SLOVENSKI STANDARD
SIST EN 4688:2012

01-september-2012

Aeronavtika - Premazna sredstva - Dvokomponentni temeljni premaz, ki se strdi na zraku, za preprečevanje korozije, za vojaško uporabo

Aerospace series - Paints and varnishes - Corrosion inhibiting two components cold curing primer for military application

Luft- und Raumfahrt - Beschichungsstoffe - Zweikomponenten Grundbeschichtung, korrosionshemmend, raumtemperaturhärtend, für militärische Anwendung

Série aérospatiale - Peinture et vernis - Peinture primaire anti corrosion chromate à deux composants polymérisant à température ambiante pour applications militaires

Ta slovenski standard je istoveten z: **EN 4688:2012**

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49.040	Prevleke in z njimi povezani postopki, ki se uporabljajo v letalski in vesoljski industriji	Coatings and related processes used in aerospace industry
95.020	Vojaška tehnika. Vojaške zadeve. Orožje	Military engineering. Military affairs. Weapons

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English Version

Aerospace series - Paints and varnishes - Corrosion inhibiting two components cold curing primer for military application

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

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Foreword

This document (EN 4688:2012) 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of an identical text or by endorsement, at the latest by September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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1 Scope

This European Standard defines the requirements for a two components, high corrosion inhibiting epoxy primer.

The coating should be suitable for use on suitably prepared metallic substrates, chromic acid anodized or conversion coated aluminium alloys, fibre reinforced composite materials and other suitably prepared substrates.

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.

EN 2101, *Aerospace series — Chromic acid anodizing of aluminium and wrought aluminium alloys*

EN 2334, *Aerospace series — Chromic-sulphuric acid pickle of aluminium and aluminium alloys*

EN 2437, *Aerospace series — Chromate conversion coatings (yellow) for aluminium and aluminium alloys*

EN 3212, *Aerospace series — Paints and varnishes — Corrosion test by alternate immersion in a buffered sodium chloride solution*

EN 3837, *Aerospace series — Paints and varnishes — Nature and method for surface preparation of test pieces in aluminium alloys* [1)]

EN 3840, *Aerospace series — Paints and varnishes — Technical specification*

EN 3847, *Aerospace series — Paints and varnishes — Determination of sedimentation rating* [1)]

EN 4160, *Aerospace series — Non-metallic materials — Paints and varnishes — Test methods — Determination of the effect of thermal exposure* [1)]

EN 4687, *Aerospace series — Paints and varnishes — Chromate free non corrosion inhibiting two components cold curing primer for military application*

EN 4689, *Aerospace series — Paints and varnishes — Two components cold curing polyurethane finish — High flexibility and chemical agent resistance for military application*

EN ISO 1513, *Paints and varnishes — Examination and preparation of test samples*

EN ISO 1518, *Paints and varnishes — Scratch test*

EN ISO 1519, *Paints and varnishes — Bend test (cylindrical mandrel)*

EN ISO 1520, *Paints and varnishes — Cupping test*

EN ISO 1524, *Paints, varnishes and printing inks — Determination of fineness of grind*

1) Published as ASD-STAN Prestandard at the date of publication of this standard (www.asd-stan.org).

EN ISO 2409, *Paints and varnishes — Cross-cut test*

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

EN ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pyknometer method*

EN ISO 2811-2, *Paints and varnishes — Determination of density — Part 2: Immersed body (plummet) method*

EN ISO 2811-3, *Paints and varnishes — Determination of density — Part 3: Oscillation method*

EN ISO 2811-4, *Paints and varnishes — Determination of density — Part 4: Pressure cup method*

EN ISO 2812-1, *Paints and varnishes — Determination of resistance to liquids — Part 1: Immersion in liquids other than water*

EN ISO 2812-2, *Paints and varnishes — Determination of resistance to liquids — Part 2: Water immersion method*

EN ISO 2813, *Paints and varnishes — Determination of specular gloss of non-metallic paint films at 20°, 60° and 85°*

EN ISO 3251, *Paints, varnishes and plastics — Determination of non-volatile-matter content*

EN ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method*

EN ISO 3678, *Paints and varnishes — Print-free test*

EN ISO 3679, *Determination of flash point — Rapid equilibrium closed cup method*

EN ISO 3680, *Determination of flash/no flash — Rapid equilibrium closed cup method*

EN ISO 4623-2, *Paints and varnishes — Determination of resistance to filiform corrosion — Part 2: Aluminium substrates*

EN ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering*

EN ISO 4628-8, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 8: Assessment of degree of delamination and corrosion around a scribe*

EN ISO 4628-10, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 10: Assessment of degree of filiform corrosion*

EN ISO 6270-1, *Paints and varnishes — Determination of resistance to humidity — Part 1: Continuous condensation*

EN ISO 9117-1, *Paints and varnishes — Drying tests — Part 1: Determination of through-dry state and through-dry time*

EN ISO 9117-3, *Paints and varnishes — Drying tests — Part 3: Surface-drying test using ballotini*

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

EN ISO 9514, *Paints and varnishes — Determination of the pot life of multicomponent coating systems — Preparation and conditioning of samples and guidelines for testing*

EN ISO 11890-1, *Paints and varnishes — Determination of volatile organic compound (VOC) content — Part 1: Difference method*

ISO 3270, *Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing*

ISO 7724-1, *Paints and varnishes — Colorimetry — Part 1: Principles*

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

ISO 7724-3, *Paints and varnishes — Colorimetry — Part 3: Calculation of colour differences*

MIL-PRF-5606H, *Performance specification: Hydraulic fluid, petroleum base; aircraft, missile, and ordnance. (NATO H-515)* [2)]

MIL-PRF-6081D, *Performance specification: Lubricating oil, jet engine. (NATO O-133)* [2)]

MIL-PRF-23699F, *Performance specification: Lubricating oil, aircraft turbine engine, synthetic base, NATO code number O-156* [2)]

MIL-DTL-83133G, *Detail specification: Turbine fuel, aviation, kerosene type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37)* [2)]

AMS 1526B, *Cleaner for aircraft exterior surfaces water-miscible, pressure- spraying type* [3)]

AMS 1527B, *Standard Practice for Operating Salt Spray (Fog) Apparatus* [3)]

AMS 1533A, *Cleaner for exterior aircraft surfaces gel-type, solvent-base* [3)]

ASTM B 117, *Cleaner for exterior aircraft surfaces gel-type, solvent-base* [4)]

DEF STAN 68-10, *Corrosion Preventive, Water Displacing NATO Code: C-634 Joint Service Designation: PX-24*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 3840 apply.

2) Published by: DoD National (US) MIL. Department of Defense http://www.defenselink.mil/

3) Published by: SAE National (US) Society of Automotive Engineers http://www.sae.org/

4) Published by: ASTM National (US) American Society for Testing and Materials http://www.astm.org/

4 Surface pretreatment

In accordance with EN 3837, the surface pretreatment applicable to aluminium alloy test panels are the following:

EN 3837 — Procedure A : Sulfochromic pickling in accordance with EN 2334;

EN 3837 — Procedure B : Chromic acid anodizing in accordance with EN 2101;

EN 3837 — Procedure C : Chromate conversion coating in accordance with EN 2437.

5 Classification

The primer is classified according to the following types:

TYPE I: Standard solvent content (VOC < 680 g/l);

TYPE II: Low volatile organic (VOC < 420 g/l);

TYPE III: Waterborne (VOC < 350 g/l).

6 Batch release and qualification testing

6.1 General

The general requirements for qualification and batch release testing shall be in accordance with (i.a.w.) EN 3840 and the applicable appendix for the specific material.

6.2 Qualification tests

For product qualification, all tests defined in this standard, in the Tables 2 to 7, shall be performed. A minimum of three batches shall be tested for qualification purposes.

6.3 Batch acceptance testing

The Manufacturer shall give evidence on the Test Report or the Certificate of Conformance that all the tests marked with the symbol * in this specification shall be performed for batch acceptance tests.

6.4 Compatibility of waterborne paints to solventborne paints

The waterborne primer type III shall be compatible to solventborne primers type I and type II according to this standard and to type I and type II primers to EN 4687. All tests to demonstrate the compatibility are defined in Table 7 and shall be performed.

6.5 Purchaser batch release testing

The purchaser may perform any of the test of this specification deemed necessary to ensure continuing uniform quality in material shipments.

Table 1 — General requirements

	Material description	Primer, corrosion inhibiting, for aerospace applications
	Formulation	Base Activator Thinner – if appropriate
	Preparation	These components shall be mixed in simple whole number proportions, by volume or weight, in accordance with the manufacturer's instructions.
	Technical specification	EN 3840
	Marking	See EN 3840.
	Storage stability	See EN 3840.
	Application and use	Dry film thickness of (25 ± 5) µm
	Drying conditions	(23 ± 2) °C / (50 ± 5) % RH for 7 (seven) days before testing, or after air drying for 4 (four) hours to 6 (six) hours before the application of the topcoat EN 4689. ISO 3270 for 7 (seven) days before application of the top EN 4689.
	Quality assurance	See EN 3840.
	Designation	Primer corrosion inhibiting
	Packaging	See EN 3840.
	Health and safety	See EN 3840.

Table 2 — Physical and chemical characteristics – Delivery conditions

Tests according to EN 3840	Test	Test criteria	Test requirements			
— *	Condition	Test method	EN ISO 1513 (as received in the original container)			
		Requirement	Shall be free from contaminants and show no skinning, gelling, hard settlement, or other defect.			
1 *	Non volatile matter	Test method	EN ISO 3251			
		Requirement	% m/m	Base	Activator	Thinner
				± 2 % reference value [a] [b]	± 2 % reference value [a] [b]	—
49	Volatile organic content (VOC) (not Type I)	Test method	EN ISO 11890-1			
		Test condition	Base + Activator + Thinner			
		Requirement	g/l	< reference value [a]		

continued

Table 2 — Physical and chemical characteristics – Delivery conditions *(continued)*

Tests according to EN 3840	Test	Test criteria	Test requirements			
7	Flash point	Test method	EN ISO 3679 or EN ISO 3680			
		Requirement	°C	Base	Activator	Thinner
				≥ reference value [a]	≥ reference value [a]	≥ reference value [a]
8 *	Flow time	Test method	EN ISO 2431			
		Test condition	Base + Activator + Thinner			
		Requirement	s	± 10 % reference value [a b]		
5	Sedimentation rating	Test method	EN 3847			
		Coating	Base + Activator + Thinner			
		Requirement	ml/4 h	≤ 30		
3 * 4 *	Density	Test method	EN ISO 2811-1 to EN ISO 2811-4 or EN ISO 3675			
		Test condition	(23 ± 2) °C / (50 ± 5) % RH			
		Requirement	g/cm^3	Base	Activator	Thinner
				[a]	[a]	[a]
10	Fineness of grind	Test method	EN ISO 1524			
		Requirement	µm	Base	Activator	Thinner
				[c]	[c]	—
— *	Application, properties and finish	Test method	None			
		Panel	EN 3837 — A_1 or EN 3837 — A_2 (2024-T3 unclad or 2024-T3 clad)			
		Pretreatment	EN 3837 — Procedure A or B or C			
		Coating	Coating to this standard.			
		Test condition	(23 ± 2) °C / (50 ± 5) % RH			
		Requirements	The paint film applied shall result in an opaque even finish free from runs, sags, wrinkling, pinholing or other defects.			
20 *	Pot life	Test method	EN ISO 9514			
		Coating	Base + Activator + Thinner			
		Requirement	s or Pa.s	[a]		

continued