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100% SOLIDS AMINE ADDUCT CURED EPOXY COATING/LINING SYSTEM

TECHNI-PLUS AEP 20 is a 100% reactive solids, high performance, amine adduct cured epoxy coating/lining that is flake filled for permeation resistance and is designed for use as an immersion lining system, a light to moderate traffic flooring system and corrosion resistant coating or lining membrane on concrete or steel. The newest version of this excellent product, AEP 20.2, bonds well to damp surfaces and resists blush even when cured at low temperatures and high humidity. AEP 20.2 is uniquely formulated to resist waterspotting within 24 hours of application when cured at or above 50°F. AEP 20.2 will cure well at temperatures as low as 30°F with LTC additive. TECHNI-PLUS AEP 20 FDA version (available upon request) meets FDA and USDA requirements for use in food processing and storage areas.

TECHNI-PLUS AEP 20 is easily applied by spray, roller or brush, has a long pot life and a convenient 2 to 1 mix ratio both by volume and by weight. The film permeability of the system is extremely low, in the range of ten times lower than conventional high build epoxy coatings. High bond strength to steel and concrete combined with exceptional abrasion resistance makes the TECHNI-PLUS AEP 20 system an ideal choice as a protective lining for secondary containment areas, chemical and waste treatment areas, crude oil and refined product storage, offshore structures, and other areas

subject to fumes, splash and spillage of a variety of chemicals. *Newest version, AEP 20.2 replaces both original AEP 20 and AEP 20.1.* Skydrol / hydraulic fluid resistance is an important feature of AEP 20.2 and it is a superior choice for aircraft maintenance and assembly facility floors, sumps and trenches. AEP 20 is also available in a graphite filled version, AEP 20 G. AEP 20 Clear Coat is recommended for low concentration caustic exposures and is applied at 5 to 10 mils over flake filled, pigmented basecoat. Special Silicone Free (SF) version is also available upon request. AEP 20 MR mat reinforced version incorporates EP 125 basecoat and 1 oz. or 1.5 oz. chopped strand fiberglass mat beneath AEP 20 topcoat(s). Abrasion resistant aluminum oxide filled versions formerly known as AEP 20, AR & AR3 have been replaced by AEP 18 AR (see separate Technical Information bulletin).

RESISTANCE TO WEATHERING

TECHNI-PLUS AEP 20 is specially formulated to resist color fade and chalking when used outdoors in UV light. However certain colors may lose some luster over time and some chalking may also occur. These events will not adversely affect the overall performance of coating system in chemical containment applications.

CHEMICAL RESISTANCE^{1, 2}

TECHNI-PLUS AEP 20 system typically surpasses the chemical resistance properties of conventional epoxy coatings. It is recommended for immersion service up to 130°F in many corrosive environments. In splash and spill conditions, TECHNI-PLUS AEP 20 performs at up to 200°F (see partial list of chemicals below), and up to 350°F in dry environments. Contact KCC Corrosion Control with complete operating service conditions for specific product recommendations.

ACIDS	ALKALINES	SOLVENTS, CHEMICALS
1-20% Acetic	All Pulp Liquors	Animal & Mineral Oils
Chrome Plating Solution	1-20% Ammonium Hydroxide	Fuels (gasoline, kerosene, jet fuels)
1-12.5% Chromic	1-5% Calcium Hypochlorite	Hydraulic fluids (Skydrol)
1-37% Hydrochloric	Copper Cyanide Plating	Isopropyl Alcohol
1-20% Hydrofluoric ²	Gold Plating Cyanide	Lubricating Oils
Nickel Plating	1-30% Hydrogen Peroxide	Methyl Alcohol (limited ¹)
1-40% Nitric	1-50% Potassium Hydroxide ²	Sour and Sweet Crude Oils
1-85% Phosphoric	1-50% Sodium Hydroxide ²	Toluene
1-80% Sulfuric	1-12% Sodium Hypochlorite	Xylene

MAXIMUM SERVICE TEMPERATURE¹ 350°F dry, 200°F for Splash/Spillage, 130°F for Immersion.

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

² TECHNI-PLUS AEP 20 G OR CLEAR COAT USED FOR HYDROFLUORIC ACID AND LOW CONCENTRATIONS OF HYDROXIDES.

TYPICAL PROPERTIES

Solids Content:.....	100% Reactive
Volatile Organic Content:	Zero
Volume Mix Ratio:	2 parts Resin to 1 part Hardener
Flash Point: (Pensky-Marten Closed Cup).....	AEP 20 Resin> 300°F AEP 20 Hardener> 225°F
Viscosity:	5,000 cps @ 77°F (mixed)
Thinner:.....	DO NOT THIN!
Weight per Gallon:.....	11.8 lbs. + 0.2 (mixed)
Coverage for Steel:	(Theoretical) ... 80 sq. ft. per gallon at 20 wet mils (Practical) 72 sq. ft. per gallon at 20 wet mils
Coverage for Concrete:.....	Same as above if concrete is dense and primer is used. Porous or unprimed concrete may reduce coverage to 65 sq. ft. per gallon or less.
Color:	Medium Gray, Off White and Tile Red are standard; safety colors and limited special colors are available with minimum quantity order.
.....	AEP 20G is available in black (charcoal gray) only.

PHYSICAL PROPERTIES OF CURED SYSTEM

Compressive Strength (ASTM D-695):	25,850 psi
Tensile Strength (ASTM D-638):	9,300 psi
Bond Strength to Steel (ASTM D-1002):	1,920 psi
Bond Strength to Concrete (ASTM C-882):	> tensile strength of concrete; breaks 5000 psi concrete.
Tensile Modulus (ASTM D-638):	418,000 psi
Impact Resistance (ASTM D-256, Method A):	0.32 ft-lb./in
Shore "D" Hardness (ASTM D-2240):	74+
Abrasion Resistance (ASTM D 4060):	AEP 20: 75 mg loss/1000 cycles Tested for 1000 cycles with 1000 grams and CS-17 wheel (Taber Test).

POT LIFE/RECOAT TIME

Temp.	Pot Life	Recoat Time	
		Minimum	Maximum
@ 30°F (w/LTC)	120 min.	40 hrs.	7 days ³
@ 50°F	120 min.	20 hrs.	7 days ³
@ 75°F	60 min.	10 hrs.	7 days ³
@ 90°F	30 min.	6 hrs.	7 days ³

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

PACKAGING

TECHNI-PLUS AEP 20.2 is packaged in pre-measured unit as follows:

1 Gal. Unit	5 Gal. Unit	30 Gal. Unit
Resin 7.3 lbs.	Resin 36.5 lbs.	Resin 219.0 lbs.
Hardener 3.75 lbs.	Hardener 18.7 lbs.	Hardener 112.0 lbs.**
*LTC 0.4 lbs.	*LTC 2.0 lbs.	*LTC 12.0 lbs.

Notes: **Hardener for 30 gallon unit in multiple containers (2 x 5 gallon pails). * LTC additive is used only when low temperature cure (<50°F) is required.

BID SPECIFICATION

Concrete or steel may be primed (optional) with a nominal 3 wet mils of TECHNI-PLUS E 3 Primer (required for surfaces to be scratch coated). Epoxy Scratch Coat shall be applied as needed to fill pits or "bug holes". TECHNI-PLUS AEP 20 shall be applied at 20 wet mils per coat by spray or roller. On horizontal traffic surfaces, 20 x 40 mesh dry round silica or 30 x 50 mesh flintshot shall be broadcast into the wet first coat until the surface appears dry, swept after cured, and topcoated with 15 to 20 wet mils of TECHNI-PLUS AEP 20, depending on non-slip finish desired. TECHNI-PLUS AEP 20 MR mat reinforced version incorporates troweled EP 125 basecoat and 1 oz. or 1.5 oz. chopped strand fiberglass mat beneath AEP 20 topcoat(s). The materials shall be applied in accordance with the manufacturer's specifications.

STORAGE AND SHELF LIFE

TECHNI-PLUS AEP 20 components should be stored in cool dry area and out of direct sunlight. The hardener is an **AMINE** and **SHOULD NOT BE STORED NEAR PEROXIDES!**

³ IF PROTECTED FROM DIRECT SUNLIGHT.

TYPICAL SHELF LIFE

Temperature	Months
@ 50°F	18
@ 75°F	12
@ 80°-90°F	6

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 vessel is to be protected from the corrosive action of the contents or the contents are to be protected from contamination from the vessel 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.

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. To facilitate the coating application, nozzles should have a larger diameter, (4" minimum) and short pipe nipple length. Nozzles smaller in diameter or with long pipe nipple lengths should be made of any alloy or utilize a fiberglass plastic nozzle insert. Threaded fittings must be avoided or made of alloy suitable to resist the corrosive contents.

All surfaces to be coated require a "White Metal" blast to SSPC-SP-5 or NACE 1, with an abrasive blast media that removes all visible mill scale, existing coating and rust. Performance is directly related to the anchor patten profile and cleanliness of the steel. For immersion service conditions, highly corrosive environments and thermal shock, the steel substrate should be clean, dry and have a minimum anchor profile of 3 mils. For less severe conditions, non-immersion service, splash, spillage and no thermal shock, a 2 mil anchor profile with a "Near White Metal" blast to SSPC-SP-10 or NACE 2, 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 only 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 repaired by "scratch 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's Specification SC-01 "Preparation of Concrete for Thermoset Polymer Systems."

Reference Documents: *National Association of Corrosion Engineers (NACE) Standard RP0178-89, "Fabrication Detail, surface Finish Requirements, and Proper Design Considerations for Tanks and Vessels to be Lined for Immersion Service."*

Steel Structures Painting Council (SSPC), Volume 1, Chapter 14.2, "The Lining of Steel Tanks."

- **Mixing and Application**

DO NOT ATTEMPT MATERIAL APPLICATION IF SUBSTRATE TEMPERATURE IS WITHIN 5°F OF DEW POINT OR IF RELATIVE HUMIDITY IS GREATER THAN 95%.

If coating concrete surfaces, concrete expels air during the day and intakes air during the night. The best time to apply coating is late afternoon or early evening at which time 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 temperatures changes will also reduce expulsion of air. Use of primer is optional, although it may minimize air expulsion from concrete. 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!** If plural component spray equipment is used, both components must be thoroughly stirred. Hardener is not added to resin, but mixed in spray equipment at nozzle. Proper ratio is important to ultimate cure and film properties.

TECHNI-PLUS AEP 20 is applied at a nominal 20 mil thickness in a single coat. On horizontal traffic surfaces, 20 x 40 mesh dry round silica or 30 x 50 mesh flintshot shall be broadcast into the wet first coat until the surface appears dry, swept after cured, and topcoated with 10 to 20 wet mils of TECHNI-PLUS AEP 20, depending on non-slip finish desired.

APPLICATION METHODS

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 AEP 20 may be applied by brush, roller or spray. When spraying with conventional equipment, the pots and lines should be flushed with KCC's 622 Clean Up Solvent after ever 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.

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 or concrete to higher temperature than ambient air. In winter, substrate or concrete may be colder than ambient air. The substrate temperature should be measured and dew point calculated prior to coating.

Time To Complete Cure

If substrate maintained:	@ 50°F.....	72 hrs.
	@ 75°F.....	48 hrs.
	@ 90°F.....	18 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.

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 KCC 622 Solvent.

• **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 TECHNI-PLUS AEP 20 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. Aged AEP 20 may be topcoated after abrasive blasting by use of EN Tie Coat.

Film thickness on steel structures should be checked with a magnetic dry film thickness gauge. Coatings to be subjected to immersion service should be tested for minute discontinuities (pin holes) using a high voltage DC holiday detector, set at no more than 100 volts per mil of the film thickness being tested.

Coatings on concrete surfaces may be checked for continuity by spark testing if so desired. If coating is to be spark tested, a conductive primer must be used on the concrete (TECHNI-PLUS E 3 C) in place of the standard primer, TECHNI-PLUS E 3. Follow test procedures for completed coating outlined above.

Reference Documents: *Steel Structure Painting Council* (SSPC), Volume 1, Chapter 14.2, "The Lining of Steel Tanks", Section VIII, Inspection.

National Association of Corrosion Engineers (NACE), Standard RP0188-88, "Discontinuity (Holiday) Testing of Protective Coatings" and Standard RP0288-88, "Inspection of Linings on Steel and Concrete."

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%.

TECHNI-PLUS AEP 20 Resin is combustible, containing epoxy resins and diluents. TECHNI-PLUS AEP 20 Hardener contains *AMINES* (*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

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 in this bulletin 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 of data contained in this bulletin are made without guarantee or representation as to results. We suggest that the user evaluate these suggestions or recommendations in your facility, laboratory or in field testing prior to use. For specific KCC 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 other intellectual property owned by any KCC company or any KCC affiliate company.

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 areas. 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.***

NOTES: