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**Aeronavtika - Električni, ognjevzdržni kabli - Enožilni in večžilni prepleteni kabli, oklopljeni (opleteni) in oplaščeni - Delovne temperature med -65 °C in 260 °C - 001. del: Tehnična specifikacija**

Aerospace series - Cable, electrical, fire resistant - Single and twisted multicore assembly, screened (braided) and jacketed - Operating temperatures between - 65 °C and 260 °C - Part 001: Technical specification

Luft- und Raumfahrt - Feuerberständige elektrische Leitungen - Einzel- und mehradrig verdrillte Leitungen, geschirmt (Geflecht) und ummantelt - Betriebstemperaturen zwischen - 65 °C und 260 °C - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Câbles électriques blindés résistant au feu - Simple et multifilaire blindé (tresse) gainé - Températures de fonctionnement comprises entre - 65 °C et 260 °C - Partie 001 : Spécification technique

**Ta slovenski standard je istoveten z: EN 4608-001:2006**

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**ICS:**

13.220.99	Drugi standardi v zvezi z varstvom pred požarom	Other standards related to protection against fire
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

**SIST EN 4608-001:2009**

**en,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 4608-001**

June 2006

ICS 49.060

English Version

**Aerospace series - Cable, electrical, fire resistant - Single and twisted multicore assembly, screened (braided) and jacketed - Operating temperatures between - 65 °C and 260 °C - Part 001: Technical specification**

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This European Standard was approved by CEN on 20 April 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.

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## Foreword

This European Standard (EN 4608-001:2006) 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 December 2006, and conflicting national standards shall be withdrawn at the latest by December 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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**EN 4608-001:2006 (E)****1 Scope**

This document specifies the required characteristics and test procedures for fire resistant or fire proof electrical cables for use in aircraft electrical systems. They shall be operated at a rated AC voltage of 600 VAC, a frequency of maximum 2 000 Hz and a long-term temperature of up to 260 °C (ambient temperature plus temperatures rise in conductor).

These cables shall also maintain a specific dielectric strength when they are subjected to a flame of 1 100 °C after five minutes (fire resistant) or 15 minutes (fire proof) exposure.

**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.

These references are not fully applicable. The present specification defines the field of application of each document.

ISO 2574, *Aircraft — Electrical cables — Identification marking.*

EN 2234, *Aerospace series — Cable, electrical, fire resistant — Technical specification.*

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

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.*<sup>1)</sup>

EN 4608-002, *Aerospace series — Cable, electrical, fire resistant — Single and twisted multicore assembly, screened (braided) and jacketed — Operating temperatures between –65 °C and 260 °C — Part 002: General.*

EN 4608-005, *Aerospace series — Cable, electrical, fire resistant — Single and twisted multicore assembly, screened (braided) and jacketed — Operating temperatures between –65 °C and 260 °C — Part 005: DW family — lightweight two-core gauge 24 for data transmission — UV laser printable — Product standard.*<sup>1)</sup>

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

**3 Terms and definitions**

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

\* And all parts quoted in Table 1.

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

## 4 Materials and construction of cables

### 4.1 General

#### 4.1.1 Materials

The material shall conform to the applicable product standard.

The materials used shall have no corrosive effect upon the conductors and screens and shall not be susceptible to attack by mould and other microorganisms.

#### 4.1.2 Individual cores

The individual cores shall conform to EN 2234 and applicable product standard.

#### 4.1.3 Construction

The construction shall conform to EN 2234.

### 4.2 Construction of cables

#### 4.2.1 Assembly

The lay length of the outer layer shall not be less than 8 times and not more than 16 times the nominal diameter of the cabled cores. The cores shall not be spliced.

#### 4.2.2 Screened cables

Shielding shall conform to EN 2235.

Efficiency of shielding is not required during the flame exposure.

#### 4.3 Colour

The colour of the outer layer and stripes shall be in accordance with EN 4608-002.

## 5 Required characteristics

The required characteristics for cables tested according to 6.1 shall conform to the values specified in the product standard or in this specification

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## 6 Tests methods

See Table 1 (Methods to be applied are compliant with EN 3475 specifications quoted hereafter).

Table 1 — Tests: methods, application, requirements

§ No.	Tests						Requirements (and/or particulars)
	Description	EN 3475- (and/or particulars)	Qualification <sup>a</sup> (§ 7.1)	Each delivery		Periodic Every 3 years (§ 7.2.4)	
				On all cables (§ 7.2.1 and 7.2.2)	Prior to delivery (§ 7.2.1 and 7.2.3)		
6	General	100	X	X	X	X	
6.1	Coverage		3				§ 4.2.2
6.2	Spiral screening or braiding angle		3				§ 4.2.2
6.3	Visual examination <sup>b</sup>	201	3	X			Marking: § 8
6.4	Mass	202 minimum length: 0,5 m	3		X		Product standard
6.5	Dimensions (all) <sup>b</sup> - outer diameter	203	3	X			Product standard
6.6	Ohmic resistance per unit length	301	3	X			Product standard
6.7	Voltage proof test: - immersion test - dry test - dry impulse test - dielectric strength of cores	302  Alternative to dry test	3 X X X	X X X			500 V ac 1,5 kV ac 5 kV peak voltage 1,5 kV ac
6.8	Insulation resistance at (20 ± 2) °C - dry test - immersion test at (95 ± 2) °C - immersion test	303	3		X		For a length of 1 km  1 500 MΩ 500 MΩ  1 MΩ
6.9	Surface resistance <sup>b</sup>	304	3			X	Minimum 1 250 MΩ.km
6.10	Overload resistance	305	NOT APPLICABLE				
6.11	Continuity of conductors	306	APPLICABLE				
6.12	Corona extinction voltage	307	NOT APPLICABLE				
6.13	Accelerated ageing	401 Mandrel Ø and test load: Table 2 Temperature: product standard	3			X	
6.14	Shrinkage and delamination	402 Temperature: product standard	3			X	Shrinkage length: product standard

continued



Table 1 (continued)

§ No.	Tests						Requirements (and/or particulars)	
	Description	EN 3475- (and/or particulars)	Qualification <sup>a</sup> (§ 7.1)	Each delivery		Periodic Every 3 years (§ 7.2.4)		
				On all cables (§ 7.2.1 and 7.2.2)	Prior to delivery (§ 7.2.1 and 7.2.3)			
6.15	Delamination and blocking	403 Mandrel Ø: Table 2 Temperature: product standard	3			X		
6.16	Thermal shock	404 Temperature: product standard	3		X		Shrinkage length: Product standard	
6.17	Bending at ambient temperature	405 Mandrel Ø: Table 2	3			X		
6.18	Cold bend test	406 Mandrel Ø and load: product standard	3			X	Product standard	
6.19	Flammability	407 Load: product standard	3			X	Distance burnt and time of flame extinction: Product standard	
6.20	Fire resistance	408 Load: Table 2	1 per fluid		X		Without fluid immersion for tests prior to delivery Test duration: product standard	
6.21	Air-excluded ageing	409		NOT APPLICABLE				
6.22	Thermal endurance	410	NOT APPLICABLE					
6.23	Resistance to fluids	411	1 per fluid			X	Variation of diameter: see product standard	
6.24	Humidity resistance	412	NOT APPLICABLE					
6.25	Wrap back test	413	NOT APPLICABLE					
6.26	Differential scanning calorimeter test (DSC)	414	NOT APPLICABLE					
6.27	Rapid change of temperature	415					Not applicable	
6.28	Thermal stability	416					Not applicable	
6.29	Fire resistance of cable inside shielded harness	417	3			X	Without fluid immersion Test duration: product standard	
6.30	Thermal endurance for conductors	418	NOT APPLICABLE					
6.31	Dynamic cut-through	501 Load and T°: Table 2	3			X	Product standard Applicable to single and jacketed cables only	
6.32	Notch propagation	502 Cut depth: product standard	3			X		

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