



# SURFACE PREPARATION AND APPLICATION GUIDE

SERIES G435  
PERMA-GLAZE®

## TNEMEC COMPANY INC

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## 1.0 INTRODUCTION

The procedures outlined in this guide are intended to aid in determining proper surface preparation, mixing, application and inspection methods for Tnemec's Series G435 Perma-Glaze epoxy lining for wastewater immersion and fume environments. Prior to starting work, please read this entire guide carefully. Please contact your Tnemec representative or call Tnemec Technical Service at 1-816-483-3400 for specific recommendations.

## 2.0 PRODUCT AND PACKAGING

The following contains information on the core components of this product.

### 2.1 SERIES G435 PERMA-GLAZE

Series G435 Perma-Glaze is a versatile, thick film, 100% solids, abrasion-resistant lining specifically designed for domestic and industrial wastewater immersion and fume environments. Series G435 provides low permeation to H<sub>2</sub>S gas, protects against MIC and provides chemical resistance to severe wastewater environments.

Series G435 can also be used as a glaze coat to prolong the service life of Series 434 Perma-Shield H<sub>2</sub>S or Series 436 Perma-Shield FR systems. Refer to these product Application and Installation Guides for further details.

#### 2.1.1 SERIES G435 PACKAGING

KIT SIZE	PART A (PARTIALLY FILLED)	PART B (PARTIALLY FILLED)	YIELD (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.

#### 2.1.2 SERIES G435 COVERAGE RATES (THEORETICAL)

##### CONVENTIONAL BUILD (SPRAY, BRUSH OR ROLLER)

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT/GAL (M <sup>2</sup> /GAL)
Minimum	15.0 (380)	15.0 (380)	107 (10.0)
Maximum	40.0 (1015)	40.0 (1015)	40 (3.7)

##### HIGH-BUILD LINER COVERAGE RATES - SERIES G435 (THEORETICAL)

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT/GAL (M <sup>2</sup> /GAL)
Minimum	40.0 (1015)	40.0 (1015)	40 (3.7)
Maximum	80.0 (2030)	80.0 (2030)	20 (1.9)

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

## 2.2 SERIES G435 STORAGE AND MATERIAL TEMPERATURE

Minimum storage temperature is 40°F (4°C) and maximum is 110°F (43°C). For optimum handling and application characteristics, both material components should be stored or conditioned between 70°F (21°C) and 80°F (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 spray and pot life.

## 3.0 SURFACE PREPARATION

### 3.1 PREPARATION OF STEEL

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

### 3.2 PREPARATION OF 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.

### 3.3 OUTGASSING

Outgassing must always be considered a possibility with any concrete substrate. A number of means exist to either eliminate or reduce out-gassing. First, application should be accomplished in indirect sunlight and during times when the surface temperature of the concrete is stable or in a descending pattern. In addition, use of primers and resurfacing agents can help reduce outgassing. Series 218 MortarClad was specifically designed, and is the preferred method, to minimize this problem. Outgassing can also be minimized when using Series G435 Perma-Glaze (high-build) direct to concrete by spray applying a "mist coat" and allowing the concrete to outgass for several minutes. This should be followed by another light tack coat. Alternately, rolling a coat of the Series G435 Perma-Glaze with the recommended roller cover can also minimize outgassing prior to spray applying at greater thicknesses.

### 3.5 TERMINATIONS

When the coating system is not scheduled to provide a monolithic surface, terminations must be built into the system. For example, when the system is scheduled to terminate, sawcuts must be installed. Apply Series 218 up to sawcuts, then install the Perma-Shield lining system into the sawcut. Please refer to the Perma-Shield Details Guide which can be found online at [www.tnemec.com](http://www.tnemec.com).

## 4.0 MIXING

Mix the entire contents of Part A and Part B separately. Scrape all of the Part B into the Part A 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. Mixing ratio is one to one by volume. **Note:** A large volume of material will set up quickly if not applied or reduced in volume.

**CAUTION:** Do not reseal material. An explosion hazard may be created.

### 4.1 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 dew point.

### 4.2 SERIES G435 POT LIFE/SPRAY LIFE

#### POT LIFE - SERIES G435

15 - 20 minutes	80°F (27°C)
25 - 35 minutes	70°F (21°C)

Material temperatures above 80°F (27°C) will significantly reduce the spray and pot life.

#### SPRAY LIFE - SERIES G435

20 - 25 minutes	75°F (24°C)
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Flush the pump and lines immediately after spraying.

## 5.0 CURE SCHEDULE

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

**Note:** If more than 7 days have elapsed between coats, the Series G435 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.

## 6.0 APPLICATION & EQUIPMENT

Series G435 Perma-Glaze is the recommended topcoat over Series 434 Perma-Shield H<sub>2</sub>S or Series 436 Perma-Shield FR for severe service environments and to extend the life expectancy of the structures.

Series G435 Perma-Glaze is also the recommended high-build lining system for the protection of concrete and steel substrates.

### 6.1 AIRLESS SPRAY EQUIPMENT

Pump Size	45:1, 56:1, 68:1, X50 or X60
Gun	Graco XTR-7 or XHF, WIWA 500F
Tip Orifice	0.021" - 0.025" (533-635 microns)
Atomizing Pressure	3400-4000 psi (234-276 bar)
Mat'l Hose ID	3/8" to 1/2" (9.5 to 12.7 mm)
Manifold Filter	N/R

**Note:** The Series G435 Perma-Glaze material also 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.

### 6.2 PUMP MAINTENANCE

After every 20 to 25 gallons the equipment should be flushed with MEK. This is accomplished in two stages. First, MEK (either new or filtered) is run through the pump for five minutes. Then, a second flush is done, again for five minutes, this time using only fresh MEK. (This MEK can be used for the first flush of the next flush cycle.) This cycle is repeated every 20 to 25 gallons or as often as needed.

After the end of a work shift, the pump is flushed as stated above. This time, after the second flush, the lower end of the pump is disassembled and thoroughly cleaned to remove all traces of coating material.

It should be noted that the amount of flushing needed is dependent on temperatures and extended spray times.

## 7.0 HIGH VOLTAGE DISCONTINUITY (SPARK TEST)

All high voltage discontinuity (spark) testing shall be performed in accordance with NACE SP0188 for concrete, ASTM D5162 for steel and the procedures outlined herein.

Series G435 Perma-Glaze shall be applied and allowed to cure within the parameters of the corresponding Product Data Sheets. Sufficient curing time of the coating system shall be allowed prior to conducting a holiday test, as indicated by the “To Place in Service” duration on the Product Data Sheets. Curing time will vary with surface temperature, air movement, humidity, and film thickness.

If the substrate is incompatible or if thickness constraints are not applicable for a non-destructive dry film thickness gauge, measurements of the coating system thickness are to be performed during application of each system component using a wet film gauge, feeler gauge, or other measurement device that can accurately measure the coating wet film thickness. These coating measurements are to be tabulated to determine the total system thickness.

All high voltage discontinuity (spark) testing shall be performed using a Tinker & Razor model AP/W Holiday Detector. Refer to the

following chart for appropriate voltage based on coating system thickness.

To perform holiday testing, attach a ground wire from the instrument ground output terminal to the conductive substrate and ensure proper electrical contact. Test conductivity by attaching the instrument ground wire to rebar or other metallic ground permanently installed in the concrete and touch the electrode to the bare concrete. If metallic ground is not visible, the ground wire can be placed directly against a bare concrete surface and weighted with a damp cloth and paper sand-filled bag. Make contact with the exploring electrode on the conductive substrate to verify the instrument is properly grounded. If the test proves negative, determining discontinuities with a high voltage spark test will be ineffective. Under no circumstances shall the voltage be increased above the recommended voltage potential.

### RECOMMENDED VOLTAGES FOR HIGH VOLTAGE SPARK TESTING WITH TINKER & RASOR MODEL AP/W

Total Dry Film Thickness (mils)	Voltages (V)
20-24	2,500
25-29	3,000
30-39	3,500
40-47	5,000
48-59	6,000
60-69	7,500
70-79	8,500
80-99	10,000
100-124	12,500
125-134	15,000
135-159	16,000
160-174	17,500
175-214	20,000
215-269	27,000
270-299	31,000
300-350	35,000

Holiday testing of repaired areas shall be performed using same testing procedures as outlined above.

If utilizing alternate high voltage DC holiday detectors, never exceed the recommended 100-125 volts DC per mil or contact Tnemec Technical Services for recommended voltage settings. Excessive voltage may produce a holiday in the coating film.

## 8.0 HEALTH & SAFETY

Series G435 is for Industrial use only and must be installed by qualified coating and lining application specialists only. Paint products contain 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.

## 9.0 HANDLING

Detailed health and safety requirements for Series G435 are available in the Safety Data Sheet. Contact your local Tnemec representative for more information.