

SVENSK STANDARD

SS-EN ISO 6719:2010

Fastställt/Approved: 2010-11-04
Publicerad/Published: 2010-11-30
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 25.220.20; 77.120.10

Aluminium och aluminiumlegeringar – Anodisering – Mätning av reflektionsegenskaper på aluminiumytor med hjälp av instrument med integrerande sfär (ISO 6719:2010)

Anodizing of aluminium and its alloys – Measurement of reflectance characteristics of aluminium surfaces using integrating-sphere instruments (ISO 6719:2010)

This preview is downloaded from www.sis.se. Buy the entire standard via <https://www.sis.se/std-75787>

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.



Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00



Europastandarden EN ISO 6719:2010 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 6719:2010.

Denna standard ersätter SS-EN 12373-12, utgåva 1.

The European Standard EN ISO 6719:2010 has the status of a Swedish Standard. This document contains the official version of EN ISO 6719:2010.

This standard supersedes the Swedish Standard SS-EN 12373-12, edition 1.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

Uppllysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna uppllysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Lättmetaller, SIS/TK 129.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

EN ISO 6719

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2010

ICS 25.220.20

Supersedes EN 12373-12:2000

English Version

Anodizing of aluminium and its alloys - Measurement of reflectance characteristics of aluminium surfaces using integrating-sphere instruments (ISO 6719:2010)

Anodisation de l'aluminium et de ses alliages - Mesurage des caractéristiques de réflectivité des surfaces d'aluminium à l'aide d'instruments à sphère d'intégration (ISO 6719:2010)

Anodisieren von Aluminium und Aluminiumlegierungen - Messung der Reflexionseigenschaften von Aluminiumoberflächen mit Hilfe Ulbrichtscher Kugeln (ISO 6719:2010)

This European Standard was approved by CEN on 14 October 2010.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Principle.....	1
4 Apparatus	1
4.1 General	1
4.2 Geometrical specifications of the apparatus.....	2
4.3 Specular-included and specular-excluded determinations	2
4.4 Irradiation beam.....	2
4.5 Housing	3
5 Calibration and operation of the reflectometer	7
5.1 General	7
5.2 Reference standards	8
6 Measurement	8
7 Expression of results	8
7.1 Calculation of reflectance values	8
8 Test report.....	9

Foreword

The text of ISO 6719:2010 has been prepared by Technical Committee ISO/TC 79 "Light metals and their alloys" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 6719:2010 by Technical Committee CEN/TC 132 "Aluminium and aluminium alloys" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12373-12:2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 6719:2010 has been approved by CEN as a EN ISO 6719:2010 without any modification.

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

1 Scope

This International Standard specifies a method of measuring the total and diffuse luminous reflectance characteristics of aluminium surfaces, using integrating-sphere instruments.

The method described is also applicable to the measurement of specular reflectance (principal gloss value), specularity and diffuseness.

The method is unsuitable for use with lighting reflectors.

2 Normative references

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

ISO 7724-2, *Paints and varnishes — Colorimetry — Part 2: Colour measurement*

ISO 11664-2:2007, *Colorimetry — Part 2: CIE standard illuminants*

3 Principle

Measurement, using an integrating-sphere reflectometer, of the total and diffuse reflected light at different angles of incidence, close to the normal surface of a test specimen.

4 Apparatus

4.1 General

The reflectometer, suitable for measuring the reflectance of metallic surfaces, consists of a suitable light source, an integrating sphere and a photometer comprising a photo-electric cell with a signal multiplier and recording, indicating, or computing equipment. Figures 1 to 5 show the optical systems and geometry of typical instruments.

The incident light beam is allowed to fall onto the specimen and is reflected into the sphere, the interior of which is white, where it is automatically integrated. The average light flux, as measured by the photometer, is a measure of the quantity of the reflected light.

The spectral product of the light source, spectral filters, and spectral response of the light detector shall closely simulate the spectral product of the CIE source C (or D65) and the spectral luminous efficiency $V(\lambda)$ for photopic vision, in accordance with ISO 11664-2.

4.2 Geometrical specifications of the apparatus

4.2.1 Integrating sphere

The interior of the sphere, white-coated and fitted with a device to permit measurement of reflectance, either including or excluding specular reflectance, serves to collect the reflected light flux.

Any diameter of sphere is satisfactory, provided that the total port area does not exceed 5 % of the total internal surface.

The internal surface shall be diffusing and of a highly reflective white for the whole of the visible spectrum. The entrance and specimen ports of the instrument shall be centred on the same great circle with an arc of more than 170° between their centres. The specimen port shall subtend $8^\circ \pm 1^\circ$ of arc in relation to the centre of the entrance port. The irradiating beam shall pass through the centreline of the entrance and specimen ports. A photometer shall be positioned on the sphere at $90^\circ \pm 0,5^\circ$ from the entrance port.

4.3 Specular-included and specular-excluded determinations

4.3.1 Pivotal sphere

In the pivotal-sphere type of instrument (Figures 1 to 4), the sphere can turn about a vertical axis passing through the specimen port, rotating $9^\circ \pm 1^\circ$ to provide for the measurements of specular-included or total reflectance (Q) and specular-excluded or diffuse reflectance (Q_d).

4.3.2 Fixed sphere (Type 1)

In the fixed-sphere Type 1 instrument, the specimen is held so that the incident beam falls on it at an angle of $9^\circ \pm 1^\circ$ to the normal. A port, of the same dimensions as the entrance port, is provided in order to accept the specular reflection. Interchangeable caps are provided for this port, a black one to absorb the specular reflection for diffuse reflectance (Q_d) measurements and one coated with the same material as the inside of the sphere for total reflectance (Q) measurements.

4.3.3 Fixed sphere (Type 2)

In the fixed-sphere Type 2 instrument (see Figure 5), the sphere is fixed and only the specimen can be inclined. A wedge, as shown in Figure 5, designed to exclude ambient light, and white-coated like the sphere interior, allows adjustment of the angle of the specimen surface. For measurement of diffuse reflectance (Q_d), the specimen surface is adjusted to be perpendicular to the incident beam. For measurement of total reflectance (Q), the specimen surface is inclined at $9^\circ \pm 1^\circ$ from the normal incident beam by insertion of the wedge.

4.4 Irradiation beam

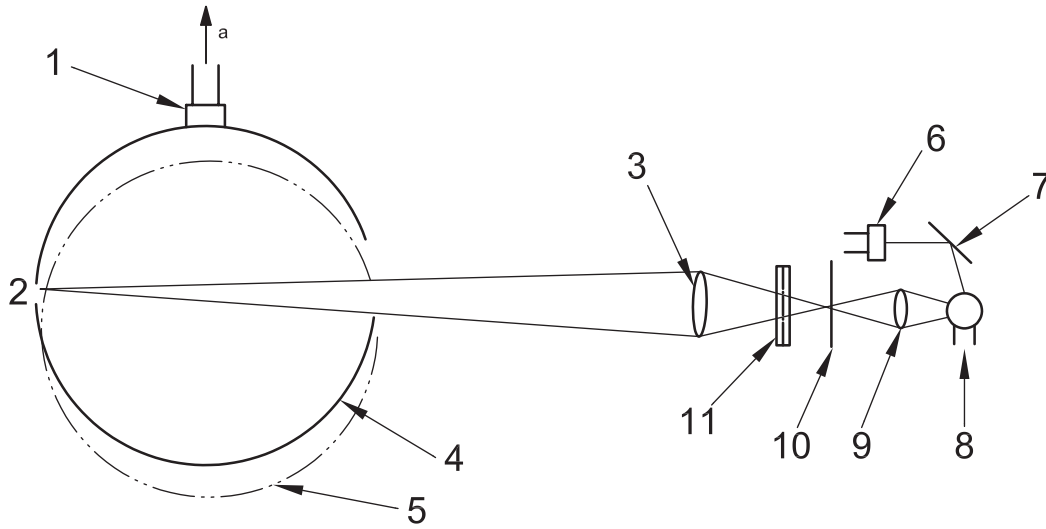
The light beam shall be substantially unidirectional with a maximum angle of any ray being less than 3° from the axis of the beam. It shall not be vignetted at either port.

The incident light beam shall have a circular cross-section concentric with the specimen port and shall have an annulus of $1,3^\circ \pm 0,1^\circ$ subtended at the entrance port. On reflection from a first surface mirror, the specular-excluded beam shall be concentric with the centre of the port when the sphere is in the specular-excluded position. The mirror-reflected beam shall have a concentric circle with the port and shall have an annulus of $0,6^\circ \pm 0,2^\circ$ subtended at the level of the exit port. The size of the exit port shall be not more than $0,1^\circ$ greater than that of the annulus.

NOTE The dimensions of this beam can be most easily measured at a point beyond the sphere at a distance corresponding to the diameter of the integrating sphere, with no obstruction at either port. However, this will not ensure alignment when specularly reflected.

4.5 Housing

A housing shall be provided to prevent ambient light from entering the entrance port.



Key

- | | | | |
|---|---|----|-----------------|
| 1 | photoelectric cell | 7 | mirror |
| 2 | test piece | 8 | light source |
| 3 | lens | 9 | lens |
| 4 | 0° incidence for diffuse reflectance | 10 | aperture |
| 5 | 9° ± 1° incidence for total reflectance | 11 | spectral filter |
| 6 | photoelectric cell for comparison | | |
| a | To the amplifiers and recorders. | | |

Figure 1 — Schematic optical plan of one type of pivotable-sphere reflectometer