SLOVENSKI STANDARD
oSIST prEN 6049-005:2023

01-julij-2023

Aeronavtika - Električni kabli, namestitev - Zaščitna obojka iz meta-aramidnih vlaken - 005. del: Upogljiva obojka z možnostjo poznejše montaže - Standard za proizvod

Aerospace series - Electrical cables, installation - Protection sleeve in meta-aramid fibres - Part 005: Sleeve flexible, post installation - Product standard

Luft- und Raumfahrt - Elektrische Leitungen, Installation - Schutzschläuche aus Meta-Aramidfasern - Teil 005: Biegsame Schutzschläuche Nachträglicher Einbau - Produktnorm

Série aérospatiale - Câbles électriques, installation - Gaine de protection en fibres méta-aramides - Partie 005 : Gaine de protection souple à installer après montage - Norme de produit

Ta slovenski standard je istoveten z: **prEN 6049-005**

ICS:

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

oSIST prEN 6049-005:2023 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

Aerospace series - Electrical cables, installation - Protection sleeve in meta-aramid fibres - Part 005: Sleeve flexible, post installation - Product standard

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Luft- und Raumfahrt - Elektrische Leitungen, Installation - Schutzschläuche aus Meta-Aramidfasern - Teil 005: Biegsame Schutzschläuche Nachträglicher Einbau - Produktnorm

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

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

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European foreword

This document (prEN 6049-005:2023) 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.

This document will supersede EN 6049-005:2014.

1 Scope

This document specifies the characteristics of post installation flexible mechanical protection sleeves for electrical cable and cable bundles made from meta-aramid fibres and provided with a water repellent protection.

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 2825, *Aerospace series - Burning behaviour of non metallic materials under the influence of radiating heat and flames - Determination of smoke density*

EN 3844-1, *Aerospace series - Flammability of non-metallic materials - Part 1: Small burner test, vertical - Determination of the vertical flame propagation*

EN 6049-001, *Aerospace series - Electrical cables, installation - Protection sleeve in meta-aramid fibres - Part 001: Technical specification*

EN 6059 (all parts), *Aerospace series — Electrical cables, installation — Protection sleeve — Test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 6049-001 apply.

ISO and IEC maintain terminology 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 Requirements

4.1 Composition and mass

4.1.1 Composition of the tows

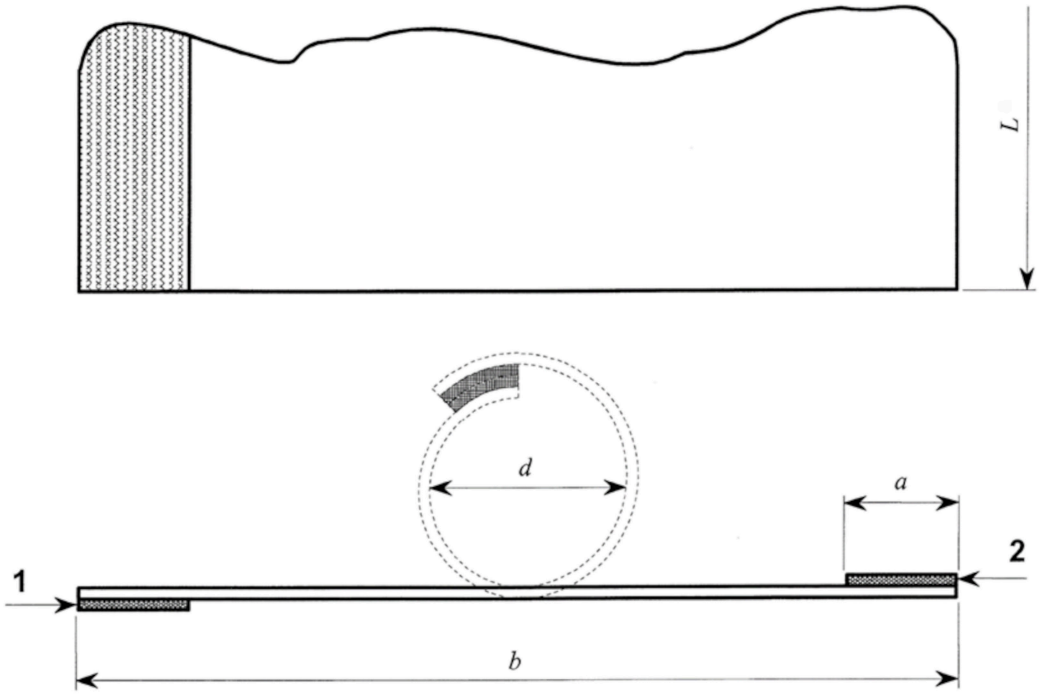
Each tow shall be built-up of groups of multifilament fibres made from meta-aramid.

The thickness of the tow shall be so that the finished sleeve meets the mechanical and environmental requirements. One length of sleeve shall be built-up of one type of tow.

4.1.2 Composition, dimensions and mass of the sleeve

Fibres knitting and the closing mechanism shall apply so that the sleeves meet the requirements for dimensions, coverage and mass. The closing system shall be a 'hook and loop' textile system. The knitted pattern of the fibres shall be in such a way that the coverage is minimum 90 % for all sizes.

Figure 1 and Table 1 give the composition and the dimensions of the sleeve.



Key

1 Closing trip (loop side)
2 Closing strip (hook side)
L Delivery length

Figure 1 — Composition of post installation sleeve

Table 1 — Dimensions, tolerances and mass

Dimensions in millimetres

Size code	Inner diameter *d* Nominal	Width of closing strip *a*	Developed width *b*	Maximum thickness of the sleeve without closing strips	Mass max. g/m
10	10	13 ± 2	45 ± 4	1,2	33
15	15		60 ± 8	1,2	37
20	20		75 ± 7	1,2	43
25	25	25 ± 1	105 ± 10	1,2	70
30	30		120 ± 12	1,2	77

4.2 Colour and materials

4.2.1 Colour

Colour shall be olive green, code 5.

4.2.2 Materials

The materials shall be multifilament fibres of meta-aramid and meet the requirements as specified in this document. The closing mechanism shall be a suitable material, which meets the requirements of this document.

4.3 Mechanical properties

4.3.1 Temperature range

The operation temperature of the protection sleeves shall be:

— Maximum: 175 °C,

— Minimum: −55 °C.

4.3.2 Sun light exposure

After testing according to EN 6059-301 for 40 hours, the retention of the tensile strength shall be 45 % minimum with respect to the determined values of non-exposed fibres. For this test, unravelled fibres of the batch, which have been used to manufacture the sleeves, may be used.

4.3.3 Bending properties

Bending of the minimum radius of five times of the nominal diameter as specified in EN 6059-402, shall be possible under the conditions mentioned in 4.3.4. The number of cycles should be 200 and load 10 N.

4.3.4 Locking of the closing system

The locking of the closing system shall be so that opening and closing is possible by hand. If closed in the longitudinal position around a cable bundle which is 80 % of the nominal inner diameter of the sleeve, the mechanism shall be in a closed position.

4.3.5 Resistance to fluids

After testing according to EN 6059-303, the locking mechanism shall not be visibly damaged and the retention of the tensile strength shall be 50 % minimum with respect to the determined values of non-exposed fibres. For this test, unravelled fibres of the batch, which have been used to manufacture the sleeves, may be used.

4.3.6 Water absorption

To meet the water absorption requirements, the sleeve shall repel water for six hours as specified in EN 6059-305. This test shall be performed after a high temperature exposure test according to EN 6059-302.

4.3.7 Mould growth

After having been tested in accordance with EN 6059-306, there shall be no external deterioration which would affect service use and no mould growth visible to the naked eye.

4.3.8 Tensile strength of fibres

The tensile force to be applied per dTEX shall not be less than 0,02 N. Degradation of the tensile strength after environmental tests shall be within the limits as mentioned in the relevant paragraph. For this test, unravelled fibres of the batch, which have been used to manufacture the sleeves, may be used.

5 Test methods

The tests shall be carried out as shown in Table 2.

For the number of samples to be tested, see EN 6049-001.

Table 2 — Test methods details *(1 of 2)*

EN 6059-	Designation of the test	Details
201[1]	Visual inspection	See 4.1 and 4.2.1.
202	Dimensions and mass	See 4.1.2.
203[1]	Coverage	See 4.1.2.
301	Sunlight exposure	See 4.3.2.
302	High-temperature exposure	At 175 °C. 50 % of tensile strength retention. The product will experience a colour change to a browner colour.
303	Resistance to fluids	See 4.3.5.
EN 3844-1, b)	Flammability	Application time of 12 s.
305	Fluid absorption	See 4.3.6.
306[1]	Mould growth	See 4.3.7.
401	Expansion range	Not applicable
402	Bending properties	See 4.3.3. Only on sizes 20, 25 and 30
403[1]	Scrape abrasion	Needle load shall be 10 N. (100 cycles) on hexagonal mandrel before ageing
404[1]	Tensile strength	See 4.3.8.
405[1]	Dynamic cut-through	Load shall be 30 N.
EN 2825 B	Smoke density	Tested closed The test duration shall be 4 min. The maximum specific optical smoke density (average) shall not exceed. Ds = 200 (flaming mode) Ds = 150 (non-flaming mode)

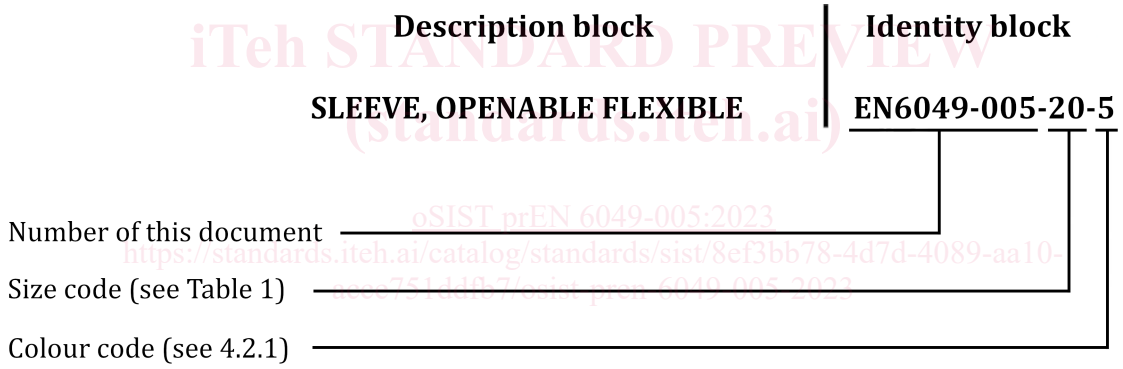
[1] Under preparation.

Table 2 — Test methods details *(2 of 2)*

EN 6059-	Designation of the test	Details		
EN 2826 B	Toxicity	Tested closed		
		Gas component		**Limit of concentration** (ppm) (duration 4 min.)
		Hydrogen fluoride	HF	100
		Hydrogen chloride	HCl	150
		Hydrogen cyanide	HCN	150
		Sulfur dioxide	SO_2/H_2S	100
		Nitrous gases	NO/NO_2	100
		Carbon monoxide	CO	1 000

6 Designation

EXAMPLE



7 Marking

For the marking of the packaging, see EN 6049-001.

8 Technical specification

The requirements of EN 6049-001 shall be applied.