



SLOVENSKI STANDARD
oSIST prEN 4604-007:2022

01-november-2022

Aeronavtika - Kabli, električni, za prenos signala - 007. del: Kabli, koaksialni, 50 ohm, 200 °C, tip WN - Standard za proizvod

Aerospace series - Cable, electrical, for signal transmission - Part 007: Cable, coaxial, 50 Ohms, 200 °C, type WN - Product standard

Luft- und Raumfahrt - Elektrische Leitungen für Signalübertragungen - Teil 007: Koaxialkabel, 50 Ohm, 200 °C, Typ WN - Produktnorm

Série aérospatiale - Câbles électriques pour transmission de signaux - Partie 007 : Câble, coaxial, 50 ohms, 200 °C, type WN - Norme de produit

Ta slovenski standard je istoveten z: prEN 4604-007

ICS:

33.120.10	Koaksialni kabli. Valovodi	Coaxial cables. Waveguides
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

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EUROPEAN STANDARD
NORME EUROPÉENNE
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English Version

Aerospace series - Cable, electrical, for signal transmission
- Part 007: Cable, coaxial, 50 Ohms, 200 °C, type WN -
Product standard

Série aérospatiale - Câbles électriques pour
transmission de signaux - Partie 007 : Câble, coaxial, 50
ohms, 200 °C, type WN - Norme de produit

Luft- und Raumfahrt - Elektrische Leitungen für
Signalübertragungen - Teil 007: Koaxialkabel, 50 Ohm,
200 °C, Typ WN - Produktnorm

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 4604-007:2022) has been prepared by the Aerospace and Defence Industries Association of Europe — Standardization (ASD-STAN).

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 4604-007:2019.

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prEN 4604-007:2022 (E)**1 Scope**

This document specifies the required characteristics of a coaxial cable, 50 Ω , type WN, for use in aircraft electrical systems at operating temperature between -55 °C and 200 °C and especially for high frequency up to 6 GHz.

The document encloses also a regular and reinforced cable version (code R) which is used for sensitive systems with controlled VSWR.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3475-100:2010, *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 100: General*

EN 3475 (all parts), *Aerospace series — Cables, electrical, aircraft use — Test methods*

EN 4604-001, *Aerospace series — Cable, electrical, for signal transmission — Part 001: Technical specification*

EN 4604-002, *Aerospace series — Cable, electrical, for signal transmission — Part 002: General*

EN 9133, *Aerospace series — Quality Management Systems — Qualification Procedure for Aerospace Standard Products*

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

ASTM B 298-99, *Standard specification for silver-coated soft or annealed copper wire* ²⁾

MIL-PRF-39012, *Performance specification: connectors, coaxial, radio frequency, general specification for* ³⁾

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 3475-100:2010 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1**epsilon (ϵ)**

value of dielectric constant TBD

¹⁾ Published as ASD-STAN Technical Report at the date of publication of this document by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN), <https://www.asd-stan.org/>.

²⁾ Published by: ASTM International (US) American Society for Testing and Materials <https://www.astm.org/>.

³⁾ Published by: DoD National (US) Mil. Department of Defense <https://www.defense.gov/>.

4 Required characteristics

4.1 Material, construction, dimensions and mass

4.1.1 Material

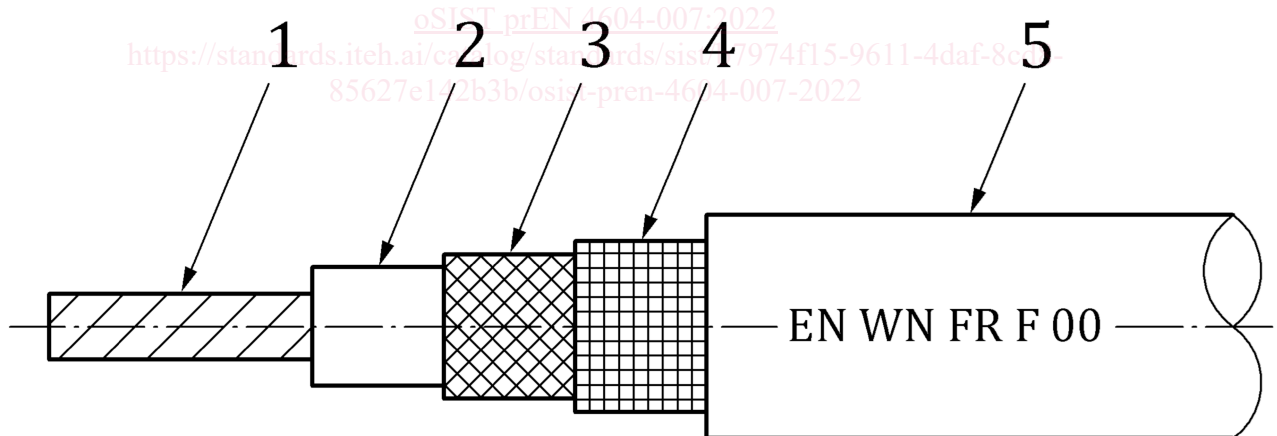
See Table 1.

Table 1 — Material

	Material	Finish	Colour
Conductor	Single-strand copper per ASTM-B298-99	1 µm silver plated	—
Dielectric	Fluorocarbon dielectric with low epsilon (PTFE)	—	—
Screen (foil)	Tape, silver plated copper or silver alloy	—	—
Shield	Braid, copper per ASTM-B298-99	1 µm silver plated	—
Jacket	Extruded Fluorinated Ethylene Propylene (FEP)	—	Violet

4.1.2 Construction, dimensions and mass

See Figure 1 and Table 2.



Key

- 1 conductor
- 2 dielectric
- 3 screen
- 4 shield
- 5 jacket

Figure 1 — Construction

Table 2 — Dimensions and mass

Diameter									Mass	
mm									g/m	
Conductor			Dielectric		Shield	Cable			nom.	max.
min.	nom.	max.	min.	max.		min.	nom.	max.		
2,27	2,30	2,33	6,1	6,3	7,3 ± 0,2	7,80	8,00	8,20	135	145

In order to ensure mechanical integrity (connection strength as per MIL-PRF-39012) the minimum shield strand diameter shall be 0,20 mm.

The dielectric diameter (min. – max.) shall be maintained during connection (after unwrapping screen).

4.2 General characteristics

- Operating temperature: – 55 °C to 200 °C.
- Minimum bend radius:
 - in static use: 80 mm;
 - in dynamic use: 120 mm.
- Performances are guaranteed up to 6 GHz.

4.3 Electrical characteristics

- Characteristic impedance: $Z_c = 50 \Omega$; see details Table 4.
- Capacitance per unit length: $C_p = 82 \text{ pF/m max.}$
- Transfer impedance up to 400 MHz: 20 m Ω /m max.
- Operating voltage: 1 000 V RMS max.
- Maximum power handling (at sea level): see Table 3 and Figure 2.
- Attenuation versus frequency: see Table 3 and Figure 2.
- Velocity of propagation: $v \geq 243\,000 \text{ km/s}$ ($v_r = 81 \text{ \% min.}$).

Table 3 — Frequency, attenuation, power handling and return loss

Frequency MHz	50	100	400	1 000	5 000	6 000
Attenuation max dB/100 m	3,5	5,5	10	15	35	41
Power handling min W	8 000	5 000	3 000	2 000	800	700
Return Loss max ^a	1,1	1,1	1,15	1,15	1,35	1,35

^a Applicable to regular and reinforced cable version (code R) only.

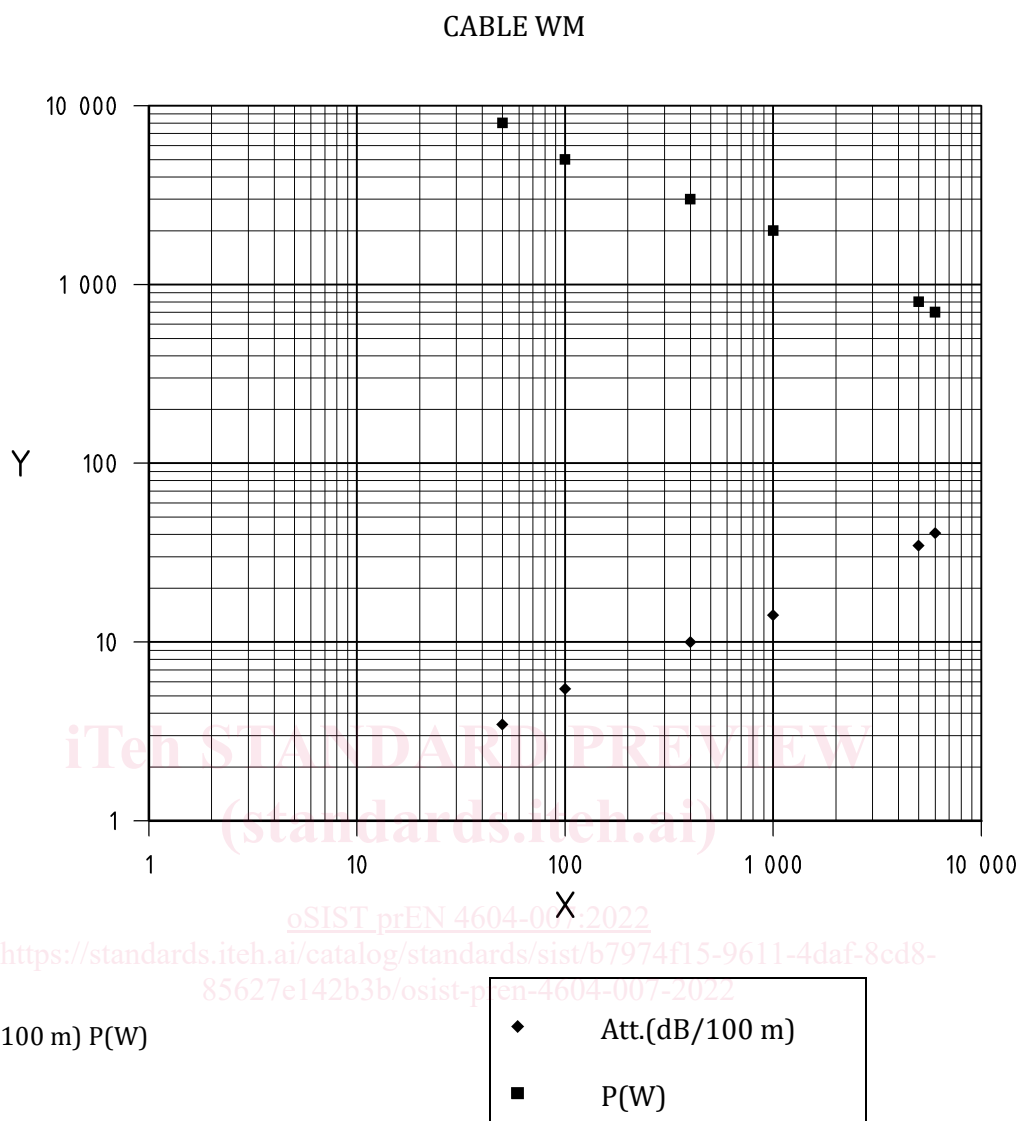


Figure 2 — Maximum attenuation curve (ascending) — Power curve (descending)

4.4 Tests

See Table 4.

Table 4 — Tests (1 of 4)

EN 3475-	Designation of the test	Remarks
201	Visual examination	Applicable
202	Mass	Applicable
203	Dimensions	Applicable See 4.1.2, Table 2
301	Ohmic resistance per unit length	Applicable 4,22 Ω/km max.

Table 4 — Tests (2 of 4)

EN 3475-	Designation of the test	Remarks
302	Voltage proof test	Applicable Dielectric: — Dry test: 3 000 VAC Jacket: — Dry impulse: 5 000 V Immersion test: 1 750 VAC
303	Insulation resistance	Applicable > 5 000 MΩ.km between shield and conductor
304	Surface resistance	Not applicable
305	Overload resistance	Not applicable
306	Continuity of conductors	Applicable
307	Corona extinction voltage	Not applicable
401	Accelerated ageing	Not applicable
402	Shrinkage and delamination	Not applicable
403	Delamination and blocking	Not applicable
404	Thermal shock	Not applicable
405	Bending at ambient temperature	Not applicable
406	Cold bend test	Not applicable
407	Flammability	Applicable Load = 20 N
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
415	Rapid change of temperature	Applicable Variation of capacitance: 5 % max. Increase of attenuation: 5 % max. Shrinkage: 1,5 mm max. First specimen length (C,α): 28 m