

# PPG RAVEN® 410 HCR

## DESCRIPTION

Two component, high-build chemical resistant novolac epoxy coating

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## PRINCIPAL CHARACTERISTICS

- 100% solids
  - Ultra-high build characteristics
  - Excellent chemical resistance
  - Physical strength allows it to be used in a semi-structural manner
  - Bonds to concrete, masonry, steel, fiberglass
  - Continuous operation in temperatures up to 140°F (60°C) and up to a 98% sulfuric acid solution
  - Can be sprayed on vertical and overhead surfaces
  - TYPICAL USES:
  - Pipelines and tanks
  - Digesters and clarifiers
  - New or deteriorated structures where enhancement of the structural integrity may be required
  - Surfaces where exposure to concentrated acids and caustics may be expected
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## COLOR AND GLOSS LEVEL

- Light blue
- Part A is Baby Blue, Part B is unpigmented
- Semi-gloss

Note:

- Color changes can occur under UV-exposure without negative impact on the product performance
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## BASIC DATA AT 68°F (20°C)

Data for mixed product	
Number of components	Two
Mass density	11.7 lb/US gal (1.4 kg/l)
Volume solids	100 ± 2%
VOC (Supplied)	EPA Method 24: 0.1 lb/US gal (7.6 g/l)
Recommended dry film thickness	20.0 - 250.0 mils (508 - 6350 µm) per coat
Theoretical spreading rate	1604 ft <sup>2</sup> /US gal for 1.0 mils (39.4 m <sup>2</sup> /l for 25 µm) 6 ft <sup>2</sup> /US gal for 250.0 mils (0.2 m <sup>2</sup> /l for 6350 µm)
Dry to touch	3.5 hours
Dry to handle	6 hours
Overcoating Interval	Minimum: Coating should no longer leave residue when touched with a gloved finger Maximum: 6 hours
Curing time	12 hours

Notes:

- Curing time reflects ready for service time
- If overcoat time is exceeded, abrade and clean surface before recoating
- 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 80°F (27°C).
- The shelf life for each of the unmixed components (Part A and Part B) for this product is 12 months at 70°F (21°C)
- See ADDITIONAL DATA – Spreading rate and film thickness

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

- Apply only to properly prepared, clean, dry and sound concrete substrates that are free of all coatings, sealers, curing compounds, oils, greases or any other contaminants. Neutralize or remove these and any laitance or weak surface layers such as broom finished concrete surfaces

### Substrate temperature and application conditions

- Substrate temperature during application should be between 40°F (5°C) and 120°F (49°C)

Note:

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



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## **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)
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## **Concrete / Masonry**

- All surfaces must be sound, clean, free of oil, grease, dirt, mildew, curing compounds, loose and flaking paint, and other foreign substances
  - 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
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## **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
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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 (2.03-6.35 mm)
- Recommended DFT for Rough Concrete: 100-250 mils (2.54-6.35 mm)
- Recommended DFT for Resurfaced Concrete: 80-250 mils (2.03-6.35 mm)
- Recommended DFT for Masonry/Brick: 125-250 mils (3.18-6.35 mm)
- Recommended DFT for Resurfaced Masonry/Brick: 80-250 mils (2.03-6.35 mm)
- Recommended DFT for Steel (Carbon): 30-50 mils (0.76-1.27 mm)

### Note:

- \*Do not use this primer if immersion temperatures will exceed 140°F (60°C)
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## INSTRUCTIONS FOR USE

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

- Mix Part A and Part B separately to ensure uniformity
- Measure out indicated volumes of both components into a clean disposable pail
- Completely mix combined components for a minimum of one minute before transferring contents to a separate, clean pail
- Continue mixing at least another minute, scraping sides and bottom, to obtain a thorough mix before application
- Properly mixed material will be a uniform color without light or dark spots
- The temperature of the unmixed material should not be above 150°F (66°C)

#### Note:

- If lower viscosity is needed, heat unmixed material by placing the containers in hot tap water until the desired flow properties are obtained

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### **Airless spray: Plural component**

- 3:1 Heated Plural Component Spray system is recommended
- When pre-heating, containers must not reach temperatures greater than 150°F (66°C)
- Heated hoses are recommended
- Achieve 1,800 - 3,000 psi (12.4 - 20.7 MPa)
- Pot life at whip/gun: 1-2 minutes
- Recommended tip size: 531-535
- Supply pump pressure: 100 psi (0.69 MPa)

### **Recommended thinner**

No thinner should be added

### **Nozzle orifice**

Approx. 0.019 – 0.031 in (0.48 – 0.78 mm)

### **Nozzle pressure**

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

#### Notes:

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

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### **Trowel / Brush**

- For touch-up or holiday repair only
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## Cleaning solvent

- MEK, acetone, or xylene

## ADDITIONAL DATA

Physical data of cured material	
Characteristic	Value
Tensile Strength (ASTM D638)	7,000 psi (48.3 MPa)
Tensile Elongation (ASTM D638)	1.4%
Compressive Strength (ASTM D695)	14,000 psi (96.5)
Hardness, Shore D (ASTM D2240)	88
Taber Abrasion (ASTM D4060, CS-17 Wheel, 1 kg load, 1,000 cycles)	<112 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 <sup>2</sup> /US gal (1.3 m <sup>2</sup> /l)
80.0 mils (2032 µm)	20 ft <sup>2</sup> /US gal (0.5 m <sup>2</sup> /l)
100.0 mils (2540 µm)	16 ft <sup>2</sup> /US gal (0.4 m <sup>2</sup> /l)
125.0 mils (3175 µm)	13 ft <sup>2</sup> /US gal (0.3 m <sup>2</sup> /l)
250.0 mils (6350 µm)	6 ft <sup>2</sup> /US gal (0.2 m <sup>2</sup> /l)

## DISCLAIMER

- 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.
- For industrial or professional use only
- 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.

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## REFERENCES

- Information sheet | Explanation of product data sheets

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