SurTec® 678
Trivalent Transparent Passivation for Zinc-Nickel Alloy

Properties

- trivalent passivation for zinc-nickel alloy
- very high concentrated solution
- contains trivalent chromium and cobalt salts
- produces coatings with a bluish to iridescent colour
- easy to operate and maintain
- can be analytically determined and adjusted

Application

make-up value:	10 %vol	(10-20 %vol)

make-up: Steps for make-up:

1. Shake well before make up!
2. Fill the calculated amount of SurTec 678 (together with the slight precipitation) into the working tank.
3. Fill up to the final volume with tap water.
4. Check the pH-value. Now the bath is ready to use.

temperature:	60 °C	(50-70 °C)
pH-value:	2.0	(1.6-2.4)

adjust with nitric acid or sodium hydrogen carbonate.

immersion time:	40 s	(10-90 s)

tank material: steel with acid resistant plastic or rubber coating

agitation: air injection and/or barrel/rack agitation

exhaust: required for worker's protection

hints: SurTec 678 has principally an unlimited service life. For good corrosion protection, the concentration of zinc and iron should be determined periodically. The zinc concentration should be lower than 10 g/l and the iron concentration lower than 120 ppm.

SurTec 678 is also sensitive against lead impurities (do not use lead to fix your air injection pipes!).

recommended process sequence:

1. Zinc/Nickel Process SurTec 715/716
2. cascade rinsing
3. optional: activation in hydrochloric acid, pH 1.5-2.0 for 10 s
4. rinsing
5. **Trivalent Passivation SurTec 678**
6. cascade rinsing
7. optional: sealing with SurTec 555 or SurTec 555 S
8. hot air drying (70-85 °C)

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

Maintenance and Analysis

Check the pH-value and analyse and adjust the concentration of SurTec 678 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 678 – Analysis by Photometry

equipment:
spectrophotometer or
filter photometer with 600 nm filter unit (± 50 nm)
100 ml volumetric flask
1 cm cuvette

procedure:
Plot of the calibration curve (quarterly):

Make up standards with SurTec 678 concentrate in a 100 ml volumetric flask:

8 %vol	Fill up 8 ml concentrate to 100 ml and mix well.
12 %vol	Fill up 12 ml …
16 %vol	Fill up 16 ml …
20 %vol	Fill up 20 ml ...

Fill each standard into a 1 cm cuvette, clean the outside of the cuvette with a soft cloth. Measure the standards at 600 nm photometrically against air and plot the absorbance against the concentration.

Sample measurement:

1. Fill the filtrated bath sample into the 1cm cuvette that was used for determining the calibration curve.
2. Clean the cuvette with a soft cloth.
3. Measure the solution in the photometer at 600 nm against air.
4. Determine the concentration using the calibration curve.

SurTec 678 – Analysis by Titration

reagents:
sodium hydroxide solution (10 %)
H_2O_2 (30 %)
hydrochloric acid (conc.)
potassium iodide
0.1 N sodium thiosulfate solution (= 0.1 mol/l)
starch solution (1 %)

procedure:

1. Pipette 5 ml bath sample into a 250 ml Erlenmeyer flask.
2. Dilute approx. 50 ml deionised water.
3. Add sodium hydroxide solution to a pH-value of approx. pH 10 (colour changes).
4. Add approx. 0.3 ml H_2O_2.
5. Boil the solution for 30-40 min. It is important to remove excessive H_2O_2 completely! (Maximum evaporation loss: 25 ml)
6. Cool down the solution.
7. Acidify with HCl (the colour changes to orange).
8. Add approx. 2 g potassium iodide.
9. Titrate with 0.1 N sodium thiosulfate to a slight yellow.
10. Add some drops of starch solution (colour changes to blue).
11. Titrate to complete discolouration.

calculation:
consumption in ml · 1.78 = %vol SurTec 678

Technical Specification

(at 20 °C)	Appearance	Density (g/ml)	pH-value (conc.)
SurTec 678	liquid, dark green, with little precipitate	1.234 (1.21-1.27)	1.8 (1.4-2.5)

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 amount should be kept in stock:

SurTec 678	90 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 678	T - Toxic N - Dangerous for the environment	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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