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75% SOLIDS MULTIFUNCTIONAL ALIPHATIC POLYURETHANE COATING SYSTEM

TECHNI-PLUS UR 5 is a unique high solids, high build, multifunctional aliphatic polyurethane coating designed for atmospheric industrial exposures. UR 5 offers excellent gloss and color retention, abrasion resistance and good chemical and stain resistance. UR 5 may be applied direct to metal or concrete surfaces, or used over TECHNI-PLUS E 3 Epoxy Primer, TECHNI-PLUS AEP 12 Epoxy Coating, or other selected KCC coatings. UR 5 may be applied over old intact coatings as a maintenance coating. Contact KCC Corrosion Control for specific recommendations when considering use over old coatings.

TECHNI-PLUS UR 5 is designed for use as a coating for exterior or interior concrete walls and floors, railcar exteriors, hopper car lining, and the exteriors of tanks, structural steel and piping.

TECHNI-PLUS UR 5 is applied in one or two coats, each coat at 7 - 8 wet mils to achieve 5 dry mils. This system can be sprayed with conventional or airless equipment, brushed or rolled. In order to achieve film build desired, spraying is highly recommended. The drying and curing times may be accelerated by using UR 5 Accelerator.

TECHNI-PLUS UR 5 has very good bond strength to steel and concrete. The film permeability is relatively high as

are most urethanes, therefore it is recommended primarily as an atmospheric coating or topcoat to other KCC coatings when subjected to harsh conditions. The abrasion resistance of TECHNI-PLUS UR 5 is excellent. This combination of product features allows TECHNI-PLUS UR 5 to be used on floors with light equipment, foot traffic and dilute chemical spills. TECHNI-PLUS UR 5 is ideally suited for use on structures in electronics, power, pulp and paper, food and beverage, wastewater treatment and chemical, petrochemical and oil refining plants.

TECHNI-PLUS UR 5 exhibits excellent splash, spill and fume resistance to dilute acids, alkalines and salt water and petroleum environments. UR 5 has excellent resistance to solvent fumes. **UR 5 is not used as an immersion lining in wet service.** In dry or atmospheric corrosive situations, TECHNI-PLUS UR 5 resists continuous heat of 200°F and intermittent heat of 250°F.

RESISTANCE TO WEATHERING

TECHNI-PLUS UR 5 is specially formulated to resist color fade, chalking and loss of gloss when used outdoors in ultraviolet light. Gradual change in color or gloss may occur over time. This will not adversely effect the overall protective performance of the coating system.

TYPICAL PROPERTIES

Solids Content:	73% ± 3% reactive by volume.
Volatile Organic Content:	2.2 lbs per gallon (2.5 lbs/gal with accelerator).
Volume Mix Ratio:	4 parts Resin to 1 part Hardener.
Flash Point: (Pensky-Martens Closed Cup)	Resin.....> 110°F Hardener.....> 122°F Accelerator.....> 94°F
Thinner:	1 pint per gallon UR 5 Thinner, if necessary.
Weight per Gallon:	13.2 lbs. mixed.
Coverage for Steel:	(Theoretical)... 234 sq. ft. per gallon per coat average applied at 7-8 wet, 5 dry mils. (Practical)..... 200 sq. ft. per gallon per coat average applied at 7-8 wet, 5 dry mils Normally applied in one or two coats to yield 5 to 10 dry mils.
Coverage for Concrete:	Same as above if concrete is dense and primer is used. Porous or unprimed concrete may reduce coverage to 170 to 180 sq. ft. per gallon per coat average at 7-8 wet mils.
Color:	Medium Gray & White. Minimum quantities apply for special colors.

¹ FOR SPECIFIC RECOMMENDATIONS CONTACT KCC CORROSION CONTROL CO., LTD.

PHYSICAL PROPERTIES OF CURED SYSTEM

Elongation (ASTM D522):	> 32%
Taber Abrasion (ASTM D 4060):	60 mg. loss / 1000 cycles with 1000 grams CS - 17 Wheel.
Impact Resistance (ASTM D522):	Direct: 140 in-lbs; Reverse: 50 in-lbs.

CHEMICAL RESISTANCE¹

Resists a wide variety of industrial chemicals in splash, spill, and fume conditions. See table below for general information. Contact KCC Corrosion Control with complete operating service conditions for specific product recommendations.

ENVIRONMENT	SPLASH, SPILLAGE	FUMES AND WEATHER
Acids	Excellent	Excellent
Alkalines	Excellent	Excellent
Fresh water	Excellent	Excellent
Petroleum products	Excellent	Excellent
Salt solutions	Excellent	Excellent
Seawater	Excellent	Excellent
Solvents	Good	Good

MAXIMUM SERVICE TEMPERATURE¹ 250°F intermittent dry, 200°F continuous dry, ambient splash and spill.

POT LIFE/RECOAT TIME

Temp.	Pot Life	Drying Time	Recoat Time
		Touch / Thru.	Min. / Max.
@ 32°F (w/Accelerator)	4 hrs.	2½ hrs. / 10 hrs.	8 hrs. / 48 hrs.
@ 50°F (w/Accelerator)	2 hrs.	4 hrs. / 8 hrs.	4 hrs. / 24 hrs.
@ 75°F	2 hrs.	3 hrs. / 60 hrs.	7 hrs. / 120 hrs.
@ 90°F	1½ hrs.	1 hr. / 5 hrs.	4 hrs. / 12 hrs.

Pot life test on 200 gm. sample; working time in larger quantities will be shorter! (See installation procedure section.)

PACKAGING

1 Gal. Unit	5 Gal. Unit
Resin 11.0 lbs.	Resin 55.0 lbs.
Hardener 2.2 lbs.	Hardener 10.4 lbs.
Accelerator 1.6 oz.	Accelerator 8 oz.

(Accelerator is recommended at temperatures < 50°F.)

BID SPECIFICATION

Concrete or steel shall be primed with a nominal 3 wet mils of KCC Corrosion Control's TECHNI-PLUS E 3 Primer. This primer shall be topcoated with a nominal 5 mils thickness of KCC Corrosion Control's TECHNI-PLUS UR 5. The material shall be applied to substrate prepared in accordance with the manufacturer's specifications.

STORAGE AND SHELF LIFE

TECHNI-PLUS UR 5 components should be stored in cool dry area and out of direct sunlight. Materials are moisture sensitive. Containers must be kept tightly closed.

TYPICAL SHELF LIFE

Temperature	Months
@ 50°F	12
@ 75°F	12
@ 80°-90°F	8

INSTALLATION PROCEDURES

The installation procedures in this bulletin will be as specific as possible. If any questions arise after reading this bulletin, please contact KCC Corrosion Control for more specific information.

• **Equipment Design, Fabrication and Surface Preparation**

Whether the structure is to be protected from the corrosive action of the contents or the contents are to be protected from contamination from the structure's surface, the coating must be continuous. The vessel design must consider the need to eliminate sharp corners, projections, crevices and acute angles and provide access to all surfaces. The design must also minimize movement when in operation.

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Steel

External stiffeners and bracing should be used when acceptable. Internal bracing, dividers, nozzle projections and similar items must have continuous welds, (no skip welding) with weld rippling, undercutting and weld splatter ground smooth. Edges must be ground to a 1/8" radius.

All surfaces to be coated require a "Near White Metal" blast (SSPC-SP-10 or NACE 2), with an abrasive blast media that removes all visible mill scale, existing loose coating and rust. Performance is directly related to the anchor pattern profile and cleanliness of the steel. For atmospheric conditions, splash, spillage and no thermal shock, a 2 mil anchor profile is acceptable.

Concrete

All oil, grease, chemicals, polymeric materials and/or weak laitance should be removed by either mechanical or chemical methods. Mechanical methods such as sandblasting, blastracking or scarifying are the preferred methods. Chemical methods such as acid etching and detergents should be utilized to remove laitance, oil and grease when mechanical methods cannot be utilized.

The concrete should have sufficient tensile strength (250 psi), and be clean and dry. All pits and surface imperfections, sharp corners, undercut areas from forms, honeycombing and bug holes opened up as a result of surface preparation must be filled with a scratch coat compatible with the coating system. It is the physical forcing, by troweling of a scratch coat onto and into the concrete surface that makes it possible to obtain an impervious finished coating. For specific scratch coat material recommendations, contact KCC Corrosion Control. Specific recommendations and testing procedures for surface tensile strength and moisture content are contained in KCC Corrosion Control Specification for Preparation of Concrete to Receive Polymeric Floors or Linings " (SC-01).

- **Mixing and Application**

DO NOT ATTEMPT COATING APPLICATION IF SUBSTRATE TEMPERATURE IS WITHIN 5°F OF DEW POINT OR IF RELATIVE HUMIDITY IS GREATER THAN 95%. DO NOT APPLY UR 5 TO SURFACES ABOVE 100°F OR BELOW 32°F.

If coating concrete surfaces, concrete expels air during the day and intakes air during the night. The best time to apply primer and topcoat is late afternoon or early evening

at which time concrete is least likely to expel air. Shading the work area from sunlight, to minimize the heating of the substrate and elimination of cyclic temperature changes will also reduce expulsion of air.

Resin and Hardener components should be stirred thoroughly prior to mixing Hardener into Resin. Add Hardener to Resin portion and mix 2 minutes using air operated or explosion-proof electric motor driven "Jiffy" type mixer. **ADD THINNER ONLY IF NECESSARY FOR HANDLING!** If plural component spray equipment is used, Resin component must be thoroughly mixed prior to use. Hardener is not added to resin, but mixed in spray equipment at nozzle. Proper ratio is important to ultimate cure and film properties.

APPLICATION METHOD

Brush-Roller: Natural bristle brush, short nap wool or mohair roller with solvent resistant core.

Airless Spray: standard Graco, DeVilbiss or Nordson equipment with 28:1 fluid pump and 0.015" to 0.021" fluid tip orifice.

Conventional, Air-assisted Airless & Electrostatic Spray: Devilbiss, Graco or Binks spray equipment with moisture and oil trap in air line.

TECHNI-PLUS UR 5 may be applied by brush, roller or spray. When spraying with conventional equipment, the pots and lines should be flushed with clean-up solvent immediately after use and after every 3 - 4 batches when temperatures exceed 80°F. Use of 1 pint thinner per gallon will necessitate a minimum of 8 wet mils to yield 5 dry mils.

- **Pot Life** (See values on Page 2)

The pot life or working time of the material is mass sensitive, the larger the volume the shorter the pot life. Do not catalyze more material than can be used within the pot life. The materials should be stored between 65°F and 75°F for 24 hours prior to use for optimum handling properties. If plural component application equipment is used materials are not premixed and pot life is not a factor. Mixing chamber and spray tip must be kept clean and flushed with solvent.

- **Clean-Up**

All mixing equipment, spray equipment and brushes should be cleaned immediately after use. Solvent recommended for clean-up is KCC's 622 Clean-up Solvent. **DO NOT USE ACETONE!**

RECOAT AND TOPCOAT LIMITATIONS

(See table above on page 2). In the event that recoat times are expired, the surface must then be roughened or abraded by light abrasive blasting to remove all shiny surfaces of the product, and then, after wiping all dust from the surface, the product is ready for topcoat application, within 4 - 6 hours.

INSPECTION OF FILM INTEGRITY

During installation of the coating, care should be taken to provide for the correct specified uniform thickness of material by carefully checking at regular, pre-specified intervals, with a wet film thickness gauge.

After allowing adequate cure time based on the actual substrate temperature, the surface should be inspected for runs, sags, foreign matter and under cured areas caused by insufficient hardener quantity, incomplete mixing or low temperature. If under cured areas are found, they must be repaired.

Film thickness on steel structures should be checked with a magnetic dry film thickness gauge.

WARRANTY

For product warranty see KCC Corrosion Control Co., Ltd. *STANDARD TERMS AND CONDITIONS* (U. S. 3/2006 KCC-Sale), stated terms including limitation of liability constitute the total warranty.

The information contained herein is believed to be accurate and reliable but is not to be construed as implying any warranty or guarantee of performance. The suggestions or recommendations and data contained herein are based on laboratory tests and field data that are believed to be accurate and reliable. The suggestions or recommendations of data contained in this bulletin are made without guarantee or representations as to results. We suggest that the user evaluate these suggestions or recommendations in your facility or laboratory or in field testing prior to use. For specific Corrosion Control Co., Ltd. product Limited Warranty and Limitations of Liability see KCC Corrosion Control Co., Ltd. Terms and Conditions of Sale - U.S. 3/2006 KCC - Sale. No statement contained herein shall infer or be construed as granting the right or permission to use, in any manner whatsoever, any patent or intellectual property owned by a KCC company or any KCC affiliate company.

NOTES:

SAFETY

TECHNI-PLUS UR 5 Thinner and Accelerator are flammables, Resin and Hardener are combustibles. All components should be stored in a cool dry place out of direct sunlight and kept tightly sealed and protected from moisture.

When working with any polymers, hardeners and dry aggregate fillers always wear appropriate safety glasses, breathing protection, clothing, and gloves. Any contaminated clothing should be washed prior to being rework. The vapors given off during application and cure should not be allowed to build up. The ventilation should be sufficient to provide several air changes per minute with special consideration for enclosed area. When using these types of materials any sources of ignition should be eliminated within a 50 ft. range.

Material Safety Data Sheets have been supplied with your shipment. KCC Corrosion Control recommends that the personnel applying the materials read and understand these prior to mixing any material. If the resin or hardener are splashed in the eyes flush with clean water for 15 minutes and ***CONTACT A PHYSICIAN. IF INGESTED DO NOT INDUCE VOMITING AND CONTACT A PHYSICIAN.*** All empty containers; bags, cans, bottles and excess material must be properly disposed of in accordance with applicable Federal, State and Local Codes. ***IN EMERGENCY SITUATIONS CONTACT CHEMTREC AT 800/424-9300.***