

SLOVENSKI STANDARD

SIST EN 4840-101:2018

01-november-2018

Aeronavtika - Toplotno skrčljive brizgane forme - 101. del: Poliolefin, poltogi, z majhno požarno nevarnostjo - Temperaturno območje - 30 °C do 105 °C - Standard za proizvod

Aerospace series - Heat shrinkable moulded shapes - Part 101: Polyolefin, semi-rigid, limited fire hazard - Temperature range - 30 °C to 105 °C - Product standard

Luft- und Raumfahrt - Wärmeschrumpfende Bauteile - Teil 101: Polyolefin, halbsteif, reduziertes Brandverhalten - Temperaturbereich - 30 °C bis 105 °C - Produktnormen
(standards.iteh.ai)

Série aérospatiale - Manchons thermorétractables - Partie 101 : Semi-rigides en polyoléfine, à risque de feu limité - Température - 30 °C à 105 °C - Norme de produit

Ta slovenski standard je istoveten z: EN 4840-101:2018

ICS:

49.025.40 Guma in polimerni materiali Rubber and plastics

SIST EN 4840-101:2018

en,fr,de

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EUROPEAN STANDARD

EN 4840-101

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2018

ICS 49.060

English Version

Aerospace series - Heat shrinkable moulded shapes - Part 101: Polyolefin, semi-rigid, limited fire hazard - Temperature range - 30 °C to 105 °C - Product standard

Série aéronautique - Manchons thermorétractables -
Partie 101 : Semi-rigides en polyoléfine, à risque de feu
limité - Température - 30 °C à 105 °C - Norme de
produit

Luft- und Raumfahrt - Wärmeschrumpfende Formteile
- Teil 101: Polyolefin, halbsteif, reduziertes
Brandverhalten - Temperaturbereich - 30 °C bis 105 °C
- Produktnormen

This European Standard was approved by CEN on 20 May 2018.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Required characteristics	5
5 Quality assurance	9
6 Designation	10
7 Labelling and packaging	10
8 Technical specification	10
Annex A (informative) Adhesive compatibility guide for EN 4840-101 moulded shapes	11

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European foreword

This document (EN 4840-101:2018) 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 February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

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

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 4840-101:2018 (E)**1 Scope**

This European Standard specifies the required characteristics for heat-shrinkable polyolefin semi-rigid, limited fire hazard heat-shrinkable boots for use in aircraft electrical systems at operating temperatures between – 30 °C and 105 °C.

The moulded shapes may be supplied with a pre-coated adhesive. Refer to the manufacturers/suppliers for options. A guide to adhesive compatibility is given in Annex A.

These moulded shapes are normally supplied in the styles and dimensions given in EN 4840-002 Tables 1 to 22. The colour is normally black.

Styles and dimensions other than those specifically listed in EN 4840-002 Tables 1 to 22 may be available as custom items. These items shall be considered to comply with this standard if they comply with the property requirements listed in Table 1 with the exception of dimensions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 3909, *Aerospace series — Test fluids and test methods for electrical and optical components and sub-assemblies*

EN 4708-106, *Aerospace series — Sleeving, heat-shrinkable, for binding, insulation and identification — Part 106: Limited fire hazard sleeving — Operating temperature – 30 °C to 105 °C — Product standard*¹⁾

EN 4840-001, *Aerospace series — Heat shrinkable moulded shapes — Part 001: Technical specification*

EN 4840-002, *Aerospace series — Heat shrinkable moulded shapes — Part 002: Index of product standards and product dimensions*¹⁾

IEC 60684-3, *Flexible insulating sleeving — Part 3: Specifications for individual types of sleeving*²⁾

IEC 60695-11-10, *Fire hazard testing — Part 11-10: Test flames — 50 W horizontal and vertical flame test methods*²⁾

IEC 62329-1, *Heat shrinkable moulded shapes — Part 1: Definitions and general requirements*²⁾

IEC 62329-2, *Heat-shrinkable moulded shapes — Part 2: Methods of test*²⁾

IEC 60757:1983, *Code for designation of colours*²⁾

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*³⁾

1) Published as ASD-STAN Prestandard at the date of publication of this European Standard by AeroSpace and Defence industries Association of Europe - Standardization (ASD-STAN), <http://www.asd-stan.org/>

2) Published by: International Electrotechnical Commission (IEC), <http://www.iec.ch/>

3) Published by: International Organization for Standardization (ISO), <http://www.iso.ch/>

MIL-PRF-87937, *Performance specification: cleaning compound, aerospace equipment* 4)

AMS 1476B, *Deodorant, Aircraft Toilet* 5)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62329-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Required characteristics

4.1 Dimensions and mass

See EN 4840-002.

4.2 Conditions of test

4.2.1 Conditions of test for the moulded shapes

The moulded shapes shall be shrunk in a forced air circulation oven for (10 ± 1) min at the temperature specified in Table 1.

4.2.2 Moulded shapes material conformance

Conformance with the requirements of this specification shall be based on the results from test sheets, $(2 \pm 0,15)$ thick, unless otherwise specified 6), which shall be prepared from the same cross-linked heat shrinkable material that is used to manufacture the heat shrinkable moulded shapes.

4.2.3 Moulded shapes compatibility

Conformance with the compatibility requirements of this specification shall be based on the results from the assembly configuration as shown in Figure 3 of IEC 62329-2.

4.3 Tests

See Table 1.

4) Published by: Department of Defense (DoD). <http://www.defenselink.mil/>

5) Published by: National (US) Society of Automotive Engineers (SAE), <http://www.sae.org/>

6) A suitable size has been found to be 150 mm × 150 mm.

Table 1 — Tests (1 of 3)

Designation of the test	IEC 62329-2 Clause or Subclause	Requirements	Remarks
Dimensions	5	EN 4840-002 Dimension tables	Condition at 150 °C ± 3 °C
Density	6	± 0,03	Max permitted deviation from manufacturers qualification values
Heat shock	7		Heat at 175 °C ± 3 °C
Tensile strength	10	5 MPa min	
Elongation at break	10	100 % min	
Bending at low temperature	8	No cracks shall be visible	Condition at – 30 °C ± 2 °C. The mandrel diameter shall be between 20 mm + 1/– 0 mm
Dimensional stability during storage	9	The dimensions shall be as specified in EN 4840-002 dimension tables	—
Tensile strength	10	7 MPa min	Use a jaw separation rate of 100 mm/min.
Elongation at break	10	200 % min	
Secant modulus at 2 % elongation	11	50 MPa min 130 MPa max	—
Electric Strength	12	8 KV/mm	—
Volume resistivity	13	10 ¹⁰ Ω m min	—
Flammability	16	30 s max.	Test in accordance with method A of IEC 60695-11-10
Oxygen Index	17	29 % min.	—
Copper corrosion	18	None above the allowable 8	Heat for (16 ± 0,5) h at 150 °C ± 3 °C
Colour fastness to light	19	The colour contrast between the exposed and unexposed parts of the specimens shall be equal to or less than that of the fastness standard.	Fastness standard No. 5
Resistance to selected fluids	20		Use the fluids and test temperatures specified in Table 2.
Tensile strength	10	4 MPa min	
Elongation at break	10	100 % min	Immersion time (24 ± 1) h

Table 1 — Tests (2 of 3)

Designation of the test	IEC 62329-2 Clause or Subclause	Requirements	Remarks
Long Term Ageing (3 000 h)	21		Heat at 105 °C ± 3 °C
Elongation at break	10	100 % min	
Mass	22	EN 4840-002 Dimension tables	—
Heat ageing	23		Heat at 150 °C ± 3 °C
Tensile strength	10	5 MPa min	
Elongation at break	10	100 % min	
Water absorption	24	0,5	—
Colour stability to heat	25	Not applicable	—
Smoke Index	26	20 max.	—
Toxicity	27	5 max.	—
Halogen content	28		Expressed as Chlorine
Chlorine, Bromine, Iodine	28.1	0,2 max.	
Fluorine	28.2	0,1 max.	
Acid gas generation	29 29.2	3,5 pH min. 10,5 pH max. 10,0 µS/mm	—
Resistance to mould growth	30		Method B
Tensile Strength	10	7 MPa min.	56 days exposure
Elongation	10	200 % min.	
Compatibility ^a	31	—	Boot: EN4840-101-B/5-BK-W1-N Tubing: EN4708-106-12.7/6.4-BK
Dynamic shear	31.1	300 N min.	Test at 23 °C ± 3 °C
		30 N min.	Test at 105 °C ± 3 °C
Static load	31.2	10 kg	Test at 23 °C ± 3 °C
		0,5 kg	Test at 105 °C ± 3 °C
Fluid resistance	31.3	150 N min.	Use the fluids and test temperatures specified in Table 3. Immersion time (24 ± 1) h