SurTec® 629
Adsorptive Colouring Gold

Properties

- ferrioxalate-based preparation in powder form
- suitable for the colouring of anodised aluminium in immersion process
- generates gold shades of high fastness and can be used on electrolytical produced aluminium oxide films
- higher photochemical stability in solutions compared to conventional ammonium ferrioxalate
- depending on the treatment time, light to powerful gold shades will be achieved

Application

The process SurTec 629 includes the following products:

- SurTec 629 Absorptive Colouring Gold
- SurTec 629 A pH-Regulator

For immersion application:

make-up values:	*pale shades*	*medium to deep shades*
SurTec 629	10-20 g/l	20-30 g/l

temperature:	40-60 °C	(30-40 °C for pale shades)
pH-value:	4.0-5.5	
application time:	0.5-20 min	(depending on desired shade, preferably for 2-10 min)
tank material:	polypropylene (PP)	
heating:	necessary	
filtration:	recommended, 10 µm	
hint:	The use of deionised water is recommended.	

Technical Specification

(at 20 °C)	Appearance	Bulk Density (kg/l)	pH-value (at 30 g/l)
SurTec 629	powder, greenish-yellow	1.000 (0.90-1.10)	4 ± 0.5
SurTec 629 A	powder, white	approx. 0.900	–

Maintenance and Analysis

In addition to constant monitoring of the dyeing properties, the control operations and correctional measures described below must be observed. It is recommended to carry out these measurements periodically using experiential values, especially when problems occur and after prolonged non-use of the bath.

Analyse and adjust the concentration of **SurTec 629** regularly. If the concentration is found to be inadequate, add the calculated amount of SurTec 629 in concentrated form.

Relative oxalate concentration is also determined as described below. The actual oxalate content must correspond at least to the concentration calculated on the composition of SurTec 629 (= 100 %). This has been found to range from 110 to 140 %. If the measured value is less than 110 %, add 2-5 g/l SurTec 629 A.

The **pH-value** of the dyeing solution can be measured with a pH meter. For a quick measurement, pH indicator paper can also be used. If the pH-value deviate from the recommended pH range between 4.0 and 5.5, correct the pH with SurTec 629 A or with diluted caustic soda solution or diluted ammonia solution.

Sample Preparation

Take a sample from the production dye bath at a homogeneously mixed position. Let it cool down to room temperature. If the sample is turbid clarify by filtration, e.g. through a folded paper filter, discarding any cloudy first running.

SurTec 629 – Analysis by Titration

reagents:

0.04 mol/l potassium permanganate solution
(0.2 N $KMnO_4$ solution):

In a measuring flask, dilute a normal concentrate (e.g. Titrisol+ Merck No. 9935) adjusted for the preparation of 1 litre of a 0.1 N solution, to 500 ml. Concentration: 6.32 g potassium permanganate in 1000 ml solution.

0.1 mol/l EDTA (ethylene diamine tetraacetic acid):

In a measuring flask, dilute a normal concentrate (Titriplex+ III Merck No. 9992) adjusted for the preparation of 1 litre of a 0.1 mol/l solution, to 1000 ml. Concentration: 37.2 g ethylene diamine tetraacetic acid, disodium salt, MW 372, in 1000 ml solution.

Buffer/Indicator solution:

164 g sodium acetate anhydrous p.a. (MW 82), 100 g chloroacetic acid, cryst. pure (MW 94.5) and 10 g of 5-sulfosalicylic acid, pure (MW 254.2). Dissolve as indicator in deionised water and diluted to 1000 ml in a measuring flask.

Sulfuric acid (20 %)

procedure:

1. Pipette 20 ml of the clear filtrate with a transfer pipette and, while heating and stirring, add this to 100 ml of deionised water.
2. Afterwards add 10 ml sulfuric acid (20 %).
3. Heat up to 50-60 °C.
4. Titrate with 0.04 mol/l $KMnO_4$ solution from a burette drop by drop until the yellowish solution turns to a steady pale pink coloration. Consumption **A** in ml 0.2 mol/l $KMnO_4$ solution (approx. 25 ml with 30 g/l SurTec 629).
5. Now add at the same temperature 20 ml buffer/indicator solution.
6. Titrate with 0.1mol/l EDTA from another burette drop by drop to this cloudy red mixture until the red colour disappears. Consumption **B** in ml 0.1 mol/l EDTA (approx. 14 ml with 30 g/l SurTec 629).

calculation: consumption B · 2.14 = g/l SurTec 629

Relative Concentration of the Oxalate in Percent:

The relative concentration indicates the molar oxalate/iron ratio, where the ratio 3 moles of oxalate (264 g) to 1 mole of iron (55.9 g) is defined as 100 %:

$C_{OX.}$ = 33.3 (A/B)

	$C_{OX.}$
pure SurTec 629	= 100 %
with excess oxalate	> 100 %
with insufficient oxalate	< 100 %
minimum value	= 110 %
maximum value	= 140 %

Ingredients

SurTec 629

- ammonium iron(III)-oxalate

SurTec 629 A

- organic acid

Consumption and Stock Keeping

The following values per m^2 can be taken as estimated average consumption:

SurTec 629	1-5 g

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

SurTec 629	25-75 kg
SurTec 629 A	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:

product	*hazard designation*	*water hazard class*
SurTec 629	Xn - Harmful	WHC 1
SurTec 629 A	Xn - Harmful	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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