

Check list

for the use of waterborne coatings

Facts for the use of waterborne coatings in principle to consider and/or to clarify are:

1. Substrate

Substrate: should not colder than +10°C and not more than +30°C, ideally 18-25°C
Temperature of substrate must be 3°C above the dewpoint – parts may not „sweat“

2. Pretreatment

- For substrates to be coated with waterborne coatings are to be paid attention must to a clean, grease-free surface.
- Suitable pretreatments are:
 - degreasing – water based / alkaline
 - shot blasting
 - chemical pretreatment

3. Spraybooth and spraying area

- Dry exhaust possible
- Water-sprinkled:
 - possibly more increasing foaming
 - coagulation must be co-ordinated with the waterborne system (tests with coagulation central manufacturer)
 - possibly coating mud delivering
 - with 1k systems recycling concepts are possible
 - Air rate of descent 0,3 – 0,6 m/sec (during primer / top coat application)

4. Hardener/ Paint mixture

Caution: The hardener / paint mixture **must** machine using a high-speed are blended (see Technical Data Sheet). A stirring by hand for a homogeneous mixture is not sufficient.

4.1 Application

- in principle no restriction in the application techniques
- all parts must be corrosion-resotant implemented
- no combination of nonferrous and ferrous metals is allowed - electro-chemical procedures can lead to destruction of the less precious metal parts. Also the waterborne coating may be separated and/or coagulated
- new plant, devices and pipes should be cleaned before start-up, i.e. no grease and other contamination, e.g. oils, dust

- for electrostatic processing:
 - perfect isolation of the coating lines and the entire plant
 - earth-isolated arrangement of the paint supply
 - alternatively: External static charge or potential separation systems
 - Caution!! coating lines and paint supply are under high voltage

4.2 Circulating Lines

There can lead to material-related changes, such as thickening. Customer-specific conditions, such as circulating lines has to be discussed in advance.

5. Thinner

- For the dilution of waterborne coatings to spraying viscosity and also for cleaning the application devices distilled or demineral water must be used.
- Hard, water can lead to coagulation of waterborne coatings.

6. Cleaning

- 2K-Hydro primer and/or coatings without hardener as well as after hardener mixture with EFD-Cleaner 400744 or FREIOTHERM-ETL-Thinner 400910.
Thinner 400910 mixed with demin. Water or Water < 15° german hardness up to a mixing ratio 1 : 9
- EFDEDUR-Hardener for waterborne coatings are not water-thinnable!
Cleaning only with organic cleaners e.g. EFD-Thinner 400320 or 400424
- See EFD-Info 510 "Recommended cleaning of 2K-Plants with different Coating-Systems"

7. Mutual use of solventborne and waterbased coating materials

- Solventborne-and waterborne coatings can affect each other with contact mutually disturbing.
This can point itself to film disturbances such as crater, specks or gloss changes. It can lead also to changes of viscosity up to thickening. Also reactions of incompatibilities may be concerned.
- With change of solvent to waterborne coating (or in reverse) the application devices must be cleaned very carefully
- Procedure of cleaning (solventborne to waterborne-coating)
 1. Rinses with the used solvent
 2. Rinses with thinner 400910
 3. Possible rinse between with cleaner 400744
 4. Rinses with demin. water
 5. Fill in waterbased-coating

When changing a waterborne to a solventborne coating should be proceeded in reverse order.

8. Site condition

- Applikation:
 - Humidity: 40 - 60 % relative humidity - optimal value
 - Temperature: 18 - 25°C - optimal value

- Flash off:
 - Absolutely need during a forced drying process and with baking enamels
 - Temperature 18 - 30°C
 - Humidity: 40 - 70 % relative humidity
 - At least 3x air change/ min. - solvent and water must be transported away
 - Velocity of airflow 2,5 - 3,0 m/sec

- Drying:
 - Air drying:
 - provide for sufficient change of air: air flow 0,3 - 0,7 m/sec.
 - Humidity < 65 % relative humidity

 - Forced drying process:
 - pay attention on the flash-off time
 - recirculation airdrying necessarily
 - consider to cooling for block- and packing firmness

 - Oven drying:
 - recirculation of air necessarily
 - do not bring coated parts directly into the oven
 - at temperatures < 90°C pre-drying and in a second step at the appropriate temperature (140 - 180 °C) to bake the system.

In principle:

For drying waterborne coatings it must be ensured that a sufficient air movement and present low humidity, that water from the surface of the coating can be removed.

Example:
for 100% relative humidity
and temperature

°C	g/m ³
0	4,8
10	9,4
20	17,3
30	30,3

Example:

100g paint consumption per 1 m² from paint with 50% solids and 50% water at 20°C, the air can hold only 17.3 g of water and is therefore 100% humidity.

So you need 2.9 (calculation.: $50 : 17,3 = 2,89$) air changes with dry air (= 0% humidity).

9. Two-component-System

- At most of two-component-systems the end of the potlife is not in form of viscosity increase recognizably. Therefore a two-component-system-plant is recommended.
- For 2C EP primer the degradation of the adhesion and corrosion protection is observed after end of the pot-life
- 2C of polyurethane finishing paints show during excess of the indicated potlife a loss of gloss.
- Often with 2K polyurethane finishing paints reaction blistering by CO₂ – education (secondary reactions of the polyisocyanate hardener and water) is observed at dry film thickness > 80µm.

10. WASTE-DISPOSAL

- Waste water from equipment cleaning, enamel residue two-component coating above the working time, also mixed, must be disposed as hazardous waste.

More information contains our safety - and technical data sheets.