

SurTec® 668

Trivalent Blue Passivation

Properties

- liquid concentrate with slight precipitate
- trivalent blue passivation without hexavalent chromium or oxidising agents
- contains cobalt, to improve the corrosion resistance
- produces passivation layers with intensive blue colour, even at shorter application times
- with long service-life
- can easily be analysed and replenished
- IMDS-number: 900924

Application

SurTec 668 is applied in rack or barrel application. It contains chromium(III) and cobalt and is used for the new make-up as well as for maintenance.

make-up value: 5 %vol (4-6 %vol)

make-up: Steps for make-up:

1. Fill the calculated amount of SurTec 668 (together with the slight precipitation) into the working tank.
2. Fill up to the final volume with tap water.
3. Check the pH-value.

Now the bath is ready to use.

temperature: 20°C (15-30°C)

pH-value: 1.8 (1.6-2.2)
adjust with nitric acid or sodium carbonate

immersion time: 30 s (15-60 s)
With growing service life of the bath, concentration and immersion time have to be adapted according to the **66x Correction Card** (see [SurTec Technical Letter 4](#)).

agitation: air agitation or rack movement

tank material: steel with acid resistant plastic coating

exhaust: required for worker's protection

hints: SurTec 668 has a potentially unlimited service-life; the limiting factor is the iron content. Depending on the make-up concentration, the critical iron value ranges within 250-500 ppm. At high throughput of incompletely zinc plated parts (e.g. long tubes) an addition of SurTec 660 A Iron Inhibitor is recommended.

SurTec 668 is sensitive against lead and other heavy metal impurities (do not use lead as weight for air blowing tubes!).

recommended process sequence:

1. cyanide free alkaline zinc plating process,
e.g. SurTec 704, minimum 8 μm
2. cascade rinse
3. activation in nitric acid at pH 1
4. **Blue Passivation SurTec 668**
5. cascade rinse
6. hot air drying at max. 70°C

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

Technical Specification

(at 20°C)	Appearance	Density (g/ml)	pH-value (at 50 g/l)
SurTec 668	liquid, black green with precipitate	1.312 (1.29-1.34)	1.8 (1.6-2.0)

Maintenance and Analysis

Check and adjust the pH-value regularly. Analyse and adjust the concentration of SurTec 668 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 668 – 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):

Prepare standards with SurTec 668 concentrate in a 100 ml volumetric flask:

2 %vol	Fill up 2 ml concentrate to 100 ml and mix well.
5 %vol	Fill up 5 ml ...
8 %vol	Fill up 8 ml ...

Fill each standard into a 1 cm cuvette. Measure all standards at 600 nm in the photometer against air and plot the absorbance against the concentration.

Sample measurement:

1. Fill the filtered bath sample into the 1 cm cuvette that was used for determining the calibration curve.
2. Measure the solution at 600 nm photometrically against air.
3. Determine the concentration using the calibration curve.

SurTec 668 – Analysis by Titration

reagents:	sulfuric acid (conc.) p.a. ammonium peroxodisulfate p.a. 0.1 N silver nitrate solution potassium iodide p.a. 0.1 N sodium thiosulfate solution (= 0.1 mol/l) starch solution (1 %)
procedure:	<ol style="list-style-type: none">1. Pipette exactly 10 ml bath sample into a 250 ml beaker.2. Acidify with 3 ml conc. sulfuric acid and mix by slight rotation (sample becomes clearly green).3. Dilute with approx. 50 ml deionised water.4. Add 15 ml silver nitrate solution.5. Add 2 g ammonium peroxodisulfate. (Thereby a precipitation of silver nitrate will occur.)6. Cover it with a watch glass, heat up with a heating plate and boil it for 20 min (only slight boiling, sample will slowly become clearly yellow).7. After cooling to room temperature, wash down the drops from the watch glass and from the beaker's walls, using small amounts of deionised water.8. Dilute with deionised water to approx. 100 ml.9. Add 2 g potassium iodide (sample changes to milky light brown).10. Titrate with 0.1 mol/l sodium thiosulfate solution to a weak brownish colour of the solution.11. Add several ml of starch solution (sample changes to milky dark brown).12. Continue titrating until the colour fades to milky pale green.
calculation:	consumption in ml · 0.66 = %vol SurTec 668

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 668 60 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 668	T - Toxic N - Dangerous for the environment	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>

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