

SurTec® 609

ZetaCoat

Properties

- liquid concentrate
- for spray and dip application
- suitable as multi-metal passivation prior to painting (steel, aluminium, HDG and EG zinc and zinc die cast)
- based on trivalent chromium
- produces uniform nano-size layers
- excellent adhesion of lacquers and excellent corrosion protection
- no or very low sludge
- low process temperature
- free of phosphates, nitrates, zinc, nickel, manganese and VOC
- in full compliance with RoHS (EU Directive 2002/95/EC), WEEE (EU Directive 2002/96/EC) and ELV
- IMDS-number: 127253084

Application

make-up values:

SurTec 609 3 %vol (2-4 %vol)

analytical values:

Total Acid (TA) 4.5 Points (3.5-8 Points)
chromium(III) 15-50 ppm

pH-value: 4.2 (4.0-4.5)
adjust with 1 % sodium hydroxide solution or 5 % sulfuric acid

temperature: 20°C (20-35°C)

application time: 30 s (20-120 s)

spray pressure: 0.8-1.2 bar

make-up: Steps for make-up:

1. Dilute SurTec 609 ZetaCoat Concentrate with deionised water under vigorous stirring.
2. Control the pH-value and adjust it cautiously with 1 % sodium hydroxide solution, if necessary.

tank material: stainless steel or steel with acid resistant coating

filtration: remove sludge, only if necessary (see: "hints")

heating: if required, out of acid resistant material

exhaust: required for workers protection

hints: The pH-value must be maintained in the desired range. It should be controlled at least 2 times per shift. An automatic bath control is recommended.

Due to drag-in of impurities like inorganic or organic salts, the Total Acidity (TA) can be influenced. In case of such a drag-in, after adjusting the pH-value the determination of the TA-Points may yield in misleading, that means at too high values. This effect can be strongly reduced by a good rinsing quality, but occasionally an additional routine control titration of the chromium content is recommended. If the Total Acidity exceeds 15 Points and the chromium(III) content is below 15 ppm, the bath has to be replaced by a new make-up.

After some time a minor amount of sludge is formed in the bath, which does not impair the quality of the process. It can be removed, e.g. during revision or bath change by pressure cleaning.

During processing steel parts, the colour of the SurTec 609 bath turns from light green to red-brown.

The colour of the processed parts depends on material and alloy. Steel surfaces appear silver to brass/gold. Aluminium surfaces will appear colourless to yellowish.

storage: During storage, in SurTec 609 a slight precipitation may occur. This will impair neither quality nor function of the product.

recommended process sequence:

1. cleaning SurTec 138 / SurTec 086 (steel only)
SurTec 132 / SurTec 086 (multi-metal)
2. rinsing
3. DI-rinsing (maximum 350 $\mu\text{S}/\text{cm}$)
4. **Passivation SurTec 609 ZetaCoat**
5. rinsing with deionised water (max. 50 $\mu\text{S}/\text{cm}$)
6. hot air drying

The rinsing methods have to be adapted to the plating line.

Technical Specification

(at 20 °C)	Appearance	Density (g/ml)	pH-value (conc.)
SurTec 609	liquid, green clear to slightly turbid	1.008 (1.00-1.02)	2.9 (2.5-3.5)

Maintenance and Analysis

Check the pH-value regularly. Analyse and adjust the concentration of SurTec 609 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.

SurTec 609 ZetaCoat and Total Acid (TA) – Analysis by Titration

reagents:	0.1 N sodium hydroxide solution indicator: phenolphthalein
procedure:	1. Pipette 100 ml bath sample into a 250 ml Erlenmeyer flask. 2. Add 3 drops of indicator. 3. Titrate with 0.1 N sodium hydroxide solution from colourless to pink.
calculation:	consumption in ml = TA-Points consumption in ml · 0.65 = %vol SurTec 609

Chromium (SurTec 609) – Analysis by Titration

reagents:	sulfuric acid (conc.) ammonium peroxodisulfate p. a. 0.1 mol/l silver nitrate solution potassium fluoride p. a. potassium iodide solution (10 %) 0.01 N sodium thiosulfate solution starch solution (2 %)
procedure:	1. Pipette 100 ml bath sample into a 250 ml Erlenmeyer flask. 2. Acidify with 3 ml sulfuric acid. 3. Add 3 g ammonium peroxodisulfate. 4. Add 10 ml silver nitrate solution. 5. Heat up the solution and boil it slightly for 20 min. 6. Let it cool down to room temperature. 7. Add a spatula tip of potassium fluoride. 8. Add 15 ml potassium iodide solution. 9. Leave 5 min for reaction. 10. Titrate with 0.01 N sodium thiosulfate solution until the solution becomes weakly yellow. 11. Add 5 ml starch solution (solution colour turns to blue-black). 12. Continue titrating until the colour changes to milky light green.
calculation:	consumption in ml · 1.6 = ppm chromium
correction	Add 1 ml/l SurTec 609 for each ppm chromium missing. If the Total Acidity exceeds 15 TA-Points and the chromium content is below 15 ppm, the bath has to be replaced with a new make up.

Ingredients

- chromium(III)salts
- fluorides

Stock Keeping

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

SurTec 609 ZetaCoat 100 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:

<u>product</u>	<u>hazard designation</u>	<u>water hazard class</u>
SurTec 609 ZetaCoat	-	WHC 1

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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