

BS EN 6049-005:2014



BSI Standards Publication

# **Aerospace series — Electrical cables, installation — Protection sleeve in meta- aramid fibres**

Part 005: Sleeve flexible, post installation —  
Product standard

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The UK participation in its preparation was entrusted to Technical Committee ACE/6, Aerospace avionic electrical and fibre optic technology.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

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

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

Luft- und Raumfahrt - Elektrische Leitungen, Installation - Schutzschläuche aus Meta-Aramidfasern - Teil 005: Schutzschlauch, flexibel, nachträglich montierbar - Produktnorm

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## **Foreword**

This document (EN 6049-005:2014) 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of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

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## 1 Scope

This European Standard defines 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 repelled protection.

## 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 6049-001, *Aerospace series — Electrical cables, installation — Protection sleeve in meta-aramid fibres — Part 001: Technical specification* <sup>1)</sup>

EN 6059 <sup>2)</sup>, *Aerospace series — Electrical cables, installation — protection sleeve — Test methods* <sup>1)</sup>

## 3 Terms and definitions

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

## 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 number of groups which forms a tow and the width of the tow depends on the braiding configuration (braiding figure and braiding angle) of the sleeve, see 4.1.2. The thickness of the tow shall be so that the finished sleeve meet 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

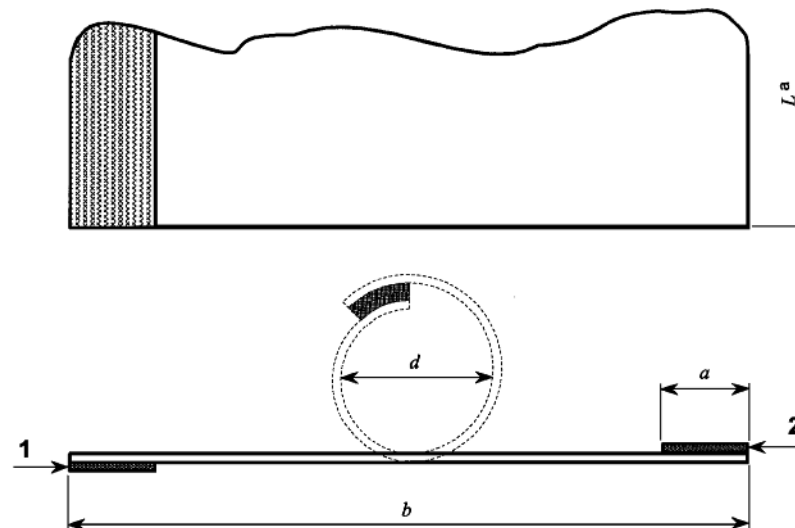
The weaving of tows and the closing mechanism shall applied so that the sleeves meet the requirements for dimensions, coverage and mass. The closing system shall be a 'hook and loop' system. The weaving pattern of the tows shall be in such a way that the coverage is minimum 90 % for all sizes.

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

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1) Published as ASD-STAN Prestandard at the date of publication of this standard. <http://www.asd-stan.org/>

2) All its parts quoted in this standard.



**Key**

- 1 Closing strip (loop side)
- 2 Closing strip (hook side)
- a Delivery length

**Figure 1 — Composition of post installation sleeve**

**Table 1 — Dimensions, tolerances and mass**

Dimensions in millimetres

Size code	Inner diameter <i>d</i> Nominal	Width of closing strip <i>a</i>	Developed width <i>b</i>	Mass max. g/m
10	10	13 ± 2	45 ± 4	32
15	15		60 ± 8	36
20	20		75 ± 7	43
25	25	25 ± 1	105 ± 10	70
30	30		120 ± 12	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 standard. The closing mechanism shall be a suitable material which fulfil the requirements of this specification.

## 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-tested tows.

### 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.

### 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 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 damaged and the retention of the tensile strength shall be 90 % minimum with respect to the determined values of non-tested tows.

### 4.3.6 Water absorption

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

### 4.3.7 Mould growth

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

### 4.3.8 Tensile strength of tows

The tensile force to be applied per dTEX shall not be less than 0,03 N. Degradation of the tensile strength after environmental tests shall be within the limits as mentioned in the relevant paragraph. For this test, unbraided tows of the batch which have been used for braiding of 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.

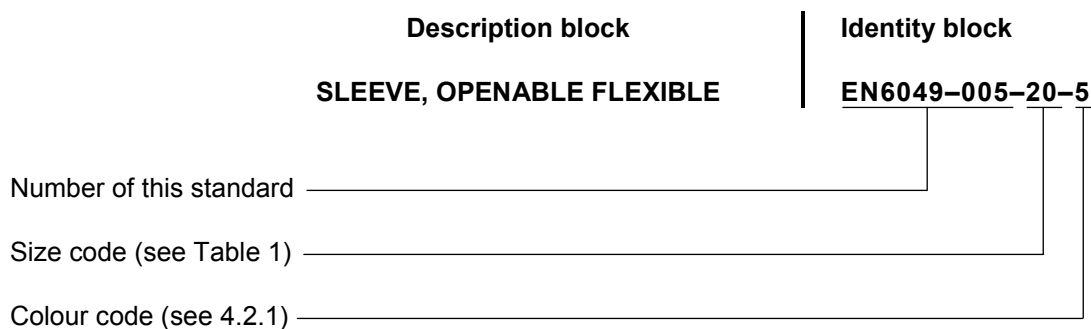


**Table 2 — Test methods and details**

<b>EN 6059-</b>	<b>Designation of the test</b>	<b>Details</b>
201	Visual inspection	See 4.1 and 4.2.1.
202	Dimensions and mass	See 4.1.2.
203	Coverage	See 4.1.2.
301	Sun light exposure	See 4.3.2.
302	High temperature exposure	At 175 °C
303	Resistance to fluids	See 4.3.5.
304	Flammability	–
305	Fluid absorption	See 4.3.6.
306	Mould growth	See 4.3.7.
401	Expansion range	Not applicable
402	Bending properties	See 4.3.3.
403	Scrape abrasion	Needle load shall be 10 N.
404	Tensile strength	See 4.3.8.
405	Dynamic cut-through	Load shall be 30 N.
601	Open and close	–
602	Toxicity	–

## 6 Designation

EXAMPLE



## 7 Marking

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

## 8 Technical specification

EN 6049-001.





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