SLOVENSKI STANDARD
oSIST prEN 4708-204:2021

01-september-2021

Aeronavtika - Toplotno skrčljiva cev za utrjevanje, izolacijo in identifikacijo - 204. del: Z izboljšanimi identifikacijskimi protipožarnimi lastnostmi - Območje delovne temperature med –40 °C in 105 °C - Standard za proizvod

Aerospace series - Sleeves, heat-shrinkable, for binding, insulation and identification - Part 204: Limited fire hazard identification sleeves - Operating Temperature range -40 °C to 105 °C - Product Standard

Luft- und Raumfahrt - Wärmeschrumpfender Schlauch zur Identifizierung - Teil 204: Identifikation-Hülse begrenzt Brandverhalten - Temperaturbereich -40 °C und 105 °C - Produktnormen

Série aérospatiale - Manchons thermo rétractables, de jonction, isolement et identification - Partie 204 : Comportement au feu limité Manchon d'identification - Température de service -40 °C à 105 °C - Norme de produit

Ta slovenski standard je istoveten z: **prEN 4708-204**

ICS:

49.025.40	Guma in polimerni materiali	Rubber and plastics
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

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EUROPEAN STANDARD

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English Version

Aerospace series - Sleeves, heat-shrinkable, for binding, insulation and identification - Part 204: Limited fire hazard identification sleeves - Operating Temperature range -40 °C to 105 °C - Product Standard

Série aérospatiale - Manchons thermo rétractables, de jonction, isolement et identification - Partie 204 : Comportement au feu limité Manchon d'identification - Température de service -40 °C à 105 °C - Norme de produit

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 4708-204:2021) 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 document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

1 Scope

This document specifies the required characteristics for heat-shrinkable limited fire hazard identification sleeves for use in aircraft electrical systems at operating temperatures between −30 °C and 105 °C.

This document is for the characterization of identification sleeves only. This sleeving is flexible, flame retarded and emits minimum smoke, gases and corrosive by-products when exposed to fire. It is suitable for use in areas where smoke, gases or corrosive by-products would constitute a particular hazard.

It is available with a shrink ratio of 2:1.

The product is normally supplied with internal diameters up to 51 mm.

The standard colours are white or yellow.

Sizes or colours other than those specifically listed in this document can be available. These items are considered to comply with this standard if they comply with the property requirements listed in Tables 2 and 3 except for dimensions and mass.

As the sleeving to be tested is a printed article, the complete system is to be recorded as part of the evaluation. The sleeve will only be considered as meeting the requirements of this specification if printed with the printer, ribbon, inks and settings referenced within the test report.

Mark adherence and print permanence are determined in this specification using method EN 6059-407.

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.

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

IEC 60684-2:2011, *Flexible insulating sleeving — Part 2: Methods of test*

IEC 60757, *Code for designation of colours*

ISO 846, *Plastics — Evaluation of the action of microorganisms*

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

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:

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

4 Required characteristics

4.1 Dimensions and mass

Table 1 — Dimensional and mass requirements

Size code	Internal diameter mm		Recovered wall thickness mm	Mass per unit length g/m Max.
	Expanded Min.	Recovered Max.		
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

4.2 Conditions of test

Unless otherwise specified, the sleeving shall be shrunk in a forced air circulation oven for (5 ± 1) min at 150 °C ± 5 °C prior to testing.

The sleeving shall be tested as a printed article the complete system is to be recorded as part of the evaluation. The sleeve will only be considered as meeting the requirements of this specification if printed with the printer, ribbon, inks and settings referenced within the test report and recorded upon the approval certificate. All test specimens shall have a series of alphanumeric characters along 75 % of the test specimen on one surface.

4.3 Tests

Table 2 — Tests

IEC 60684-2:2011 Clause or subclause	Designation of the test	Requirements	Remarks
3 3.1.2 3.3.2 3.3.3	Dimensions – internal diameter – wall thickness – concentricity • expanded • recovered	 Table 1 Table 1 65 % min 85 % min	
	Initial Mark adherence	Mark adherence 20rubs, 1kg, method A	EN 6059-407 Method A
6 13	Heat shock	 Bend test Print permanence 20 rubs, 1kg, method B	Heat at 150 °C ± 5 °C 4hr EN 6059-407 Method B
9	Longitudinal change	± 20 %	Heat the expanded sleeving at 150 °C ± 5ºC for (5 ± 1) min
14	Bending at low temperature	No cracks shall be visible	Condition at –40 °C ± 3 °C For strips, the mandrel shall be between 20 and 22 times the wall thickness. Full section sleeving is tested unfilled and the mandrel shall be between 20 and 22 times the outer diameter
16 19.1 and 19.2 19.1 and 19.2	Dimensional stability during storage Tensile strength Elongation at break	The dimensions shall be as specified in table 1 7 MPa min 80 %	2 weeks at 40 °C Use a jaw separation rate of 100 mm/min. Below 6,5 mm diameter test as sleeving, at 6,5 mm diameter and above test as dumb-bells
26 Method C	Flame propagation Time of burning Length burned	 30 s max 75 mm max	?

IEC 60684-2:2011 Clause or subclause	Designation of the test	Requirements	Remarks
27 27.1 27.2	Oxygen Index At ambient temperature At elevated temperature	 29 180 °C min	
33	Copper corrosion	None above the allowable 8 % max	Heat for (16 ± 0,5) h at 150 °C ± 3 °C
34	Colour fastness to light	N/A Print permanence 20rubs, 1kg, Method B	Fastness standard No. 5 EN 6059-407 Method B
36 13	Resistance to selected fluids	Bend test Print permanence 20rubs, 1kg, Method B	Use the fluids and test temperatures specified in table 7 Immersion time (24 ± 1) h EN 6059-407 Method B
38	Mass per unit length	Table 1	
39 13	Heat ageing	 Bend test Print permanence 20 rubs, 1kg Method B	Heat at 135 °C ± 3 °C for 168hrs EN 6059-407 Method B
40	Water absorption	1,0 % max.	
41	Restricted shrinkage Visual	No cracking or splitting	Perform the visual determination only
43	Smoke Index	20 max	
44	Toxicity	5 max	
45 45.1 45.2	Halogen content	 0,2 % max 0,1 % max	Expressed as chlorine
46 46.2	Acid gas generation	 pH 3,5 min pH 10,5 max PS/mm 10,0 max	

IEC 60684-2:2011 Clause or subclause	Designation of the test	Requirements	Remarks
50 13	Long term ageing	Bend test Print permanence 20 rubs, 1kg Method B	Ageing temperature shall be 105 °C ± 3 °C EN 6059-407 Method B
19.1 and 19.2 19.1 and 19.2	Fungus resistance Tensile strength Elongation at break	Bend test Print permanence 20 rubs, 1kg, Method B	The test method shall be ISO 846, method B. 56 days exposure EN 6059-407 Method B
EN 4708-001:2019 Clause 4.6	Shelf life*	The dimensions shall be as specified in table 1	Condition the sleeving for 60 months at ambient temperature prior to testing; interim measurements shall be made every 12 months
EN 4708-001:2019 Table 2	Artificial weathering	Bend test Print permanence 20 rubs, 1kg. Method B	EN 6059-407 Method B
* Due to the duration of this test, lack of completion of this test shall not preclude certification of this sleeving. Additional evidence of compliance with this requirement in the interim shall be as agreed between the supplier and/or the approval authority and/or the customer.			