



SLOVENSKI STANDARD

SIST EN 4056-001:2009

01-junij-2009

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Aerospace series - Cable ties for harnesses - Part 001: Technical specification

Luft- und Raumfahrt - Befestigungsbänder für Leitungsbündel - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Frettes de câblage pour harnais - Partie 001 : Spécification technique

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ICS:

49.060

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Aerospace electric
equipment and systems

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 4056-001

July 2006

ICS 49.060

English Version

**Aerospace series - Cable ties for harnesses - Part 001:
Technical specification**

Série aérospatiale - Frettes de câblage pour harnais -
Partie 001 : Spécification technique

Luft- und Raumfahrt - Befestigungsbänder für
Leitungsbündel - Teil 001: Technische Lieferbedingungen

This European Standard was approved by CEN on 6 January 2006.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This European Standard (EN 4056-001:2006) has been prepared by the AeroSpace and Defense 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 January 2007, and conflicting national standards shall be withdrawn at the latest by January 2007.

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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EN 4056-001:2006 (E)

1 Scope

This standard specifies the characteristics, test methods, qualification and acceptance conditions of plastic cable ties, used for the bundling, fixing and/or marking of cable harnesses in aircraft. The cable ties should be installed with a qualified application tool, which controls the application force thus avoiding damage to the cable insulation.

It defines the aerospace requirements not specified in EN 50146.

2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 8815; *Aircraft — Electrical Cables and Cable Harnesses — Vocabulary*

EN 2424; *Aerospace series — Marking of aerospace products*

EN 2825; *Aerospace series — Burning behaviour of non metallic materials under the influence of radiating heat and flames — Determination of smoke density*¹⁾

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*¹⁾

EN 3475-100; *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 100: General*

EN 4057 (series); *Aerospace series — Cable ties for harnesses — Test methods*

EN 4057-407; *Aerospace series — Cable ties for harnesses — Test methods — Part 407: Verification of application tool settings*

EN 50146; *Cable ties for electrical installations*

EN 9133; *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

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

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in EN 3475-100 and ISO 8815 and the following apply.

3.1

cable loom or cable harness

any assembly of cables, complete with end terminals, which may be manufactured and formed on or off the aircraft, with two or more end destinations

3.2

cable bundle

any group of cables which are tied together

1) Published as ASD Prestandard at the date of publication of this standard.

4 Conditions of use

4.1 Temperature ratings (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

Temperature ratings shall be defined by the material code in Table 1.

4.2 Flammability class

Ties shall meet either class 1 or class 2 flammability requirements as defined in the appropriate product standard:

- Class 1 has the highest degree of flame retardant properties;
- Class 2 has a lower degree of flame retardant properties.

5 Descriptions and design

5.1 Description

Ties, see Figure 1, shall be designed for installation by a tool providing controlled tension in accordance with MS 90387. The head design, locking system and strap cross sectional dimensions shall be such that the requirements of the tests given in Clause 6 are met. Ties are available with plastic or metallic locking mechanisms and those with plastic locking mechanisms may have either internal or external serrations on the strap.

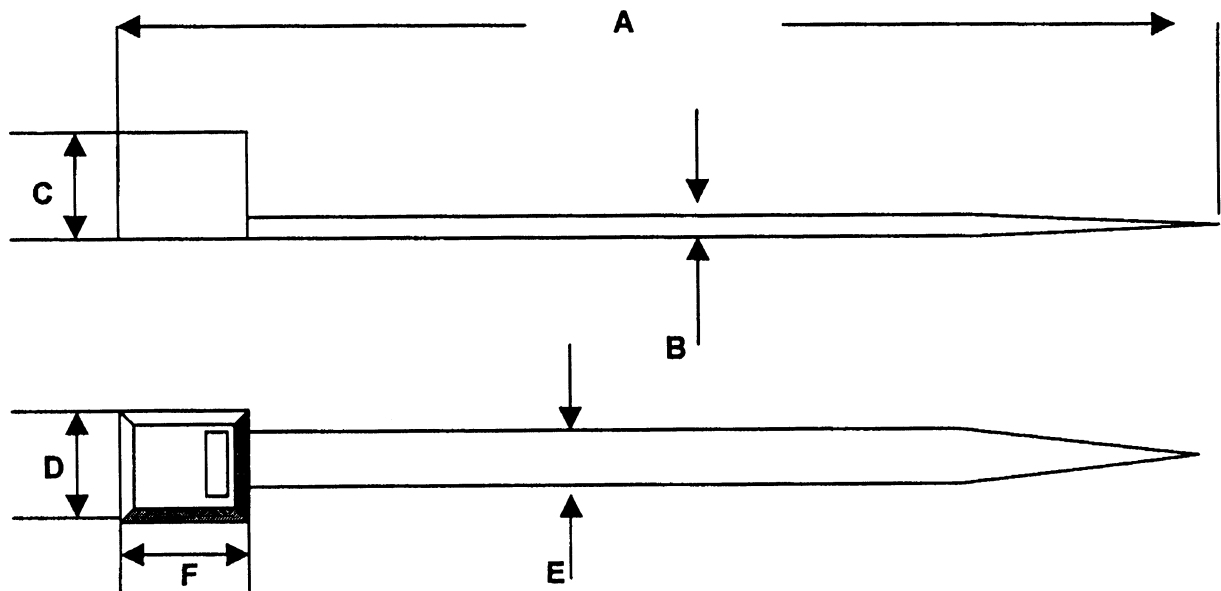


Figure 1

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5.2 Design and manufacture

The finish shall prevent abrasion to the harness and to adjacent harnesses or breakouts. In completing the joint, no sharp or abrasive edges shall be formed that could damage the cable insulation of the loom or any adjacent looms, or that could cause injury to an operator.

5.3 Materials

Ties shall be made from virgin materials which may be formulated to be UV resistant. The use of in process reground material to a maximum of 25 % by mass is permissible but is limited to the percentage used in the qualification sample.

Materials shall be identified by the codes in Table 1.

Table 1 — Material codes

Material code	Temperature rating type	Material description
A	1	Non UV resistant
B	1	UV resistant ^a
C	2	UV resistant
D	2	UV resistant ^a
^a UV resistant materials are normally coloured black.		

5.4 Colour

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Ties shall be either natural or unpigmented material finish or a colour according to the codes shown in Table 2.

Table 2 — Colour codes

Code	Colour
0	Black
1	Brown
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Violet
8	Grey
9	Natural/unpigmented

The colour shall be uniform throughout any coloured tie.

6 Tests

All non-metallic materials used for the manufacture of cable ties shall be tested for their smoke and toxicity properties in accordance with EN 2825 and EN 2826 as defined in the product standard.

Finished products shall be tested as detailed in Table 3 and the product standard. Before commencement of these tests the calibration of the application tools to be used shall be verified in accordance with EN 4057-407.

Table 3 — Tests

EN 4057-	Designation of the test	Number of specimens	Details
201 ^a	Visual examination	All test Specimens to be examined	There shall be no sharp or abrasive edges.
202 ^a	Examination of mass and dimensions	All test Specimens to be tested	The mass and dimensions shall be in accordance with the product standard.
301 ^a	Salt mist test (applicable to ties containing metallic locking barbs)	3 specimens for each cross section grouping (i.e. loop tensile strength group)	The minimum loop tensile strength shall be in accordance with the product standard. The locking device shall show no sign of corrosion.
302 ^a	Flammability	3 specimens (see Table 5) of the largest cross-section each material code. (i.e. loop tensile strength group) ^b	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	3 specimens for each material type and or class for each of the test solutions.	The minimum loop tensile strength should be in accordance with the product standard:
304	Loop tensile strength at maximum working temperature	3 specimens for each cross section grouping (see Table 5) (i.e. loop tensile strength group)	The minimum loop tensile strength should be in accordance with the product standard.
305	Colour fastness (applicable only to coloured ties)	1 specimen per colour, material type and material class	The colour fastness of the specimen should be in accordance with the product standard.
306	Heat ageing test	3 specimens for each material code and cross section group	The tensile strength shall not be lower than that specified in the appropriate product standard
307	Resistance to Ultra violet radiation	As detailed	The average elongation at break of the exposed samples shall be not less than 60 % of the figure for the unexposed samples:

(continued)