

SurTec® 551

Sealing

Properties

- liquid concentrate
- suited for trivalent thin layers
- is added directly into the passivation bath
- becomes an integral part of the passivation layer
- increases corrosion resistance and heat resistance of the coating
- suited for rack and barrel processes
- easy to handle and highly economical
- IMDS-number: 974606

Application

SurTec 551 is applied in rack or barrel application. The process SurTec 551 includes the following products:

- SurTec 551 Sealer is added slowly into the passivation bath while stirring vigorously
- SurTec 551 A Antifoam Agent has to be added in case of strong foam formation

make-up values:

SurTec 551 Sealer	1-3 %vol	
SurTec 551 A Antifoam Agent	if necessary	(0-0.3 ml/l)

used in combination with the following passivations:

SurTec 660 Blue Passivation	12.5 %vol	(7-15 %vol)
SurTec 664 Blue Passivation	7 %vol	(5-15 %vol)
SurTec 669 Blue Passivation	15 %vol	(12-17 %vol)
SurTec 680 Chromiting	12.5 %vol	(10-15 %vol)

make-up:

Steps for make-up:

1. Add the calculated amount of SurTec 551 Sealer to the appropriated passivation bath while constant stirring.
2. Check the pH-value and adjust if necessary.

temperature:

depending on the passivation bath:

SurTec 660	25°C	(20-35°C)
SurTec 664	25°C	(20-35°C)
SurTec 669	25°C	(20-35°C)
SurTec 680	60°C	(30-60°C)

pH-value:

2.0 (1.8-2.5)
adjust with NaOH (10 %) or nitric acid

immersion time: depending on the passivation bath:

SurTec 660	30 s	(20-60 s)
SurTec 664	30 s	(20-60 s)
SurTec 669	60 s	(45-75 s)
SurTec 680	60 s	(40-90 s)

agitation: rack (barrel) movement or slight air agitation

tank material: steel with heat and acid resistant plastic coating

heating: made of acid resistant material (e.g. quartz, Teflon)

hints: For application of the thick layer passivation SurTec 680, a working temperature of 50-60°C is recommended. Layer thickness and corrosion resistance are best obtained at these temperatures. For improved process economy, it is recommended to feed back the rinsing water into the passivation solution. We'll be pleased to calculate the conditions for your plant (see: <http://chromitierung.SurTec.com/>).

The effective integration of SurTec 551 into the Chromiting SurTec 680 layer is affected by type and amount of drag-in and by the zinc content in the passivation solution (see "Information on the Process Control" in the annex).

Using SurTec 551 in a blue passivation, it results in varying colours. By increasing application time or temperature, the colour will change from light yellow to red and finally to green iridescent. These iridescent colours are associated with thin passivation layers and are less resistant than films produced from a thick layer passivation.

Activation with 0.5 %vol nitric acid is recommended before the passivation, especially after alkaline zinc plating.

Maintenance and Analysis

Check the pH-value regularly and adjust it.

Analyse the passivation solution as described in the data sheet for the particular used passivation process.

Add SurTec 551 together with the passivation concentrate in the recommended ratio of the corresponding make-up.

In case of strong foam formation SurTec 551 A Antifoam Agent can be added. Only if foam occurs, we recommend a maximum dosage of 0.3 ml/l.

Technical Specification

(at 20°C)	Appearance	Density (g/ml)	pH-value (conc.)
SurTec 551	liquid, colourless, clear - slightly turbid	1.100 (1.08-1.12)	10 (9-11)
SurTec 551 A	liquid, colourless-yellowish, clear	0.965 (0.95-0.98)	8.5 (at 100 g/l)

Ingredients

- silicon compounds

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 551	25 kg
SurTec 551 A	4.5 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 551	-	WHC 0
SurTec 551 A	Xi - Irritant	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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Annex

Information on the Process Control Passivation with SurTec 551 Sealer

The integration of SurTec 551 into the passivation layer strongly depends on two factors:

- 1) concentration of SurTec 551 in the passivation bath
- 2) zinc content in the passivation bath

1) To reach the desired integration of SurTec 551 Sealer into the passivation layer, which leads to higher corrosion resistance, the concentration of SurTec 551 has to be kept > 1.0 %vol in plating lines with high throughput.

Drag-in of excessive organic compounds, such as from acid zinc electrolytes, will cause the precipitation of SurTec 551 in the bath, reducing the amount absorbed into the passivation layer. This leads to higher consumption of sealer and less than optimum corrosion protection. Precipitated sealer becomes inactive and cannot be re-dispersed into the passivation solution. The replenishment of SurTec 551 can be affected by the precipitated sealer and the integration into the layer is impeded.

To avoid undesirable organic drag-in into the passivation tank and higher consumption of SurTec 551, filter the preceding rinsing tank with active carbon.

2.) The integration of SurTec 551 in the layer also depends on the zinc content in the passivation bath. The amount of absorbed sealer and, therefore, the additional corrosion resistance, decreases with rising zinc content in the passivation bath. At zinc contents higher than 15 g/l, even concentrations of 2 %vol SurTec 551 will not give a sufficient integration of the sealer (< 0.2 %). In case of a new bath make-up, even at lower concentrations of SurTec 551 (0.5 %vol) the sealer content in the resulting passivation layer is at optimum. However, at zinc contents higher than 2 g/l, a minimum concentration of 1 %vol SurTec 551 is necessary to provide optimum corrosion resistance. At higher than 10 g/l zinc, a minimum concentration of 2 %vol SurTec 551 is necessary.

The following picture shows the influences of the concentration of SurTec 551 and zinc on the integration of the sealer and, thus, on the corrosion resistance.

