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**Aeronavtika - Razširjeni optični zaključki, nefizični stik optičnih vlaken v standardnih votlinah po standardu EN 3645 - 104. del: Večrodovni ženski zaključki velikosti 12 - Tehnična specifikacija**

Aerospace series - Expanded beam termini, fibre optic non-physical contact in EN 3645 standard cavities - Part 104: Multimode female termini size 12 - Technical specification

Luft- und Raumfahrt - Strahlaufweitender Anschluss, berührungsloser Lichtwellenleiterkontakt in EN 3645-Standardkontaktkammer - Teil 104: Multimode-Buchsenanschluss, Größe 12 - Technische Lieferbedingungen

Série aérospatiale - Contact à faisceau expansé, fibre optique sans contact physique, dans alvéoles standards EN 3645 - Partie 104 : Contact femelle multimode taille 12 - Spécification technique

**Ta slovenski standard je istoveten z: prEN 4869-104**

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**ICS:**

49.090	Oprema in instrumenti v zračnih in vesoljskih plovilih	On-board equipment and instruments
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**oSIST prEN 4869-104:2023**

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EUROPEAN STANDARD  
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**DRAFT**  
**prEN 4869-104**

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ICS 49.090

English Version

**Aerospace series - Expanded beam termini, fibre optic  
non-physical contact in EN 3645 standard cavities - Part  
104: Multimode female termini size 12 - Technical  
specification**

Série aérospatiale - Contact à faisceau élargi, fibre  
optique sans contact physique, dans alvéoles standards  
EN 3645 - Partie 104 : Contact femelle multimode taille  
12 - Spécification technique

Luft- und Raumfahrt - Strahlauweitender Anschluss,  
berührungsloser Lichtwellenleiterkontakt in EN 3645-  
Standardkontaktkammer - Teil 104: Multimode-  
Buchsenanschluss, Größe 12 - Technische  
Lieferbedingungen

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (prEN 4869-104:2023) 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 document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

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<https://standards.iteh.ai/catalog/standards/sist/9fb2be08-0426-4575-846d-b71883fd6dae/osist-pren-4869-104-2023>

**prEN 4869-104:2023 (E)****1 Scope**

This document details the dimensions and performance requirements of a multimode female size 12, non-physical contact expanded beam terminus. This terminus is suitable for use with connectors which have standard size 12 socket crimp contact cavities (series I and III): connectors with cavities for contact of type EN 3155-009F12.

**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 2591-100, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 100: General*

EN 2591-304, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 304: Damp heat steady state*

EN 2591-407, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 407: Durability of contact retention system and seals*

EN 2591-601, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 601: Optical elements — Insertion loss*

EN 2591-602, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 602: Optical elements — Variation of attenuation and optical discontinuity*

EN 2591-604, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 604: Optical elements — Cleaning capability of optical face*

EN 2591-605, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 605: Optical elements — Return loss*

EN 2591-609, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 609: Optical elements — Effectiveness of cable attachment — Cable cyclic flexing*

EN 2591-610, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 610: Optical elements — Effectiveness of cable attachment — Cable pulling*

EN 2591-611, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 611: Optical elements — Effectiveness of cable attachment — Cable torsion*

EN 2591-612, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 612: Optical elements — Effectiveness of cable attachment — Cable axial compression*

EN 2591-613, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 613: Optical elements — Impact test*

EN 2591-617, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 617: Optical elements — Temperature cycling*

EN 2591-6301, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6301: Optical elements — Endurance at temperature*

EN 2591-6305, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6305: Optical elements — Rapid change of temperature*

EN 2591-6307, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6307: Optical elements — Salt mist*

EN 2591-6314, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6314: Optical elements — Immersion at low air pressure*

EN 2591-6405, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6405: Optical elements — Axial load*

EN 2591-6406, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6406: Optical elements — Mechanical endurance*

EN 4639-101, *Aerospace series — Connectors, optical, rectangular, modular, multicontact, 1,25 diameter ferrule, with removable alignment sleeve holder — Part 101: Optical contact for cable EN 4641-100 — Operating temperatures between -65 °C and 125 °C — Product standard*

EN 4639-102, *Aerospace series — Connectors, optical, rectangular, modular, multicontact, 1,25 diameter ferrule, with removable alignment sleeve holder — Part 102: Optical contact for cable EN 4641-102 — Operating temperatures between -55 °C and 100 °C — Product standard*

EN 4641-100, *Aerospace series — Cables, optical 125 µm diameter cladding — Part 100: Tight structure 62,5/125 µm core GI fibre 1,8 mm outside diameter — Product standard*

EN 4641-102, *Aerospace series — Cables, optical, 125 µm outside diameter cladding — Part 102: Semi-loose 62,5/125 µm GI fibre nominal 1,8 mm outside diameter — Product standard*

EN 4641-301, *Aerospace series — Cables, optical 125 µm diameter cladding — Part 301: Tight structure 50/125 µm GI, fibre nominal 1,8 mm, outside diameter — Product standard*

EN 4869-001, *Aerospace series — Expanded beam termini, fibre optic non-physical contact in EN 3645 standard cavities — Part 001: Technical specification*

MIL-I-81969/14,<sup>1)</sup> *Installing and removal tools, connector electrical contact, type III, class 2, composition B*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 2591-100 apply.

ISO and IEC maintain terminology 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/>

<sup>1)</sup> Published by: DoD National (US) Mil. Department of Defense <https://www.defense.gov/>.

## 4 Fibre optic contact designation and dimensions

### 4.1 Contact designation

See Table 1.

Table 1

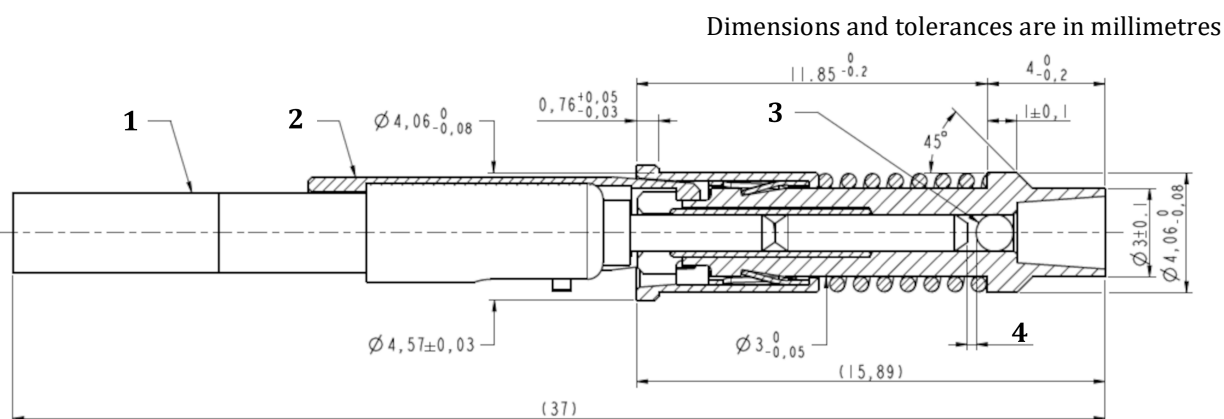
Contact designation	Wavelength of AR coating <sup>a</sup>	Identity letter for the wavelength of AR coating	Fibre diameter	Identity number for the fibre diameter
Size 12 expanded beam fibre optic pin contact for a wavelength of 850 nm and for fibre diameter of 50 µm/125 µm	850 nm	A	50 µm/125 µm	1
Size 12 expanded beam fibre optic pin contact for a wavelength of 1 300 nm and for fibre diameter of 50 µm/125 µm	1 300 nm	B	50 µm/125 µm	1
Size 12 expanded beam fibre optic pin contact for a wavelength of 850 nm and for fibre diameter of 62,5 µm/125 µm	850 nm	A	62,5 µm/125 µm	2
Size 12 expanded beam fibre optic pin contact for a wavelength of 1 300 nm and for fibre diameter of 62,5 µm/125 µm	1 300 nm	B	62,5 µm/125 µm	2

<sup>a</sup> AR coating:

- full coated or coating on two active sides of the ball lens;
- transmittance T % > 98 % at the specified wavelength;
- AR coating area should be free from stains.

### 4.2 Contact dimensions

See Figure 1 and Figure 2.



#### Key

- EN 4639-10X termini
- Clip
- Ball lens
- D: see chart

#### Chart

D	Wavelength
0,3	850 nm
0,308	1 300 nm

Figure 1



Dimensions and tolerances are in millimetres

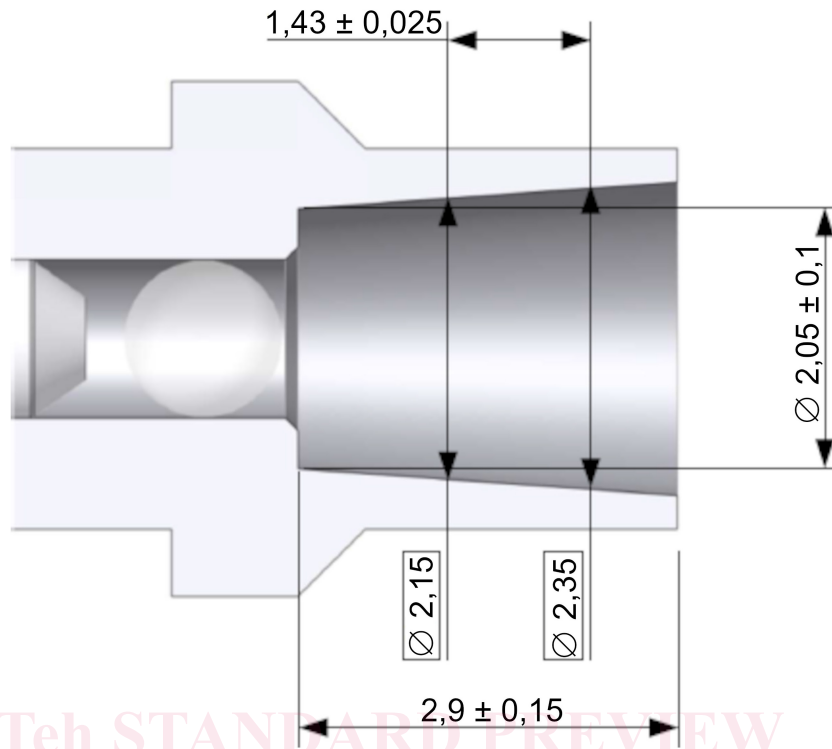


Figure 2 — Conical shape definition

### 4.3 Optical interface

Table 2 — Interface requirements for fibre with diameter 62,5 µm/125 µm (1 of 2)

Parameter	Value	Units
Beam size diameter (at power level: 1/e <sup>2</sup> ) Tolerance: ±3 %		
At 850 nm and distance of:		
– 0,56 mm:	0,430	mm
– 1 mm:	0,430	
– 10 mm:	0,700	
– 50 mm:	3,030	
– 100 mm:	5,550	

**Table 2 — Interface requirements for fibre with diameter 62,5 µm/125 µm (2 of 2)**

Parameter	Value	Units
At 1 300 nm and distance of:		
– 0,56 mm:	0,430	mm
– 1 mm:	0,430	
– 10 mm:	0,700	
– 50 mm:	2,800	
– 100 mm:	5,490	
Angle of beam divergence between:		
– 0,56 mm and 1 mm	0,00 ± 0,1	degrees
– 1 mm and 10 mm	0,85 ± 0,1	
Beam circularity	> 93	%
Air gap distance between the lenses of the 2 termini	0,61 ± 0,05	mm

Measurement method: the beam analysis is based on a micro-positioning optical bench. An optical fibre is aligned in front of the contact lens. The fibre is moved backward following the optical axis at the measurement distance. Also, at this distance the fibre is moved in the plane. The origin of measurement distance is fixed from the extremity of the optical contact lens.

Launch conditions: overfilled launch conditions.

**Table 3 — Interface requirements for fibre with diameter 50 µm/125 µm (1 of 2)**

Parameter	Value	Units
Beam size diameter (at power level: $1/e^2$ )		
Tolerance: ±3 %		
At 850 nm and distance of:		
– 0,56 mm:	0,320	mm
– 1 mm:	0,320	
– 10 mm:	0,570	
– 50 mm:	2,350	
– 100 mm:	4,130	