SLOVENSKI STANDARD
SIST EN 4056-005:2023

01-april-2023

Aeronavtika - Kabelske spojke za vezalno pasovje - 005. del: Plastične vezice s kovinskimi zapornimi napravami, s stalno delovno temperaturo od –65 °C do 105 °C in od –65 °C do 150 °C - Standard za proizvod

Aerospace series - Cable ties for harnesses - Part 005: Plastic cable ties with metallic locking devices, operating temperatures -65 °C to 105 °C and -65 °C to 150 °C - Product standard

Luft- und Raumfahrt - Befestigungsbänder für Leitungsbündel - Teil 005: Befestigungsbänder aus Kunststoff mit Verriegelungssystemen aus Metall, Betriebstemperaturen -65 °C bis 105 °C und -65 °C bis 150 °C - Produktnorm

Série aérospatiale - Frettes de câblage pour harnais - Partie 005 : Frettes en plastique avec languette métallique, températures d'utilisation -65 °C à 105 °C et -65 °C à 150 °C - Norme de produit

Ta slovenski standard je istoveten z: **EN 4056-005:2023**

ICS:

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

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Aerospace series - Cable ties for harnesses - Part 005: Plastic cable ties with metallic locking devices, operating temperatures -65 °C to 105 °C and -65 °C to 150 °C - Product standard

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This European Standard was approved by CEN on 23 October 2022.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 4056-005:2023) 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, prior to its presentation to CEN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2023, and conflicting national standards shall be withdrawn at the latest by August 2023.

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

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1 Scope

This document defines the required characteristics of cable ties with a metallic locking device manufactured from plastics material, for installation under controlled tension on aircraft cable harnesses.

It is used together with EN 4056-001:2015.

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 2826, *Aerospace series — Burning behaviour of non-metallic materials under the influence of radiating heat and flames — Determination of gas components in the smoke*

EN 4056-001:2015, *Aerospace series — Cable ties for harnesses — Part 001: Technical specification*

EN 4057 (all parts), *Aerospace series — Cable ties for harnesses — Test methods*

MS 90387, *Tool, hand adjustable for plastic and metal tiedown straps*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4056-001:2015 apply.

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

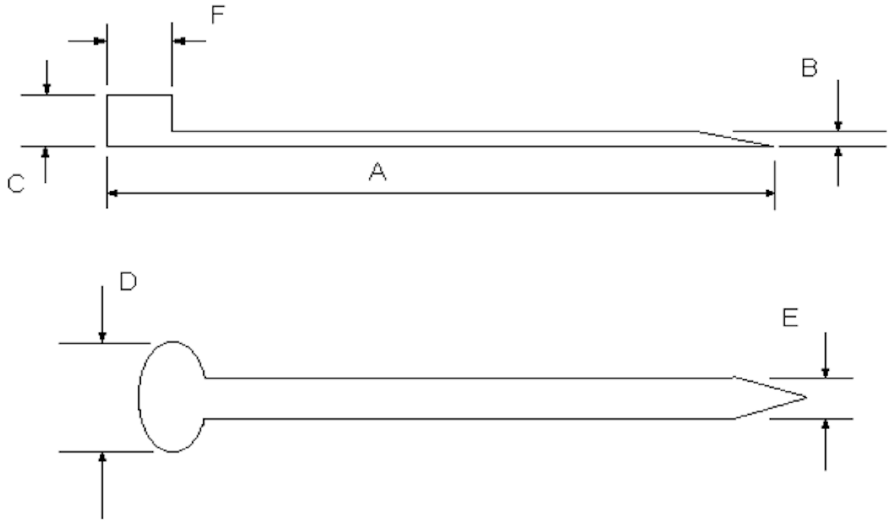
— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

4 Required characteristics

4.1 Dimensions

See Figure 1 and Table 1.



Key

A	Length of tie	**Head dimensions**	
B	Thickness of strap	F	Length
E	Width of strap	D	Width
		C	Height

Figure 1 — Cable tie

Table 1 — Dimensions and mass

Size code	Recommended bundle diameter		Length of tie	Thickness of strap	Width of strap		Head dimensions			Loop tensile strength	Mass of 10 ties related to minimum length
							Length	Width	Height		
			A	*B*	*E*		*F*	*D*	*C*		
	mm		mm	mm	mm		mm	mm	mm	N	g
	min.	max.	min.	max.	min.	max.	max.	max.	max.	min.	max.
P	1,6	20	92	1,1	2,3	2,5	4,4	5,0	4,0	80	3,0
R	1,6	50	190	1,3	3,3	3,8	5,6	6,6	5,0	120	9,5
S	1,6	80	280	1,3	4,4	4,8	7,0	8,6	6,0	220	21,0
T	5,0	100	335	1,9	7,4	7,8	9,5	13,5	8,3	530	65,0
U	1,6	110	360	1,3	4,4	4,8	7,0	8,5	6,0	220	28,0
V	5,0	130	456	1,9	6,8	7,8	9,5	13,5	8,3	530	86,0

4.2 Material

4.2.1 Temperature rating (type)

The ties shall be capable of use within the following temperature ranges:

— Type 1: -65 °C to 105 °C

— Type 2: -65 °C to 150 °C

4.2.2 Flammability class

Available as class 1 and class 2.

See Table 4 for requirements.

4.2.3 Colour

The requirements of Table 2 of EN 4056-001:2015 shall be applied.

4.2.4 Smoke density and toxicity

4.2.4.1 General

Materials for cable ties shall satisfy the following requirements when tested to EN 2825 and EN 2826.

4.2.4.2 Smoke density

The maximum specific optical density (average), shall not exceed:

— Dm = 200 (flaming mode);

— Dm = 150 (non-flaming mode).

4.2.4.3 Toxicity

The average concentration in parts per million (ppm) of the following gas components shall not exceed the following limits after a test duration of 4 min. See Table 2.

Table 2

Gas component		Limit of concentration (ppm)
Hydrogen Fluoride	HF	100
Hydrogen Chloride	HCI	150
Hydrogen Cyanide	HCN	150
Sulphur Dioxide	SO_2	100
Hydrogen Sulphide	H_2S	100
Nitrous Gases	NO/NO_2	100
Carbon Monoxide	CO	1 000

4.3 UV-resistant cable ties

UV-resistant cable ties shall meet the requirements of EN 4057-307, given in Table 4.

4.4 Application tool

Cable ties shall be applied using a tensioning tool, as specified in MS 90387, calibrated in accordance with EN 4057-407, ensuring that the application force does not exceed the values shown in Table 3.

Table 3 — Maximum recommended application force

Size code	N
P	60
R	100
S	150
T	150
U	300
V	150

5 Tests and requirements

It shall be in accordance with Table 4 and EN 4056-001.

Table 4 — Tests *(1 of 2)*

EN 4057-	Designation of the test	Requirement
201	Visual examination	There shall be no sharp or abrasive external edges.
202	Examination of mass and dimensions	The mass and dimensions shall be in accordance with Table 1 of this document.
301	Salt mist test	The ties shall meet the loop tensile requirements as stated in Table 1 of this document.
302	Flammability	After removal of the burner from the specimen, any flame shall extinguish within 5 s. If there are no flaming droplets (or particles) during the test, and the flame extinguishes within 5 s, the specimen will be classified as class 1. If there are flaming droplets (or particles) but all the flames extinguish within 5 s, the specimen will be classified as class 2.
303	Resistance to fluids	All the specimens shall meet the minimum loop tensile strength as stated in Table 1 of this document.
304	Loop tensile strength at maximum working temperature	All specimens shall meet at least 60 % of the minimum loop tensile strength as stated in Table 1 of this document.

Table 4 — Tests *(2 of 2)*

EN 4057-	Designation of the test	Requirement
305	Colour fastness (applicable only to coloured ties)	The colour fastness of the specimen shall not be less than wool standard number 6.
306	Heat ageing test	The tensile strength shall not be lower than that specified in the appropriate product standard. The elongation at break of the aged flat samples shall not be less than 75 % of the elongation of the flat unaged samples, as specified in the product standard.
307	Resistance to ultraviolet radiation	All the specimens shall meet at least 95 % of the requirement for part EN 4057-401. The average elongation at break of the exposed specimens shall not be less than 60 % of the figure for the unexposed samples.
401	Loop tensile strength	All the specimens shall meet the minimum loop tensile strength for their size code, as stated in Table 1 of this document.
402	Life cycle	After the vibration test: 1) There shall be no damage to the cable insulation when viewed with a 10 magnification aid times. 2) The specimens shall be examined for cracks, breaking and/or release of the locking device during removal from the vibration test harness. 3) All the specimens shall meet the minimum loop tensile strength as stated in Table 1 of this document.
404	Low temperature installation	All the specimens shall meet the minimum loop tensile strength as stated in Table 1 of this document.
405	Compass safe distance	The samples shall have a minimum compass safe distance of 125 mm.
406	Locking device retention (ties containing metal locking barbs only)	The minimum locking device retention force shall, be determined according to the rated loop tensile strength, as given below:
		Loop tensile: Retention force (N)
		80: 5
		135: 10
		220: 10
		530: 20
407	Verification of application tool settings	See Table 3 of this document (± 5 %).