



PROPONENTE



PROGETTO PER LA REALIZZAZIONE DI UN PARCO EOLICO OFFSHORE
NELLO STRETTO DI SICILIA - EUREKA WIND
38 WTG – 570 MW

PROGETTO DEFINITIVO - SIA

GRUPPO DI PROGETTAZIONE

Progettazione e Studio di Impatto Ambientale



GEOWYND



Studio misure di mitigazione e compensazione



3 STRUTTURE DI FONDAZIONE DEGLI AEROGENERATORI

REV.	DATA	DESCRIZIONE
00	07/24	1ª emissione

R.3.5 Schede tecniche delle vernici utilizzate



Rev 01 (22/02/22)

Technical Data Sheet Humidur® WF22 FP

ACOTEC N.V.

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HUMIDUR.

Let's face corrosion.



1. Product Description

Humidur WF22 FP is a two-component, solvent-free, modified polyamine cured epoxy 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 DHV)
- Compatible with fire protection coating Multifire basecoat S707-120 and SC901/SC90 (70 minutes heat resistance at 300 – 350 °C)

2. Composition

Humidur WF22 FP consists of two components:

A is the base component and contains:

- Non-crystallizable 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

3. Recommended Use

In the Humidur product range, Humidur WF22 FP has the highest chemical resistance offering solutions to:

- 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 WF22 FP comes in two variants: WF22 FP Single and WF22 FP Brush.

Each has been developed for specific application means:

PRODUCT USE		HUMIDUR WF22 FP SINGLE	HUMIDUR WF22 FP BRUSH
By brush	Stripe coat	Yes	Yes
	Thick layers	Yes	Yes
By spray (heated hoses)	One layer	Yes	/
	Multiple layers	Yes	/

4. 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.humidur.com for reference projects.

5. Product Data

SPECIFIC DATA		HUMIDUR WF22 FP SINGLE	HUMIDUR WF22 FP BRUSH
Density @ 23 °C	Component A	± 1,43 g/cm ³	± 1,15 g/cm ³
	Component B	± 1,08 g/cm ³	± 1,08 g/cm ³
	Mixture A + B	± 1,36 g/cm ³	± 1,13 g/cm ³
Solid content		100 %	100 %
Viscosity of the mixture @ 23 °C and CSS 750 Pa		25 ± 1 Pa·s	8,8 ± 1 Pa·s
Flash point mixture A + B		> 100 °C	> 100 °C
Hardness		Shore D > 74	Shore D > 74
Colour (gloss) (For colour stability (only aesthetic), apply Humidur TC on top of Humidur WF22 FP)		Any RAL colour 25 colours immediately deliverable	Any RAL colour 25 colours immediately deliverable
Compatibility with Cathodic Protection Systems (ISO 20340)		Yes	Yes
Practical thickness in one layer	Brush	400 µm	200 µm
	Stripe coat	400 µm – 500 µm	400 µm
	Thick layer	400 µm – 800 µm	/
Spray	One layer		
Minimum thickness in 1 layer		400 µm – 600 µm	400 µm – 600 µm
Covering capacity (WFT = DFT)	Theoretical @ 200 µm	/	0,23 kg/m ²
	Theoretical @ 400 µm	0,54 kg/m ²	0,45 kg/m ²
	Theoretical @ 600 µm	1,08 kg/m ²	/
Mixing ratio A : B	By weight	5 : 1	3,7 : 1
	By volume	3,8 : 1	3,475 : 1
Overcoating time		Unlimited	Unlimited
Standard packaging / set		18 kg or 264 kg	1 kg or 5 kg
Pot life @ 23 °C		25 minutes	25 minutes
Shelf life max. 25 °C dry		24 months	24 months



6. 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	48 hours	24 hours	12 hours	8 hours

7. Surface preparation

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

SURFACE PREPARATION	CLEANLI-NESS	METHODS	ROUGHNESS	EXPECTED LIFE TIME	WARRANTY
Minimum	St 2 – 3	Hand tool Power tool (wire brush, needle gun, bristle blaster, grinding disc)	Original profile	15 years	On request
Optimal	Sa 2 ½ Iso 8501	Grit blasting	60 ± 10 µm 2/3 reference ISO 8503	> 30 years	On request

8. Application

APPLICATION PARAMETERS	HUMIDUR WF22 FP SINGLE	HUMIDUR WF22 FP BRUSH
Temperature before mixing	35 °C – 40 °C	20 °C – 25 °C
Application temperature of mixture	35 °C ± 5 °C	25 °C ± 5 °C
Surface temperature* minimum Surface temperature* maximum	Dew point + 3 °C 50 °C	Dew point + 3 °C 50 °C
Humidity* Relative Humidity Humidity* Surface	< 95 % No condensation	< 95 % No condensation
Spray nozzle opening Spray nozzle angle	0,015" – 0,025" 30° - 60°	/ /



* 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.

Humidur WF22 FP is almost always applied in a single coat. If several coats are requested, different Humidur layers can be applied wet-on-wet depending the maximum layer thickness or on top of fully cured layers after removing possible surface contamination/pollution. The overcoating interval is unlimited over time.

9. Environment

Humidur WF22 FP has been designed to fully respect the environment.

The product contains:

- No VOC (0 %) (100 % solids)
- No solvents or diluents (WFT = DFT)
- No coal tar
- No isocyanates
- No heavy metals

Humidur WF22 FP 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 WF22 FP 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.

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

All technical reports are available upon request.

10. 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 request.

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.

11. Humidur WF22 FP Approval / Certificates

Approved in petrochemical industry and offshore oil and gas market by: Shell, Statoil, ConocoPhillips, 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
- SGS: Resistance to liquids of Humidur WF22 FP (EI 1541 + ISO 2 812-1)
- Force Technology: Fuel and water resistance testing of Humidur WF22 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
- The use of Humidur WF22 FP in combination with the Humidur Non-Skid Aggregate is approved according to the Friction Test Standard Requirements as per UK CAA CAP 437 (Standards for offshore helicopter landing areas).

12. 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.com.

Should there be any discrepancies between this document and the document online, the online document takes precedence.

Rev 03 (29/09/23)

Technical Data Sheet Humidur® WF22 QR

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1. Product Description



Humidur WF22 Quick Repair, with its straightforward application, has been specifically developed for the repair of coatings and for small/difficult to reach areas of application. It comes in pre-dosed tubes and is applied by a dispensing gun. Only the amount that is needed, however small, is mixed automatically at the correct ratio in the tip, eliminating waste and mixing errors. Thanks to this unique application technology, the pot life is no longer relevant.

Humidur WF22 QR is a two-component, solvent-free, modified polyamine cured epoxy system offering the following benefits:

- Compatible with most epoxy, polyester and vinyl ester coatings
- Long term protection in highly corrosive environments: life expectancy over 30 years on thorough prepared surfaces and 15 years on minimally prepared surfaces
- 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 and precipitation immediately after application
- Capable of curing at freezing temperatures
- NDT inspection allowed
- Resistant to temperatures from -35 °C to 150 °C and to most fluids between pH 0 and pH 14 (contact your local Acotec representative for more information)
- Cost-effective (LCCA conducted by Royal Haskoning DHV)
- Tested and accepted for applications on sweating lines
- Tested and accepted for CUI applications

2. Composition

Humidur WF22 QR consists of two components:

A is the base component and contains:

- Non-crystallizable 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



3. Recommended Use

Humidur WF22 QR has been designed to simplify coating repairs in the most extreme and aggressive environments (marine environment, offshore wind and offshore oil & gas, petrochemical industry, pipelines, ...).

It offers high quality repairs of coating systems in one layer. Humidur WF22 QR can be easily spread out over the surface by brush.

The application of Humidur WF22 QR is carried out by means of a dispensing gun, which is available all over the world. Only the amount that is needed, however small, is mixed automatically at the correct ratio in the tip. The pot life becomes irrelevant and the remainder of the tube can be used at a later moment.

Humidur WF22 QR is therefore ideal for use in the most difficult application conditions (e.g. confined spaces, rope access, ...).



4. 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.humidur.com for reference projects.

5. Product Data

SPECIFIC DATA		HUMIDUR WF22 QR
Density @ 23 °C	Component A	± 1.43 g/cm ³
	Component B	± 1.085 g/cm ³
	Mixture A + B	± 1.31 g/cm ³
Solid content		100 %
Flash point mixture A + B		> 100 °C
Hardness		Shore D > 74
Colour (gloss) (For colour stability (only aesthetic), apply Humidur TC on top of Humidur WF22 QR)		Ask your Acotec representative
Practical thickness in one layer		400 µm
Minimum recommended thickness		400 µm
Covering capacity (WFT = DFT)	Theoretical @ 400 µm	0.52 kg/m ²
Mixing ratio A : B	By weight	2.63 : 1
	By volume	2 : 1
Overcoating time		Before overcoating, carry out a solvent wash and roughen the surface slightly
Standard packaging / set		0.5 kg in pre-dosed tubes
Pot life @ 23 °C		N/A
Shelf life max. 25 °C dry		24 months

6. 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	15 °C	25 °C
Touch-dry	36 hours	8 hours	6 hours	4 hours
Full cure	10 days	5 days	48 hours	24 hours



7. Surface preparation

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

SURFACE PREPARATION	CLEANLI-NESS	METHODS	ROUGHNESS	EXPECTED LIFE TIME	WARRANTY
Minimum	St 2 – 3	Hand tool Power tool (wire brush, needle gun, bristle blaster, grinding disc)	Original profile	15 years	On request
Optimal	Sa 2 ½ Iso 8501	Grit blasting	60 ± 10 µm 2/3 reference ISO 8503	> 30 years	On request

8. Application

APPLICATION PARAMETERS	HUMIDUR WF22 QR
Temperature before mixing	Room temperature
Application temperature of mixture	25 °C ± 5 °C
Surface temperature* minimum	Dew point + 3 °C
Surface temperature* maximum	50 °C
Humidity* Relative Humidity	< 95 %
Humidity* 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.

Humidur WF22 QR is almost always applied in a single coat. If several coats are requested, different Humidur layers can be applied wet-on-wet depending the maximum layer thickness or on top of fully cured layers after removing possible surface contamination/pollution. The overcoating interval is unlimited over time.

9. Environment

Humidur WF22 QR has been designed to fully respect the environment.

The product contains:

- No VOC (0 %) (100 % solids)
- No solvents or diluents (WFT = DFT)
- No coal tar



- No isocyanates
- No heavy metals

Humidur WF22 QR 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 WF22 QR 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.

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

All technical reports are available upon request.

10. 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 request.

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.

11. Humidur WF22 QR Approval / Certificates

Approved in petrochemical industry and offshore oil and gas market by: Shell, Statoil, ConocoPhillips, 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
- SGS: Resistance to liquids of Humidur WF22 QR (EI 1541 + ISO 2 812-1)
- Force Technology: Fuel and water resistance testing of Humidur WF22 QR (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)

12. 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.com.

Should there be any discrepancies between this document and the document online, the online document takes precedence.

Rev 01 (08/03/22)

Technical Data Sheet Humidur® WF22 TC

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1. Product Description

Humidur WF22 TC is a two-component, solvent-free, epoxy silane hybrid topcoat offering the following benefits:

- Excellent gloss and colour retention
- UV-resistant
- Environmentally friendly (100% solids, no solvents, no VOC's, no heavy metals, no iso-cyanates)
- High weather resistance
- Excellent impact resistance
- Outstanding adhesion to substrate

2. Composition

Humidur WF22 TC consists of two components:

A is the base component and contains:

- The epoxy siloxane resin
- Lamellar abrasion and impact resistant fillers
- Colouring pigments

B is the hardener and contains:

- Amino-silane hardener complex

3. Recommended Use

Humidur WF22 TC is generally applied on top of epoxy coatings and on top of concrete for aesthetic reasons, for its high weather and UV resistance. Apply Humidur WF22 TC on top of Humidur WF22 FP and QR when a durable high grade and colour stable finish is required.

Opposed to the other Humidur coatings, Humidur WF22 TC cannot cure under water.

The application of Humidur WF22 TC can be done by using airless spray, gravity feed spray gun, brush or roller.



4. 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.humidur.com for reference projects.

5. Product Data

SPECIFIC DATA		HUMIDUR WF22 TC
Density @ 23 °C	Component A	± 1.27 g/cm ³
	Component B	± 0.985 g/cm ³
	Mixture A + B	± 1.23 g/cm ³
Solid content		100 %
Viscosity of the mixture at 23 °C and CSS 750 Pa		3 ± 1 Pa·s
Flash point mixture A + B		> 90 °C
Hardness		Shore D > 80
Colour (gloss)		Any RAL colour 25 colours immediately deliverable
Practical thickness in one layer		60 µm
Minimum recommended thickness		100 µm
Covering capacity (WFT = DFT)	Theoretical @ 60 µm	0.074 kg/m ²
	Theoretical @ 100 µm	0.123 kg/m ²
Mixing ratio A : B	By weight	7.6 : 1
	By volume	5.9 : 1
Overcoating time		4 – 48 hours
Standard packaging / set		4 kg or 16 kg
Pot life @ 23 °C		2 hours
Shelf life max. 25 °C dry		18 months



6. Curing time

The curing times depend on air circulation, temperature and the film thickness. The touch dry time at 23 °C is 4 hours and full cure is achieved after 3 days at this temperature. These values are indicative.

Opposed to the other Humidur coatings, Humidur WF22 TC does not have the ability to cure under water.

	10 °C	15 °C	20 °C	25 °C	30 °C
Touch-dry	6 hours	5 hours	4 hours	3,5 hours	3 hours
Full cure	5 days	4 days	3 days	48 hours	36 hours

7. Surface preparation

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

SUBSTRATE	CLEANLINESS	ROUGHNESS
Coating	Remove all grease, dirt, any other contamination, and moisture	Orbital electric sander or abrasive paper 120 –180 grade
Concrete	Remove all grease, dirt, any other contamination, and moisture	Orbital electric sander or abrasive paper 60-120 grade Sweep blasting

8. Application

APPLICATION PARAMETERS	HUMIDUR WF22 TC
Temperature before mixing	20 °C – 25 °C
Application temperature of mixture	25 °C ± 5 °C
Surface temperature* minimum Surface temperature* maximum (1)	> 5 °C and > DPT + 3 °C 50 °C (1)
Humidity* Relative Humidity Humidity* Surface	< 95 % No condensation
Spray nozzle opening Spray nozzle angle	0.009 " – 0.019 " 30 ° – 50 °



* 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.

¹ At elevated temperatures it might be difficult to achieve the demanded layer thickness in one layer, in that case a second layer will be needed.

9. Environment

Humidur WF22 TC has been designed to fully respect the environment.

The product contains:

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

10. Important note

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