SurTec® 641
Conversion Coating

Properties

- bases on zirconium compounds and polymers
- bi-components process: SurTec 641 A and SurTec 641 B
- used as pre-treatment before painting
- free of chromium, free of phosphates
- gives an excellent protection of the treated metals and guarantees a perfect adhesion of paint
- suited for aluminium and zinc surfaces
- applicable in spray or immersion process

Application

SurTec 641 can be used in spray or immersion application.

The process includes the following products:

- SurTec 641 A
- SurTec 641 B

make-up values:	*spray*	*immersion*
SurTec 641 A	8-12 ml/l	8-12 ml/l
SurTec 641 B	5-10 ml/l	5-10 ml/l
temperature:	20-40°C	20-40°C
pH-value:	2.2-2.8	2.2-2.8
application time:	15-45 s	20-60 s

make-up: Steps for make-up:

1. Fill 75 % of the deionised (DI-)water into the tank.
2. Add SurTec 641 A and SurTec 641 B portion by portion, stirring vigorously.
3. Fill up to the final volume with deionised water.

tank material: steel with acid resistant coating

heating: not necessary

exhaust: recommended for worker's protection

hints: To reach nearly constant coating conditions, it is recommended to keep 30 % of the old bath at the end of service life for replenishing with 70 % new bath solution.

SurTec 641 conversion layers are nearly colourless, so it may be difficult to identify the formed layer.

recommended process sequence:

for spray application:

1. acidic pickling cleaning, e.g. **SurTec 478**
2. rinse
3. rinse
4. DI-rinse (< 30 µS/cm)
5. Conversion Coating **SurTec 641**
6. hot air drying

for immersion application:

1. alkaline degreasing, e.g. **SurTec 152**
2. rinse
3. rinse
4. acidic pickling, e.g. **SurTec 478**
5. rinse
6. rinse
7. DI-rinse (< 30 µS/cm)
8. Conversion Coating **SurTec 641**
9. hot air drying

Technical Specification

(at 20°C)	Appearance	Density (g/ml)	pH-value (conc.)
SurTec 641 A	liquid, colourless-yellowish	1.010 (1.00-1.02)	1.9 (1.8-2.0)
SurTec 641 B	liquid, colourless	1.020 (1.01-1.03)	1.0 (0.9-2.0)

Maintenance and Analysis

Check the pH-value regularly and adjust it with SurTec 641 B (if the other parameters allow it) or with nitric acid. Analyse the free acid and adjust the concentration of SurTec 641 A and SurTec 641 B regularly.

Sample Preparation

Take a sample at a homogeneously mixed position. Let it cool down to room temperature. If the sample is turbid, let the turbidity settle down and decant or filter the solution.

Free Acid – Analysis by Titration

reagents: 0.1 N sodium hydroxide solution (NaOH solution)
indicator: bromophenol blue

procedure:
1. Pipette 100 ml bath sample into a 250 ml Erlenmeyer flask.
2. Add 5 drops of indicator.
3. Titrate with 0.1 N NaOH solution from yellow to blue-purple.

calculation: The recorded consumption of 0.1 N NaOH solution should be in the range of 3-5 ml.

correction: rise by 1 ml NaOH solution = addition of 1.6 ml/l SurTec 641 B and of 2.0-3.0 ml/l SurTec 641 A according to the COD value

Chemical Oxygen Demand (COD) – Analysis by Spectral Photometer

equipment:	UV/VIS spectral photometer COD-test, e.g. Dr. Lange LCK 114, 150-1000 ppm heating block for digestion
procedure:	1. Pipette 2 ml bath sample in a COD cuvette and mix well. 2. Let digest at 150°C for 2 h. 3. Measure in the spectral photometer.
result:	Chemical oxygen demand in ppm. The COD should be in the range of 200-300 ppm.
correction:	rise by 25 ppm = addition of 1 ml/l SurTec 641 A If the COD is too high: stop the addition of SurTec 641 A, until the desired value will be reached again.

Layer Weight on Aluminium – Analysis by Analytical Balance

equipment:	analytical balance (+/- 0.1 mg)
reagents:	2 N oxalic acid
procedure:	1. Treat a test part with known surface (in m^2) with SurTec 641 and dry it at 60-80°C. 2. Weigh out the dry part at the analytical balance (**= M_1**). 3. Remove the conversion coating in 2 N oxalic acid for 4 min at room temperature. 4. Rinse with DI-water and wipe off loose components with a soft non-abrasive towel. 5. Rinse again with DI-water and dry it. 6. Weigh out the dry part at the analytical balance again (**= M_2**).
calculation:	(**M_1** - **M_2**) / surface = layer weight in g/m^2 The layer weight should be in the range of 50-150 mg/m^2.

Ingredients

SurTec 641 A

- polymers
- complex fluorides

SurTec 641 B

- zirconium compounds

Consumption and Stock Keeping

The consumption depends heavily on the drag-out. To determine the exact amounts of drag-out, see SurTec Technical Letter 11.

In order to prevent delays in the production process, per 1,000 l bath the following amounts should be kept in stock:

SurTec 641 A	50 kg
SurTec 641 B	25 kg

Product Safety and Ecology

The safety instructions and the instructions for environmental protection have to be followed in order to avoid hazards for people and environment. The Material Safety Data Sheets (according to European legislation) contain explicit details for this.

The following hazard designations and classifications into water hazard classes (WHC) have to be taken into account:

product	*hazard designation*	*water hazard class*
SurTec 614 A	-	WHC 2
SurTec 614 B	Xn - Harmful	WHC 3

Warranty

We are responsible for our products in the context of the valid legal regulations. The warranty exclusively accesses for the delivered state of a product. Warranties and claims for damages after the subsequent treatment of our products do not exist. For details please consider our general terms and conditions.

Further Information and Contact

In our forum, you can discuss topics of the surface technology:
http://forum.SurTec.com/

If you have any questions concerning the process, please contact your local technical department: http://SurTec.com/International.html

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