

SLOVENSKI STANDARD

SIST EN 4049-003:2009

01-maj-2009

Aeronavtika - Podaljševalni kabel termol'lena - Delovne temperature med -65 °C in 260 °C - 003. del: Enožilni, nikelj-kromov/nikelj- aluminijev - Standard za proizvod

Aerospace series - Thermocouple extension cable - Operating temperatures between - 65 °C to 260 °C - Part 003: Single core nickel chromium/nickel aluminium - Product standard

Luft- und Raumfahrt - Thermoelement Ausgleichsleitung - Betriebstemperaturen zwischen - 65 °C to 260 °C - Teil 003: Eindadrig Nickel-Chrom und Nickel Aluminium - Produktnorm

Série aérospatiale - Câbles thermocouple - Températures de fonctionnement comprises entre - 65 °C et 260 °C - Partie 003: Fil simple Nickel chrome/Nickel aluminium - Norme de produit

Ta slovenski standard je istoveten z: EN 4049-003:2006

ICS:

49.060

Letalska in vesoljska
električna oprema in sistemi

Aerospace electric
equipment and systems

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EUROPEAN STANDARD

EN 4049-003

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2006

ICS 49.060

English Version

**Aerospace series - Thermocouple extension cable - Operating
tempera-tures between - 65 C to 260 C - Part 003: Single core
nickel chro-mium/nickel aluminium - Product standard**

Série aérospatiale - Câbles, thermocouple - Températures
de fonctionnement comprises entre - 65 C et 260 C -
Partie 003 : Fil simple Nickel chrome/Nickel aluminium -
Norme de produit

Luft- und Raumfahrt - Thermoelement Ausgleichsleitung -
Betriebstemperaturen zwischen - 65 C to 260 C - Teil 003:
Eindadrig Nickel-chrom und Nickel Aluminium -
Produktnorm

This European Standard was approved by CEN on 28 October 2005.

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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Foreword

This document (EN 4049-003:2006) 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 4049-003:2006 (E)**1 Scope**

This standard specifies the characteristics of thermocouple cables used for the connection between the thermocouple and the equipment. Temperatures between $-65\text{ }^{\circ}\text{C}$ and $260\text{ }^{\circ}\text{C}$ (except otherwise specified in the product standard).

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 8056-1:1985, *Aircraft — Nickel-chromium and nickel-aluminium thermocouple extension cables — Part 1: Conductors — General requirements and tests*

ISO 8815, *Aircraft — Electrical cables and cable harnesses — Vocabulary*

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

EN 4049-001, *Aerospace series — Thermocouple extension cable — Operating temperatures between $-65\text{ }^{\circ}\text{C}$ to $260\text{ }^{\circ}\text{C}$ — Part 001: Technical specification*

EN 4049-002, *Aerospace series — Thermocouple extension cable — Operating temperatures between $-65\text{ }^{\circ}\text{C}$ to $260\text{ }^{\circ}\text{C}$ — Part 002: General*

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

EN 60584-2, *Thermocouples — Part 2: Tolerances*

TR 6058, *Aerospace series — Cable code identification list*¹⁾

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3 Definitions

See EN 3475-100, ISO 8056-1 and ISO 8815.

4 Materials and construction**4.1 Materials****Conductor**

Conductors shall be in accordance with ISO 8056-1.

Tolerance class 1 in accordance with EN 60584-2

Insulation

The insulation shall comply with the requirements of subclause 4.2 of EN 4049-001.

1st tape: PTFE 51 % min. overlap;

2nd tape: Polyimide wrapped in opposite direction to first tape 51 % min. overlap;

3rd tape: PTFE wrapped in opposite direction to second tape 51 % min. overlap.

4.2 Construction

See Table 1.

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

Table 1

Cable code	Code for nominal section	Nominal cross-section mm ²	Conductor construction max./min.	Conductor diameter mm	Linear resistance at 20 °C Ω/km		External diameter mm		Mass kg/km max.
					min.	max.	min.	max.	
NiCr	004	0,4	19 × 0,15	0,75	1 956	2 364	1,27	1,40	5,55
	006	0,6	19 × 0,20	1,00	1 100	1 330	1,57	1,67	8,35
NiAl	004	0,4	19 × 0,15	0,75	0 771	0 932	1,27	1,40	5,55
	006	0,6	19 × 0,20	1,00	0 434	0 524	1,57	1,67	8,35

4.3 Colour coding of cores

See EN 4049-002.

5 Required characteristics

According to EN 4049-001 and EN 3475-100.

See Table 2.

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Tests as per EN 3475-parts	Tests	Details
201	Visual examination	Applicable
202	Mass	Applicable
203	Dimensions	Applicable
301	Ohmic resistance per unit length	Applicable + ISO 8056-1 subclause 5.4
302	Voltage proof test	Applicable
303	Insulation resistance	Applicable
304	Surface resistance	Not applicable
305	Overload resistance	Not applicable
306	Continuity of conductors	Applicable
401	Accelerated ageing	Applicable at temperature (310 ± 5) °C
402	Shrinkage and delamination	Applicable at temperature (310 ± 5) °C Shrinkage (max. at each end of cable 3 mm)
403	Delamination and blocking	Applicable at temperature (310 ± 5) °C
404	Thermal shock	Applicable at temperature (290 ± 5) °C Shrinkage (max. at each end of cable 3 mm)
405	Bending at ambient temperature	Applicable

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Table 2 (concluded)

Tests as per EN 3475-parts	Tests	Details
406	Cold bend test	Applicable
407	Flammability	Applicable max. after burn time 3 s
408	Fire resistance	Not applicable
409	Air-excluded ageing	Not applicable
410	Thermal endurance	Not applicable
411	Resistance to fluids	Applicable
412	Humidity resistance	Not applicable
413	Wrap back test	Not applicable
414	Differential scanning calorimeter (DSC test)	Not applicable
501	Dynamic cut-through	Not applicable
502	Notch propagation	Not applicable
503	Scrape abrasion	Not applicable
504	Torsion	Not applicable
505	Tensile test on conductors and strands	Applicable
506	Plating continuity	Not applicable
507	Adherence of plating	Not applicable
508	Plating thickness	Not applicable
509	Solderability	Not applicable
510	Tensile strength and elongation of extruded insulation, sheath and jacket material	Not applicable
511	Cable-to-cable abrasion	Not applicable
512	Flexure endurance	Not applicable
601	Smoke density	Not applicable
602	Toxicity	Not applicable
603	Resistance to wet arc tracking	Not applicable
604	Resistance to dry arc propagation	Not applicable
605	Wet short circuit test	Not applicable
701	Strippability and adherence of insulation to the conductor	Applicable: adherence 3 N min. Strippability with 45-1733-1 stripmaster tool.
702	Screen pushback capability	Not applicable
703	Permanence of manufacturer's marking	Applicable
704	Flexibility	Not applicable
705	Contrast measurement	Not applicable
706	Laser markability	Not applicable
Test as per ISO 8056-1	Tests	Details
5.2	Magnetic properties of conductors	Applicable
5.3	Thermo-electric test	Applicable

6 Quality assurance

See EN 9133.

7 Designation

7.1 Identification

Each cable shall be designated according to the following example.

EXAMPLE

Description block		Identity block	
ELECTRICAL CABLE		EN4049-003	A 006 A
Number of this standard	_____		
Code letter for number of cores (see EN 4049-002, Table 1)	_____		
Code for nominal cross-section (see Table 1)	_____		
Code for colour coding of cores (see EN 4049-002, Table 2 and 3)	_____		

NOTE If necessary, the code 19005 shall be placed between the description block and the identity block.

7.2 Type code (for short designation)

Code designation in accordance with TR 6058, see Table 3.

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Table 3

	EN reference	Code designation
Nickel chromium	EN4049-003A 004A	HS 22
	EN4049-003A 006A	HS 20
Nickel aluminium	EN4049-003A 004B	HT 22
	EN4049-003A 006B	HT 20

8 Identification and marking

See EN 4049-002.