
Aeronavtika - Barve in laki - Brezkromatni, protikorozijski, dvokomponentni temeljni premaz, ki se strdi pri temperaturi okolja, za vojaško uporabo

Aerospace series - Paints and varnishes - Chromate free non corrosion inhibiting two components cold curing primer for military application

Luft- und Raumfahrt - Beschichtungsstoffe - Zweikomponenten Grundbeschichtung, chromatfrei, nicht korrosionshemmend, raumtemperaturhärtend, für militärische Anwendung

Série aéronautique - Peinture et vernis - Peinture primaire sans chromate non anticorrosive à deux composants polymérisant à température ambiante pour applications militaires

Ta slovenski standard je istoveten z: EN 4687:2012

ICS:

49.040	Prevleke in z njimi povezani postopki, ki se uporabljajo v letalski in vesoljski industriji	Coatings and related processes used in aerospace industry
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EUROPEAN STANDARD
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EN 4687

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ICS 49.040

English Version

**Aerospace series - Paints and varnishes - Chromate free non
corrosion inhibiting two components cold curing primer for
military application**

Série aérospatiale - Peinture et vernis - Peinture primaire
sans chromate non anticorrosive à deux composants
polymérisant à température ambiante pour applications
militaires

Luft- und Raumfahrt - Beschichtungsstoffe -
Zweikomponenten Grundbeschichtung, chromatfrei, nicht
korrosionshemmend, raumtemperaturhärtend, für
militärische Anwendung

This European Standard was approved by CEN on 21 January 2012.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	7
4 Surface pretreatments.....	7
5 Classification.....	7
6 Batch release and qualification testing	8
7 Requirements for fibre reinforced composites	18
8 Designation	18

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Foreword

This document (EN 4687:2012) 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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Introduction

The requirements concerning fibre reinforced composite substrates are established in Clause 7.

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1 Scope

This European Standard defines the requirements for a two components, chromate and lead free epoxy, non corrosion inhibiting primer.

The coating should be suitable for use on fibre reinforced composite materials, titanium and corrosion resistant steels and other suitably prepared corrosion resistant 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 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 4688, *Aerospace series — Paints and varnishes — 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 — Determination of scratch resistance*

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*

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

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

EN 4687:2012 (E)

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 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 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 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*

EN ISO 11890-2, *Paints and varnishes — Determination of volatile organic compound (VOC) content — Part 2: Gas-chromatographic 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, *Cleaner for aircraft exterior surfaces water-miscible, foam-on, pressure-spraying* ³⁾

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

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.

4 Surface pretreatments

In accordance with EN 3837, the surface pretreatments 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 content (VOC < 420 g/l);
- TYPE III: Waterborne (VOC < 350 g/l).

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/>

EN 4687:2012 (E)

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 solvent borne paints

The waterborne primer type III shall be compatible to solvent borne primers type I and type II according to this standard and to type I and type II primers to EN 4688. All tests to demonstrate the compatibility are defined in Table 6 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	Chromate free primer, 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 manufacturers's instructions.
	Technical specification	EN 3840
	Marking	See EN 3840.
	Storage stability	See EN 3840.
	Application and use	Dry film thickness of $(25 \pm 5) \mu\text{m}$
	Drying conditions	$(23 \pm 2) ^\circ\text{C}$ / $(50 \pm 5) \% \text{RH}$ 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 topcoat EN 4689.
	Quality assurance	See EN 3840.
	Designation	Chromate free primer
	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 ± 2 % reference value ^{a b}	Activator ± 2 % reference value ^{a b}	Thinner —
49	Volatile organic content (VOC)	Test method	EN ISO 11890-1 for Type I / Type II EN ISO 11890-2 for Type III			
		Coating	Base + Activator + Thinner			
		Requirement	g/l	< reference value ^a		
7	Flash point	Test method	EN ISO 3679 or EN ISO 3680			
		Requirement	°C	Base ≥ reference value ^a	Activator ≥ reference value ^a	Thinner ≥ reference value ^a
8 *	Flow time	Test method	EN ISO 2431			
		Coating	Base + Activator + Thinner			
		Requirement	s	± 10 % reference value ^{a b}		
5	Sedimentation rating	Test method	EN 3847 (23 ± 2) °C / (50 ± 5) % RH			
		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			
		Requirements	g/cm ³	Base a	Activator a	Thinner a
10	Fineness of grind	Test method	EN ISO 1524			
		Requirement	µm	Base c	Activator c	Thinner —

continued