SLOVENSKI STANDARD
oSIST prEN ISO 7599:2017

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Aluminij in aluminijeve zlitine - Specifikacije za dekorativne in zaščitne anodizirane plasti na aluminiju (ISO/DIS 7599:2016)

Anodizing of aluminium and its alloys - Method for specifying decorative and protective anodic oxidation coatings on aluminium (ISO/DIS 7599:2016)

Anodisieren von Aluminium und Aluminiumlegierungen - Verfahren zur Spezifizierung dekorativer und schützender anodisch erzeugter Oxidschichten auf Aluminium (ISO/DIS 7599:2016)

Anodisation de l'aluminium et de ses alliages - Spécifications générales pour couches anodiques sur aluminium (ISO/DIS 7599:2016)

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Anodizing of aluminium and its alloys — Method for specifying decorative and protective anodic oxidation coatings on aluminium

Anodisation de l'aluminium et de ses alliages — Spécifications générales pour couches anodiques sur aluminium

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 79, *Light metals and their alloys*, Subcommittee SC 2, *Organic and anodic oxidation coatings on aluminium*.

This third edition cancels and replaces the second edition (ISO 7599:2010), which has been technically revised.

Anodizing of aluminium and its alloys — Method for specifying decorative and protective anodic oxidation coatings on aluminium

1 Scope

This International Standard lays down a method for specifying decorative and protective anodic oxidation coatings on aluminium (including aluminium-based alloys). It defines the characteristic properties of anodic oxidation coatings, lists methods of test for checking the characteristic properties, provides minimum performance requirements, and gives information on the grades of aluminium suitable for anodizing and the importance of pretreatment to ensure the required appearance or texture of the finished work.

It is not applicable to

a) non-porous anodic oxidation coatings of the barrier layer type,

b) anodic oxidation coatings produced by chromic acid or phosphoric acid anodizing,

c) anodic oxidation coatings intended merely to prepare the substrate for subsequent application of organic coatings or for the electrodeposition of metals,

d) hard anodic oxidation coatings used mainly for engineering purposes, for which abrasion and wear resistance are the primary characteristics (see ISO 10074).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1463, *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method*

ISO 2085, *Anodizing of aluminium and its alloys — Check for continuity of thin anodic oxidation coatings — Copper sulfate test*

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

ISO 2128, *Anodizing of aluminium and its alloys — Determination of thickness of anodic oxidation coatings — Non-destructive measurement by split-beam microscope*

ISO 2135, *Anodizing of aluminium and its alloys — Accelerated test of light fastness of coloured anodic oxidation coatings using artificial light*

ISO 2143, *Anodizing of aluminium and its alloys — Estimation of loss of absorptive power of anodic oxidation coatings after sealing — Dye-spot test with prior acid treatment*

ISO 2360, *Non-conductive coatings on non-magnetic electrically conductive basis materials — Measurement of coating thickness — Amplitude-sensitive eddy-current method*

ISO 2376, *Anodizing of aluminium and its alloys — Determination of electric breakdown potential*

ISO 2931, *Anodizing of aluminium and its alloys — Assessment of quality of sealed anodic oxidation coatings by measurement of admittance*

ISO 3210, *Anodizing of aluminium and its alloys — Assessment of quality of sealed anodic oxidation coatings by measurement of the loss of mass after immersion in phosphoric acid/chromic acid solution*

ISO 3211, *Anodizing of aluminium and its alloys — Assessment of resistance of anodic oxidation coatings to cracking by deformation*

ISO 6581, *Anodizing of aluminium and its alloys — Determination of the comparative fastness to ultraviolet light and heat of coloured anodic oxidation coatings*

ISO 6719, *Anodizing of aluminium and its alloys — Measurement of reflectance characteristics of aluminium surfaces using integrating-sphere instruments*

ISO 7583, *Anodizing of aluminium and its alloys — Vocabulary*

ISO 7668, *Anodizing of aluminium and its alloys — Measurement of specular reflectance and specular gloss of anodic oxidation coatings at angles of 20 degrees, 45 degrees, 60 degrees or 85 degrees*

ISO 7759, *Anodizing of aluminium and its alloys — Measurement of reflectance characteristics of aluminium surfaces using a goniophotometer or an abridged goniophotometer*

ISO 8251, *Anodizing of aluminium and its alloys — Measurement of abrasion resistance of anodic oxidation coatings*

ISO 8993, *Anodizing of aluminium and its alloys — Rating system for the evaluation of pitting corrosion — Chart method*

ISO 8994, *Aluminium and aluminium alloys — Rating system for the evaluation of pitting corrosion — Grid method*

ISO 9220, *Metallic coatings – Measurement of coating thickness – Scanning electron microscope method*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 10215, *Anodizing of aluminium and its alloys — Visual determination of image clarity of anodic oxidation coatings — Chart scale method*

ISO 10216, *Anodizing of aluminium and its alloys — Instrumental determination of image clarity of anodic oxidation coatings — Instrumental method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7583 apply.

4 Information supplied by customer to anodizer

4.1 General

The information required from the customer by the anodizer in order to anodize the product correctly is given in 4.2 and 4.3: 4.2 specifies information that is essential whenever a product is to be anodized; 4.3 identifies additional information required for particular product applications. A summary of the subclause references relating to this information is given in Annex F.

NOTE Certain properties (for example, high specular reflectance) are only obtainable by the use of special alloys, and some properties can be incompatible with others.

4.2 Essential information

The following information shall be supplied by the customer to the anodizer, if necessary in consultation with the aluminium supplier and/or anodizer:

a) a reference to this International Standard;

b) the intended service use of the article to be anodized;

c) the specification of the aluminium to be anodized;

d) an indication of the significant surface(s) of the article to be anodized;

e) the surface preparation to be used on the aluminium before anodizing;

f) the anodic oxidation coating thickness class required (see 6.2);

g) whether a clear or coloured anodized finish is required;

h) whether the product is to be sealed or left unsealed, and if it is to be sealed, what sealing method is to be used.

Significant surfaces as per d) above are indicated preferably by drawings or by suitably marked samples; in some cases, there can be different requirements for the finish on different parts of the significant surface(s).

The surface preparation as per e) above is indicated preferably by agreed samples; guidance on surface preparation is given in Annex B.

NOTE Guidance on the choice of aluminium is given in Annex A.

4.3 Additional information

Additional information can be required for certain applications and, if so, shall be specified by the customer, if necessary in consultation with the anodizer. It includes the following:

a) the type of anodizing and the colouring process to be used;

b) details of any formal sampling plans required;

c) the preferred position and maximum size of contact marks;

d) any limits of variation of final surface finish on the significant surface(s);

e) the colour of the anodized article(s) and maximum limits of colour variation (see 8.2);

f) any requirements for quality of sealing;

g) any requirements for corrosion resistance and the method of test to be used;

h) any requirements for abrasion (wear) resistance, the property to be tested and the measurements required
(i.e. wear resistance, wear resistance coefficient, wear index, mass wear index, mean specific abrasion resistance) and the method of test to be used;

i) any requirements for resistance to cracking by deformation;

j) any requirements for fastness to light or ultraviolet radiation of coloured anodic oxidation coatings;

k) any requirements for light reflection properties, i.e. total reflectance, specular reflectance, specular gloss, diffuse reflectance and image clarity;

l) any requirements for electric breakdown potential;

m) any requirements for the continuity of the anodic oxidation coating;

n) any requirements for the mass per unit area (surface density) of the coating.

Acceptable limits of variation of final surface finish as per d) above are identified preferably by agreed limit samples.

Acceptable maximum limits of colour variation as per e) above are identified preferably by agreed limit samples.

5 Tests

5.1 Sampling procedures

Sampling procedures shall be specified by the customer. Guidance on the choice of suitable sampling procedures is given in ISO 2859-1.

5.2 Test pieces

Wherever practicable, test pieces shall be production components. However, if by agreement special test pieces are prepared for convenience in referee or acceptance tests, they shall be of the same alloy as the production components and processed through the anodizing line at the same time as the production components.

5.3 Acceptance tests

Acceptance tests shall be as specified by the customer.

5.4 Referee tests

In cases of dispute, the appropriate referee tests specified in this International Standard shall be used.