PPG RAVEN® 405 Epoxy

DESCRIPTION

100% solids epoxy coating for use as a corrosion protection and structural enhancement lining system

PRINCIPAL CHARACTERISTICS

- 100% solids
- Near zero VOCs (< 3 g/l)
- Ultra-high build characteristics
- Excellent chemical resistance
- Bonds to dry and damp concrete, masonry, steel, ductile iron and fiberglass
- Acceptable for both new and existing structures
- TYPICAL USES:
- Wastewater structures, buried pipelines, tanks, and other corrosive environments

COLOR AND GLOSS LEVEL

- Light blue
- Part A is White, Part B is Blue; Mixed product is Light Blue
- Semi-gloss

Note:

- Color changes can occur under UV-exposure without negative impact on the product performance

BASIC DATA AT 72°F (22°C)

Data for mixed product	
Number of components	Two
Mass density	10.1 lb/US gal (1.2 kg/l)
Volume solids	100 ± 2%
VOC (Supplied)	EPA Method 24: 0.0 lb/US gal (0.5 g/l)
Recommended dry film thickness	30.0 - 250.0 mils (762 - 6350 µm) per coat
Theoretical spreading rate	54 ft^2/US gal for 30.0 mils (1.3 m^2/l for 750 µm) 6 ft^2/US gal for 250.0 mils (0.2 m^2/l for 6250 µm)
Dry to touch	3.5 hours
Overcoating Interval	Minimum: Coating should no longer leave residue when touched with a gloved finger Maximum: 12 Hours
Curing time	5 hours
Shelf life	Part A: at least 24 months when stored cool and dry Part B: at least 24 months when stored cool and dry

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Notes:

- See ADDITIONAL DATA – Spreading rate and film thickness
- If overcoat time is exceeded, abrade and clean surface before recoating
- Curing time reflects ready for service time
- Material should be stored in dry conditions, out of direct sunlight, and in unopened original factory containers, at temperatures above 60°F (16°C) and below 100°F (38°C)

RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

Steel (immersion service)

- Remove all surface contaminants, oil and grease in accordance with SSPC SP-1
- Abrasive blast with an angular abrasive to an SSPC SP-10 cleanliness or higher. Achieve a surface profile of 3.0 – 5.0 mils (75 – 125 µm)
- Ensure surface is dust free after blasting
- Contact PPG for maximum allowable salt containment levels

Steel (non-immersion service)

- Remove all surface contaminants, oil and grease in accordance with SSPC SP-1
- Abrasive blast with an angular abrasive to an SSPC SP-6 or higher. Achieve a surface profile of 2.5 – 4.0 mils (65 – 100 µm)
- Ensure surface is dust free after blasting
- Contact PPG for maximum allowable salt containment levels

Concrete / Masonry

- Surface must be sound and free from contamination (such as oil, grease, rust, scale, or deposits).
- Abrade surface to achieve a surface profile equivalent to CSP 3 to CSP 5 in accordance with ICRI 310.2R-2013
- Prepare in accordance with SSPC SP-13 guidelines

Note:

- For best results in limiting outgassing, apply to prepared concrete when the substrate temperature is stable or falling

Ductile iron

- All oils, small deposits of asphalt paint, and grease shall be removed by solvent cleaning per NAPF 500-03-01
- Abrasive blast in accordance with NAPF 500-03-04

Substrate temperature and application conditions

- Substrate temperature during application should be between 40°F (5°C) and 120°F (49°C)
- Substrate temperature during application and curing should be at least 5°F (3°C) above dew point

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SYSTEM SPECIFICATION

- Primers for concrete (optional): PPG RAVEN® 175 Primer, PPG RAVEN® 171FS Primer, PPG RAVEN® 155 Primer
- Primer for Carbon Steel: PPG AQUATAPOXY® 190 Primer*
- Primer for non-ferrous metals: PPG AQUATAPOXY® 190 Primer*
- Recommended DFT for New/Smooth Concrete: 80-250 mils (2030-6350 µm)
- Recommended DFT for Rough Concrete: 100-250 mils (2540-6350 µm)
- Recommended DFT for Resurfaced Concrete: 80-250 mils (2030-6350 µm)
- Recommended DFT for Masonry/Brick: 125-250 mils (3175-6350 µm)
- Recommended DFT for Resurfaced Masonry/Brick: 80-250 mils (2030-6350 µm)
- Recommended DFT for Steel (Carbon): 30-80 mils (762-2030 µm)
- Recommended DFT for Non-Ferrous Metals: 30-80 mils (762-2030 µm)

Note:

- *Do not use this primer if immersion temperatures will exceed 140°F (60°C)

INSTRUCTIONS FOR USE

Mixing ratio by volume: Part A to Part B 3:1

- Application with twin-feed hot airless spray equipment

Notes:

- Do not thin with solvents.
- Do not heat unmixed material above 150°F (66°C)
- If lower viscosity is needed, heat unmixed material by placing the containers in hot tap water until the desired flow properties are obtained

Material temperature

Pot life

20 minutes at 72°F (22°C)

Notes:

- Longer pot life is possible by mixing smaller amounts and cooling down the components before mixing
- Listed pot life is for one US gallon quantity

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Airless spray: Plural component

- 3:1 Heated Plural Component Spray system is recommended
- 5:1 or 10:1 transfer pumps
- Heated hoses are recommended
- Achieve 2,000 - 3,000 psi
- Use 1/2" x 3/8", 24-element static wand mixer
- Pot life at whip/gun: 1-2 minutes
- Recommended tip size: 531-535
- Supply pump pressure: 100 psi (0.689 MPa)

Recommended thinner

No thinner should be added

Nozzle orifice

Approx. 0.031 in – 0.035 in (0.78 – 0.89 mm)

Nozzle pressure

1800 - 3000 p.s.i. (approx. 124 - 207 bar; 12.4 - 20.7 MPa)

Notes:

- Part B should be maintained at temperature range of 90-125°F (32-52°C)
- Part A should be maintained at temperature range of 115-145°F (46-62°C)
- Part A should be 20°F (11°C) warmer than Part B during processing

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Trowel / Brush

- Product may be applied by brush or trowel by mixing small quantities and applying immediately
- For touch-up or holiday repair only
- HAND MIX INSTRUCTIONS:
- Individually power mix both the Part A and Part B components separately to ensure uniformity
- Measure out 3 parts of Part A to 1 part of Part B by volume into a clean disposable pail
- Completely mix combined A & B for a minimum of one minute before transferring contents to a clean pail.
- Continue mixing for at least another minute, scraping the sides and bottom, to obtain a thorough mix.
- Properly mixed material will be a uniform color without light or dark spots

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Cleaning solvent

- MEK, acetone, or xylene

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ADDITIONAL DATA

Physical data of cured material	
Characteristic	**Value**
Tensile Strength (ASTM D638)	>9,000 psi (>62.0 MPa)
Tensile Elongation (ASTM D638)	>6%
Compressive Strength (ASTM D695)	>18,000 psi (>124.1 MPa)
Flexural Strength (ASTM D790)	>15,000 psi (>103.4 MPa)
Hardness, Shore D (ASTM D2240)	87
Taber Abrasion (ASTM D4060, CS-17 Wheel, 1 kg load, 1,000 cycles)	57 mg loss
Adhesion to Concrete (ASTM D7234)	To substrate failure

Note:

- The value ranges stated in this Product Data Sheet are based on system processing under laboratory conditions. Equipment configurations and/or field application conditions may produce variances in final system values.

Spreading rate and film thickness	
DFT	**Theoretical spreading rate**
30.0 mils (762 µm)	53 ft^2/US gal (1.3 m^2/l)
80.0 mils (2032 µm)	20 ft^2/US gal (0.5 m^2/l)
100.0 mils (2540 µm)	16 ft^2/US gal (0.4 m^2/l)
125.0 mils (3175 µm)	13 ft^2/US gal (0.3 m^2/l)
250.0 mils (6350 µm)	6 ft^2/US gal (0.2 m^2/l)

DISCLAIMER

- For industrial or professional use only
- This product is specifically suitable for use on the substrates mentioned in this document. For application on any other substrates, please always contact your distributor or PMC representative for specific instructions and in order to make sure that the product performance can be safeguarded.
- PPG Protective & Marine Coatings does not accept any responsibility or liability for any odor, taste or contamination imparted to the drinking water from the coatings or products retained in the coating

SAFETY PRECAUTIONS

- Read all label and Safety Data Sheet (SDS) information prior to use

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WORLDWIDE AVAILABILITY

It is always the aim of PPG Protective & Marine Coatings to supply the same product on a worldwide basis. However, slight modification of the product is sometimes necessary to comply with local or national rules/circumstances. Under these circumstances an alternative product data sheet is used.

REFERENCES

- Information sheet | Explanation of product data sheets

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