International Standard 8079

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Aerospace process — Anodic treatment of aluminium alloys — Sulfuric acid process, dyed coating

Procédés de traitement dans l'industrie aérospatiale — Traitement anodique des alliages d'aluminium — Traitement à l'acide sulfurique pour revêtement coloré

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8079 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*.

Aerospace process — Anodic treatment of aluminium alloys — Sulfuric acid process, dyed coating

1 Scope and field of application

This International Standard specifies requirements for producing and testing a dyed anodic coating on aluminium alloys where the coating is not required to withstand prolonged exposure to weathering and direct sunlight. The anodic coating is produced by the sulfuric acid process.

The anodizing process is applied in the manufacture of aerospace products to improve resistance to corrosion, produce coloured surfaces for aesthetic reasons or to colour code parts for identification purposes.

2 References

ISO 2064, *Metallic and other non-organic coatings — Definitions and conventions concerning the measurement of thickness.*

ISO 2106, *Anodizing of aluminium and its alloys — Determination of mass per unit area (surface density) of anodic oxide coatings — Gravimetric method.*

ISO 2360, *Non-conductive coatings on non-magnetic basis metals — Measurement of coating thickness — Eddy current method.*

ISO 2859, *Sampling procedures and tables for inspection by attributes.*

ISO 3768, *Metallic coatings — Neutral salt spray test (NSS test).*

3 Technical requirements

3.1 Materials to be anodized

The alloys shall be of a chemical composition amenable to sulfuric acid anodizing.

The base metal shall be sufficiently free from surface defects caused by metalworking processes or handling, and free from grease, pitting, corrosion, heavy etching, etc. which will be detrimental to the application of anodized coatings capable of meeting all requirements of this International Standard.

3.2 Process requirements

The processes employed shall be such that they will consistently produce coatings to the requirements of this International Standard.

3.3 Process details

3.3.1 Electrolyte

The electrolyte shall be an aqueous solution of sulfuric acid, technical grade (ϱ 1,83) at a nominal concentration of 15 % (m/m) (allowable range: 150 to 200 g H_2SO_4 per litre). The maximum dissolved aluminium content in the electrolyte shall not exceed 15 g/l. The chloride content, measured as NaCl, shall not exceed 0,2 g NaCl per litre. The temperature of the bath shall be maintained at 21 ± 2 °C.

3.3.2 Dye

The colouring agent shall be such as to produce the required colour on all coatings produced to the requirements of this International Standard. After application, it shall maintain its colour without fading under all reasonable expected conditions of storage and service. Fading due to exposure to ionizing radiation shall not be considered as a reasonably expected condition of service.

3.3.3 Water quality

The quality of the water used shall be such that its initial conductivity does not exceed 1,000 µS/m. Total dissolved solids should not be greater than 12 ppm (sulfates, chlorides, etc.), including a maximum of 4 ppm SiO_2. The pH value shall be held between 5,5 and 6,9. Acetic acid or ammonia may be used to maintain the required pH level.

3.3.4 Sealer

This shall be an aqueous solution of nickel acetate or cobalt acetate at a concentration of 0,4 to 0,8 % (m/m) $(CH_3COO)_2Ni$ or $(CH_3COO)_2Co$ in hot water (3.3.3). The pH value shall be held between 5,5 and 5,8. When specified, a second sealer may be used, after the acetate sealing treatment, consisting of an aqueous solution of sodium dichromate or potassium dichromate at a concentration of 1 to 3 % (m/m) $Na_2Cr_2O_7 \cdot 2H_2O$ or $K_2Cr_2O_7 \cdot 2H_2O$. The pH value shall be held between 5,0 and 6,0. Adjustments in the pH value of both the acetate and dichromate solutions shall be made by the addition of acetic acid or sodium hydroxide, as required.

NOTE — The use of the second sealer (dichromate) can cause a colour change in the dye. When such a change is undesirable, the second sealing should be omitted