



Raven 405

Technical Data Sheet

MANUFACTURER

Raven Lining Systems
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DESCRIPTION

Raven[®] 405 is a solvent-free 100% solids, ultra high build epoxy coating formulated with exceptionally high physical strengths and broad range chemical resistance. 405 exhibits superior bond to concrete, steel, masonry, fiberglass and other surfaces. Designed for operating temperatures up to 200°F, 405's unique ultra high-build ability allows it to be spray applied on vertical and overhead surfaces. The surface tolerance and high physical strengths of 405 allow it to be designed as a structural lining in manholes, pipelines, tanks and other deteriorated structures.

PHYSICAL PROPERTIES (Typical)

<u>Description</u>	<u>Method</u>	<u>Result</u>
Tensile Strength	ASTM D 638	7,600 psi
Tensile Elongation	ASTM D 638	1.5%
Compressive Strength	ASTM D 695	18,000 psi
Flexural Strength	ASTM D 790	13,000 psi
Hardness, Shore D	ASTM D 2240	88
Taber Abrasion, CS-17 Wheel	ASTM D 4060, 1 kg load/1,000 cycles	<112 mg loss
Adhesion, Concrete	ASTM D 7234	Substrate Failure
VOC's	Calculated	0.0 lbs/gal

TYPICAL USES

Surfaces where rehabilitation of an existing structure requires enhancement of the structural integrity and where exposure to concentrated acids and caustics may be expected, including:

- Tunnels and pipelines
- Clarifiers
- Digesters
- Tanks
- Secondary containment
- Manholes
- Wastewater facilities
- Floors and walls

COLOR

The Part A Resin is white; the Part B Curing Agent is blue. When mixed the product is light blue. Limited special colors are available on request.

FILM THICKNESS

Raven 405 is a 100% solids epoxy with zero shrinkage. Wet film thickness and dry film thickness are the same (i.e. 80mils WFT = 80mils DFT). Depending on substrate type and profile, a maximum of 200 mils per coat is recommended to prevent sagging. Recommended thickness will vary from 40 - 250 mils+ based on service conditions.

COVERAGE

Theoretical coverage is 20 square feet per gallon at 80 mils wet film thickness. Actual surface coverage will depend on substrate porosity and roughness. Good painting practices suggest application of two coats for quality assurance. A wet film thickness gauge may be used to determine actual coating coverage.

APPLICATION

Apply with brush, roller, airless or air-assisted spray or other suitable method. Optimal proportioning and mixing is achieved with the use of a Raven approved plural component airless spray system. For best results, apply this product to concrete when its temperature is stable or falling.

THINNING

Do not thin with solvents. If lower viscosity is needed, heat unmixed material by placing the containers in hot tap water until the desired flow properties are obtained. To heat larger quantities, drum heaters or inline heaters on specialized spray equipment may be used. Unmixed material should not be heated above 150°F.

COMPONENTS AND MIX RATIO

Part A Resin: Part B Curing Agent mix ratio is 3:1 by volume.

POWER MIXING

Individually power mix both Part A and Part B containers prior to measuring 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 at least another minute, scraping the sides and bottom, to obtain a thorough mix before application. Properly mixed material will be a uniform color without light or dark spots.

CLEAN UP

To clean tools, use acetone, MEK or xylene. To clean skin, wash immediately and thoroughly with soap and water. Refer to the Material Safety Data Sheet for additional information on health and safety.

POT LIFE

The pot life is 20 minutes for one gallon at 72°F. Longer pot life is possible by mixing smaller amounts and/or cooling down the part A & B before mixing.

CURE TIME

Thin film set time varies with substrate temperature and application thickness. Generally, the coating will be tack-free in 3 ½ hours at 72°F and dry-hard in about 5 hours.

RECOAT TIME

This product may be recoated as soon as it becomes tacky but does not transfer to the finger. When applying multiple coats, do not allow more than 12 hours at 72°F substrate temperature to pass between coats, higher temperatures will shorten this window. Before recoating; inspect, clean and dry surface thoroughly to remove all contamination, including amine blush or condensation. If the recoat time is missed, abrade and clean surfaces prior to recoating.

SUBSTRATE TEMPERATURE

Minimum recommended substrate temperature: 40°F
Maximum recommended substrate temperature: 120°F

TEMPERATURE RESISTANCE

Maximum recommended dry temperature: 150°F. May be post-cured for service up to 200°F. Wet temperature resistance depends on chemical concentration and exposure time.

SURFACE PREPARATION

Prior to coating, the substrate must be prepared in a manner that provides a uniform, clean, sound, neutralized surface suitable for the specified coating. The substrate must be free of all contaminants, such as oil, grease, rust, scale or deposits. In general, coating performance is proportional to the degree of surface preparation.

Steel surfaces may require “Solvent Cleaning” (SSPC-SP 1) to remove oil, grease and other soluble contaminants.

Chemical contaminants may be removed according to SSPC-SP 12/NACE No. 5. Identification of the contaminants along with their concentrations may be obtained from laboratory and field tests as described in SSPC-TU 4 “Field Methods for Retrieval and Analysis of Soluble Salts on Substrates”. Surfaces to be coated should then be prepared according to SSPC-SP 5/NACE No.1 “White Blast Cleaning” for immersion service or SSPC-SP 10/NACE No. 2 “Near White Blast Cleaning” for all other service. In certain situations, an alternate procedure may be to use high (>5,000 psi) or ultrahigh (>10,000 psi) pressure water cleaning or water cleaning with sand injection. The resulting anchor profile shall be 2.5-5.0 mils and be relative to the coating thickness specified.

Concrete and Masonry surfaces must be sound and contaminant-free with a surface profile equivalent to a minimum CSP3 to CSP5 in accordance with ICRI Technical Guideline No. 310.2R-2013. This can generally be achieved by abrasive blasting, shot blasting, high pressure water cleaning, water jetting, or a combination of methods.

AVAILABLE PACKAGES

Available in 5 gallon pails (20 gallon kit), 30 gallon drums (120 gallon kit) and 55 gallon drums (220 gallon kit). Kits are supplied in the correct proportions of A & B; these two components must be mixed together before use. Raven 405 is available through Raven Certified Applicators.

SHELF LIFE AND STORAGE

Product shelf life is 1 year from purchase date in original unopened containers, stored in a sheltered area between 60°F and 80°F (15°C and 27°C).

SAFETY

MSDS's are available on the website (www.ravenlining.com) or upon request. All personnel should read and understand the safety recommendations as set forth in the MSDS. Keep uncured product away from children at all times.

Warranty and Disclaimer: Raven Lining Systems, Inc. (“Raven”) warrants its products to be free of manufacturing defects in accord with applicable Raven quality control procedures and that they meet the formulation standards of Raven. To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. If, within one year from purchase, any product is proven defective, Raven, at its sole option, will either replace the defective product or refund the purchase price. This warranty is void if the product is used contrary to Raven’s written directions.

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