



SLOVENSKI STANDARD

SIST EN 4474:2016

01-oktober-2016

Nadomešča:

SIST EN 4474:2009

Aeronavtika - Premazi, pigmentirani z aluminijem - Premazna metoda

Aerospace series - Aluminium pigmented coatings - Coating methods

Luft- und Raumfahrt - Aluminium pigmentierte Beschichtungen - Beschichtungsverfahren

Série aérospatiale - Revêtements aluminés organiques - Méthode d'application
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ICS:

49.025.20	Aluminij	Aluminium
49.040	Prevleke in z njimi povezani postopki, ki se uporabljajo v letalski in vesoljski industriji	Coatings and related processes used in aerospace industry

SIST EN 4474:2016

en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 4474

July 2016

ICS 49.040

Supersedes EN 4474:2009

English Version

**Aerospace series - Aluminium pigmented coatings -
Coating methods**

Série aérospatiale - Revêtements aluminos-organiques -
Méthode d'application

Luft- und Raumfahrt - Aluminiumpigmentierte
Beschichtungen - Beschichtungsverfahren

This European Standard was approved by CEN on 4 March 2016.

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-CENELEC 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-CENELEC 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 4474:2016) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

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 January 2017, and conflicting national standards shall be withdrawn at the latest by January 2017.

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 4474:2009.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 4474:2016 (E)**1 Scope**

This European Standard defines the coating methods and characteristics of aluminium pigmented coatings to EN 4473 which may be applied to fasteners in titanium, titanium alloys, heat resisting nickel base or cobalt base alloys and corrosion resisting steels.

2 Purpose of process

To reduce galvanic corrosion, friction and risk of seizing.

3 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.

EN 2516, *Aerospace series — Passivation of corrosion resisting steels and decontamination of nickel base alloys*

EN 3032, *Aerospace series — Test method for dry film lubricants — Thickness measurement*

EN 4473, *Aerospace series — Aluminium pigmented coatings — Technical specification*

EN 9100, *Quality Management Systems — Requirements for Aviation, Space and Defence Organizations*

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

EN ISO 2409, *Paints and varnishes — Cross-cut test* SIST EN 4474:2016
<https://standards.iteh.ai/catalog/standards/sist/43c86d5c-124b-43fd-8250-052b5249b77d/sist-en-4474-2016>

EN ISO 2431, *Paints and varnishes — Determination of flow time by use of flow cups*

EN ISO 2884-1, *Paints and varnishes — Determination of viscosity using rotary viscometers — Part 1: Cone-and-plate viscometer operated at a high rate of shear*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 8080, *Aerospace — Anodic treatment of titanium and titanium alloys — Sulphuric acid process*

4 Terms and definitions

For the purposes of this standard, the following terms and definitions apply.

4.1**batch**

parts subjected to the same aluminium pigmented coating application at the same time under the same condition

4.2**pre-production parts**

parts representing future production parts

4.3**definition document**

document specifying directly or indirectly all the requirements for the parts

4.4**scratch**

gouged out or scoring of metallic coating

4.5**run**

localized excess amount of coating to the extent of creating a drip or running of coating

4.6**indentation**

indent or uneven surface thickness (orange peel)

4.7**flaking**

particles of coating falling off due to poor adhesion or excess coating

4.8**crack**

separation of coating due to improper mix or poor adhesion of material

4.9**sampling plan**

plan according to which one or more samples are taken in order to obtain information and to reach a decision, if possibly

4.10**Acceptable Quality Limit (AQL)**

maximum percent defective (or the maximum number of defects per hundred units) that, for purposes of sampling inspection, can be considered satisfactory as a process average

Note 1 to entry: Variant: quality level which in a sampling plan corresponds to a specified but relatively high probability of acceptance.

5 Apparatus**5.1 For application by dipping**

Container with a lid, stirring device and temperature control.

The apparatus shall be capable of applying the specified thickness, for example by controlling the speed of immersion and removal and by draining or centrifuging the parts.

EN 4474:2016 (E)**5.2 For application by spraying**

A dry, oil free air fed gun shall be used, with settings adapted to the characteristics of the aluminium pigmented coating used and to the shape of the parts to be coated.

Preferably a mechanical stirring device in the reservoir.

NOTE 1 A device allowing for rotation of the parts to be coated and the automatic displacement of the gun will give a more uniform application.

NOTE 2 Use of an aerosol spray is not suitable as it does not always ensure acceptable reproducibility.

5.3 For curing

An oven capable of curing temperatures prescribed by the coating manufacturer and controlled by periodical calibration.

6 Information for the processor

The following information is to be given:

- designation of the aluminium pigmented coating to EN 4473;
- percentage of solvent plus reference of the solvent product;
- number of the material standard and metallurgical condition of the latter;
- areas to be processed;
- thickness of the pigmented coating, if necessary, (see Table 1);
- duration and temperature of curing.

7 Surface roughness of parts prior to application

It shall be specified on the drawing or in the definition documents.

NOTE The surface roughness is an important factor affecting adhesion and behaviour of the coating in service.

8 Surface preparation**8.1 Parts in titanium and titanium alloys**

Unless otherwise specified, degreasing followed by abrasive blasting.

8.2 Parts in corrosion resisting steel

Unless otherwise specified, or degreasing followed by abrasive blasting.

9 Coating

9.1 General

It is recommended to apply the coating:

- if possible within 24 h, after surface preparation ; precautions shall be taken to prevent contamination or corrosion of the parts awaiting treatment;
- in a clean and dry environment, avoiding any operations liable to contaminate the surfaces to be treated.

9.2 Application by dipping

Dipping can be performed as follows:

- adjust the viscosity of the solution (see EN ISO 2431 or EN ISO 2884-1) to the value given by the manufacturer of the product to be deposited;
- if necessary, pre-heat the parts to about 50 °C;
- immerse the parts at a speed determined by tests on pre-production parts;
- keep the parts immersed for 2 s to 10 s;
- remove the parts at a speed determined by tests on pre-production parts;
- drain parts;
- dry parts avoiding handling them;
- if necessary, cure the coating in an oven. The temperature and duration shall comply with the values given by the manufacturer of the product used.

9.3 Application by spraying

Spaying can be performed as follows:

- adjust the viscosity of the solution (see ISO 2431 or ISO 2884-1) to the value given by the manufacturer;
- if necessary, pre-heat the parts to approx. 50 °C;
- produce the coating by applying successive passes, the gun setting and its distance being determined by tests on pre-production parts;
- dry parts avoiding handling them;
- if necessary, cure the coating in an oven. The temperature and duration shall comply with the values given by the manufacturer of the product to be used.

9.4 Other applications

Other application methods producing the same quality of deposit may be used (for example: barrel deposition).