

# SurTec® 669

## SurPass Tri

### Properties

- liquid concentrate
- trivalent passivation with medium layer thickness and very good corrosion protection
- applicable at room temperature
- produces bluish to yellowish-golden passivation layers
- IMDS-number: 900924

### Application

make-up value:	15 %vol	(12-17 %vol)
make-up:	Steps for make-up:	
	1.	Fill the calculated amount of SurTec 669 SurPass Tri into the tank.
	2.	Fill up to the final volume with deionised water.
	3.	Check the pH-value and adjust to pH 1.9.
temperature:	25°C	(20-30°C)
pH-value:	1.9	(1.7-2.0)
		adjust with nitric acid or sodium hydrogen carbonate
application time:	60 s	(45-75 s)
agitation:	rack movement or air agitation	
tank material:	steel with acid-resistant coating	
hints:	SurTec 669 SurPass Tri has a potentially unlimited service life; the limiting factor is the iron content. Depending on the make-up concentration, the critical iron value concerning corrosion protection ranges within 50-100 ppm. At high throughput of incompletely zinc plated parts (e.g. long tubes) an addition of SurTec 660 A Iron Inhibitor is recommended in order to extend the service life.	

### Technical Specifications

(at 20°C)	Appearance	Density (g/ml)	pH-value (conc.)
SurTec 669	liquid, purple	1.142 (1.11-1.17)	< 2

### Maintenance and Analysis

Check the pH-value regularly. Analyse and adjust the concentration of SurTec 669 SurPass Tri regularly.

#### Sample Preparation

Take a bath sample at a homogeneously mixed position and filter it using a fluted filter.

### SurTec 669 SurPass Tri – Analysis by Photometry

- equipment: spectrophotometer or  
filter photometer with 560 nm filter unit ( $\pm 50$  nm)  
100 ml volumetric flask, 1 cm cuvette
- procedure: Plot of the calibration curve (quarterly):  
Prepare standards with SurTec 669 concentrate (dilution 1:4)  
in a 100 ml volumetric flask:
- |         |   |
|---------|---|
| 10 %vol | Fill up 2.5 ml concentrate to 100 ml and mix well |
| 12 %vol | Fill up 3.0 ml ...                                |
| 14 %vol | Fill up 3.5 ml ...                                |
| 16 %vol | Fill up 4.0 ml ...                                |
- Fill each standard into a 1 cm cuvette and measure the standards  
at 560 nm in the photometer against air. Plot the absorbance  
against the concentration.
- Sample measurement (dilution 1:4):
1. Fill 25 ml of the filtrated sample into a 100 ml volumetric flask.
  2. Fill up with deionised water and mix well
  3. Fill the solution into the 1 cm cuvette that was  
used for determining the calibration curve.
  4. Measure the solution in the photometer at 560 nm against air.
  5. Determine the concentration using the calibration curve.

### SurTec 669 SurPass Tri – 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:
1. Pipette exactly 5 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.
  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 (change 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 starch solution (change to milky dark brown).
  12. Continue titrating until the colour fades to milky pale green.
- calculation: consumption in ml  $\cdot 1.572 =$  %vol SurTec 669 SurPass Tri

## 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 669 SurPass Tri      150 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 669	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>