

Revised: October 2006

1/8 INCH WOVEN CLOTH REINFORCED POLYESTER LINING/FLOORING SYSTEM

TECHNI-PLUS PB 125CR is a corrosion resistant lining or floor topping with excellent chemical and wear resistance based on advanced polyester technology, peroxide cured and filled with blended silica aggregate. TECHNI-PLUS PB 125CR is a 1/8 inch system reinforced with 10 oz. woven glass cloth saturated with TECHNI-PLUS P 3 Primer. TECHNI-PLUS PC 125CR version is specially designed for concentrated nitric and chromic acid spillage. Graphite filled versions "G" is used for Fluoride and low concentration caustic soda exposure conditions.

Abrasion resistant "AR" version (PC 125CR/AR) is also available for highly abrasive environments.

TECHNI-PLUS PB125CR functions as a monolithic flooring designed to withstand a broad range of chemicals including splash and spillage of acids, alkalis and solvents. TECHNI-PLUS PB 125CR functions as a lining designed to withstand a broad range of chemicals in immersion at elevated temperatures. The short cure time of PB 125CR results in minimum downtime and the reinforcement layer offers resistance to thermal cycling.

CHEMICAL RESISTANCE ¹

PC 125CR version is recommended for concentrated nitric and chromic acid exposures. Examples of chemical resistance for immersion services are listed. In flooring applications, the system will generally withstand higher concentrations. Contact KCC Corrosion Control with complete operating service conditions for specific recommendations.

ACIDS	ALKALINES	SOLVENTS, CHEMICALS
glacial Acetic	1-29% Ammonium Hydroxide	Carbon Tetrachloride
1-30% Chromic ²	Black Liquor (pulp)	Formaldehyde
1-37% Hydrochloric	1-30% Hydrogen Peroxide	Isopropyl Alcohol
1-70% Hydrofluoric ³	1-50% Potassium Hydroxide	Methyl Ethyl Ketone
1-60% Nitric ²	1-10% Sodium Hydroxide ⁴	Naphtha
1-85% Phosphoric	10-50% Sodium Hydroxide	Perchloroethylene
1-75% Sulfuric	White Liquor (pulp)	Salt Brine (sodium chloride)

MAXIMUM SERVICE TEMPERATURE ¹ 300°F for Splash/Spillage, 160°F for Immersion. If using PB 40.1 Polymer System, Immersion Temperature is 210°F. System with PB 40.1 Polymer is called PB 125.1 CR. See PB 40.1 Coating for chemical resistance that is applicable to PB 125.1 CR.

PHYSICAL PROPERTIES OF CURED SYSTEMS

Compressive Strength (ASTM C579A-82): 12,000 psi
 Flexural Properties (ASTM C580-85):
 Strength:..... 2,900 psi
 Modulus of Elasticity:..... 2.0 X 10⁶ psi
 Tensile Strength (ASTM C307-83): 2,400 psi
 Tensile Bond Strength: Concrete - exceeds 500 psi tensile.
 Taber Abrasion AR3 sysem (ASTM D 4060): 17 mg. loss/1000 cycles with 1000 gms. CS - 17 Wheel.
 Water Absorption (ASTM C413-83):..... + 0.05 %
 Moisture Permeability (ASTM E96-85): 0.0019 perm-inch

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

² PC 125 CR IS RECOMMENDED FOR NITRIC AND CHROMIC ACIDS.

³ PB 125 CR (G) IS RECOMMENDED FOR HYDROFLUORIC ACID.

⁴ PB 125 CR (G) IS RECOMMENDED FOR LOW CONCENTRATION HYDROXIDES.

TYPICAL PROPERTIES

Solids Content:	100% Reactive polyester.
Volatile Organic Content:	0.45 lbs. per gallon; basecoat and topcoat mortar.
Liquids Mix Ratio by Volume:	2 fl. oz. hardener per gallon of resin.
Mortar Mix Ratio by Weight:	2.8 parts powder; 1 part mixed resin and hardener.
Flash Point: (Pensky-Martens Closed Cup)	PB 125 CR Resin > 80°F
	PC 125 CR Resin > 80°F
	Hardener 2 C (MEKP) > 137°F
Viscosity:	200-300 cps @ 73°F.
Thinner:	DO NOT THIN!
Weight per Gallon:	13.2 lbs. Resin, Hardener, Powder Mix; 9.1 lbs. Resin, Hardener.
Color:	Gray is standard. Graphite "G" version is Black. Minimum quantities apply for special colors.

ESTIMATING AND ORDERING

**Priming with TECHNI-PLUS P 3
COVERAGE**

<u>Concrete</u>	<u>Steel</u>
150 sq. ft./ 1 gal. unit	300 sq. ft./ 1 gal. unit
750 sq. ft./ 5 gal. unit	1500 sq. ft. / 5 gal. unit

PB 125 CR Basecoat/ Saturant/ Topcoat Resin & Hardener Unit

90 sq. ft./ 5 gal. unit @ 0.125 inches thick

PC 125 CR Basecoat/ Saturant/ Topcoat Resin & Hardener Unit

90 sq. ft./ 5 gal. unit @ 0.125 inches thick

Lining Powder #4 for Basecoat and Topcoat

35 sq. ft./ 35 lb. bag @ 0.125 inches thick

Lining Powder G - For Graphite (G) Version Only

40 sq. ft./ 35 lb. bag @ 0.125 inches thick

Lining Powder AR - For AR Version Topcoat Only

(Add 9 lbs. to each 24 lbs. of Lining Powder. #4 in topcoat)

385 sq. ft / 50 lb. bag mixed with Lining Powder. #4

P/VE Finishing Liquid:

250 - 400 sq. ft./gallon

Cloth Reinforcement:

Order sq. ft. needed + 10%

PACKAGING

TECHNI-PLUS P 3

1 Gal. Unit	5 Gal. Unit
Resin 8.1 lbs.	Resin 40.5 lbs.
Hardener 2 C 2.0 fl. oz.	Hardener 2 C 10.0 fl. oz.

PB 125 CR Basecoat, Saturant & Topcoat Resin and Hardener

2 Gal. Unit	5 Gal. Unit
Resin 9 lbs.	Resin 45.0 lbs. each
Hardener 2 C 2.0 fl. oz.	Hardener 2 C 10.0 fl. oz.

PC 125 CR Basecoat, Saturant & Topcoat Resin and Hardener

2 Gal. Unit	5 Gal. Unit
Resin 9 lbs.	Resin 45.0 lbs. each
Hardener 2 C 2.0 fl. oz.	Hardener 2 C 10.0 fl. oz.

**For Graphite - "G" version:
substitute following Hardener**

- 1 - bottle Hardener 2 C 16.0 fl. oz. for 5 gal. unit
- 1 - bottle Hardener 2 C 3.2 fl. oz. for 1 gal. unit

**Basecoat and Topcoat Powder
Lining Powder #4 - 35 lb. Bag**

**For "AR" version: (used in Topcoat only)
Lining Powder AR - 50 lb. Bag**

**For "G" version: (used in Basecoat & Topcoat)
Lining Powder G - 35 lb. Bag**

BID SPECIFICATION

Substrate shall be primed with a nominal 3 wet mils of KCC Corrosion Control's TECHNI-PLUS P 3 Primer. The substrate shall be protected with a nominal 1/8 inch thickness of KCC Corrosion Control's TECHNI-PLUS PB 125 CR, consisting of a nominal 1/16 inch Basecoat reinforced with 10 oz. woven glass cloth saturated with TECHNI-PLUS P 3 Primer and a nominal 1/16 inch Topcoat. The materials shall be applied to substrate prepared in accordance with the manufacturer's specifications.

STORAGE AND SHELF LIFE

The shelf life of the powder is indefinite provided it is stored in a cool dry place. The hardeners are **PEROXIDES** (KCC Yellow Label) and **SHOULD NOT BE STORED NEAR AMINES** (KCC Red Label). The shelf life of the resins and hardeners are:

TYPICAL SHELF LIFE

	P 3	PB 125/PC 125
Temperature	Months	Months
@ 50°F	4-6	5-6
@ 75°F	2-4	3-5
@ 80°-90°F	1	1

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.

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

- 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 lining 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, etc. must have continuous welding (no skip welding) with weld rippling, undercutting and weld spatter ground smooth. Edges must be ground to a 1/8" radius. To facilitate the lining application, nozzles should have a large diameter (4" minimum) and short pipe nipple length. Nozzles smaller in diameter or with long pipe nipple lengths should be made of an alloy or utilize a Fiberglass Plastic nozzle insert. Threaded fittings must be avoided or be of an alloy suitable to resist the corrosive contents.

All surfaces to be lined require a white metal blast to SSPC-SP-5 or NACE 1 specification with a blast media that removes all visible mill scale and rust. Performance is directly related to the anchor pattern profile and cleanliness of the steel. For immersion service conditions, highly corrosive environments and thermal shock, the substrate should be clean, dry and have a minimum anchor profile of 3 mils.

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, blasttracking or scarifying are the preferred methods. Chemical methods such as acid etching and detergents should be utilized to remove oil and grease or 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's Specification (SC-01).

Reference Documents: *National Association of Corrosion Engineers Standard* (NACE) 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

• **Priming the Substrate**

If lining concrete surfaces, concrete expels air during the day and intakes air during the night. The best time to apply primer and basecoat 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 temperature changes will also reduce expulsion of air.

TECHNI-PLUS P 3 Primer should be used for TECHNI-PLUS PB 125 CR System. Primer should be applied to the concrete at a thickness of 3 wet mils. The hardener should be added to the mixed resin and mixed for approximately 2 minutes. The primer can be applied by brush, roller or spraying. Specific instructions are contained in the TECHNI-PLUS P 3 Primer bulletin.

When installing PB 125 CR the basecoat should not be installed over very rough or porous concrete unless either a fill material or scratch coat has been installed. The slurry coat should not exceed ¼ inch thickness. A fill material would be recommended for any thicknesses over ¼ inch. Contact KCC Corrosion Control or recommendations if there is any question about the roughness or texture of the concrete. The primer or slurry coat should be allowed to cure before proceeding to the next installation step.

• **Mixing of Basecoat/Topcoat Materials**

The units of PB 125 CR should be mixed in a mortar mixer. First the Hardener 2 C should be added to the resin in the pail and mixed approximately 3 - 5 minutes with a jiffy type mixer on a slow speed drill. For each 5 gallon pail of the combined mix of resin and hardener, 3½ bags (120 lbs.) of powder are added while the mixer is running. The mixing should continue until the powder is completely wet out and no dry spots remain. Smaller mixes can be made by using a one gallon unit of PB 125 CR or PC 125 CR (Resin and Hardener) with one bag 24 lbs. of Lining Powder #4. Bucket mixers are efficient for such small mixes.

For Graphite "G" version, four (4) bags of Lining Powder G are used with the 5 gallon unit of resin. For "AR" version, topcoat mixture is modified by adding 9 lbs. of Lining Powder AR to each 24 lbs. of Lining Powder #4 used in the mix. Quantity of Lining Powder #4 used in mix may vary according to site.

• **Working Time**

The 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. At ambient temperature above 90°F, best results are obtained when the catalyzed material is poured into smaller containers reducing the mass. When ambient temperatures exceed 80°F the pot life can be extended by cooling the materials. The materials should be stored between 65°F and 75°F for 24 hours prior to use of optimum handling properties.

Working Time of Mixed Units (mortar)

@ 50°F	90 min.
@ 75°F	60 min.
@ 90°F	30 min.

NOTE: Working time of mixed resin and hardener without lining powder is reduced by half.

• **Application**

The mixed basecoat should be troweled onto the cured P 3 Primer or Scratch Coat at a thickness of 1/16 inch. The basecoat should be applied in sections wide enough to be covered with the cloth in one pass. Do not trowel more material than can be embedded with cloth and saturated prior to the basecoat hardening.

The 10 oz. woven glass cloth should be rolled into the wet basecoat and saturated with P 3 Primer utilizing a short nap roller and a steel ribbed roller. The cloth should be saturated so no white or dry spots remain. The cloth should be overlapped a minimum of 1 inch. When ending for the day the cloth should be embedded and saturated in all the basecoat applied. Starting the next day trowel a ½"-2" wide overlap section of basecoat over the cured saturated cloth and then begin troweling basecoat on the cured P 3 Primer or Slurry Coat. The cloth is rolled into the ½"-2" wide section and then applied as previously stated.

When the basecoat and saturated cloth layer is cured the surface should be checked for air pockets or other imperfections. These imperfections should be cut out and repaired; the seams should be ground down with a sander or grinder.

The topcoat units are mixed in the same manner as the basecoat units. The topcoat is troweled at a nominal 1/16 inch thickness. The surface of the topcoat can be smoothed with a brush dampened with P/VE Smoothing Liquid. For AR topcoat, 9 lbs. of Lining Powder AR is added for each 24 lbs. of Lining Powder #4 in the topcoat mix. Topcoat may be smoothed while wet by brush applying small amounts of KCC's P/VE Smoothing Liquid. **DO NOT FLOOD SURFACE!**

CURE TIME OF COMPLETED SYSTEM

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. Substrate temperatures below 50°F will retard curing.

Time To Complete Cure

For minimum chemical service/foot traffic

If substrate is maintained:	@ 50°F.....	24 hrs.
	@ 75°F.....	16 hrs.
	@ 90°F.....	8 hrs.

For full chemical service/fork lift traffic

If substrate is maintained:	@ 50°F.....	72 hrs.
	@ 75°F.....	48 hrs.
	@ 90°F.....	24 hrs.

CAUTION: Styrene fumes are offensive to personnel and heavier than air, therefore, it is necessary to maintain sufficient ventilation in closed areas to meet OSHA regulations, and to continuously ventilate closed areas such as tanks, pits and trenches to keep the working environment safe, and prevent styrene fumes from being trapped and building up, which will prevent the proper cure of the product.

INSPECTION OF FILM INTEGRITY

During installation of the lining, care should be taken to provide for the correct specified uniform thickness of material by carefully checking at regular, pre-specified intervals, with guide bars or by using 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

• **Clean-Up**

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

RECOAT AND TOPCOAT LIMITATIONS

It is important that basecoat be fully cured prior to topcoat application and equally important that the basecoat is not exposed for a long period prior to topcoating. Minimum recoat time between basecoat and topcoat is 6 hours at 75°F. Maximum allowable time between basecoat and topcoat application is 3 days @ 75°F.

insufficient hardener quantity, incomplete mixing or low temperatures. 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. Linings 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.

Linings on concrete surfaces may be checked for continuity by spark testing if so desired. If a lining is to be spark tested, a conductive primer must be used on the concrete in place of standard primer. Follow test procedure for completed coating outlined above.

Reference Documents: *Steel Structures 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

TECHNI-PLUS PB 125 CR and P 3 Primer resin is flammable, polyester resins containing styrene. The hardeners are **PEROXIDES** (*KCC Yellow Label*) and **SHOULD NOT BE STORED NEAR AMINES** (*KCC Red Label*). Finishing Liquid P/VE is a flammable solvent blend. 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 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:

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 turn over the air 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, as well as product labels, 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.**