Enviroline® 405HTR

International

Epoxy Novolac

PRODUCT DESCRIPTION

An ultra-high solids, two component polycyclamine cured lining system utilising advanced epoxy novolac technology with glass fibre and flake reinforcement.

INTENDED USES

To provide corrosion protection for the internals of pressure vessels, steel storage tanks, spools and pipes for a range of products/cargos especially at higher service temperatures.

Resists a wide range of cargos typically found in the hydrocarbon industry including crude oil up to 300° F (150°C), refined oil products (including unleaded gasoline blends and solvents) and produced water up to 300°F (150°C). Resistant to typical steam cleaning procedures.

Resistant to different renewable/bio feedstocks and refined products (fuels) including animal/vegetable oils and fats, biodiesel, ethanol etc. and elevated temperature service.

Enviroline 405HTR is also suitable as an external coating for buried pipes.

Complies with the definition of a thick-film reinforced lining as per API 652 and API 653, Table 6.1,i

PRACTICAL INFORMATION FOR ENVIROLINE 405HTR

Color	Tan
Gloss Level	Not applicable
Volume Solids	98% ±2% (ISO 3233:1998)
Typical Thickness	20-60 mils (500-1500 microns) dry equivalent to 20.4-61.2 mils (510-1531 microns) wet
Theoretical Coverage	52 sq.ft/US gallon at 30 mils d.f.t and stated volume solids 1.30 m²/liter at 750 microns d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless Spray, Plural Component Airless Spray

Drying Time

			Overcoating interval with self	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
50°F (10°C)	16 hours	23 hours	23 hours	30 hours
59°F (15°C)	10 hours	16 hours	16 hours	21 hours
77°F (25°C)	2.5 hours	6.5 hours	6.5 hours	10 hours
104°F (40°C)	1.5 hours	2.5 hours	3 hours	6 hours

The values quoted relate to use within an enclosed tank or vessel environment.

REGULATORY DATA

Flash Point (Typical)	Part A 151°F; Part B 151°F; Mixed 151°F	
Product Weight	13.1 lb/gal (1.57 kg/l)	
VOC		
	0.20 lb/gal (24 g/lt)	EPA Method 24
	51 g/kg	EU Solvent Emissions Directive (Council Directive 1999/13/EC)

See Product Characteristics section for further details

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SURFACE PREPARATION

All surfaces to be coated should be clean and free from contamination. Prior to application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Where necessary, remove weld spatter and where required smooth weld seams and sharp edges. Oil or grease should be removed in accordance with SSPC-SP1 solvent cleaning.

Abrasive Blast Cleaning

Best performance will always be achieved when Enviroline 405HTR is applied to surfaces prepared by abrasive blast cleaning to Sa3 (ISO 8501-1:2007) or SSPC-SP5. Where Enviroline 405HTR is not to be used in high heat and/or aggressive service, preparation to Sa2½ (ISO 8501-1:2007) or SSPC-SP10 may be acceptable. Contact International Protective Coatings for further information.

A sharp, angular surface profile of a minimum 3 mils (75 microns) is recommended.

Enviroline 405HTR must be applied before oxidation of the steel occurs. If oxidation does occur the entire oxidised area should be reblasted to the standard specified above.

Surface defects revealed by the blast cleaning process should be ground, filled or treated in the appropriate manner.

The preferred method of holding the blast standard is by dehumidification.

APPLICATION

Mixing

The detailed Enviroline 405HTR Application Guidelines should be consulted prior to use.
Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed, it must be used within the working pot life specified.

Mix Ratio

2 part(s) : 1 part(s) by volume

Working Pot Life

77°F (25°C)	104°F (40°C)
50 minutes	30 minutes

Plural component airless spray	Recommended	Tip Range 21-27 thou (0.53-0.68 mm) Total output fluid pressure at spray tip not less than 3000 psi (211 kg/cm²)
Airless Spray	Suitable	
Brush	Suitable	Small areas only
Thinner	Not normally required	Refer to Enviroline Application Guidelines for specific advice.

Cleaner

Enviroline 71C / International GTA203

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with Enviroline 71C or International GTA203. Once units of paint have been mixed, they should not be resealed and it is advised that after prolonged stoppages, work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with Enviroline 71C or International GTA203. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency should depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus material and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

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PRODUCT CHARACTERISTICS

The detailed Enviroline 405HTR Application Guidelines should be consulted prior to use. This datasheet provides general guidance on the use of Enviroline 405HTR. Specific project requirements will be dependent upon the service end use and operating conditions of the tank or vessel. Always consult International Protective Coatings to confirm that Enviroline 405HTR is suitable for contact with the product to be stored.

The detailed project coating specification provided by International Protective Coatings must be followed at all times.

Apply by plural component airless spray or standard airless spray (with in-line heater). Application by other methods, e.g. brush or roller, may require more than one coat and is suggested for small areas only or initial stripe coating. Stripe coating is an essential part of good working practice and as such should form part of any lining specification. For heavily pitted or porous steel, spray apply approximately 50% of the required film thickness and follow immediately with a short nap roller or squeegee to work material into the bottom of pitted areas.
For plural component airless spray application, best results will be achieved when the product is heated prior to application; Part A (Resin) to a maximum of 140°F (60°C) and Part B (Hardener) to a maximum of 115°F (46°C).

Surface temperature must always be a minimum of 5°F (3°C) above dew point. Do not apply at steel temperatures below 50°F (10°C).

The climatic conditions within the tank must be controlled as recommended in the Enviroline 405HTR Application Guidelines. The relative humidity within the confines of the tank should be controlled using dehumidification equipment. Where such equipment is not available, a single coat application technique should be employed to avoid intercoat adhesion problems.

After the coating system has cured hard, the dry film thickness should be measured using a suitable non-destructive magnetic gauge to verify the minimum applied system thickness. The coating system should be free of all pinholes or other holidays. The cured film should be essentially free of runs, sags, drips, inclusions or other defects. All deficiencies and defects should be corrected. The repaired areas shall be retested and allowed to cure as specified before placing the finished lining into service.

Return to Service
The following minimum cure times are recommended for Enviroline 405HTR to achieve its full chemical resistance properties.

Temperature	**Cure Schedule**
50°F (10°C)	5 days
77°F(25°C)	14 hours
104°F (40°C)	12 hours

Cure schedule refers to the minimum time at the specified substrate temperature prior to immersion in all chemicals as per the chemical resistance list. This does not take into consideration any specific curing requirements for third party approvals.

Note: VOC values are typical and are provided for guidance purpose only. These may be subject to variation depending on factors such as differences in color and normal manufacturing tolerances.

SYSTEMS COMPATIBILITY

Enviroline 405HTR should always be applied to correctly prepared substrates. A primer is not available for the system.

Enviroline 405HTR is designed as a single coat system. It must only be overcoated with itself should re-coats or touch-up be required.

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ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage
- Enviroline 405HTR Application Guidelines

Individual copies of these information sections are available upon request.

SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations.
All work involving the application and use of this product should be performed in compliance with all relevant national Health, Safety and Environmental standards, regulations and legislation.

Proper ventilation must be provided during application and afterwards during curing (refer to product datasheets for typical curing times) to ensure safe limits and prevent fires and explosions. Forced extraction will be required in confined spaces. Ventilation and/or respiratory personal protective equipment (airfed hoods or appropriate cartridge masks) must be provided during application and curing. Take precautions to avoid skin and eye contact (overalls, gloves, goggles, masks, barrier cream, etc).

Before use, obtain, read and then follow the advice given on the Material Safety Data Sheets (Base and Curing Agent if two-pack) and the Health and Safety section of the Coatings Applications Procedures for this product.

In the event that welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

The detailed safety measures are dependent on application methods and the work environment. If you do not fully understand these warnings and instructions or if you cannot strictly comply with them, do not use the product and consult International Protective Coatings.

Warning: This product contains liquid epoxies and modified polyamines and may cause skin sensitization if not used correctly.

PACK SIZE

Unit Size	Part A		Part B	
	Vol	Pack	Vol	Pack
18 liter	12 liter	20 liter	6 liter	10 liter
4 US gal	2.67 US gal	5 US gal	1.33 US gal	2 US gal
150 US gal[1]	100 US gal[1]	50 US gal[1]	50 US gal[1]	50 US gal[1]

[1] 150US gal unit supplied as 2x50gal of Part A and 1x50gal of Part B
For availability of other pack sizes, contact AkzoNobel.

SHIPPING WEIGHT (TYPICAL)

Unit Size	Part A	Part B
18 liter	18.68 kg	10.04 kg
4 US gal	33.6 lb	18.6 lb
150 US gal[1]	677.7 lb[1]	739.4 lb[1]

[1] 150US gal unit supplied as 2x678lb Part A and 1 x 740lb of Part B

STORAGE

Shelf Life	12 months minimum at 77°F (25°C) in original, unopened containers. Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

Disclaimer

The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local representative that this data sheet is current prior to using the product.

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