

Technical Data Sheet

Humidur® FP Brush Extreme



Product Description

Humidur FP Brush Extreme is a 2-component solvent-free modified polyamine cured epoxy developed for brush and roller application at cold temperatures. The system offering the following benefits:

- Long term **protection in highly corrosive environments**: life expectancy over 30 years
- **Single coat** system; **No primers** required
- **High chemical resistance** to acids, alkalis, acids, oils, lubricants, detergents, ...
- **Environmentally friendly** (100% solids, no solvents, no heavy metals, no coal tar)
- **Excellent abrasion resistance and impact resistance**
- **Surface tolerant & Outstanding adhesion** to substrate and interadhesion between layers
- Capable of **curing under water**: can be exposed to water immediately after application
- Capable of **curing at freezing temperatures**
- **Unlimited overcoating**
- **Excellent cathodic disbondment resistance**
- **NDT inspection** allowed
- Resistant to temperatures from **-35°C to 150°C** and to most fluids between **pH 0 and pH 14** (see Humidur chemical resistance list)
- **Cost-effective** (LCCA conducted by Royal Haskoning)

Manufacturer's Information

Acotec nv, with registered offices at Aalst, Belgium, is the developer and sole manufacturer of the Humidur products, distributed worldwide through a wide network of agents and cooperative companies. The proven lifetime of the Humidur coatings in practice is more than 30 years. Contact Acotec directly or visit www.acotec.be or www.humidur.be for reference projects.

Composition

Humidur FP Brush Extreme consists of two components:

A is the base component and contains:

- non-crystallisable epoxy resins,
- high-tech modifying agents and elastifiers,
- lamellar abrasion and impact resistant fillers,
- colouring pigments

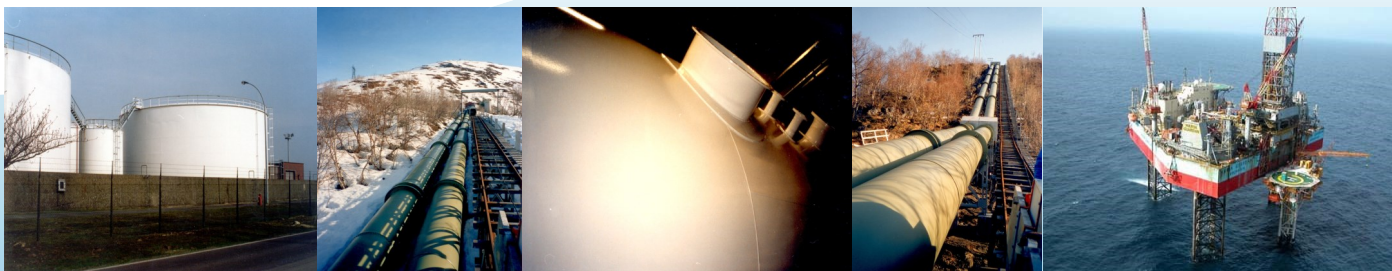
B is the hardener and contains:

- polyamine hardener complex

Recommended Use

In the Humidur product range, Humidur FP Brush Extreme has been developed for applications during which the substrate temperature is below 12°C for brush and roller application.

- Marine structures in extreme corrosive environments : splash zone, atmospheric and submerged steel
- Offshore and petrochemical structures (submerged, splash zone and tidal movements)
- Storage tanks that hold petroleum, diesel and chemical products
- Pipelines in oil and gas or penstocks in hydropower facilities



Humidur FP Brush Extreme can be applied by brush and roller.

PRODUCT USE	Humidur FP Brush Extreme
By Brush	Yes
By Roller	Yes



Product Data

SPECIFIC DATA	Humidur FP Brush Extreme
Solid content	100%
Flash point mixture A + B	>120°C
Hardness	Shore D > 74
Colour (gloss) (For colour stability (only esthetic), apply Humidur TC on top of Humidur FP Brush Extreme)	Red (spc 234 - RAL 3002) Yellow (spc 239 - RAL 1032) Grey (spc 253 - RAL 7035)
Compatibility with Cathodic Protection Systems (ISO20340)	Yes
Practical max thickness in one layer on vertical surfaces If not respected, sagging will occur	200 µm
Mixing ratio A : B by weight	2.6 : 1
Overcoating time	unlimited
Pot life at 23°C	25 minutes
Shelf life max 25°C dry	24 months

Curing time

Humidur coatings have the ability to cure under water. The curing of Humidur is a chemical reaction and is water repellent. The curing times depend on air circulation, temperature and the film thickness. Humidur is able to cure at sub-zero temperatures.

	-5°C	5°C	10°C	15°C	20°C	25°C	30°C
Touch-Dry	24 hours	7 hours	5 hours	4 hours	3 hours	2.5 hours	2 hours
Full cure	6 days	5 days	3 days	2 days	24 hours	12 hours	8 hours



Application

All surfaces shall be free of oil, grease, dust or any other contamination prior to coating.

SURFACE PREPARATION	Cleanliness	Methods	Roughness	Expected life time	Warranty
Minimum	St 2 - 3 ISO 8501	Hand tool Power tool (wire brush, needle gun, bristle blaster, grind disk)	Original Profile	15 years	On request
Optimal	Sa 2½ ISO 8501	Gritblasting	60 ± 10 µm 2/3 reference ISO 8503	> 30 years	On request

APPLICATION PARAMETERS		Humidur FP Brush Extreme
Temperature before mixing		18°C - 25°C
Application temperature of mixture		18°C - 25°C
Surface temperature*	Minimum	Dew point + 3°C
	Maximum	50°C
Humidity*	Relative Humidity	< 95%
	Surface	No condensation

* These criteria are valid to achieve the most durable protection. If a reduced coating lifetime is desired, application can continue outside this window. The existing warranties do not apply in these conditions. Please contact Acotec nv directly for more information on the expected lifetime in these conditions.

Environment

Humidur FP Brush Extreme is capable of curing under water without leaching taking place and has no detrimental effect on the sediment, fauna and flora in and out of the water. When using Humidur FP Brush Extreme on static marine structures, the biofilm can form itself on top of the Humidur coating without affecting the substrate and without any loss of the anti-corrosion properties.



Environment

Humidur FP Brush Extreme has been designed to fully respect the environment. The product contains:

- No VOC (0%) (100 % solids),
- No solvents or diluents (WFT = DFT),
- No coaltar,
- No isocyanates,
- No heavy metals.

As Humidur is a one-layer system, it reduces the amount of waste and minimizes loss spray.

All technical reports are available upon request.

Insurance

After application, an adhesion test is performed (according to ISO 4624) for which we commit ourselves to achieve a minimum criterion of 8 MPa.

A corporate warranty can be given under certain conditions. More information upon report.

An insurance policy of 10 years, given by HDI Gerling, is available on all Humidur coatings in case of optimal surface preparation. For the terms and conditions on this warranty, please contact Acotec nv directly.

The proven lifetime of the Humidur coatings in practice is more than 30 years. Contact Acotec directly or visit www.acotec.be or www.humidur.be for reference projects.

Approvals/Certificates

- Approved in petrochemical industry and offshore oil and gas market by: Shell, Statoil, ConocoPhilips, Talisman Energy, Maersk Offshore, Transocean Drilling, Fairfield Energy
- University Ghent: Approval for resistance against Microbially Induced Corrosion (MIC)
- TÜV Rheinland: Approval for combination with cathodic protection systems



Approvals/Certificates

- SGS: Resistance to liquids of Humidur FP (EI 1541 + ISO 2812-1)
- Force Technology: Fuel and water resistance testing of Humidur FP (MIL-PRF 4456F)
- Norsok M-501: Rev. 6 June 2013, section n° 7, by SGS
- NDT inspections allowed (tested on Talisman Energy assets)
- Royal Haskoning: Most cost-effective anti-corrosion solution (Life Cycle Cost Analysis)
- Approved by CCS for above and below ship's waterline and the inside of tanks

Important note

The English version of the Technical Data Sheet takes precedence over other languages. The latest version of the Technical Data Sheet can be found on our website www.humidur.be. Should there be any discrepancies between this document and the document online, the online document takes precedence.