

SurTec® 431

Electrolytic Stainless Steel Pickling

Properties

- acidic, liquid concentrate
- based on sulfuric acid and phosphoric acid
- can be used as chemical as well as electrolytic pickle
- specially developed for the de-scaling of stainless steels before electropolishing
- composition of the acids matches to our SurTec 459 electrolyte system
- free of nitric acid and fluorides
- chemical pickling: only slight surface corrossions and surface coatings can be dissolved
- electrolytic pickling: removal of strongly adherent surface oxides (weld seam oxides or annealing or mill scales)
- electropolishing can take place immediately without intermediate rinsing
- environmentally friendly

Application

make-up values:	<i>chemical operation</i>	<i>electrolytic operation</i>
SurTec 431	100-400 g/l	150-350 g/l
application time:	600-1200 s	600-1200 s
temperature:	60-80 °C	20-40 °C
current density:	-	5-10 A/dm ²
pH-value:	< 1	< 1
tank material:	gummed steel or glass fibre reinforced plastic (GRP) tanks with PVDF (polyvinylidene fluoride) lining. To avoid heat loss, an isolation of tank walls is recommended for chemical operation.	
heating:	required, made of acid resistant material (heat exchanging material PVDF).	
exhaust:	required for worker's protection	
filtration:	Oil-separator recommended	
hints:	Tap water can be used for initial bath preparation. Above mentioned parameters refer to standard conditions. Due to special requirements of material or customer-specific plant conditions tolerances in A/m ² values may be necessary.	

If the pickling bath is operated electrolytically, shielding effects may come up. This may lead to an inhomogeneous pickling attack. So pay attention to fix workpieces in a way, that the electrical current will equally reach all sectors of the material. Further on the parts must be equipped with sufficient areas of contact.

In order to avoid harmful acidic aerosols install a bath exhausting device unconditionally. In addition, it is possible to form a thin blanket of foam on the bath surface by the help of our additive SurTec 310 S Fume Suppressant, which will act as aerosol retarder.

Technical Specification

(at 20 °C)	Appearance	Density (g/ml)	pH-value
SurTec 431	liquid, colourless, clear	1.78 (1.75-1.81)	< 1

Maintenance and Analysis

Analyse the concentration of SurTec 431 by titration of the acidity regularly and adjust it if necessary.

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 431 – Analysis by Titration

reagents:	1 mol/l caustic soda solution (= 1 N NaOH solution) potassium fluoride solution (KF solution, 35 %) indicator: phenolphthalein
procedure:	1. Pipette 5 ml bath sample into a 300 ml Erlenmeyer flask. 2. Dilute to approx. 100 ml with deionised water. 3. Add 25 ml potassium fluoride solution and mix. 4. Let react for 2 minutes. 5. Add some drops of the indicator solution and mix. 6. Titrate with 1 mol/l caustic soda solution until the colouration or the solution remain pink.
calculation:	consumption in ml · 10.95 = g/l SurTec 431
nominal values:	100-400 g/l SurTec 431 9.1-38.5 ml of 1 mol/l caustic soda solution

Ingredients

- sulfuric acid
- phosphoric acid

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](#).

The following values can be taken as estimated average consumption:

SurTec 431	15-40 g per m ²	<i>chemical operation</i>
SurTec 431	15-35 g per m ²	<i>electrolytic operation</i>

In order to prevent delays in the production process, per 1,000 l bath the following amounts should be kept in stock:

SurTec 431	500 kg	<i>chemical operation</i>
SurTec 431	400 kg	<i>electrolytic operation</i>

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 431	C - Corrosive	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>