SLOVENSKI STANDARD
SIST EN 12487:2000

01-december-2000

Antikorozijska zaščita kovin - Kromatne prevleke na aluminiju in aluminijevih zlitinah, splaknjene ali nesplaknjene

Corrosion protection of metals - Rinsed and non-rinsed chromate conversion coatings on aluminium and aluminium alloys

Korrosionsschutz von Metallen - Gespülte und no-rinse Chromatierüberzüge auf Aluminium und Aluminiumlegierungen

Protection contre la corrosion des métaux - Couches de conversion au chromate rincées et non rincées sur l'aluminium et les alliages d'aluminium

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25.220.40	Kovinske prevleke	Metallic coatings
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English version

Corrosion protection of metals - Rinsed and non-rinsed chromate conversion coatings on aluminium and aluminium alloys

Protection contre la corrosion des métaux - Couches de conversion au chromate rincées et non rincées sur l'aluminium et les alliages d'aluminium

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This European Standard was approved by CEN on 1 March 2000.

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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 Central Secretariat has the same status as the official versions.

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

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 262 "Metallic and other inorganic coatings", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by October 2000, and conflicting national standards shall be withdrawn at the latest by October 2000.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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for rinsed and non-rinsed chromate conversion coatings on aluminium and aluminium alloys intended to give protection against corrosion and as a base for other coatings.

2 Normative references

This European Standard incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 3892, *Conversion coatings on metallic materials — Determination of coating mass per unit area - Gravimetric methods (ISO 3892 :1980).*

ISO 4519, *Electrodeposited metallic coatings and related finishes — Sampling procedures for inspection by attributes.*

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

IEC 60130-1, *Connectors for frequencies below 3 MHz — Part 1: General requirements and measuring methods.*

3 Terms and definitions

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

3.1
rinsed chromate coating
chromate coating that is rinsed in water prior to drying

NOTE This type of coating is typically applied to extruded and rolled aluminium fabricated parts, castings and long coils.

3.2
non-rinsed chromate coating
chromate coating that is dried immediately after the chromating step without receiving a water rinse

NOTE This type of coating is normally used on long coils of aluminium sheet stock that receive an immediate subsequent paint or adhesive coating. Sometimes referred to as "coil coating".

4 Information to be supplied by the purchaser

The following information shall be supplied by the purchaser:

a) the coating designation (see clause 5);

b) sampling methods, acceptance levels or any other inspection requirements, if different from those given in ISO 4519 (see clause 6);

c) the surface preparation prior to chromate conversion coating (see annex A for guidance);

d) the requirements for adhesion (see 7.3) and corrosion resistance (see 7.6);

e) the nature, condition and finish of the basis metal, if any of these could affect the serviceability and/or the appearance of the coating.

5 Coating types and designation

5.1 Coating types

A conversion coating shall be referred to as type A, C1, C2, E1 or E2 in accordance with table 1.

NOTE Annex A provides guidance on coating type, purpose, end use and mass per unit area.

Table 1 — Types of chromate conversion coating

Type	Appearance	Coating mass per unit area (g/m²)	Corrosion protection	Other properties
A	Colourless	0,05 to 0,2	Slight	Decorative, low insulation resistance
C1	Yellow (light to iridescent)	0,4 to 1,0	Moderate	Used as a paint base and for bonding to rubber
C2	Yellow (to brown)	1,0 to 3	Maximum	Generally used as final finish
E1	Light green	0,4 to 1,2	Moderate	Used as a paint base and for bonding to rubber
E2	Green	2 to 5	Moderate	Generally used as final finish

5.2 Conversion coating designation

The conversion coating designation shall comprise the following:

a) the number of this European Standard;

b) a hyphen;

c) the basis metal code, e.g. its chemical symbol (or that of the principal constituant of an alloy) (see note 1);

d) a solidus;

e) a symbol designating the type of coating (see table 1 and note 1).

If the chromate conversion coating has to be after-treated, the designation shall also comprise the following:

a) a solidus;

b) a symbol indicating any after-treatment of the conversion coating, as specified in table B.1, annex B (see note 2).

NOTE 1 It is recommended that the chemical symbol is followed by the standard designation of the basis metal.

NOTE 2 This can be repeated if more after-treatments are required.

EXAMPLE

Designation of a chromate conversion coating of coating mass 0,4 g/m^2 to 1,2 g/m^2 (E1) on aluminium (Al) that has been after-treated with the application of inorganic or organic sealant (T2)

Chromate conversion coating EN 12487-Al/E1/T2

6 Sampling

Sampling shall either be in accordance with ISO 4519 or as specified by the purchaser (see 4,b)).

7 Coating requirements

7.1 General

Any tests (including corrosion resistance tests) shall be deferred until the expiry of a period of 24 h after treatment.

NOTE Conversion coatings harden with age by gradual dehydration, and they should therefore be handled carefully for the first 24 h after the last treatment.

7.2 Electrical insulation

When measured at an open circuit voltage of 9 V and a current of 2 A in accordance with IEC 60130-1, the resistance between an electrical contact and the aluminium shall be less than 0,1 Ω for type A, C1 and E1 coatings.

NOTE Highly coloured type C2 and E2 coatings show a marked increase in electrical resistance with increasing mass per unit area of the chromate layer.

7.3 Adhesion

7.3.1 The coatings shall be adherent and non-powdery. The conversion coating shall pass the test described in 7.3.2 or 7.3.3.

7.3.2 Rub the dried surface with a white soft tissue paper using normal hand pressure (approximately 10 moves). This treatment shall not leave any trace of staining on the paper.

7.3.3 If the test described in 7.3.2 is not sufficiently adequate to measure the adhesion of a conversion coating on aluminium, another practical evaluation of the adhesion can be made by measuring the adhesion of a secondary organic film applied to the chromated aluminium.

7.4 Coating mass per unit area

For all but thin (type A) coatings, the coating mass per unit area of chromate and chromate-phosphate coatings on aluminium shall be determined in accordance with EN ISO 3892 or with the methods described in C.2 to C.4.

For thin (type A) chromate coatings, the coating mass per unit area shall be determined in accordance with C.3 and C.4.

NOTE For thin chromate coatings, the errors associated with the methods described in EN ISO 3892 are unacceptably high.

7.5 Coating identification

7.5.1 General

The test methods specified in annex D shall be used to determine the presence or the absence of relevant chemical elements in the conversion coating.

7.5.2 Chromate conversion coatings (yellow)

The presence of chromium and the absence of phosphate in the coating shall identify the layer as a chromate conversion coating.

7.5.3 Chromate phosphate coatings (green)

The presence of phosphate and chromium and the absence of zinc shall identify the layer as a chromate-phosphate conversion coating.

7.6 Corrosion resistance

The corrosion resistance of a conversion coating shall be determined in accordance with ISO 9227.

NOTE Requirements for corrosion resistance of conversion coatings vary widely depending on the aluminium alloys to which they are applied. Annex E gives typical figures of corrosion resistance attained under the best possible conditions.