KCC Coatings

EP 14 TECHNICAL BULLETIN

Revised: August, 2005

95% SOLIDS POLYAMIDE CURED EPOXY COATING SYSTEM

TECHNI-PLUS EP 14 is a 12 to 16 dry mil epoxy polyamide cured, flake-filled, polymer system. EP 14 is designed for use as an interior wall and structural surface coating on metal, concrete or gypsum board. EP 14 is suitable for coating interior structural steel which will be exposed to chemical fumes and concrete sub-floors exposed to occasional spills.

TECHNI-PLUS EP 14 is applied in two 6 to 8 dry mil coats. This system can be sprayed with conventional or airless equipment, brushed or rolled. In order to achieve film build desired, spraying is highly recommended.

TECHNI-PLUS EP 14 has exceptional bond strength to steel, concrete, and gypsum wall board. The product may also be applied in many cases without the use of a primer. EP 14 has good resistance to chemical fumes. This combination of product features allows EP 14 to be used on walls and sub-floors in areas where chemicals are handled. TECHNI-PLUS EP 14 exhibits good fume resistance to dilute inorganic acids, aliphatic and aromatic solvents, alkaline and salt water environments. In dry or atmospheric corrosive situations, TECHNI-PLUS EP 14 resists continuous heat of 250ºF.

RESISTANCE TO WEATHERING

TECHNI-PLUS EP 14 is specially formulated to resist color fade and chalking when exposed to ultraviolet light. However, over time, the color may lose some luster and color, depending on the color selected, and some chalking and yellowing can also occur. These events will not have an adverse effect on overall performance of the coating.

TYPICAL PROPERTIES

Solids Content:		95% Reactive by volume.
Volatile Organic Content:		0.7 lbs. per gallon.
Volume Mix Ratio:		2 parts Resin to 1 part Hardener.
Flash Point: (Pensky-Martens Closed Cup)		Resin > 164°F
		Hardener > 149°F
Thinner:		**DO NOT THIN!**
Weight per Gallon:		11.2 lbs. Mixed.
Coverage for Steel or Gypsum:	(Theoretical)	200 sq. ft. per gallon per coat average when applied at 8 wet mils.
	(Practical)	160 sq. ft. per gallon per coat average when applied at 7 - 9 wet mils yielding 6 to 8 dry mils. Normally applied in two coats to yield 12 to 16 dry mils.
Coverage for Concrete:		Same as above if concrete is dense and primer is used. Porous or unprimed concrete may reduce coverage to 130 to 150 sq. ft. per gallon per coat average at 7.5 to 10 wet mils.
Color:		Light Gray, Medium Gray, Off White, Black. Safety colors and special colors are available, minimum order quantities apply.

PHYSICAL PROPERTIES OF CURED SYSTEM

Tensile Bond Strength (ASTM D1002):	Sandblasted Steel – 2,500 psi.
(ASTM C882):	Concrete - exceeds 500 psi (tensile).
Tensile Strength (ASTM D638):	9,350 psi
Tensile Modulus (ASTM D638):	414,000 psi
Tensile Elongation (ASTM D638):	> 5%
Taber Abrasion (ASTM D4060-90):	78 mg. loss / 1000 cycles with 1000 grams CS - 17 Wheel.
Shore "D" Hardness (ASTM D2240):	75+
Gas Chromatograph Analysis for Volatile Amines & Solvents (70ºF to 200ºF @ 10ºF/min.):	Zero detected

[1] *FOR SPECIFIC RECOMMENDATIONS CONTACT KCC CORROSION CONTROL CO., LTD.*
[2] *IF PROTECTED FROM DIRECT SUNLIGHT.*

CHEMICAL RESISTANCE [1]

Examples of resistance to a wide variety of industrial chemicals in splash, spill, and fume conditions are listed in the table below. Contact KCC Corrosion Control with complete operating service conditions for specific product recommendations.

ACIDS	ALKALINES	SOLVENTS, CHEMICALS
10% Acetic acid	10% Ammonium Fluoride	10% Acetone (F)
10% Acrylic acid	Ammonium Nitrate	Alum (saturated solution)
10% Chromic acid	Ammonium Persulfate	Butyl Cellosolve
Copper Plating acid	Gold Plating Cyanide	Carbon Tetrachloride
20% Hydrochloric acid	30% Hydrogen Peroxide	Ethyl Alcohol
37% Hydrochloric acid (F)	Potassium Chlorate	Formaldehyde
10% Hydrofluoric acid	45% Potassium Chlorate	Isopropyl Alcohol
Nickel Plating solution	50% Sodium Hydroxide	Methyl Alcohol
20% Nitric acid	Sodium Metasulfite (F)	Napthalene
40% Nitric acid (F)	Sodium Sulfide (saturated)	Perchloroethylene
Sodium Chromate	Sulfite Liquor	Phosphorous Oxychloride
70% Sulfuric acid		Phosphorous Trichloride
10% Lactic acid		Potassium Fluoride
		1,1,1 Trichloroethane
(F) = rated for fume exposure only		Toluene

MAXIMUM SERVICE TEMPERATURE [1] 250°F continuous dry (fumes), ambient splash and spill**.**

POT LIFE/RECOAT TIME

Temp.	Pot Life	Recoat Time	
		Minimum	Maximum
@ 50°F	12 hrs.	16 hrs.	7 days [2]
@ 75°F	4 hrs.	7 hrs.	7 days [2]
@ 90°F	2 hrs.	3 hrs.	7 days [2]

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	30 Gal. Unit
Resin 7.4 lbs.	Resin 37.0 lbs.	Resin 222.0 lbs.
Hardener 3.4 lbs.	Hardener 17.0 lbs.	Hardener 102.0 lbs.

BID SPECIFICATION

Concrete, steel or gypsum board may be primed (optional) with a nominal 3 wet mils of KCC Corrosion Control's TECHNI-PLUS E 3 Primer. Topcoat shall be a nominal 12 to 16 mils thickness of KCC Corrosion Control's TECHNI-PLUS EP 14 applied in two 6 – 8 dry mil coats. The material shall be applied to substrate prepared in accordance with the manufacturer's specifications.

STORAGE AND SHELF LIFE

TECHNI-PLUS EP 14 components should be stored in cool dry area and out of direct sunlight. The hardener is a ***POLYAMIDE*** and ***SHOULD NOT BE STORED NEAR PEROXIDES.***

TYPICAL SHELF LIFE

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

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 structure's 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.

[2] *IF PROTECTED FROM DIRECT SUNLIGHT.*

Steel and other Metals
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 spatter ground smooth. Edges must be ground to a 1/8" radius. All metal surfaces to be coated require a "Near White Metal" blast to SSPC-SP-10 or NACE 2, with an abrasive blast media that removes all visible mill scale, existing coating and rust. Performance is directly related to the anchor pattern profile and cleanliness of the steel. For splash, spillage and no thermal shock, a 2 mil anchor profile is acceptable.

Gypsum
Surfaces should be clean; dust and oil free. Coating may be applied directly without primer, however use of primer may improve coverage rate of first coat.

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%.

When 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 the concrete is least likely to expel air. Other precautions such as 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.

Both components should be stirred thoroughly prior to mixing Hardener into Resin. Add Hardener to Resin portion and mix approximately 2 minutes. ***DO NOT THIN!*** **At temperatures below 65ºF and/or humidity conditions above 80% RH, allow the mixed product to stand (induct) for 10 to 15 minutes prior to application.** Plural component spray equipment is not recommended in these situations due to the need for mixed induction time.

APPLICATION METHOD

Brush-Roller: Natural bristle brush, short nap wool or mohair roller.
Spray: Refer to KCC Recommended Practice Bulletin: RP-01, Spray Application Methods and Equipment.

TECHNI-PLUS EP 14 may be applied by brush, roller or spray. When spraying with conventional equipment, the pots and lines should be flushed with solvent after every 3 to 4 batches when temperatures exceed 80°F.

- **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. Plural component application equipment is not recommended due to requirement for mixed product induction time.

- **Clean-Up**

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

RECOAT AND TOPCOAT LIMITATIONS

The maximum recoat time for all KCC Products exposed to direct sunlight (ultraviolet light) is 2 days. This time period can be extended to 7 days by protecting the product from exposure to direct sunlight. In the event that either of above 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 to 6 hours.

CURE TIME

The cure time is dependent on temperature of the substrate. The ambient air temperature may not be the temperature of the substrate, i.e. direct sunlight will heat substrate to higher temperature than ambient air. In winter, substrate may be colder than ambient air. The substrate temperature should be measured and dew point calculated prior to coating.

		Time To Complete Cure For Chemical Service	Time to Cure For Handling
If substrate maintained:	@ 50°F	6 days	48 hrs.
	@ 75°F	4 days	24 hrs.
	@ 90°F	24 hrs.	12 hrs.

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.

SAFETY

CAUTION: Exposure of this product to concentrated nitric acid, above 70% concentration, is not recommended, as a nitration reaction may result, with potential hazard of fire or explosion. This does not mean the product is recommended for concentrations of nitric acid up to 70%. [1]

TECHNI-PLUS EP 14 Resin is combustible, containing epoxy resins and aromatic solvents.

TECHNI-PLUS EP 14 Hardener is combustible and corrosive, containing ***POLYAMIDES*** *(KCC Red Label)* and ***SHOULD NOT BE STORED NEAR PEROXIDES*** (*KCC Yellow Label*). All components should be stored in a cool dry place out of direct sunlight.

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 reworn. 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 is 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.***

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.**