Product information Alfiflex 403

Alfiflex 403

is a well-tested chemical brightening bath for aluminium. High-grade and highest grade aluminium, but also a broad selection of low-alloy aluminium materials can be brightened satisfactorily.

Alfiflex 403 produces an especially bright shine on highest grade aluminium and its magnesium alloys. Casting alloys, however, may either be not treated at all or only with unsatisfactory results.

Alfiflex 403 develops nitrous fumes during use due to its nitric acid content. It is therefore absolutely necessary to provide for the sufficient exhaust of the fumes and for subsequent exhaust gas treatment!

Characteristics

Initial quantity	170 kg = approx. 100 l Alfiflex 403
Density	1.6 - 1.7 g/ml
Duration of treatment	0.5 - 5.0 minutes depending on the material, temperature and content of aluminium and nitric acid
Temperature	90 - 105°C, generally 95 - 100°C
Desired values	Nitric acid (100%): min. 10 - 20 g/l
Quality control	see paragraph Maintaining concentration
Form of delivery	liquid/ 40-kg-plastic jerrican and 1400-kg-container (IBC)

The way the product is strongly influenced by the material and the composition of the surface. In individual cases the optimal operating parameters may vary from the given standard parameters.

Safety precautions

Please observe the usual safety precautions for handling chemical substances. Classifications according to the statutory regulations for transport, storage and handling of the product and other product-specific instructions are included in the EG-safety sheet. Bath solutions, rinse water and concentrates must be treated according to the applicable regulations before entering the sewage system.

Procedure

Greaseless and deoxidised parts (e.g. after vibratory grinding) can possibly be brightened immediately. If the parts have other surfaces and if high quality requirements are to be met, the parts must be pre-treated by degreasing and/or etching. Subsequently they are rinsed and clarified in nitric acid. In many cases it is also possible to bring the parts from the nitric acid into the brightening bath without rinsing. To avoid the formation of gas traces, the parts must be moved continuously and slowly during brightening. After brightening first a warm rinse is provided, then a cold one, the parts are clarified in nitric acid and rinsed again. Then they are anodised as usual.

Tank material

Heatable tanks of special plastic are suitable. The tank can be heated either by means of Teflon or porcelain immersion heaters or by special heat exchangers. The exhaust fan should be made of stainless steel or plastic.

Maintaining concentration

The bath must be maintained at a constant level with respect to density, the control of aluminium content and the content of nitric acid. Density should be between 1.70 and 1.78 at a temperature of 20°C depending on the aluminium content of the brightening solution. With baths already in use optimum brightening results are usually achieved with a density of 1.73 - 1.76. Should density increase slowly as a result of the evaporation of water, small quantities of water may be added cautiously. The nitric acid content is dependent on the purity of the material, the bath temperature and the aluminium content. Highest grade aluminium requires a higher nitric acid content than alloys. With high temperatures the required amount of nitric acid also increases. In contrast, if the aluminium content increases, the nitric acid concentration can be reduced. An optical control during the brightening process will usually provide immediate and sufficient information on the state of the bath. If nitric acid is lacking, few small whitish blisters will form during operation of the bath. The surface will be milky white and the surface film produced during the brightening process can be scaled off only difficulty or incompletely. If the nitric acid content is too high, only a cloudy milky brightness will be obtained. In a well working bath the nitric acid demand will usually be about 1 - 2% of the bath volume. Also remember that a heated bath consumes nitric acid even during the time where no brightening takes place. Losses due to drag out are replenished by addition of Alfiflex 403.

Determination of nitric acid: 2 ml of the brightening bath are pipetted with a volumetric pipette into a 300 ml Erlenmeyer flask and (caution!) 100 ml of sulphuric acid (96%) is added. When the solution has cooled to room temperature, titration is performed using the Alfiflex Titrierloesung until the color changes to light pink. Since the point at which the change takes place cannot be recognised clearly when the solution is warm, the sample should be kept as close to room temperature as possible by intermediate cooling.

used ml = A

2 ml of the Testloesung A20 are pipetted with a volumetric pipette into a 300 ml Erlenmeyer flask, then sulphuric acid (96%) is added, and the solution is cooled and titrated, as described above.

used ml = B

calculation: (5/B x A) x 6.96 = g/l nitric acid (100%)

Testloesung A20: The Testloesung A20 for the various brightening solutions can be purchased from us ready-made. If you want to make the Testloesung A20 yourself, please pipette exactly 5 ml of nitric acid (52% techn.) into a 100 ml measuring flask and fill with phosphoric acid (85%) to slightly below the calibration mark. Then mix well and fill up the mark.

Alfiflex Titrierloesung: The Alfiflex Titrierloesung for the various brightening solutions can be purchased from us ready-made.

Maintaining concentration (continuation)

Determination of aluminium: A 5 ml sample of the brightening solution which has been cooled to 20°C is diluted in a 1000 ml measuring flask with dist. water up to 1000 ml. Then exactly 100 ml of this dilution are pipetted with a volumetric pipette into a 300 ml Erlenmeyer flask and 25 ml of 0.1 mol Titriplex(III)solution are added. This mixture is left for 15 minutes and neutralised with a 15% sodium acetate solution to a pH-value of 5.4. After adding a spatula-tipful of pulverised indicator xylenol orange, titration is performed using 0.1 mol zinc(II)sulphate solution until the color changes to red-violet.

used ml zinc(II)sulphate solution = A

calculation: (25 - A) x 5.4 = g/l aluminium

We will be glad to give you advice in this area and to send you relevant informations.