SLOVENSKI STANDARD

SIST EN 2267-009:2006

01-julij-2006

Aeronavtika ï Elektriļ ni kabli za sploġno uporabo ï Delovne temperature med ï 55 ÁC in 260 ÁC ï 009. del: Druġina DRA, snop enoġilnih in veļ ġilnih kablov ï Standard za proizvod

Aerospace series - Cables, electrical, for general purpose - Operating temperatures between - 55 °C and 260 °C - Part 009: DRA family, single and multicore assembly - Product standard

Luft- und Raumfahrt - Leitungen, elektrisch, für allgemeine Verwendung - Betriebstemperaturen zwischen - 55 °C und 260 °C - Teil 009: DRA-Familie ein-und mehradrige Leitungen - Produktnorm

Série aérospatiale - Câbles, électriques, d'usage général, températures de fonctionnement comprises entre - 55 °C et 260 °C - Partie 009 : Famille DRA, fil simple et éléments assemblés - Norme de produit

Ta slovenski standard je istoveten z: **EN 2267-009:2005**

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EUROPEAN STANDARD

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English Version

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This European Standard was approved by CEN on 26 September 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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This European Standard (EN 2267-009:2005) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-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 AECMA, 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 May 2006, and conflicting national standards shall be withdrawn at the latest by May 2006.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies the characteristics of electrical lightweight cables DRA family for use in the on-board electrical systems of aircraft at operating temperatures between – 55 °C and 260 °C. Nevertheless, if needed, – 65 °C is also acceptable as shown by cold test.

It shall be possible to mark these cables by qualified compatible marking. These markings shall satisfy the requirements of EN 3838.

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 2083, *Aerospace series — Copper or copper alloy conductors for electrical cables — Product standard*.

EN 2084, *Aerospace series — Cables, electric, single-core, general purpose, with conductors in copper or copper alloy — Technical specification.*

EN 2235, *Aerospace series — Single and multicore electrical cables, screened and jacketed — Technical specification.*[1)]

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

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

EN 3838, *Aerospace series — Requirements and tests on user-applied markings on aircraft electrical cables.*[1)]

EN 4434, *Aerospace series — Copper or copper alloy lightweight conductors for electrical cables — Product standard (Normal and tight tolerances)*.

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

TR 6058, *Aerospace series — Cable code identification list.*[2)]

3 Terms, definitions and symbols

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

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* All parts quoted in this standard.

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

2) Published as AECMA Technical Report at the date of publication of this standard.

4 Materials and construction

4.1 Materials

Conductor:

These cable conductors shall be made of copper or copper alloy and nickel plated (code D) according to EN 4434 Table 2 (tight tolerances) for 001 to 140 section codes and to EN 2083 for 220 to 340 section codes.

Insulation:

All conductor size codes shall be defined to satisfy all required characteristics of § 5.

4.2 Construction

See EN 4434, EN 2083 and Table 1.

Table 1

Code for nominal section	Nominal section mm^2	AWG [a]	Linear resistance at 20 °C Ω/km	External diameter mm		Mass kg/km
			max.	min.	max.	max.
001	0,15	26	160,0	0,75	0,84	2,08
002	0,25	24	114,0	0,85	0,96	2,72
004	0,4	22	60,0	1,00	1,10	4,14
006	0,6	20	33,2	1,22	1,34	6,85
010	1	18	21,1	1,46	1,61	10,43
012	1,2	16	14,5	1,76	1,92	14,61
020	2	14	10,9	2,04	2,24	19,78
030	3	12	6,8	2,50	2,70	31,33
051	5	10	4,1	3,13	3,33	49,85
090	9	8	2,3	4,10	4,40	90,00
140	14	6	1,58	5,30	5,70	135,0
220	22	4	0,97	6,71	7,41	222,0
340	34	2	0,61	8,28	9,16	347,0

[a] AWG = closest American Wire Gage.

4.3 Number of cores

See EN 2267-002.

See EN 2235 for cabling.

4.4 Colour coding of cores

See EN 2267-002.

5 Required characteristics

According to EN 2084 and EN 3475-100.

See Table 2.

Table 2

EN 3475-	Test	Details
201	Visual examination	Applicable
202	Mass	Applicable; see Table 1.
203	Dimensions	Applicable; see Table 1.
301	Ohmic resistance per unit length	Applicable; see Table 1.
302	Voltage proof test	Applicable
303	Insulation resistance	Applicable
304	Surface resistance	Applicable
305	Overload resistance	Applicable T_1 = (310 ± 5) °C; T_2 = (450 ± 5) °C
306	Continuity of conductors	Applicable
307	Corona extinction voltage	Not applicable
401	Accelerated ageing	Applicable Temperature (310 ± 5) °C
402	Shrinkage and delamination	Applicable Temperature (290 ± 5) °C Maximum shrinkage at each end of cable: — 0,15 mm^2 to 0,6 mm^2: 0,8 mm — 1 mm^2 to 1,2 mm^2: 1 mm — 2 mm^2 to 5 mm^2: 1,2 mm — 9 mm^2: 1,5 mm — 14 mm^2 to 34 mm^2: 2 mm
403	Delamination and blocking	Applicable temperature (310 ± 5) °C

continued

Table 2 *(continued)*

EN 3475-	Test	Details
404	Thermal shock	Applicable but (– 65 ± 2) °C instead of (– 55 ± 2) °C Temperature (260 ± 5) °C Maximum shrinkage at each end of cable: — 0,15 mm^2 to 0,6 mm^2: 0,8 mm — 1 mm^2 to 1,2 mm^2: 1 mm — 2 mm^2 to 5 mm^2: 1,2 mm — 9 mm^2: 1,5 mm — 14 mm^2 to 34 mm^2: 2 mm
405	Bending at ambient temperature	Applicable
406	Cold bend test	Applicable Temperature (– 65 ± 2) °C
407	Flammability	Applicable Extinguishing time: 3 s max.
408	Fire resistance	Not applicable
409	Air-excluded ageing	Not applicable
410	Thermal endurance	Applicable Test: 10 000 h (temperature 260 °C) and curve extrapolation: 100 000 h (temperature 200 °C)
411	Resistance to fluids	Applicable
412	Humidity resistance	Applicable Method B – temperature (95 ± 5) °C Duration 360 h
413	Wrap back test	Applicable
414	Differential scanning calorimeter (DSC test)	Applicable (only if PTFE in the construction)
415	Rapid change of temperature	Not applicable
416	Thermal stability	Not applicable

continued