

SurTec® 960

Wetting Agent for ABS Pickling

Properties

- wetting agent is resistant to chromic acid
- liquid to viscous additive
- produces an evenly distributed foam on top of the bath surface to prevent chromic acid aerosols
- fast wetting effect on the parts for an uniform pickling attack
- reduces the surface tension, even at low make-up concentrations
- reduces the consumption of chromic acid

Application

make-up values:

chromic acid	350 g/l	
sulfuric acid	350 g/l	
SurTec 960 Wetting Agent	0.7 ml/l	(0.5-1 ml/l)

analytical values:

chromic acid	350 g/l	(320-380 g/l)
sulfuric acid	350 g/l	(320-380 g/l)
chromium (III)	< 28 g/l	

make-up:

Steps for make-up:

1. Dissolve chromic acid and sulfuric acid in 75 % of the deionised water portion by portion, stirring vigorously (caution: solution becomes hot!).
2. After cooling down, add SurTec 960 Wetting Agent (pre-diluted in deionised water!).
3. Fill up to the final volume.

temperature: 68°C (66-70°C)

application time: 12 min

tank material: steel with chromic acid resistant coating

heating: necessary; of chromic acid resistant material

exhaust: required for worker's protection

recommended process sequence (for ABS):

1. Chromo-sulfuric Acid Pickling with **SurTec 960**
2. Reduction with SurTec 965
3. Pd-Activator SurTec 966
4. Accelerator SurTec 969
5. Electroless Nickel Process SurTec 835
6. Watts Nickel Process SurTec 850
(2 min at 2 Volt, then 8 min at 4 Volt, approx. 10 min)
7. Bright Acid Copper Process SurTec 869
8. Semi Bright Nickel Process SurTec 854
9. Bright Nickel Process SurTec 855
10. (optional: Microporous Nickel Process SurTec 859)
11. Bright Chromium Process
trivalent: SurTec 876
hexavalent: SurTec 871

Between each step, there has to be rinsed. The rinsing methods have to be adapted to the plating line.

Maintenance and Analysis

Analyse and adjust chromic acid and sulfuric acid regularly.

The addition of SurTec 960 should be done according to the thickness of the foam film on top of the pickling bath. If the foam gets smaller, SurTec 960 has to be added.

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.

Chromic Acid (CrO₃) – Analysis by Titration

reagents: sodium fluoride
hydrochloric acid (1:1)
potassium iodide (10 %)
0.1 N sodium thiosulfate solution
starch solution (1 %)

procedure: 1. Pipette 10 ml bath sample into a 500 ml volumetric flask.
2. Fill up with deionised water and mix well.
3. Pipette 10 ml of this solution into a 250 ml Erlenmeyer flask.
4. Acidify with 10 ml hydrochloric acid (1:1).
5. Add 0.5 g sodium fluoride.
6. Add 10 ml potassium iodide (10 %).
7. Add approx. 1 ml starch solution.
8. Titrate with 0.1 N sodium thiosulfate solution until discolouring of the solution.

calculation: consumption in ml (= consumption **A**) · 16.67 = g/l CrO₃

Chromium (III) – Analysis by Titration

- reagents: ammonium peroxodisulfate
hydrochloric acid (conc.)
potassium iodide
0.1 N sodium thiosulfate solution
starch solution (1 %)
- procedure: 1. Pipette 10 ml bath sample into a 500 ml volumetric flask.
2. Fill up with deionised water and mix well.
3. Pipette 10 ml of this solution into a 250 ml Erlenmeyer flask.
4. Add 100 ml deionised water.
5. Add 5 g ammonium peroxodisulfate.
6. Acidify with 10 ml conc. hydrochloric acid.
7. Boil it for 25 min at low flame and let it cool down.
8. Add 2 g potassium iodide.
9. Titrate with 0.1 N sodium thiosulfate solution until the solution becomes yellow.
10. Add 3 drops starch solution.
11. Continue titrating until discolouring of the solution.
- calculation: (consumption in ml - consumption **A**) · 8.666 = g/l Cr(III)

Sulfuric Acid (H₂SO₄) – Analysis by Titration

- reagents: 0.1 N sodium hydroxide solution
mixed indicator by Mortimer (pH 4.5):
0.3 g bromocresol green indicator and
0.06 g methyl red in 300 ml ethanol
- procedure: 1. Pipette 10 ml bath sample into a 500 ml volumetric flask.
2. Fill up with deionised water and mix well.
3. Pipette 10 ml of this solution into a 250 ml Erlenmeyer flask.
4. Dilute with 100 ml deionised water.
5. Add 10 drops of the mixed indicator by Mortimer (pH 4.5).
6. Titrate with 0.1 N sodium hydroxide solution until the colour changes from blue to grey-green. (Over-titration leads to the next colour change to red!)
- calculation: (consumption in ml - (consumption **A** / 3)) · 24.5 = g/l H₂SO₄

Technical Specification

(at 20°C)	Appearance	Density (g/ml)	pH-value (conc.)
SurTec 960	liquid, colourless	1.030 (1.02-1.04)	7 (5-9)

Consumption and Stock Keeping

The wetting agent is consumed only by 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 amount should be kept in stock:

SurTec 960 Wetting Agent ABS Pickling 30 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 960	T - Toxic	WHC 2

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>

3 February 2011/DK, BiB