



# PERMA-SHIELD® MCU SERIES 446

## PRODUCT PROFILE

**GENERIC DESCRIPTION** Hydrophobic Aromatic Polyurethane

**COMMON USAGE** An advanced technology moisture-cured, hydrocarbon-modified coating providing excellent protection to steel and concrete substrates in wastewater environments. Provides excellent resistance to H<sub>2</sub>S gas permeation, protects against MIC and provides chemical resistance to domestic wastewater environments. It is user-friendly and rapid curing.

**COLORS** 1221 Black, 1222 Gray, 1223 Red. **Note:** Color will yellow and fade when exposed to UV light.

**PERFORMANCE CRITERIA** Contact your Tnemec representative for specific test results.

## COATING SYSTEM

**PRIMERS** **Steel:** Self-priming or Series 1, 66, N69, N69F, V69, V69F, N140, N140F, V140, V140F, 161. **Concrete:** Series 215, 217, 218. **Note:** When using Series 66, N69, V69, N140, V140 or 161 for immersion service, scarify the surface with fine abrasive before topcoating if the Series 66, N69, V69, N140, V140, or 161 prime coat has been exterior exposed for 60 days or longer. When using N69F, V69F, N140F, or V140F for immersion service, scarify the surface with fine abrasive before topcoating if the N69F, V69F, N140F or V140F prime coat has been exterior exposed for 30 days or longer.

**TOPCOATS** Series 73, 446, 1074, 1074U, 1075, 1075U. **Note:** The following recoat windows apply: Series 1074/1074U or 1075/1075U—3 days, Series 73—14 days, Series 446—30 days. Series 446 must be scarified or an additional “tie coat” of 446 must be applied if recoat time has elapsed before topcoating with Series 73, 1074/1074U or 1075/1075U. Series 446 must be scarified if recoat time has elapsed and Series 446 is the specified topcoat.

## SURFACE PREPARATION

**STEEL** **Immersion Service or Elevated H<sub>2</sub>S Environment:** SSPC-SP10/NACE 2 Near-White Blast Cleaning with a minimum angular anchor profile of 2.0 mils. **Non-Immersion Service:** SSPC-SP6/NACE 3 Commercial Blast Cleaning with a minimum angular anchor profile of 2.0 mils.

**CAST/DUCTILE IRON CONCRETE** Contact your Tnemec representative or Tnemec Technical Service. 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.

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

## TECHNICAL DATA

**VOLUME SOLIDS** 71.0 ± 2.0% (mixed) †

**RECOMMENDED DFT** 5.0 to 10.0 mils (125 to 250 microns) per coat.

CURING TIME	Temperature	To Handle	Recoat	Immersion
	90°F (32°C)	3 hours	6 hrs	4 hours
	75°F (24°C)	4.5 hours	8 hrs	4 hours
	55°F (13°C)	8 hours	12 hrs	4 hours
	35°F (2°C)	48 hours	16 hrs	16 hours

Curing time will vary with surface temperature, humidity and film thickness.

**VOLATILE ORGANIC COMPOUNDS** **Unthinned:** 1.98 lbs/gallon (237 grams/litre)  
**Thinned 10% (No. 49 Thinner):** 1.98 lbs/gallon (237 grams/litre)  
**Thinned 10% (No. 2 Thinner):** 2.46 lbs/gallon (295 grams/litre) †

**HAPS** **Unthinned:** 0.05 lbs/gal solids  
**Thinned 10% (No. 49 Thinner):** 0.05 lbs/gal solids  
**Thinned 10% (No. 2 Thinner):** 1.06 lbs/gal solids

**THEORETICAL COVERAGE** 1,150 mil sq ft/gal (28.2 m<sup>2</sup>/L at 25 microns). See APPLICATION for coverage rates. †

**NUMBER OF COMPONENTS** Two: Part A & Part B

PACKAGING	PART A (Partially filled)	PART B	Yield (mixed)
Large Kit	1-5 gallon pail	1-1 gallon can	4 gallons
Small Kit	1-1 gallon can	1-1 quart can	1 gallon

**NET WEIGHT PER GALLON** 11.00 ± 0.25 lbs (4.99 ± .11 kg) (mixed) †

**STORAGE TEMPERATURE** Minimum 20°F (-7°C) Maximum 110°F (43°C)  
 Prior to application, the material temperature should be above 60°F (16°C). It is suggested the material be stored at this temperature at least 48 hours prior to use.

**TEMPERATURE RESISTANCE** (Dry) Continuous 250°F (121°C) Intermittent 300°F (149°C)

**SHELF LIFE** Part A: 12 months; Part B: 24 months at recommended storage temperature.

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**FLASH POINT - SETA**  
**HEALTH & SAFETY**

Part A: 84°F (29°C) Part B: >200°F (>93°C)

Paint products contain chemical ingredients which are considered hazardous. Read container label warning and Material 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**

	Dry MILS (Microns)	Wet MILS (Microns)	Sq Ft/Gal (m <sup>2</sup> /Gal)
Suggested	7.0 (178)	10.0 (250)	163 (15.1)
Minimum	5.0 (125)	7.0 (178)	227 (21.1)
Maximum	10.0 (250)	14.0 (350)	114 (10.5)

Allow for overspray and surface irregularities. Wet film thickness is rounded to the nearest 0.5 mil or 5 microns. Application of coating below suggested or above maximum recommended dry film thicknesses may adversely affect coating performance. †

**MIXING**

Power mix contents of the Part B container, making sure no pigment remains on the bottom. Scrape all of the Part B into the Part A pail by using a flexible spatula. Continue agitation until the two components are thoroughly mixed. Do not use mixed material beyond pot life limits. **Note:** For optimum application properties, the material temperature should be above 60°F (16°C).

**THINNING**

Use No. 2 or No. 49 Thinner. Product may be thinned up to 5% per gallon for airless spray or up to 10% per gallon for air spray, brush or roller.

**POT LIFE**

90 minutes at 75°F (24°C) and 50% R.H. **Caution: Application at film thicknesses exceeding 10.0 dry mils per coat or at humidity levels above/below the recommended range of 20% to 90% R.H. may adversely affect the properties of the cured film.** When feasible keep containers of material covered during use.

**SPRAY LIFE**

60 minutes at 75°F (24°C) and 50% R.H.

**APPLICATION EQUIPMENT**

**Air Spray**

Gun	Fluid Tip	Air Cap	Air Hose ID	Mat'l Hose ID	Atomizing Pressure	Pot Pressure
DeVilbiss JGA	.070	765	5/16" or 3/8" (7.9 or 9.5 mm)	3/8" or 1/2" (9.5 or 12.7 mm)	70-90 psi (4.8-6.2 bar)	15-25 psi (1.0-1.7 bar)

Low temperatures or longer hoses will require additional pressure. Use pressure pot equipped with an agitator and keep pressure pot at same level or higher than the spray gun. Compressed air must be dry.

**Airless Spray**

Tip Orifice	Atomizing Pressure	Mat'l Hose ID	Manifold Filter
0.017"-0.021" (432-533 microns)	3400-4700 psi (234-324 bar)	1/4" or 3/8" (6.4 or 9.5 mm)	60 mesh (250 microns)

Use appropriate tip/atomizing pressure for equipment, applicator technique and weather conditions.

**Roller:** Use a 3/8" or 1/2" (9.5 mm or 12.7 mm) synthetic woven nap cover. Multiple applications are required to obtain recommended per coat thickness.

**Brush:** Use high quality natural or synthetic bristle brushes. Multiple applications are required to obtain recommended per coat thickness.

**SURFACE TEMPERATURE**

Minimum 35°F (2°C) Maximum 120°F (49°C)  
The surface should be dry and at least 5°F (3°C) above the dew point.

**AMBIENT HUMIDITY**

Minimum 20% Maximum 90%

**CLEANUP**

Flush and clean all equipment immediately after use with xylene or MEK.

† Values may vary with color.

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