C&B PIPING, INC.

P.O. Box 942
Leeds, AL 35094
(205) 699-0455

www.cbpiping.com

C&B Piping Coating Submittal

Exterior Coating:	Perma-Glaze Series G435 Epoxy
Manufacturer:	Tnemec
Surface Prep:	Remove oil, grease, and other surface contaminants per NAPF 500-03-01 Abrasive blast clean per NAPF 500-03-04 for pipe, NAPF 500-03-05 for cast fittings
Thickness:	20 mils Nominal DFT

Notes:

- C&B Piping applies this coating per the Tnemec recommendations specific to ductile iron.
- In order to achieve the 20 mils Nominal DFT for this system, C&B Piping may apply additional thickness within the guidelines published in the Tnemec PDS attached.
- Final thickness will be checked and certified in the shop by C&B Piping per SSPC PA2 TABLE A7 pipe example attached.
- C&B Piping will perform shop holiday detection testing and provide certification. After products leave our shop facility and while not in our direct control, piping will be exposed to physical and environmental changes that can result in failed holiday testing in the field. C&B Piping does not participate in such testing and/or remediation of issues if required.

Handling & Storage:

- Careful handling and effective storage are critical in limiting physical and environmental damage to the coating. Coatings exposed to weather and/or chemical exposure will limit the maximum recoat window and potentially cause adhesion issues.
- C&B Piping will use padded forks and/or nylon slings for loading/packaging to limit scuffing. C&B Piping will use padded dunnage and chocks or rubber separators for pipes. C&B will use padding under the truck straps to limit strap markings on the coating. Palletized products will use separators and padding as necessary to limit scuffing. Pallets will be shrink wrapped with plastic. These methods will reduce the amount of paint scuffing, but cannot fully eliminate all exposure to minor scuffs during transit.
- Contractor must use Nylon Slings or Padded Forks for unloading and movement. Nylon slings are best.
- All products should be stored off the ground on wood dunnage with padding, chocks, and separators in place. Carpet, Foam, or Cardboard are commonly used forms of padding.

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- All products should be stored out of the weather or protected from the weather.
- If field top coating is required, C&B Piping recommends final top coat be applied within 28 days of delivery to jobsite, or shorter if the project specifications require.
- Contractor must repair minor and normal scuff damage. C&B Piping will provide price and availability of repair kits for field repair if requested.

TNEMEC

PRODUCT DATA SHEET

PERMA-GLAZE SERIES G435

PRODUCT PROFILE

GENERIC DESCRIPTION Modified Polyamine Epoxy

COMMON USAGE A versatile, thick film, 100% solids, abrasion-resistant lining specifically designed for domestic wastewater immersion and fume environments. Series 435 provides low permeation to H_2S gas, protects against MIC and provides chemical resistance to severe wastewater environments. Contains micro-fiber reinforcement for improved film integrity.

COLORS 5020 Gray, ~~5023 Beige~~. **Note:** Epoxies chalk with extended exposure to sunlight.

FINISH Gloss

COATING SYSTEM

SURFACER/FILLER/PATCHER Series 215, 217, 218.

PRIMERS **Steel:** Self-priming or Series 61, L69, L69F, N69, N69F, V69, V69F. **Note:** Series 61 is recommended for use in mesophilic anaerobic digesters and other severe exposures. Contact your Tnemec representative for more information. **Note:** Series 61, L69, L69F, N69, N69F, V69, or V69F must be scarified after 7 days before topcoating with G435.
Concrete: Self-priming or Series 61, N69, N69F, 201. **Note:** Series 201 must be scarified after 24 hours before topcoating with G435. **Note:** Series 61, N69, or N69F must be scarified after 7 days before topcoating with G435. **Note:** Series 61 is recommended for use in mesophilic anaerobic digesters and other severe exposures. Contact your Tnemec representative for more information.

INTERMEDIATE Series 434 or 436 (optional)

Note: To minimize pinhole formation in the topcoat, it is recommended that concrete substrates be fully resurfaced and/or primed prior to topcoat application.

SURFACE PREPARATION

Prepare surfaces by method suitable for exposure and service. Refer to the appropriate primer data sheet for specific recommendations.

STEEL ~~SSPC-SP5/NACE 1 White Metal Blast Cleaning with a 3.0 mil minimum angular anchor profile.~~

CONCRETE ~~Allow new cast-in-place concrete to cure a minimum of 28 days at 75°F (24°C). Verify concrete dryness in accordance with ASTM F 1869 "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride" (moisture vapor transmission should not exceed three pounds per 1,000 square feet in a 24 hour period), F 2170 "Standard Test Method for Determining Relative Humidity in Concrete using in situ Probes" (relative humidity should not exceed 80%), or D 4263 "Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method" (no moisture present). Prepare concrete surfaces in accordance with NACE No. 6/SSPC-SP13 Joint Surface Preparation Standards and ICRI Technical Guidelines. Abrasive blast, shot blast, water jet or mechanically abrade concrete surfaces to remove laitance, curing compounds, hardeners, sealers and other contaminants and to provide a minimum ICRI CSP 5 surface profile. Large cracks, voids and other surface imperfections should be filled with a recommended filler or surfacer.~~

OTHER SUBSTRATES Contact your Tnemec representative or Tnemec Technical Services.

ALL SURFACES Must be clean, dry and free of oil, grease and other contaminants.

TECHNICAL DATA

VOLUME SOLIDS 100% (mixed)

RECOMMENDED DFT **Steel:** 15.0 to 40.0 mils (380 to 1015 microns) in one or two coats.
Concrete: 30.0 to 40.0 mils (760 to 1015 microns) in one or two coats.
High-Build Option: 40.0 to 125.0 mils (1015 to 3175 microns) in one or two coats.
Glaze Coat Option (over Series 434 or 436): 15.0 to 20.0 mils (380 to 510 microns).
Note: Number of coats and thickness requirements will vary with substrate, application method, and exposure. Contact your Tnemec representative.

CURING TIME

Temperature	To Touch	Dry Through	To Place in Service	Max. Recoat
75°F (24°C)	3 hours	14 hours	2 days	7 days
55°F (13°C)	7 hours	30 hours	3 days	7 days

Note: If more than 7 days have elapsed between coats, the Series 435 coated surface must be mechanically abraded before topcoating. Curing time will vary with surface temperature, air movement, humidity and film thickness. **Note:** Use "To Touch" cure information for minimum recoat times if succeeding coats are spray-applied and "Dry Through" if succeeding topcoats are applied by roller or brush.

VOLATILE ORGANIC COMPOUNDS EPA Method 24
Unthinned: 0.32 lbs/gallon (38 grams/litre)

HAPS 0.1 lbs/gal solids

THEORETICAL COVERAGE 1,604 mil sq ft/gal (39.4 m²/L at 25 microns). See APPLICATION for coverage rates.

NUMBER OF COMPONENTS Two: Part A (Epoxy) and Part B (Amine)

MIXING RATIO By volume: One (Part A) to one (Part B)

PERMA-GLAZE | SERIES G435

PACKAGING

	Part A (partial fill)	Part B (partial fill)	When Mixed
Large Kit †	5 gallon pail	5 gallon pail	8 gallons (30.28 L)
Medium Kit	3 gallon pail	6 gallon pail	5 gallons (15.14 L)
Small Kit	1 gallon can	1 gallon can	1 gallon (3.79 L)

† Plural Component application only.

NET WEIGHT PER GALLON
10.85 ± 0.25 lbs (4.92 ± 0.11 kg) (mixed)

STORAGE TEMPERATURE
Minimum 40°F (4°C) Maximum 110°F (43°C)
For optimum handling and application characteristics, both material components should be stored or conditioned between 70°F and 80°F (21°C and 27°C) 48 hours prior to use.

TEMPERATURE RESISTANCE
(Dry) Continuous 275°F (135°C) Intermittent 300°F (149°C)

SHELF LIFE
12 months at recommended storage temperature.

FLASH POINT - SETA
Part A: >230°F (110°C) Part B: 184°F (84°C)

HEALTH & SAFETY
This product contains chemical ingredients which are considered hazardous. Read container label warning and Safety Data Sheet for important health and safety information prior to the use of this product.
Keep out of the reach of children.

APPLICATION

COVERAGE RATES
Before commencing, obtain and thoroughly read the Series 435 Surface Preparation and Application Guide.

	Conventional Build (Spray, Brush, or Roller)			High-Build (Spray Only)		
	Dry Mils (Microns)	Wet Mils (Microns)	Sq Ft/Gal (m²/Gal)	Dry Mils (Microns)	Wet Mils (Microns)	Sq Ft/Gal (m²/Gal)
Minimum	15.0 (380)	15.0 (380)	107 (10.0)	40.0 (1015)	40.0 (1015)	40 (3.7)
Maximum	40.0 (1015)	40.0 (1015)	40 (3.7)	125.0 (3175)	125.0 (3175)	13 (1.2)

Note: Recommended DFT will depend on substrate condition and system design. Refer to Recommended DFT section on page 1. Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mil or 5 microns. Application of coating below the minimum or above maximum recommended dry film thicknesses may adversely affect coating performance.

MIXING
Mix the entire contents of Part A and Part B separately. Scrape all of the Part A into the Part B using a flexible spatula. Use a variable speed drill with a PS Jiffy blade and mix the blended components for a minimum of two minutes. During the mixing process, scrape the sides and bottom of the container to ensure all of Parts A and B are blended together. Apply the mixed material within pot life limits after agitation. **Note:** A large volume of material will set up quickly if not applied or reduced in volume. **Caution: Do not reseal mixed material. An explosion hazard may be created.** Mixing ratio is one to one by volume.

THINNING
DO NOT THIN

POT LIFE
25 to 30 minutes at 70°F (21°C) 15 to 20 minutes at 80°F (27°C)
Material temperatures above 80°F (27°C) will significantly reduce the spray and pot life.

SPRAY LIFE
20 to 25 minutes at 75°F (24°C)
Flush the pump and lines immediately after spraying.

APPLICATION EQUIPMENT
Airless Spray

Pump Size	Tip Orifice	Atomizing Pressure	Mat'l Hose ID	Manifold Filter
45:1, 56:1, X50, 68:1 or X60	0.021"-0.025" (533-635 microns)	3400-4000 psi (234-276 bar)	3/8" to 1/2" (9.5 to 12.7 mm)	N/R

Note: Material needs to be gravity fed through a material hopper. Material will not feed through a suction tube.
Roller: Use high quality 3/8" to 1/2" synthetic woven nap roller covers.
Brush: Recommended for small areas only. Use high quality synthetic or nylon bristle brushes.
Plural Component: Please contact your Tnemec representative or Tnemec Technical Service for information.

SURFACE TEMPERATURE
Minimum of 50°F (10°C), optimum 65°F to 80°F (18°C to 27°C), maximum of 130°F (54°C). The substrate temperature should be at least 5°F (3°C) above the dew point.

MATERIAL TEMPERATURE
For optimum handling and application characteristics, both material components should be stored or conditioned between 70°F and 80°F (21°C and 27°C) 48 hours prior to use. Temperature will affect the workability. Cool temperatures increase viscosity and decrease workability. Warm temperatures will decrease viscosity and shorten the spray and pot life.

HOLIDAY TESTING
If required by project specifications, High Voltage Discontinuity (spark) testing shall be performed using a Tinker & Rasor AP/W High Voltage Holiday Tester. Contact Tnemec Technical Service for voltage recommendations.

CLEANUP
Flush and clean all equipment immediately after use with Tnemec's No. 4 Thinner or MEK.

MIL THICKNESS VERIFICATION METHOD OF TEST FOR PIPE & PIPE SPOOLS

TABLE A7

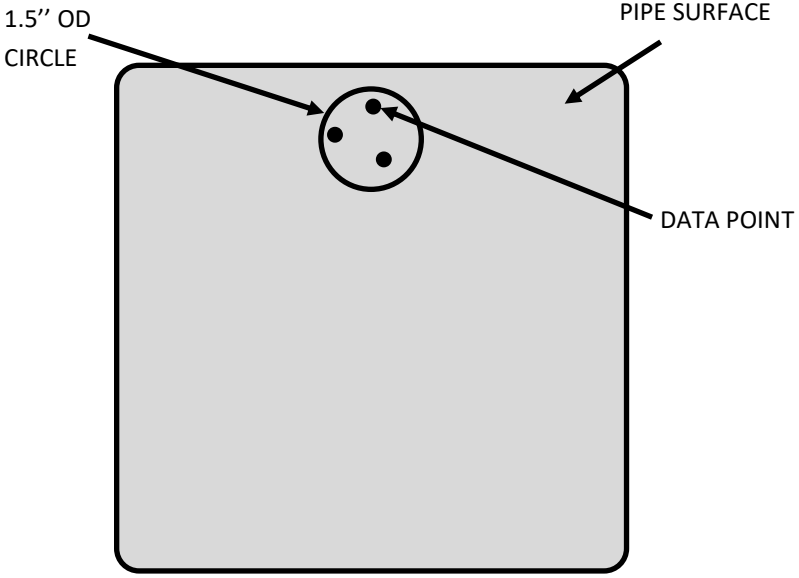
NUMBER AND LOCATION OF SPOT MEASUREMENTS - PIPE SPOOLS

PIPE DIAMETER	CIRCUMFERENTIAL SPOT MEASUREMENTS	PA2 INTERVAL SPACING	C&B STANDARD INTERVAL SPACING
UP to 12 INCHES (30 cm)	4 EVENLY SPACED	10 FEET (3 METERS) APART*	4 FEET APART
14 to 24 INCHES (36-60 cm)	6 EVENLY SPACED	10 FEET (3 METERS) APART*	4 FEET APART
GREATER THAN 24 INCHES (60 cm)	8 EVENLY SPACED	10 FEET (3 METERS) APART*	4 FEET APART

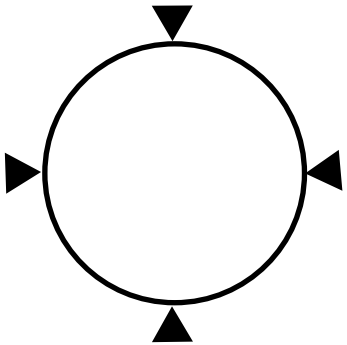
***Table From SSPC-PA2**

EXAMPLE 12'' PIPE

HOW TO TAKE A SPOT READING
ON A PIPE SPOOL



SPOT MEASUREMENTS 4
PLACES EVENLY SPACED



4 MEASUREMENTS
HERE

TAKE 3 DATA POINTS THE AVERAGE OF THOSE 3 DATA POINTS IS THE SPOT READING FOR THAT SPOT. FOR THIS EXAMPLE FOR 12'' PIPE YOU WOULD TAKE 4 EVENLY SPACED SPOT READINGS AROUND THE CIRCUMFERENCE OF THE PIPE

WHEN YOU HAVE OBTAINED AN AVERAGE OF THE 4 DATA POINTS IN ALL 4 LOCATIONS THE AVERAGE OF THOSE 4 LOCATIONS ARE YOUR AVERAGE MIL THICKNESS READING