



SLOVENSKI STANDARD
SIST EN 4057-402:2009
01-maj-2009

**Aeronavtika - Kabelske spojke za vezalno pasovje - Preskusne metode - 402. del:
Življenjski cikel**

Aerospace series - Cable ties for harnesses - Test methods - Part 402: Life cycle

Luft- und Raumfahrt - Befestigungsbänder für Leitungsbündel - Prüfverfahren - Teil 402:
Gebrauchszyklus

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Série aérospatiale - Frettes de câblage pour harnais - Méthodes d'essais - Partie 402 :
Durée de vie

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ICS:

49.060 Štejni inštrumenti in oprema za letalstvo in zrakoplovstvo Aerospace electric
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 4057-402

December 2006

ICS 49.060

English Version

**Aerospace series - Cable ties for harnesses - Test methods -
Part 402: Life cycle**

Série aérospatiale - Frettes de câblage pour harnais -
Méthodes d'essais - Partie 402 : Durée de vie

Luft- und Raumfahrt - Befestigungsbänder für
Leitungsbündel - Prüfverfahren - Teil 402: Gebrauchszyklus

This European Standard was approved by CEN on 23 November 2005.

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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
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Foreword

This document (EN 4057-402:2006) 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 2007, and conflicting national standards shall be withdrawn at the latest by June 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 4057-402:2006 (E)**1 Scope**

This standard specifies the procedure to determine the life cycle of cable ties for harnesses under random vibration conditions for aerospace applications.

It shall be used together with EN 4057-100.

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.

EN 2266-002, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 200 °C — Part 002: General*

EN 2266-007, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 200 °C — Part 007: UV laser printable multicore jacketed cable — Product standard*

EN 2267-002, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 260 °C — Part 002: General*

EN 2267-007, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 260 °C — Part 007: DMA family, single ink-jet printable and multicore assembly — Product standard*

EN 2267-008, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 260 °C — Part 008: DM family, single UV laser printable and multicore assembly — Product standard*

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EN 2591-403, *Aerospace series — Elements of electrical and optical connections — Test methods — Part 403: Sinusoidal and random vibration*

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

EN 4057-100, *Aerospace series — Cable ties for harnesses — Test methods — Part 100: General*

EN 4057-401, *Aerospace series — Cable ties for harnesses — Test methods — Part 401: Loop tensile strength*

3 Apparatus

The vibration system consisting of the vibration machine together with its auxiliary equipment shall be capable of generating a random vibration to meet the requirements of EN 2591-403.

A laboratory oven capable of reaching a temperature corresponding to the maximum working temperature of the cable ties as specified in the appropriate product Standard plus 30 °C.

A refrigerator capable of reaching a minimum temperature of – 65 °C.

A tensile tester as required in EN 4057-401.

A magnification aid of $\times 10$.

4 Procedure

The cable ties shall be mounted on the vibration jig as shown in Figure 1 and constructed as shown in Table 1.

The jig shall be mounted onto the table using the clamps as shown in Figure 1.

Set the vibration machine to deliver the required frequencies and intensities conforming to the spectral shape and density test curve of EN 2591-403, method B, Figure 2, Table 2 and level J.

Subject the specimens to the vibration specified for eight hours in each of two mutually perpendicular directions, one of which is parallel to the bundle axis.

The cable harness shall be removed from the vibration jig.

Submit the specimen still mounted on the harness to the following temperature cycling test with a transfer time between each condition of not more than two minutes.

Place in an oven at the maximum continuous operating temperature increased by (30 ^{+5}_0) °C for (30 ^{+5}_0) min

Place in a refrigerator at (-65 ^{-0}_5) °C for (30 ^{+5}_0) min

Repeat the first two conditions four times in addition.

Allow the specimen to cool down to room temperature and condition as specified in EN 4057-100.

The specimen shall be inspected for cracks, distortion, breaks or the releasing of the locking device with a $\times 10$ magnification aid.

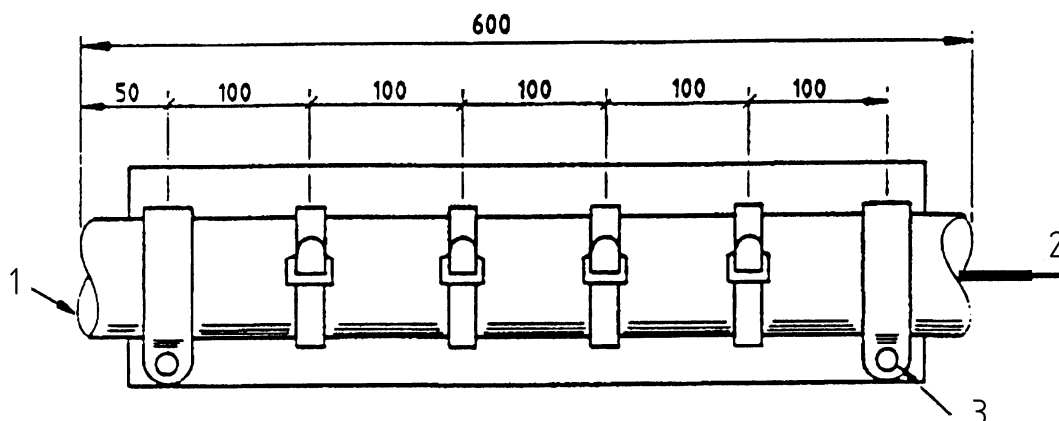
Then remove the centre cable from the bundle permitting the bundle to collapse and the cable tie specimens to be removed.

The cable insulation shall be inspected for damage under each cable tie.

The cable tie specimens shall then be slid onto an appropriate split mandrel and the loop tensile strength test performed as per EN 4057-401.

Then submit the specimen still mounted on the original mandrels to the loop tensile strength test specified in EN 4057-401.

The minimum force to failure shall be recorded.



Key

- 1 Wire bundle
- 2 Single cable
- 3 Clamp or tie and retainer

All dimensions in millimetres. Tolerance on dimensions is ± 5 mm

Figure 1 — Assembly of cable ties, cable harness and fixture

Table 1 — Cable harness construction

Tie size code	Cable type	Number of cables
P, R, S, U	EN 2266-002 and EN 2266-007/ EN 2267-002, EN 2267-007 and EN 2267-008 Code 020	26
T, V	EN 2266-002 and EN 2266-007 EN 2267-002, EN 2267-007 and EN 2267-008 Code 050	140

5 Requirements

The performance shall be achieved as required by the technical specification EN 4056-001.

All specimens shall meet the requirements of the appropriate Product standard.

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