BS EN 4056-003:2016

BSI Standards Publication

# Aerospace series — Cable ties for harnesses

## Part 003: Plastic cable ties — Operating temperatures -65 °C to 105 °C and -65 °C to 150 °C — Product standard

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**National foreword**

This British Standard is the UK implementation of EN 4056-003:2016

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

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EUROPEAN STANDARD

NORME EUROPÉENNE

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# EN 4056-003

September 2016

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English Version

# Aerospace series - Cable ties for harnesses - Part 003: Plastic cable ties - Operating temperatures -65 °C to 105 °C and -65 °C to 150 °C - Product standard

Série aérospatiale - Frettes de câblage pour harnais - Partie 003: Frettes en plastique - Températures d'utilisation -65 °C à 105 °C et -65 °C à 150 °C - Norme de produit

Luft- und Raumfahrt - Befestigungsbänder für Leitungsbündel - Teil 003: Kabelbinder aus Kunststoff - Betriebstemperatur -65 °C bis 105 °C und -65 °C bis 150 °C - Produktnorm

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**



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## European foreword

This document (EN 4056-003:2016) 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of an identical text or by endorsement, at the latest by March 2017, and conflicting national standards shall be withdrawn at the latest by March 2017.

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# 1 Scope

This European Standard defines the required characteristics of cable ties with either internal or external serrations manufactured entirely from plastics material, for installation under controlled tension on aircraft cable harnesses.

It shall be used together with EN 4056-001.

# 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 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, *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 tie down straps* [1)]

# 3 Terms and definitions

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

# 4 Required characteristics

## 4.1 Dimensions

See Figure 1 and Table 1.

1) Published by: DoD National (US) Mil. Department of Defense. http://www.defenselink.mil/

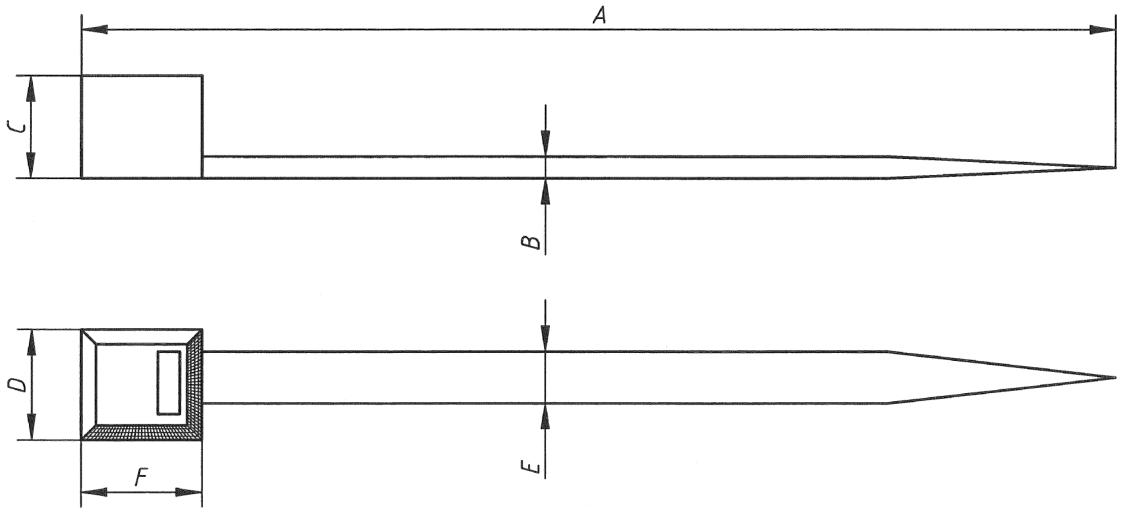



**Figure 1 — Cable tie**

**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 | 4,3 | 5,0 | 4,0 | 80 | 3,0 |
| R | 1,6 | 50 | 190 | 1,3 | 3,3 | 3,8 | 6,3 | 6,6 | 5,0 | 120 | 9,5 |
| S | 1,6 | 80 | 280 | 1,3 | 3,3 | 3,8 | 6,3 | 6,6 | 5,0 | 120 | 17,0 |
| T | 1,6 | 80 | 280 | 1,3 | 4,4 | 4,8 | 6,7 | 8,6 | 6,0 | 220 | 21,0 |
| U | 5,0 | 100 | 335 | 1,9 | 6,6 | 7,1 | 9,4 | 13,5 | 8,3 | 530 | 65,0 |
| V | 1,6 | 110 | 360 | 1,3 | 4,4 | 4,8 | 6,7 | 8,5 | 6,0 | 220 | 24,5 |
| W [a] | 5,0 | 230 | 700 | 1,9 | 7,6 | 8,9 | 9,4 | 13,5 | 8,3 | 400 | 94 |
| X [a] | 5,0 | 130 | 456 | 1,9 | 7,4 | 7,8 | 9,4 | 13,5 | 8,3 | 530 | 86 |

[a] Based on NSA 835401.

## 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, 135 °C;

— Type 2: – 65 °C to 150 °C.

### 4.2.2 Flammability class

Available as class 1 and class 2.

See Table 3 for requirements.

#### 4.2.3 Colour

See Table 2 of EN 4056-001.

#### 4.2.4 Burning behaviour

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

##### 4.2.4.1 Smoke density

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

— Dm = 200 (flaming mode);

— Dm = 150 (non flaming mode).

##### 4.2.4.2 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.

| Gas component | | Limit of concentration ppm |
|---|---|---|
| Hydrogen Fluoride | HF | 100 |
| Hydrogen Chloride | HCl | 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 U.V. resistance

U.V. resistant cable ties shall meet the requirements of EN 4057-307, given in Table 3.

### 4.4 Application tool

Cable ties shall be applied using a tensioning tool as specified in MS 90387, verificated in accordance with EN 4057-407 ensuring that the application force does not exceed the values shown in Table 2.

**Table 2 — Maximum recommended application force**

| Size code | N |
|---|---|
| P | 60 |
| R | 100 |
| S | 150 |
| T | 300 |
| U | 150 |
| V | 300 |
| W | 320 |
| X | 300 |

# 5 Tests and requirements

See Table 3 and EN 4056-001.

**Table 3 — Tests**

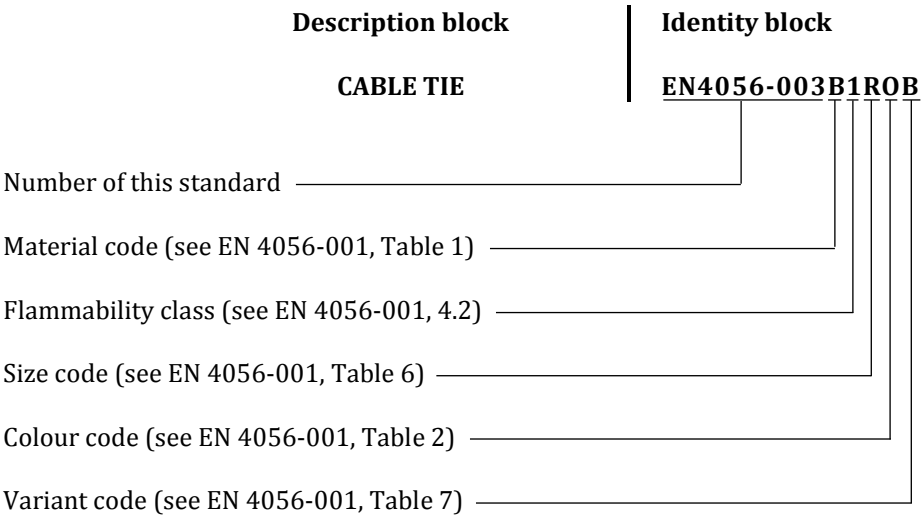
| EN 4057- | Designation of the test | Requirement |
|---|---|---|
| 201 | Visual examination | There shall be no sharp or abrasive edges. |
| 202 | Examination of mass and dimensions | The mass and dimensions shall be in accordance with Table 1 of this European Standard. |
| 301 | Salt mist test | Not applicable |
| 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 European Standard. |
| 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 European Standard. |
| 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 be not less than 75 % of the elongation at break of the unaged flat samples as defined in the product standard. |
| 307 | Resistance to ultra violet radiation | All the specimens shall meet at least 95 % of requirement for EN 4057-401. The average elongation at break shall be not less than 60 % of that of the unexposed standard. |
| 401 | Loop tensile strength | All the specimens shall meet the minimum loop tensile strength as stated in Table 1 of this European Standard. |
| 402 | Life cycle | After the vibration test:<br>There shall be no damage to the cable insulation when viewed with a 10 times magnification aid.<br>The specimens shall be examined for cracks, breaking and/or release of the locking device during removal from the vibration test harness.<br>All specimens shall meet the minimum loop tensile strength as stated in Table 1 of this European Standard. |
| 404 | Low temperature installation | All the specimens shall meet the minimum loop tensile strength as stated in Table 1 of this European Standard. |
| 405 | Compass safe distance | Not applicable |
| 406 | Locking device retention (ties containing metal locking barbs only). | Not applicable |
| 407 | Verification of application tool settings | See Table 2 (± 5 %). |

## 6 Quality assurance

Quality assurance requirements to be in accordance with EN 4056-001.

## 7 Designation

EXAMPLE




NOTE If necessary, the code I9005 may be placed between the description block and the identity block.

## 8 Marking

See EN 4056-001.

## 9 Packaging and storage

See EN 4056-001.

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**BSI Group Headquarters**

389 Chiswick High Road London W4 4AL UK

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