SLOVENSKI STANDARD
SIST EN 4708-106:2018

01-december-2018

Aeronavtika - Toplotno skrčljiva cev za utrjevanje, izolacijo in identifikacijo - 106. del: Z izboljšanimi protipožarnimi lastnostmi - Delovna temperatura med –30 °C in 150 °C - Standard za proizvod

Aerospace series - Sleeving, heat-shrinkable, for binding, insulation and identification - Part 106: Limited fire hazard sleeving - Operating temperature - 30 °C to 150 °C - Product standard

Luft- und Raumfahrt - Wärmeschrumpfender Schlauch zur Befestigung, Isolierung und Identifizierung - Teil 106: Schlauch mit reduziertem Brandverhalten - Temperaturbereich - 30 °C und 150 °C - Produktnorm

Série aérospatiale - Manchons thermorétractables, de jonction, isolement et identification - Partie 106 : Risque d'incendie limité - Températures d'utilisation -30 °C à 105 °C - Norme de produit

Ta slovenski standard je istoveten z: **EN 4708-106:2018**

ICS:

49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

SIST EN 4708-106:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4708-106

October 2018

ICS 49.060

English Version

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This European Standard was approved by CEN on 27 May 2018.

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

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

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European foreword

This document (EN 4708-106:2018) 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of an identical text or by endorsement, at the latest by April 2019, and conflicting national standards shall be withdrawn at the latest by April 2019.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.

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1 Scope

This European Standard specifies the required characteristics for four types of heat-shrinkable limited fire hazard sleevings for use in aircraft electrical systems at operating temperatures between – 30 °C and 105 °C.

This sleeving is flexible, flame retarded and emits minimum smoke, gases and corrosive by-products when exposed to fire. It is available with various wall thicknesses and also in a higher shrink ratio according to the application and degree of mechanical protection required. It is suitable for use (e.g. as cable protection) in areas where smoke, gases or corrosive by-products would constitute a particular hazard.

Type A Thick wall shrink ratio 2:1 and is normally supplied with internal diameters up to 102,0 mm

Type B Medium wall, shrink ratio 2:1 and is normally supplied with internal diameters up to 60,0 mm

Type C Thick wall, shrink ratio 2:1 and is normally supplied with internal diameters up to 51,0 mm

Type D Medium wall, shrink ratio 3:1 and normally supplied with internal diameters up to 40,0 mm

The standard colour is black.

Sizes or colours other than those specifically listed in this standard may be available. These items shall be considered to comply with this standard if they comply with the property requirements listed in Tables 5, 6 and 7 except for dimensions and mass.

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 4708-001, *Aerospace series — Sleeving, heat-shrinkable, for binding, insulation and identification — Part 001: Technical specification*

EN ISO 846, *Plastics — Evaluation of the action of microorganisms* (ISO 846)

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

EN 60684-1, *Flexible insulating sleeving — Part 1: Definitions and general requirements* (IEC 60684-1)

EN 60684-2, *Flexible insulating sleeving — Part 2: Methods of test* (IEC 60684-2)

IEC 60757, *Code for designation of colours* [1)]

1) Published by: IEC International Electrotechnical Commission, http://www.iec.ch/

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60684-1 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 Tables 1 to 4.

Table 1 — Type A – Dimensional and mass requirements

Size code	Internal diameter mm		Recovered wall thickness	Mass per unit length max.
	Expanded min.	Recovered max.	mm	g/m
3,2/1,6	3,2	1,6	0,50 ± 0,10	6,0
4,8/2,4	4,8	2,4	0,50 ± 0,10	8,2
6,4/3,2	6,4	3,2	0,65 ± 0,15	13,5
9,5/4,8	9,5	4,8	0,65 ± 0,15	19,5
12,7/6,4	12,7	6,4	0,65 ± 0,15	25,0
19,0/9,5	19,0	9,5	0,75 ± 0,15	43,0
25,4/12,7	25,4	12,7	0,90 ± 0,15	67,0
38,0/19,0	38,0	19,0	1,00 ± 0,20	112
51,0/25,4	51,0	25,4	1,15 ± 0,25	175
76,0/38,0	76,0	38,0	1,25 ± 0,25	281

Table 2 — Type B – Dimensional and mass requirements

Size code	Internal diameter mm		Recovered wall thickness	Mass per unit length
	Expanded min.	Recovered max.	mm	max. g/m
3,0/1,5	3,0	1,5	0,70 ± 0,10	8,5
5,0/2,5	5,0	2,5	0,75 ± 0,15	13,5
8,0/4,0	8,0	4,0	0,80 ± 0,15	21,0
12,0/6,0	12,0	6,0	0,90 ± 0,15	33,0
18,0/9,0	18,0	9,0	1,00 ± 0,20	54,0
24,0/12,0	24,0	12,0	1,10 ± 0,20	77,0
40,0/20,0	40,0	20,0	1,30 ± 0,25	146
60,0/30,0	60,0	30,0	1,50 ± 0,30	250

Table 3 — Type C – Dimensional and mass requirements

Size code	Internal diameter mm		Recovered wall thickness	Mass per unit length
	Expanded min.	Recovered max.	mm	max. g/m
3,2/1,6	3,2	1,6	0,75 ± 0,15	9,9
4,8/2,4	4,8	2,4	0,85 ± 0,20	15,8
6,4/3,2	6,4	3,2	0,90 ± 0,20	21,0
9,5/4,8	9,5	4,8	1,00 ± 0,20	32,0
12,7/6,4	12,7	6,4	1,20 ± 0,30	53,6
19,0/9,5	19,0	9,5	1,45 ± 0,35	91,6
25,4/12,7	25,4	12,7	1,80 ± 0,45	155
38,0/19,0	38,0	19,0	2,40 ± 0,50	294
51,0/25,4	51,0	25,4	2,80 ± 0,50	435

Table 4 — Type D – Dimensional and mass requirements

Size code	Internal diameter mm		Recovered wall thickness	Mass per unit length
	Expanded min.	Recovered max.	mm	max. g/m
3,0/1,0	3,0	1,0	0,60 ± 0,10	5,5
6,0/2,0	6,0	2,0	0,70 ± 0,10	10,5
9,0/3,0	9,0	3,0	0,80 ± 0,15	17,0
12,0/4,0	12,0	4,0	0,85 ± 0,15	23,0
18,0/6,0	18,0	6,0	1,00 ± 0,20	39,0
24,0/8,0	24,0	8,0	1,20 ± 0,20	61,0
40,0/13,0	40,0	13,0	1,25 ± 0,20	98,5

4.2 Conditions of test

Unless otherwise specified, the sleeving shall be shrunk in a forced air circulation oven for (5 ± 1) min at 200 °C ± 5 °C prior to testing.

4.3 Tests

See Table 5.