

SurTec® 966

Activator with Palladium/Tin Colloid

Properties

- activator for germinating the pre-treated surface of plastic parts
- low process costs
- excellent stability
- high efficiency: with 1 liter, 1200 m² surface can be treated

Application

make-up values:	<i>for ABS</i>		<i>for PA</i>	
hydrochloric acid, p.a.	300 ml/l		30 ml/l	
SurTec 966	10 ml/l	(10-20 ml/l)	10 ml/l	(10-20 ml/l)
NaCl, p.a.	-		200 g/l	

analytical values:				
palladium	50 mg/l	(35-100 mg/l)	50 mg/l	(35-100 mg/l)
hydrochloric acid (37 %)	300 ml/l	(280-320 ml/l)	30 ml/l	(25-35 ml/l)
NaCl	-		200 g/l	(190-210 g/l)

make-up: Steps for make-up:

1. Clean the tank and all equipment very thoroughly.
2. Into the clean tank fill 1/2 of the amount of distilled water.
3. Add hydrochloric acid.
4. After cooling down, add SurTec 966 and fill up to the final volume.

temperature: 25 °C (20-30 °C)

pH-value: < 1 (analyse the concentration of HCl)

application time: 1-5 min

agitation: rack agitation

tank material: steel with PVC, PP or PE coating

heating/cooling: porcelain or Teflon coated

exhaust: recommended for worker's protection

hints: It is recommended to install a pre dip consisting of the identically concentrations as mentioned above, but without SurTec 966. Afterwards, the parts are put into the activator solution without rinse.

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, than 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.

Technical Specification

(at 20 °C)	Appearance	Density (g/ml)	pH-value
SurTec 966	liquid, brown	1.440 (1.41-1.48)	< 1

Maintenance and Analysis

Analyse and adjust the concentration of SurTec 966 or Palladium (via AAS) and of hydrochloric acid 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.

Palladium (Pd) - Analysis by AAS

equipment:	atomic absorption spectrometer (AAS) wave length: 247.6
reagents:	hydrochloric acid (1:1)
procedure:	<ol style="list-style-type: none">1. Pipette 20 ml bath sample into a 100 ml volumetric flask.2. Add approx. 20 ml hydrochloric acid (1:1).3. Fill up with deionised water.4. Determine the concentration of palladium by AAS at 247.6 nm against standard solutions.
calculation:	measured value in mg · 5 = mg/l Pd
correction:	rise by 1 mg/l Pd = addition of 0.2 ml/l SurTec 966

SurTec 966 / Tin - Analysis by AAS

- equipment: atomic absorption spectrometer (AAS)
wave length: 286.3
- reagents: hydrochloric acid (1:1)
- procedure:
 1. Pipette 4 ml bath sample into a 100 ml volumetric flask.
 2. Add approx. 20 ml hydrochloric acid (1:1).
 3. Fill up with deionised water.
 4. Determine the concentration of by AAS at 286.3 nm against standard solutions.
- calculation: measured value in mg · 0.0867 = ml/l SurTec 966

SurTec 966 / Tin - Analysis by Titration

- reagents: 0.05 ml/l iodine solution (= 0.1 N)
hydrochloric acid (1:1)
0.1 mol/l sodium thiosulfate solution
marble powder
starch solution
- procedure: Repeat determination:
 1. Fill 100 ml deionised water into a 300 ml Erlenmeyer flask.
 2. Add 30 ml hydrochloric acid (1:1).
 3. Add half of a spatula tip marble powder (maximum 0.5 g).
 4. Add exactly 30 ml 0.1 N iodine solution.
 5. Add 25 ml bath sample and rinse the walls of the Erlenmeyer flask with deionised water.
 6. Add some drops of starch solution (colour turns to dark-black).
 7. Titrate with 0.1 mol/l sodium thiosulfate solution to a clear red-brown solution.
- calculation: (30 - consumption in ml) · 0.856 = ml/l SurTec 966

Hydrochloric Acid - Analysis by Titration

- reagents: 1 N sodium hydroxide solution
distilled water
indicator: phenolphthalein
- procedure:
 1. Pipette 5 ml bath sample into a 300 ml Erlenmeyer flask.
 2. Dilute with 150 ml distilled water.
 3. Add some drops of indicator.
 4. Titrate with 1 N sodium hydroxide solution from colourless to pink.
- calculation: consumption in ml · 16.65 = ml/l HCl (37 %)

Consumption and Stock Keeping

The additives are consumed also by drag-out. To determine the exact amounts of drag-out, see [SurTec Technical Letter 11](#).

The following values can be taken as estimated average consumption:

SurTec 966 100 ml per 100 m² + drag out

To prevent interruptions due to logistic problems, a certain stock is indispensable. We recommend to keep the following amounts per 1000 l bath:

SurTec 966 10 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 966	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>

18 June 2008/DK, BiB