and a part of the molecule that attaches to an organic surface. The use adhesion promoters result in a chemical bond between the coating and the metal surface where most coatings only use a mechanical property for adhesion.

Normal primers and coatings are limited by mechanical adhesion. On a surface, the area to be coated is greater than a flat surface because there are thousands (and in some cases millions) of little bumps and dimples that result in more surface area. A coating as it wets the surface, fills the voids and then dries. When you try to pull the coating off of the surface, the tension you feel is actually suction which prevents the coating from coming off the surface of the metal. The larger the surface area the more suction prevents the coating from being pulled from the surface and the greater the mechanical adhesion. ULTRA-FLEX provides both kinds of adhesion, chemical and mechanical.

There are three adhesion promoters. Each is applied in the same manner but each has unique qualities suited to surfaces to be coated. **ULTRA -FLEX AP** is for non ferrous metals, glass and fiberglass and ferrous metals which are to be coated within a very short time of cleaning.

ULTRA -FLEX AP-174 is used for adhesion to plastic substrates such as PVC, EPDM and Hypalon among other substrates.

ULTRA -FLEX API-RCI is for ferrous metal substrates and is unique in that it creates a chemical bond with the substrate and will also convert any flash rust present. It will continue to prevent rust from forming for up to 15 days.

Adhesion Promoters can be applied by brush, roller but are best applied using manual pump operated spray equipment. The use of airless spray equipment can be used but **low pressure and large nozzles** should be used to avoid high atomization and waste of the material. The surface to which it is applied should be clean and dry. The adhesion promoter should be applied at a rate of approximately 300-350 sq. ft. per gallon. The adhesion promoter should be let to stand for at least 1/2 hour and allowed to flash off until the surface is dry. ULTRA-FLEX[®] 5000 should be applied in accordance with the following time table:

Adhesion Promoter	Coating Window
ULTRA-FLEX AP	After ½ hour and within 3 hours.
ULTRA-FLEX AP174	After ½ hour and within 3 hours.
ULTRA-FLEX AP-RCI	After ½ hour and within 15 days.

Precautionary Measures:

It is important to remember that ULTRA-FLEX Adhesion Promoters are **highly flammable liquids**. The organic solvent carrier is very toxic when ingested and must not be swallowed or used for any purpose other than the intended use as an adhesion promoter for ULTRA-FLEX^Y coatings. Always wear appropriate chemically resistant eyewear, gloves and protective clothing when working with or around acidic environments.

ULTRA-FLEXTM AP-RCI

ULTRA-FLEXTM AP-RCI is a, rust converting, corrosion inhibiting, adhesion promoter for ferrous metal substrates. ULTRA-FLEXTM AP-RCI is a milky liquid that easily flows onto metal surfaces and into cracks and corners to clear the surface of flash rust converting it to a non-reacting film and preventing the formation of new rust. ULTRAFLEXTM AP-RCI will serve as a protective shield and for up to 15 days before any recoating or priming of the metal surface will be required without a second application. ULTRA-FLEXTM AP-RCI, when applied to a slightly rusty surface will immediately begin to turn a dark blue to black hue and form a shiny hardened surface over a period of several hours. When applied to a white metal surface, the surface may turn a light metallic blue in hue.

Surface Pretreatment: Ferrous Metals

New metal surfaces or surfaces that have been blasted to a white metal condition and stored before use are generally precoated at the manufacturing facility with fine oil or lightly coated with a protective grease or light paint that will inhibit water and moisture from penetrating and resulting in corrosion. This coating must first be removed prior to applying any coating or surface treatment. Depending upon the type of oil or protective coating, the method for removing the film will vary. Acid etching with a dilute solution (approx 2% acid in water) muriatic acid will clean most surfaces and etch the metal to provide a clean surface to which most coatings will adhere. Vinegar, Citric acid, oxalic and phosphoric acids are other acids that are effective cleaners however some should be avoided unless applied by trained personnel. Vinegar in many cases is a good, safe cleaner to remove oils and grease residue and will easily rinse off. It is not as reactive as other acids are with certain metals and is generally not harmful to the environment. Another very safe method for removing grease and oil is the use of TSP (trisodium Phosphate) in water to wash the surface and then rinse thoroughly. Depending on the extent of the oil or grease coating, one of the above methods will prepare the surface for obtaining a proper surface to which you can apply ULTRA-FLEXTM AP-RCI. You should test the above to determine which best suits your particular surface.

Precautionary Measures

The mixing procedure for blending acids and water: Always blend acid into water never pour water into an acid.

Muriatic or hydrochloric acid is not recommended to clean galvannealing or to treat galvanized surfaces (surfaces that contain zinc in the metal mix). Even in dilute solutions, hydrogen gas will be released. Hydrogen is very flammable and vapors that are formed in this process are very caustic and can cause severe respiratory irritation. If adequate ventilation is not present, use NIOSH approved respiratory protection. Always wear appropriate chemically resistant eyewear, gloves and protective clothing when working

with or around acidic environments.

Oils and grease removed by etching or by washing should be contained and removed in a safe manner consistent with good practices and in accordance with Federal, State and local ordinances.

APPLICATION SPECIFICATION - ULTRA-FLEX™ RCI (Rust Converting, Corrosion Inhibiting Primer)

ULTRA-FLEX™ RCI is a state-of-the-art single component coating consisting of an acrylic copolymer that is a metal primer combined with chemicals that react with steel substrates to inhibit the formation of new rust and to change the nature of corrosion that has already formed. ULTRA-FLEX™ RCI is a light pink in color and opaque when first applied. ULTRA-FLEX™ RCI is comprised of chemicals that are used to convert a microscopic layer on the surface iron to another chemical, to prevent the formation of iron oxide (rust), while the other chemicals react with the iron oxide already present, changing it to iron tannate (conversion), a stable blue/black corrosion byproduct. An advanced acrylic copolymer base provides a protective priming layer over the reacted surface.

Any surface coated with ULTRA-FLEX™ RCI may be over coated with ULTRA-FLEX™ 5000 or ULTRA RAY -FLEX when the surface is dry to the touch.

ULTRA-FLEX™ RCI is sold in 1 and 5 gallon containers and may be ordered in larger containers upon request.

GENERAL

Simple to use, ULTRA-FLEX™ RCI can be brushed or sprayed on the surface of the metal. Work neatly and consider masking off the area where you are applying ULTRAFLEX™ RCI. The temperature of the metal should be between 50 and 90 degrees F, and there should be no risk of rain for 8 hours. Within 20 minutes after application the conversion will begin to turn any rust it touches black or a blue/black in color. The reaction is complete after 8 hours unless the ULTRA-FLEX™ RCI primer has not been able to dry due to high humidity. If the ambient humidity exceeds 75% to 80% it may take up to 24 hours to dry adequately.

An illustration of the coating of piece of rusted metal that has been half coated with ULTRA-FLEX RCI is below. Note the curing to a black/blue hard finish.



Untreated Oxidized Metal	ULTRA-FLEX RCI Application	Converted Rust
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SURFACE PREPARATION

It is important that you remove any large scale, grease and oil, previous coatings and other loose material that might lead to bond failure.

No sandblasting is required. Wire brushing or abrading the surface is required only if there is a need for a smoother finished appearance. However, the surface should be in a condition called “Tight Rust.” The conditions for “Tight Rust” are described in Footnote 2 below.

Used metal surfaces are generally free of a protective coating from the manufacturer. Most oxidized steel surfaces evidence corrosion by the formation of iron oxide (rust) or pitting. Chlorides (salt) will also increase corrosion and must be removed from the surface prior to coating. Chlorides form in marine environments, cold weather areas where salt and other chlorides are used to remove ice and snow, or form as deposits in areas such as chemical plants or in areas where chemicals are added to sumps as water treatment chemicals. Oil and grease can form on these old metal surfaces and cling to dirt particles that adhere to the surface and should be removed. Removal of these contaminants as well as loose coatings from prior applications and paint should be accomplished prior to coating with ULTRA-FLEX™ RCI. A preferred method will be the use of a high pressure water blast in which an abrasive such as sand is added to the stream. This will remove flaking and loose particulate matter such as loose paint and large flakes of rust that will interfere with the adhesion process. A pre-wash solution of water and TSP (trisodium phosphate) applied and then rinsed with the water blast will provide a surface that will qualify as a “Tight Rust”² surface.

As ideal as ULTRA-FLEX™ RCI sounds, it is only effective if used correctly. Though you don't need to scrape or chip down to bare metal, surface preparation is important. ULTRA-FLEX™ RCI when applied in sufficient concentration will convert any rust it comes in contact with, including fine particles.

ULTRA-FLEX™ RCI is formulated to be used as a primer. Unlike traditional coatings, though, it must not be sanded. Nonetheless, ULTRA-FLEX™ RCI should always be followed with an impervious topcoat as a final corrosion proofing layer.

² Tight Rust- a surface that has been cleaned fairly well, with all loose rust scraped off, and maybe even sanded, although not sanded down to bare clean steel.

APPLICATION INSTRUCTIONS

Once the surface is prepared as above, it is ready for an application of ULTRA-FLEX™ RCI. The temperature of the metal should be between 10 and 30°C (50 - 90°F), and there should be no risk of rain for 8 hours.

Shake the ULTRA-FLEX™ RCI container vigorously to insure that there is no settlement from transportation or storage. Due to the diverse chemicals contained in ULTRAFLEX™ RCI, there is a tendency to settle in storage and vigorously mixing or shaking the container will prevent any striation from affecting a homogenous application. Do not pour out more than you can use in any application. Do not pour any solution back into the main container that has been used or cross contaminated by using a brush or roller during the application. This will cause a reaction between the chemicals in ULTRAFLEX™ RCI and microscopic particulate of iron oxide that are picked up by the brush or roller in the application during storage and cause a degeneration of the effectiveness of ULTRA-FLEX™ RCI.

ULTRA-FLEX™ RCI is applied by brush, roller or spray. ULTRA-FLEX™ RCI should be applied at a rate of approximately 200 to 250 square feet per gallon (ft²/gal). Rough surfaces where the corrosion is significant and layered and cannot be adequately brushed to remove extensive layers require a more liberal application and will result in a reduced rate of coverage. If there are voids in the first application, or if the duration between the first application and the application of a topcoat exceeds 15 days, it is preferable to apply a second coat within 4 hours.

Liberally applying ULTRA -FLEX™ RCI with a stiff brushing action in tight areas such as corners joints and around protrusions and nuts and bolts will insure that all surfaces come in contact with ULTRA-FLEX™ RCI and are properly treated. Make sure that the liquid material is pushed deep into cracks, small pockets and pits that have formed and between metal parts that have been bolted together. Spray flat surfaces using a simple garden sprayer or airless spray equipment with a tip of about .049 to .052. The material should just coat vertical surfaces and not be allowed to run. A second light coat on vertical surfaces after a short interval will insure that you are getting adequate coverage.

Precautionary Measures

Avoid fine atomization of ULTRA-FLEX™ RCI and breathing the mist. A simple NIOSH respirator with an organic canister will provide adequate respiratory coverage. Always wear appropriate chemically resistant eyewear, gloves and protective clothing when working with or around acidic environments. Do not ingest this material.

Read the MSDS sheet before using this product.

Due to slight corrosive effects of dilute acids contained in ULTRA-FLEX™ RCI, avoid over spray by masking off and covering sensitive areas. Mask off windows if they are near as the acrylic copolymer once cured will be very hard to remove and may discolor or etch glass. Over spray can cause damage to car finishes and other finely painted surfaces. The reduction of atomized mist and over spray will reduce any chances of damage to adjacent surfaces.

ULTRA-FLEX™ RCI can stand alone for up to 15 days after curing before being top coated. If you anticipate a lengthy duration prior to the application of ULTRA-FLEX 5000

or ULTRA RAY-FLEX, the preferred method is to apply a second light coat over all surfaces after the first coat cures. The acrylic copolymer will seal the system and protect any reacted material. You will also avoid potential voids in the primer that may have occurred during the first application. Do not exceed a thirty-day period after you have applied a second coat prior to applying a topcoat of ULTRA -FLEX 5000 or ULTRA RAY-FLEX.

CLEAN -UP

ULTRA-FLEX™ RCI is a waterborne mixture and may be cleaned up with soap and water while wet and prior to fully curing. Once ULTRA-FLEX™ RCI has cured, mineral spirits will aid in the removal of hardened residue. Rinse all brushes and equipment with copious amounts of water and wash all clothing immediately after applying ULTRA-FLEX™ RCI

Do not contaminate the stock solution by pouring used ULTRA-FLEX™ RCI back into the bottle. Only pour what is needed for the job and discard any that is left over.

STORAGE

Store ULTRA-FLEX™ RCI where there is no danger of frost or freezing, and discard any quantities that have been allowed to freeze. ULTRA-FLEX™ RCI is a water-based solution and will deteriorate when frozen.

APPLICATION SPECIFICATION FOR ULTRA-FLEX™ CWG (CONCRETE Water Guard)

General

ULTRA-FLEX CWG is an organic solvent based silicon solution applied as a penetrating treatment thereby producing a barrier against water for concrete and other cementitious surfaces. The resinous substance that is formed is very hard and hydrophobic. ULTRA-FLEX CWG acts by forming hydroxyl bonds with the alkaline surfaces modifying the capillaries in the cement so that they are smaller than a molecule of water.

ULTRA-FLEX CWG (Concrete Water Guard) is applied by airless sprayer, manual pump sprayer (Garden Type), brush or roller. The surface should be clear of loose dirt, grease or oil, standing water and other contaminants. The surface may be moist or damp but the dryer the surface, the deeper the penetration and longer the effectiveness of the waterproof properties. When applied repeated applications may be required until the surface is saturated and remains wet for several minutes. When applied on vertical surfaces, apply in an upward application until the surface runs with the ULTRA-FLEX CWG for about 6 to 8 inches below the roller, brush or spray fan. ULTRA-FLEX CWG is clear and will dry to a finish that will indicate that the surface has formed a bond with loose cementitious material making the surface waterproof within 24 hours.

Precautionary Measures:

Exposure of ULTRA-FLEX CWG to moisture or water in open container prior to application may cause the material to cure in the can and will void any waterproofing and structural enhancement.

Do not apply in rain or when rain is imminent.

If applying by an airless sprayer, caution should be taken to avoid over spray and prevent drift to avoid contamination of windows, automobiles or other nearby substrates that may be affected.

This material is a **FAMMABLE LIQUID**. Use this material in a well ventilated area and avoid breathing, skin contact and do not smoke in the vicinity of application. Keep away from open flame, sparks or other sources of ignition.

Read the MSDS sheet before using this product.

ULTRA-FLEX CWG has a one year shelf life. Use immediately after opening or purge open container with a dry nitrogen blanket and immediately seal the container to avoid contamination by atmospheric moisture.

PHYSICAL PROPERTIES:

ULTRA-FLEX CWG when tested in accordance with NCHRP Report # 244 will produce the following results:

Color	Clear
Reduction of water absorption into concrete	Exceeds 80%
(ASTM C 642) (21 day soak) Reduction of chloride content in concrete	Exceeds
Moisture vapor transmission	100%
UV 90 day exposure (ASTM C 1378)	No change in appearance
Flash Point (Abel)	54°F / 12°C

APPLICATION SPECIFICATION FOR ULTRA-FLEX™ EP-990C

General

ULTRA-FLEX EP-990C is a chemical and corrosion resistant, slow setting medium solids epoxy for use on concrete substrates to prevent a condition called cold wall blistering. Cold wall blistering occurs when a prolonged temperature difference arises in a concrete basin and the interior of a basin has been coated with a polyurethane or polyurea membrane. The warmth of the basin will cause moisture to collect and migrate from the colder outside surfaces through the concrete and exert hydraulic forces against the underside of the membrane and cause a delamination. ULTRA-FLEX EP-990C is durable and highly abrasion resistant.

ULTRA-FLEX EP-990C is mixed in a ratio of 2:1. Two Parts A are mixed in with one Part B for a period of at least 3 minutes at approximately 500RPM until homogenous. Blending is best accomplished with a plaster mixer or propeller and not a jiffy mixer. ULTRA-FLEX EP-990C, once mixed, can be sprayed with an airless or may be applied by brush or roller. Coverage is approximately 200-250 square feet per gallon. ULTRA-FLEX EP-990C is prepackaged in three or 15 gallon kits.

Physical Properties

Physical properties are set forth in the table on the following page:

Test	Description	Results
ASTM G-8 (Modified)	Cathodic Disbondment	Under 1mm / small chips only
	92 days @0-250oF-1.v, 3%NaCl	
ASTM D4541	Pull force Adhesion – Ambient	1487 psi
	Elkometer	
ASTM 4060 CS	Taber Abrasion – 17 wheel 1000g wt/1000 cycles	Wt. Loss <181 mg.
ASTM D986	Falling Abrasive	Wt. Loss Nil
	20 mesh coal, 25,000 ml of abrasive across face	