

SurTec® 312

Hard Anodising Additive

Properties

- acidic liquid
- additive for hard anodising electrolytes based on sulfuric acid (DC-process)
- economically advantageous, compared to low temperature anodising processes
- reduces the dissolution of the oxide film under unfavourable anodising conditions
- improves the uniformity of the film thickness
- minimizes the effects of temperature and current density fluctuations during anodising
- increases the capacity of sulfuric acid anodising processes as higher temperatures are possible

Application

make-up values:

SurTec 312	2 %vol	(4 %vol for difficult alloys, e.g. 2024 or 7075)
sulfuric acid	150-180 g/l	

application time: depending on the desired thickness of the oxide layer

temperature: -10 to +10°C

tank material: polypropylene tanks (PP) or steel tanks (alloy 1.4571)

heating: not required

cooling: required

exhaust: required for worker's protection

Technical Specification

(at 20°C)	Appearance	Density (g/ml)
SurTec 312	liquid, light yellow to amber-coloured, clear	1.26 (1.24-1.29)

Maintenance and Analysis

Analyse and adjust the concentration of SurTec 312 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 312 – Analysis by Titration

- reagents: 0.1 mol/l ferrous ammonium sulfate solution
(0.1 mol/l FAS solution, $\text{Fe(II)(NH}_4)_2(\text{SO}_4)_2$ -solution)
sulfuric acid (50 %)
0.1 mol/l cerium(IV) sulfate solution (0.1 mol/l $\text{Ce(IV)(SO}_4)_2$ -
solution)
indicator: ferroin
- procedure: Standardisation:
1. Pipette 25 ml of the approx. 0.1 mol/l ferrous ammonium sulfate solution (FAS solution) into a 300 ml Erlenmeyer flask.
 2. Dilute with 100 ml deionised water.
 3. Add 25 ml half conc. sulfuric acid.
 4. Add 4 drops of indicator.
 5. Titrate with 0.1 mol/l cerium(IV)-sulphate solution until the red colour changes to blue.
= consumption (ml)
- Analysis of the bath:
1. Pipette 25 ml bath sample into a 1000 ml volumetric flask.
 2. Fill up with deionised water to the calibration mark and mix well.
 3. Pipette 25 ml of this diluted solution into a 300 ml Erlenmeyer flask.
 4. Add 25 ml half conc. sulfuric acid.
 5. Add exactly 25 ml of the 0.1 mol/l cerium(IV)-sulfate solution.
 6. Dilute to 150 ml with deionised water.
 7. Boil the solution 10-15 minutes with 2-3 boiling stones.
 8. Cool down to room temperature.
 9. Add deionised water to reach a volume of 150 ml again.
 10. Add 3 drops of indicator.
 11. Titrate with 0.1 mol/l FAS solution from green/blue to red.
= consumption **A** (ml)
- calculation: Standardisation:
consumption in ml / 25 = factor **F**
Note: the FAS solution should be discarded, if the consumption of 0.1 mol/l Cerium(IV)-sulfate solution is < 15 ml.
Analysis of the bath:
 $[25 - (\text{consumption } \mathbf{A} \text{ in ml} \cdot \text{factor } \mathbf{F})] / 2.67 = \% \text{vol SurTec 312}$
- nominal values: 2-4 %vol SurTec 312 corresponds to:
19.7-14.3 ml 0.1 mol/l FAS solution (if $F = 1$)

Ingredients

- organic acid

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](#).

The following value per m² can be taken as estimated average consumption:

SurTec 312 5-10 g

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

SurTec 312 25-50 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 312	C - Corrosive	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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