BS EN 4531-201:2016

BSI Standards Publication

Aerospace series — Connectors, optical, circular, single and multipin, coupled by triple start threaded ring — Flush contacts

Part 201: Optical contact for EN 4641 singlemode cable -55 °C to 125 °C — Product standard

bsi.

National foreword

This British Standard is the UK implementation of EN 4531-201:2016.

The UK participation in its preparation was entrusted to Technical Committee ACE/6, Aerospace avionic electrical and fibre optic technology.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Aerospace series - Connectors, optical, circular, single and multipin, coupled by triple start threaded ring - Flush contacts - Part 201: Optical contact for EN 4641 singlemode cable -55 °C to 125 °C - Product standard

Série aérospatiale - Connecteurs optiques circulaires à accouplement par bague filetée à trois filets - Contacts affleurants - Partie 201: Contact optique pour câble monomode EN 4641 - 55 °C à 125 °C - Norme de produit

Luft- und Raumfahrt - Optische Rundsteckverbinder mit dreigängiger Schraubkupplung - Bündige Kontakte - Teil 201: Optischer Kontakt für EN 4641-Monomodekabel, -55 °C bis 125 °C - Produktnorm

This European Standard was approved by CEN on 8 June 2015.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European Foreword

This document (EN 4531-201:2016) 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of an identical text or by endorsement, at the latest by July 2016, and conflicting national standards shall be withdrawn at the latest by July 2016.

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1 Scope

This standard defines the performance and dimensions of optical PC profiled contact for singlemode 9 micrometres/125 micrometres fibre and (1,8 ± 0,1) mm diameter cable.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2591 (all parts), *Aerospace series — Elements of electrical and optical connection — Test methods*

EN 4531-001, *Aerospace series — Connectors, optical, circular, single and multipin, coupled by triple start threaded ring — Flush contacts — Part 001: Technical specification*

EN 4533 (all parts), *Aerospace series — Fibre optic systems — Handbook*

EN 4641 (all parts), *Aerospace series — Cables, optical, 125 µm diameter cladding*

TR 4646 [1)], *Aerospace series — Termination procedure for EN 4531 optical contact*

MIL-I-81969/8-10 [2)], *Installing and removal tools, connector electrical contact, types I and II, class 2, composition A*

1) Published as ASD-STAN Technical Report at the date of publication of this European Standard (http://www.asd-stan.org/).

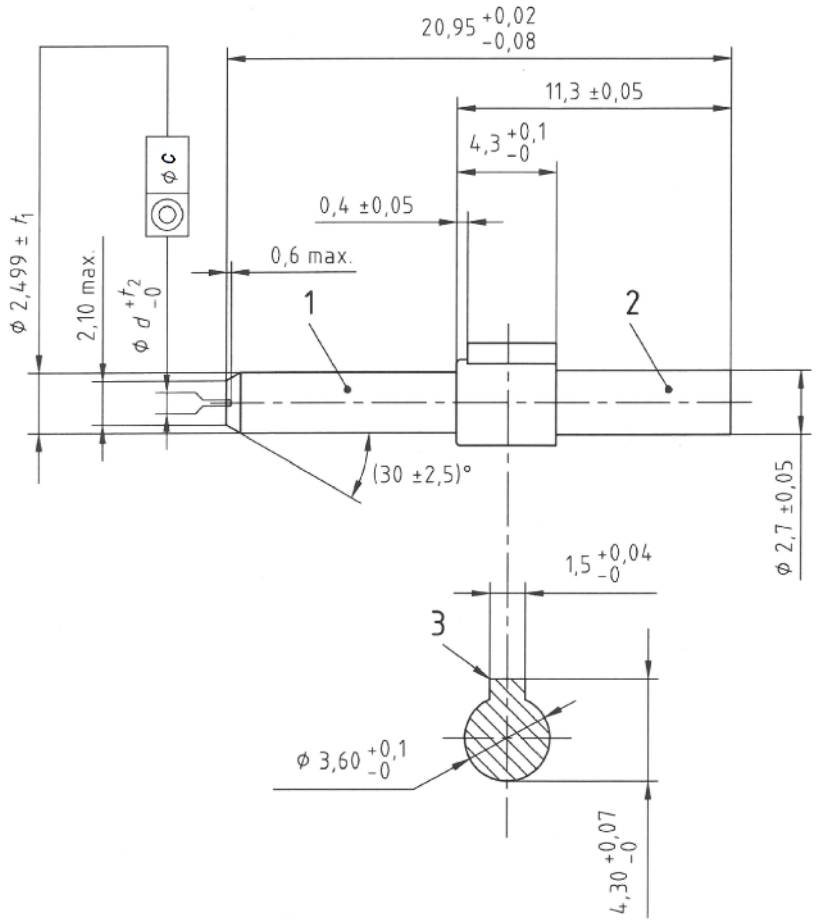
2) Published by: DoD National (US) Mil. Department of Defense http://www.defenselink.mil/

3 Termini dimensions

See Figure 1.

Dimensions and tolerances are in millimetres.

Dimensions of t_1, t_2, c and d of Figure 1 are detailed Table 1.



Key

1 ferrule
2 flange
3 chamfer or radius = 0,05 min./0,2 max.

Figure 1

Table 1

EN 4531-	**Cable**	**Optical fibre type** micrometre	**Outer diameter** mm	c µm	d µm	t_1 µm	t_2 µm
201	EN 4641-xxx	9/125	1,8 ± 0,1	1	126,5	0,5	1

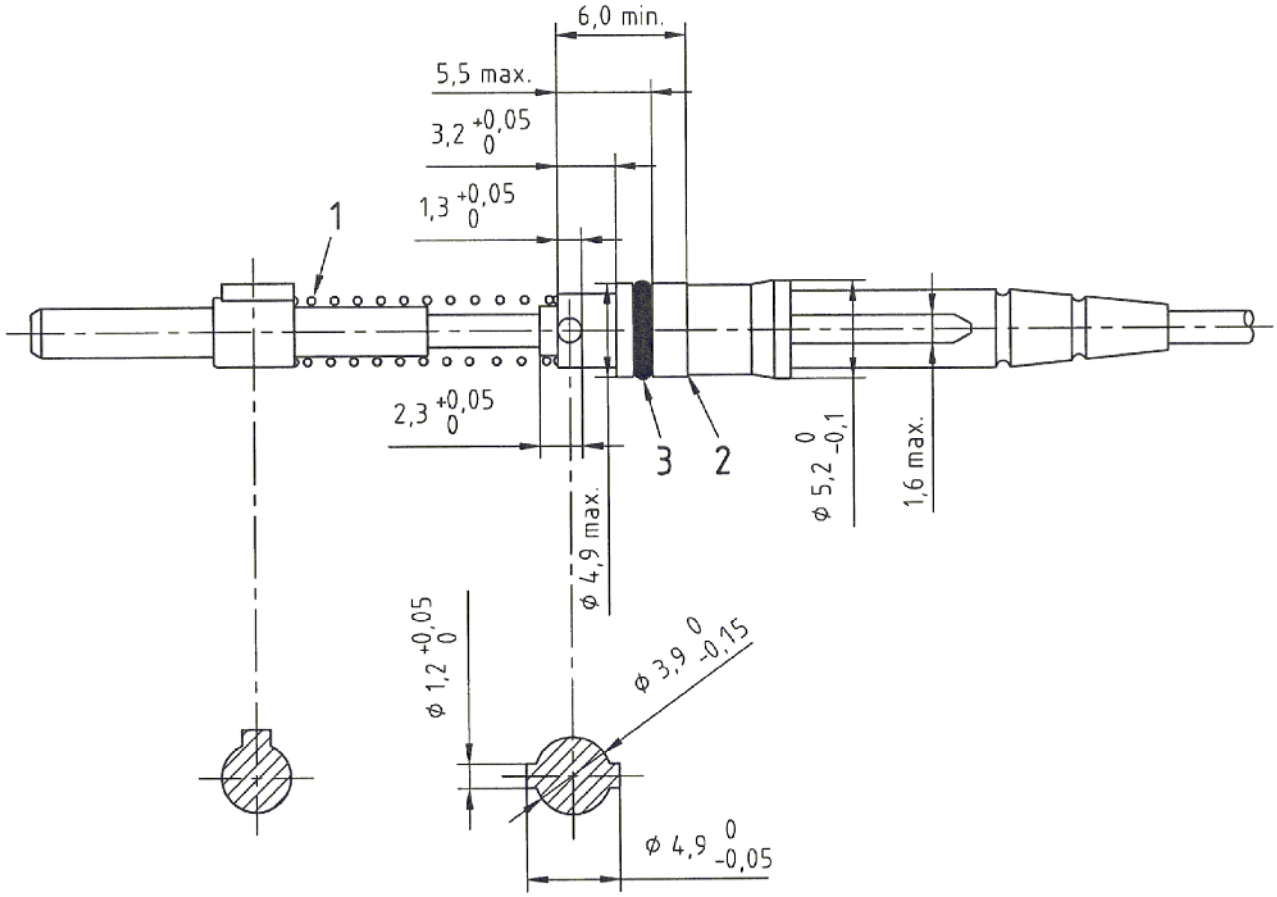
4 General dimensions of the optical termini

4.1 Contact dimension and mass

See Figure 2.

Dimensions and tolerances are in millimetres.

Mass of the contact: 1,5 g maximum.



Key

1 spring force when spring length is 13,5 mm = 9 N min.
When spring length is 8,5 mm, spring force shall be between 13 N and 15 N
Spring is never compressed to joined coils

2 beginning of bending

3 o-ring

Figure 2

4.2 Boot dimension

4.2.1 Long version

See Figure 3 and Table 2.

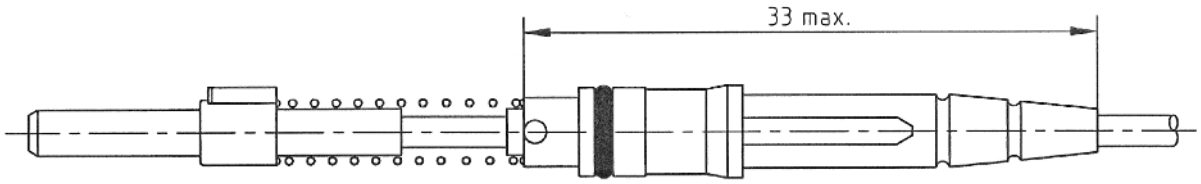


Figure 3

4.2.2 Short version

See Figure 4 and Table 2.

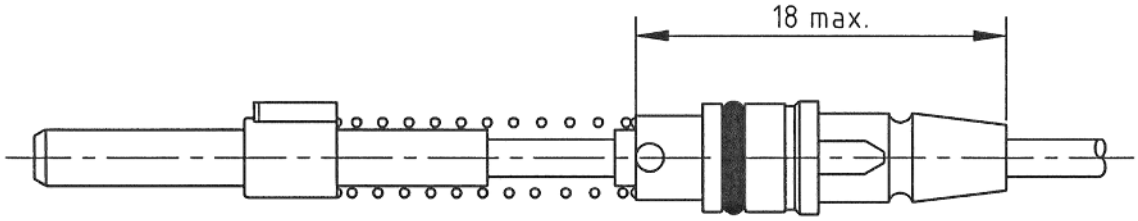


Figure 4

Table 2

	Boot code	Boot colour
Long boot	L	White or cream
Short boot	S	White or cream

4.3 Material

See Table 3.

Table 3

Flange material	Code
Composite	C
Metal	M

Ferrule material: Zirconia ($Zr\ O_2$)

5 Technical specification

This component is qualified as part of a complete connector assembly when tested to the qualification requirements of EN 4531-001 and the applicable product standards.

6 Tests according to EN 2591-100

The tests of EN 2591-100, applicable in the context of this standard as well as the details necessary for implementing them and for inspecting connector characteristics, are given in Table 4.

Environmental tests are specified in EN 4531-001.

These tests shall be carried out without cable outlet.

Table 4

EN 2591–	Designation of the test	Details
102	Examination of dimensions and mass	Applicable
6301	Optical elements - Endurance at temperature	1 000 h at 125 °C
6305	Optical elements - Rapid change of temperature	10 cycles. $T_A = 125$ °C. $T_B = -65$ °C.
6307	Optical elements - Salt mist	Contact wired – Duration 48 h
311	Low air pressure	Not applicable.
312	Air leakage	Test performed on non-hermetic connectors. Method B – Differential pressure: 100 kPa. Maximum leakage: $16 \times 10 - 6$ m^3/h. and Method A – Differential pressure: minimum 40 kPa during 2 (two) h, maximum leakage flow: 16 cm^3/h.
6314	Optical elements - Immersion at low air pressure	Connector mated
6316	Optical elements - Ozone resistance	Not applicable.
6405	Optical elements - Axial load	100 N maintained for 1 (one) min, 3 (three) cycles.
6406	Optical elements - Mechanical endurance	500 mating/unmating cycles 4 (four) to 5 (five) cycles/min Inspection and cleaning of contact end face every 20 cycles.
407	Durability of contact retention system and seals (maintenance ageing)	Applicable. EN 2591-601 initial and final: Δ insertion loss < 0,1 dB

EN 2591–	Designation of the test	Details
601	Optical elements - Insertion loss	For the pair, after termination: At 25 °C: insertion loss ≤ 0,3 dB maximum for 95 % of the samples (statistic approach), i.e. minimum 19 samples with insertion loss ≤ 0,3 dB for the total of 21 optical cords of the 3 (three) groups. For all environmental conditions: insertion loss ≤ 0,7 dB maximum for all samples, i.e. insertion loss ≤ 0,7 dB for the 21 optical cords.
602	Optical elements - Variation of attenuation and optical discontinuity	Method A, insertion loss maximum = 0,7 dB
604	Optical elements - Cleaning capability of optical face	Applicable.
605	Optical elements - Return loss	Return loss: 45 dB minimum
607	Optical elements - Immunity to ambient light coupling	Not applicable.
609	Optical elements - Effectiveness of cable attachment - Cable cyclic flexing	Method C: 100 cycles at a load of 5 N Pendulum length: 350 mm Pivoted at extremity of the boot.
610	Optical elements - Effectiveness of cable attachment - Cable pulling	Method B: 111 N tensile load, 1 (one) mn, 3 (three) pulls
611	Optical elements - Effectiveness of cable attachment - Cable torsion	100 cycles at a load of 40 N
612	Optical elements - Effectiveness of cable attachment - Cable axial compression	Compression force of 10 N for 2 (two) mn
613	Optical elements - Impact test	Variation of insertion loss 0,25 dB maximum after test
615	Optical elements - Connection integrity at temperature	Not applicable.
617	Optical elements - Temperature cycling	Not applicable.

7 Cleaning instructions

Suitable cleaning processes are detailed in EN 4533-004.

8 Tooling

No tools required for insertion/extraction of the optical contact. The optical contact is inserted/extracted by hand from the rear of the connector.

The standard tool as per MIL-I-81969/8-10 standard (P/N for size 12) may be used.

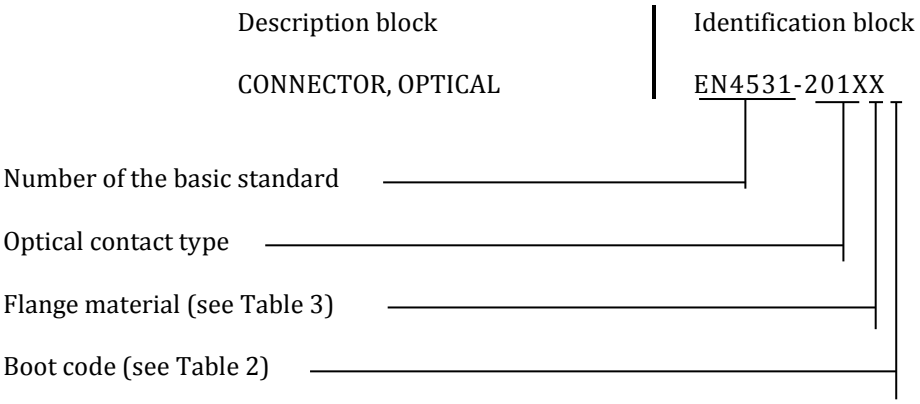
9 Termination instructions

Termination instructions are detailed in TR 4646.

See handbook EN 4533 for details.

10 Designation

EXAMPLE



Bibliography

[1] EN 4531-002, *Aerospace series — Connectors, optical, circular, single and multipin, coupled by triple start threaded ring — Flush contacts — Part 002: Specification of performance and contact arrangements*

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