



HUMIDUR.

HUMIDUR ME
HUMIDUR E
HUMIDUR FP

APPLICATION MANUAL

04-10-2019 / REVISION 01

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1 Product Description

Humidur ME, ME Brush, E, FP Single, FP Plural and FP Brush have been developed as anti-corrosion coating with excellent barrier properties. These Humidur coatings are two-component, solvent-free, liquid, modified polyamine-cured epoxy coatings. They are single coat systems (no primer required). If required, multiple coats can be applied wet-on-wet or after curing indefinitely.

The base or A-component contains non-crystallisable epoxy resins, high-tech modifying agents, elastifiers, lamellar abrasion and impact resistant fillers and colouring pigments. The B component contains the polyamine hardener complex.

For more information we refer to the technical datasheets and the product overview tables which can be found on www.humidur.be.

Training videos focusing on the application can be found on our Youtube channel Acotec Headquarters.

For the right product choice, contact your Acotec representative.

An inspection sheet is available for quality control of the surface preparation and coating.

Table 1 shows the possible application methods for each product.

Table 1	ME	ME BRUSH	E	FP SINGLE	FP PLURAL	FP BRUSH	FP BRUSH EXTREME
Roller	√	√	√	√		√	√
Brush	√	√	√	√		√	√
Single component spray	√			√			
Plural component spray	√		√	√	√		

2 Packaging

The products are delivered in two parts (Part A resin and part B hardener) in pre-dosed labelled containers. Standard packages can be found in Table 2. Smaller or bigger packages are available on demand.

Part A and B can also be distinguished by colour: A contains the colour pigments and has the final colour. The colour of component B is amber.

Table 2	ME	ME BRUSH	E	FP SINGLE	FP PLURAL	FP BRUSH	FP BRUSH EXTREME
Packages	22 kg	5 kg	22 kg	18 kg	22 kg	5 kg	5 kg

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3 Surface Preparation

Before coating application, all surfaces shall be free of oil, grease, dirt or any other contamination.

3.1 Steel

3.1.1 Optimal preparation

1. Remove fouling, dirt and salts by power wash
2. Degrease the surface (acetone or another suitable solvent)
3. Grit blast the surface by abrasive blasting to Sa 2½ (ISO 8501) (Abrasive media shall be checked to ensure that there is no contamination of oil).
Wet abrasive blasting and hydro-blasting to HB2 ½ are alternatives.
4. The roughness shall be at least $\pm 60 \mu\text{m}$ or medium or coarse in accordance with ISO 8503
5. Remove dust
6. Clean with cleaning agent (acetone or another suitable agent)
7. Check surface preparation
 - a. Check for salts $< 60 \text{ mg/m}^2$ ISO 8502-6, ISO 8502-9
 - b. Check roughness ISO 8503-2
 - c. Check for dust ISO 8502-3 (max Q = 3, max C = 3)

3.1.2 Minimal surface preparation

1. Degrease the surface (acetone or another suitable solvent) and remove salts
2. Roughen up the surface by grinding disc, wire brush, needle gun or bristle blaster
3. The cleanliness should be grade St 2 or 3 in accordance with ISO 8501-1
4. Solvent wash with suitable solvent (acetone or other)

Before coating application, check if the surface temperature is at least 3°C above dew point and does not exceed 50°C. Make sure that the surface is dry (no condensation) and free of contamination.

3.2 Concrete

For a more detailed description of concrete surface preparation, we refer to the document *"Instructions for Concrete Surface Preparation"*.

All surfaces must be free from grease, oil, dirt or any other contamination.

Localized weak or deteriorated concrete must be removed with cementitious or polymer concrete repair mortars. Always check the compatibility with Humidur prior to application.

The surface shall be prepared in accordance with CSP 3, 4 or 5. This surface profile can be created by different means: abrasive blasting, steel shot blasting, scarifying and high pressure jetting.

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Any surface irregularities must be repaired with cementitious or polymer concrete repair mortar or filled with an adequate epoxy filler.

After preparation, all dust and other contaminants should be removed.

ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

This qualitative method will indicate the presence of moisture movement, but it will not quantify the amount of moisture movement.

Before coating application, check if the surface temperature is at least 3°C above dew point and does not exceed 50°C. Make sure that the surface is dry (no condensation) and free of contamination.

4 Component mixing

When using plural component airless spray, continue to 5 Coating application.

The components A and B are delivered in pre-dosed sets so that they can be readily mixed. Before mixing, components A and B should have a temperature as described in Table 3.

First stir component A. Pour component B in component A and mix the two materials to an even consistency with an electrical mixer at less than 300 rpm to avoid incorporated air. In case electrical mixers may not be used, pneumatic or hydraulic mixers can be used (Power: 2000 watt).

Only mix the components supplied: never add anything else. As the components are delivered in pre-dosed sets, mix one set completely.

Thinners cannot be used!

As the product has a limited pot life (see Table 3), application should be done immediately after mixing. When the temperature increases, the pot life reduces and when the temperature decreases, the pot life increases. The temperature of the product should be high enough to ensure good application and low enough in order to maintain the pot life. The ideal temperatures of the mixed products before application are given in Table 4.

Attention: once the components have been mixed, the exothermic reaction starts and the temperature may increase quickly reducing the pot life. No extra safety measures should be taken against heat.

Table 3	ME	ME BRUSH	E	FP SINGLE	FP PLURAL	FP BRUSH	FP BRUSH EXTREME
Temperature before mixing	18-25°C	18-25°C	18-25°C	35-40°C	50-60°C	20-25°C	18-25°C
Mixing ratio by weight	4.4 : 1	3.7 : 1	4.03 : 1	5.0 : 1	4.0 : 1	3.7 : 1	2.6 : 1
Mixing ratio by volume	3.2 : 1	2.9 : 1	2.9 : 1	3.8 : 1	2.9 : 1	3.475 : 1	
Pot life at 23°C	45 min	45 min	10 min	25 min	25 min	25 min	25 min

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5 Coating application

Before coating application, check if the surface temperature is at least 3°C above dew point and does not exceed 50°C. Make sure that the surface is dry (no condensation) and free of contamination.

All Humidur systems are single coat systems. They are applied straight to the steel or concrete substrate without the use of a primer.

Before application, check if the values in Table 4 are respected. Humidur is able to cure at freezing temperatures.

Table 4	ME	ME BRUSH	E	FP SINGLE	FP PLURAL	FP BRUSH	FP BRUSH EXTREME
Temp. before mixing	18-25°C	18-25°C	18-25°C	35-40°C	50-60°C	20-25°C	18-25°C
Application temp. of mixture	25° ± 5°C	25°C ± 5°C	30°C±5°C	35°C±5°C	55°C±5°C	25°C±5°C	18-25°C
Min surface temp.	Dew point + 3°C	Dew point + 3°C	Dew point + 3°C	Dew point + 3°C	Dew point + 3°C	Dew point + 3°C	Dew point + 3°C
Max surface temp.	50°C	50°C	50°C	50°C	50°C	50°C	50°C
R.H.	< 95%	< 95%	< 95%	< 95%	< 95%	< 95%	< 95%
Humidity of surface	No condensation	No condensation	No condensation	No condensation	No condensation	No condensation	No condensation

5.1 Brush and roller application

Before starting spray application, welds and edges are typical areas to be pre-brushed (stripe coating).

Brush application is mainly used for smaller surfaces, for touch ups or when spraying application is too difficult.

Follow the instructions for mixing as described in 4 Component mixing.

5.2 Airless spray application

For more information, consult the video on our Youtube channel Acotec Headquarters concerning pump adjustments.

For airless spray application, both single and plural component pumps can be used.

The pump should have a capacity of at least 60 : 1. Remove all filters from the pump and gun to prevent any blockage. Remove the elbow from the pump and pump the product directly.

It is recommended that the hose has an inner diameter of 3/8" and the last 2 – 3 m before the spray gun a reduced diameter of 1/4". The use of heated hoses is mandatory if the ambient temperature is below 35°C. Otherwise, problems may occur during the spraying process.

The recommended spray nozzle should have an angle between 40° and 60° and an opening between 0.019" and 0.023". It is recommended that the pressure is at least 360 bar.

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Perform a test spray before the actual application: try to spray component A without mixing B into it, to set the right conditions. Spray component A directly back into its pail. When satisfactory, the components can be mixed.

For a single component pump, mix the components first as described in section 4 Component mixing. The temperature of the mixture should be as described in Table 4. Monitor the pot life closely.

When using a plural component pump, the separate components can be connected to the pump. Make sure that the pump has the right settings regarding the mixing ratio (see Table 3).

Apply the coating preferably by cross-spraying and measure the wet film thickness regularly.

If problems occur: stop spraying, clean the pump and the equipment and contact Acotec NV or your local representative.

5.3 Film thickness

Always follow recommendations of your Acotec contact concerning the film thickness that should be applied. In Table 5 the practical limitations are given when applying one layer on vertical surfaces. If thicker layers are requested, overcoating can be done wet-on-wet. The overcoating time is unlimited.

Table 5	ME	ME BRUSH	E	FP SINGLE	FP PLURAL	FP BRUSH	FP BRUSH EXTREME
Min thickness in one layer (µm)	400	200	300	400	400	200	100
Max thickness in one layer (µm)	1000	300	2000	800	2000	400	200

5.4 Inspection

5.4.1 Layer thickness

During application it is recommended to check the layer thickness by means of wet layer thickness gauges. After sufficient curing of the coating, the layer thickness is checked in conformity with ISO 19840.

Criteria

- Each individual dry layer thickness value less than 80% of the required dry layer thickness is unacceptable.
- The average of all individual dry layer thicknesses should be equal to or more than the specified dry layer thickness.
- The number of measurements between 80% and 100% of the required dry film thickness can at the most amount to 20 % of the total number of measurements.

When the DFT is extremely high, no specific measures should be taken. The quality of the protection will not be affected.

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5.4.2 Adhesion ISO 4624

Before performing this test, the coating should already be sufficiently cured. The optimal delay, in function of the long term properties, amounts to one month. However after about 7 days, it can already be tested with sufficient certainty.

For applications under aggressive exposure, an adhesion with the substrate of 8 MPa is required. This is measured with a hydrodynamic adhesion tester. Failures in the glue or cohesion failures with lower values are rejected. At least three representative measurements are necessary.

5.4.3 Spark test

Spark tests can be done for discontinuity (holiday) testing of the coating on steel if the conditions allow it.

5.5 Clean-up

Immediately after application of Humidur, the pump must be cleaned.

The cleansing agent (preferably HumiClean) is connected with the pump and recycled into its pail via the spraying gun. By disconnecting the spray nozzle from the gun and continuously pumping up the solvent cleansing agent under low pressure for at least 20 minutes, a good intermittent cleaning will be obtained. The agent is refreshed until a constantly clear solvent comes out of the gun.

If the pump does not need to be re-used and will be stored for a number of days or weeks, it is advised to open the paint reservoir of the pump completely for thoroughly cleaning.

5.6 Water Immersion

The Humidur products have the ability of curing under water. They can be immersed in water right after application. Note that it is possible, as for all epoxy systems, that amine blooming occurs when the wet coating comes in contact with water. This results in colour changes. However, this has no influence on the performance or durability of Humidur.

6 Disposal of Waste and Spillage

After application, the product and the packages should be considered as waste.

Product

Incinerate in an appropriate incineration plant. The legal prescriptions should however be taken into account.

Non-cleaned packaging

Soiled packaging should be emptied as thoroughly as possible, after appropriate cleaning it can be re-used. Packaging which cannot be cleaned should be disposed of in the same way as the substance.

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7 Curing

Curing times for full cure and touch-dry are given respectively in Table 6 and Table 7.

These values are indicative and depend on a number of parameters such as air circulation, film thickness, temperature, etc.

The Humidur coatings are able to cure at sub-zero temperatures.

Table 6

FULL CURED AT	ME	ME BRUSH	E	FP SINGLE	FP PLURAL	FP BRUSH	FP BRUSH EXTREME
10°C	4 days	4 days	48 hours	3 days	3 days	3 days	3 days
15°C	3 days	3 days	36 hours	48 hours	48 hours	48 hours	48 hours
20°C	48 hours	48 hours	12 hours	24 hours	24 hours	24 hours	24 hours
25°C	36 hours	36 hours	6 hours	12 hours	12 hours	12 hours	12 hours
30°C	24 hours	24 hours	4 hours	8 hours	8 hours	8 hours	8 hours

Table 7

	ME	ME BRUSH	E	FP SINGLE	FP PLURAL	FP BRUSH	FP BRUSH EXTREME
Touch dry at 20°C	4 hours	4 hours	2 hours	3 hours	3 hours	3 hours	3 hours

8 Storage

The product should be stored in a dry environment at max. 25°C in the unopened original pails.

The shelf life is 12 months for Humidur ME and ME Brush. For Humidur E and the Humidur FP product range the shelf life is 24 months.

9 Safety Precautions

Details can be found in the Material Safety Data Sheets for Components A and B.

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