

SurTec® 544

Post-Dip for Black Passivation Layers

Properties

- chromium(III) based post-dip
- free of hexavalent chromium
- improves appearance and corrosion protection of trivalent black passivations
- contains no organic polymers, thus easy to strip from racks and parts in conventional pretreatment
- produces glossy layers which are dry to the touch
- IMDS-number: 63172992

Application

SurTec 544 can be used in rack or barrel application. The process includes the following products:

- SurTec 544 I Basic Solution is the main additive which can be used alone or in combination with SurTec 544 II, III and IV as a post-dip solution
- SurTec 544 II Additive for homogenous appearance and to avoid green hazes
- SurTec 544 III Hardener improves the cross linking of the post-dip
- SurTec 544 IV Wetting Agent reduces the "last drop" especially on rack parts

make-up values:	rack application		barrel application	
SurTec 544 I	50 ml/l	(30-200 ml/l)	150 ml/l	(50-300 ml/l)
SurTec 544 II	5 ml/l	(3-7 ml/l)	-	
SurTec 544 III	10 ml/l	(1-20 ml/l)	10 ml/l	(1-20 ml/l)
SurTec 544 IV	10 ml/l	(1-20 ml/l)	10 ml/l	(1-20 ml/l)
temperature:	25°C	(15-40°C)	25°C	(15-40°C)
immersion time:	5-20 s		5-20 s	
pH-value:	4.0	(3.5-4.5)	3.7	(3.5-4.5)
	adjust to lower values with SurTec 544 I (if the concentration is less) or with phosphoric acid (H ₃ PO ₄) resp. to higher values with NaOH solution (10 %)			
make-up:	Steps for make-up:			
	1. Fill the calculated amount of SurTec 544 I into the tank.			
	2. Dilute with deionised water to about 90 % of the final volume, mixing well.			
	3. Add the calculated amount of SurTec 544 II, SurTec 544 III and SurTec 544 IV slowly under continuous stirring.			
	4. Fill up to the final volume with deionised water.			
	5. Check the pH-value and adjust if necessary.			
drying temperature:	60°C	(40-70°C)		
tank material:	plastic or steel with plastic coating			
heating:	strictly recommended: lined with Teflon			

Technical Specification

(at 20°C)	Appearance	Density (g/ml)	pH-value (conc.)
SurTec 544 I	liquid, dark green	1.345 (1.31-1.38)	2.9 (2 - 4)
SurTec 544 II	liquid, milky, turbid	1.003 (0.95-1.05)	6.1 (4 - 8)
SurTec 544 III	liquid, colourless	1.001 (0.95-1.05)	6.1 (5 - 7)
SurTec 544 IV	liquid, colourless-yellowish	1.022 (0.98-1.06)	10.8 (9-12)

Maintenance and Analysis

Check the pH-value regularly and adjust it. Analyse and adjust the concentration of SurTec 544 I regularly.

Replenish SurTec 544 II, SurTec 544 III and SurTec 544 IV according to the make-up concentrations together with the addition of SurTec 544 I.

At replenishing of 1 l SurTec 544 I following additions are recommended:

	<i>rack application</i>	<i>barrel application</i>
SurTec 544 II	100 ml	-
SurTec 544 III	200 ml	65 ml
SurTec 544 IV	200 ml	65 ml

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 544 I and Chromium – Analysis by AAS

equipment: atomic absorption spectrometer (AAS) or ICP

reagents: nitric acid (HNO₃, 1:5)
chromium standard solutions

procedure:

1. Pipette 0.05 ml bath sample into a 100 ml volumetric flask.
2. Dilute with 50 ml deionised water.
3. Add 5 ml nitric acid (1:5).
4. Dilute to 100 ml with deionised water.
5. Measure the chromium concentration against chromium standard solutions using a AAS or ICP.

calculation: measured value of chromium in mg/l · 39.53
= ml/l SurTec 544 I Basic Solution

SurTec 544 I – Analysis by Photometer

equipment: spectrophotometer with wavelength 590 nm
10 mm cuvette (optical glass)

procedure:

1. Pipette 5 ml bath sample into a 25 ml volumetric flask.
2. Fill up with deionised water and mix thoroughly.
3. Fill some of this dilution into a 10 mm cuvette.
4. Measure the absorbance by photometer at 590 nm against deionised water.

calculation: absorbance · 106 = ml/l SurTec 544 I

Ingredients

- chromium(III) salts
- nonionic surfactants
- organic acids

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 amounts should be kept in stock:

SurTec 544 I	150 kg
SurTec 544 II	25 kg
SurTec 544 III	25 kg
SurTec 544 IV	25 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 544 I	C - Corrosive N - Dangerous for the environment	WHC 2
SurTec 544 II	-	WHC 1
SurTec 544 III	-	-
SurTec 544 IV	-	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>