BRITISH STANDARD

BS EN
3155-033:2009

Aerospace series — Electrical contacts used in elements of connection

Part 033: Contacts, electrical,coaxial, 50 ohms, size 5, female, type D, crimp, class R. Product Standard

ICS 49.060

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British Standards

National foreword

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Foreword

This document (EN 3155-033:2009) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

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of an identical text or by endorsement, at the latest by November 2009, and conflicting national standards shall be withdrawn at the latest by November 2009.

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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.

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Introduction

The contacts defined by this standard are derived from those of SAE-AS39029/100, and are intermateable with those of SAE-AS39029/99.

1 Scope

This standard specifies the required characteristics, tests and tooling applicable to female electrical coaxial contacts, size 5, type D, crimp, class R, used in elements of connection according to EN 3155-002.

It shall be used together with EN 3155-001.

The associated male contacts are defined in EN 3155-032.

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

EN 3155-001:2008, *Aerospace series — Electrical contacts used in elements of connection — Part 001: Technical specification*[1]

EN 3682-001, *Aerospace series — Connectors, plug and receptacle, electrical, rectangular, interchangeable insert type, rack to panel, operating temperature 150 °C continuous — Part 001: Technical specification*

MIL-DTL-22520G, *Crimping tools, wire termination, general specification for*[2]

MIL-I-81969/28, *Installing and removal tools, connector electrical contacts, type II, class 2, composition C*[2]

TR 6058, *Aerospace series — Cable code identification list*[3]

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in EN 3155-001:2008 apply.

4 Required characteristics

4.1 Specific characteristics

Type D contacts are for application where contacts with a screening feature are requested and class R corresponds to an operating temperature range from – 65 °C to 150 °C.

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* All parts quoted in this document.

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

2 Published by: Department of Defense (DOD), the Pentagon, Washington D.C. 20301 USA.

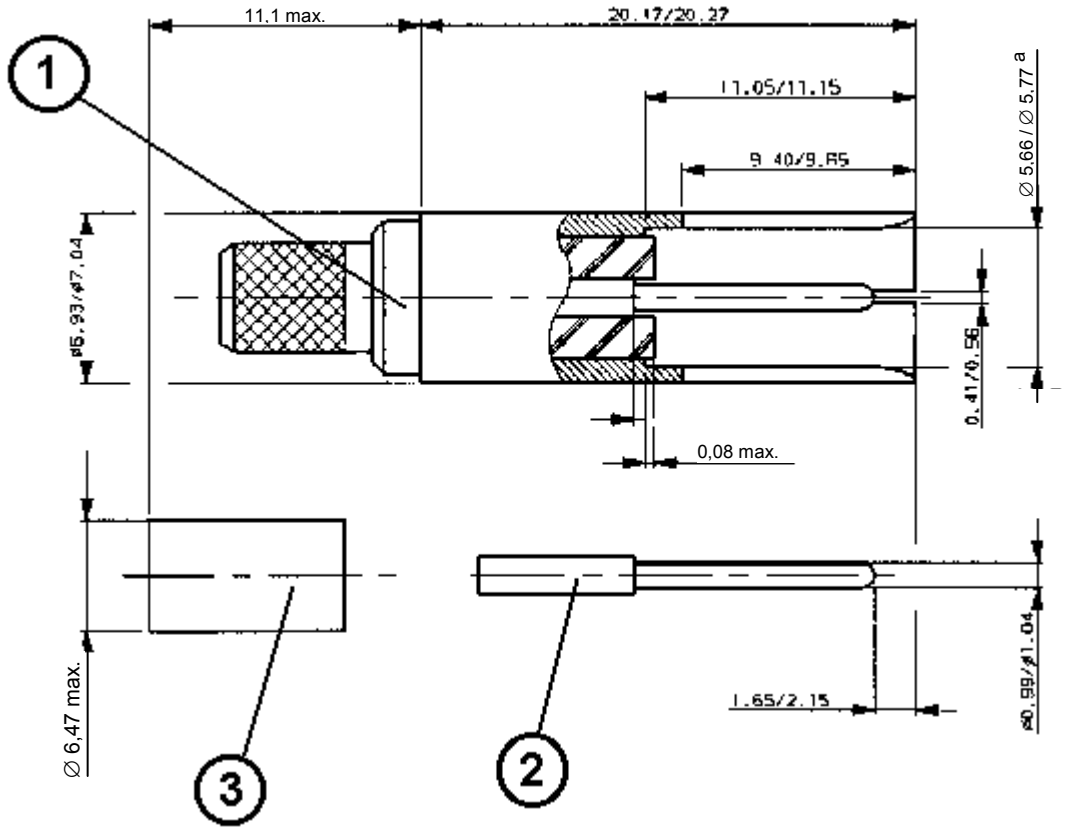
3 Published as ASD Technical Report at the date of publication of this standard.

4.2 Dimensions and mass

See Figure 1.

Mass: 46 g.

Dimensions and tolerances are given in millimetres and apply after surface treatment.



Key

① Outer body
② Center contact
③ Ferrule
a Diameter form to

Figure 1

4.3 Marking by colour code

Not applicable.

4.4 Material, surface treatment

— Outer body material (female) : copper alloy.
— Center contact (male) : copper alloy.
— Crimp ferrule : copper alloy.

— Surface treatment : gold on appropriate undercoat, thickness of protection not specified, selective protection permitted.

— Hood : stainless steel.

— Dielectric : PTFE, or equivalent.

4.5 Permissible cables

See Figure 2 and Table 1.

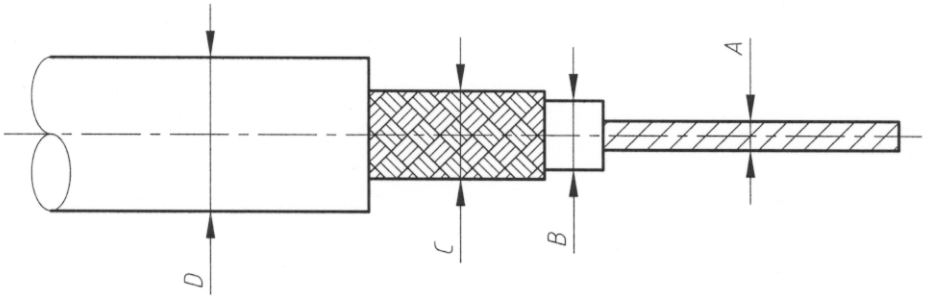


Figure 2

Table 1

Permissible cable group code	Permissible cable code according to TR 6058	Dimensions of cable							
		A		*B*		*C*		*D*	
		min.	max.	min.	max.	min.	max.	min.	max.
A	XA	0,9	–	2,85	3,05	3,37	3,57	4,85	5,05
	XG	0,94	–	2,83	3,07	3,35	3,59	4,68	4,92
	XF	–	–	–	–	–	–	–	–
	WM	0,99	–	2,74	2,94	3,30	3,70	3,70	4,00

4.6 Cable stripping and wiring method

1) Place the sealing sleeve ④ (semi environmental version only) and the ferrule ③ on the cable.

2) Trim cable to dimensions shown on Figure 3.

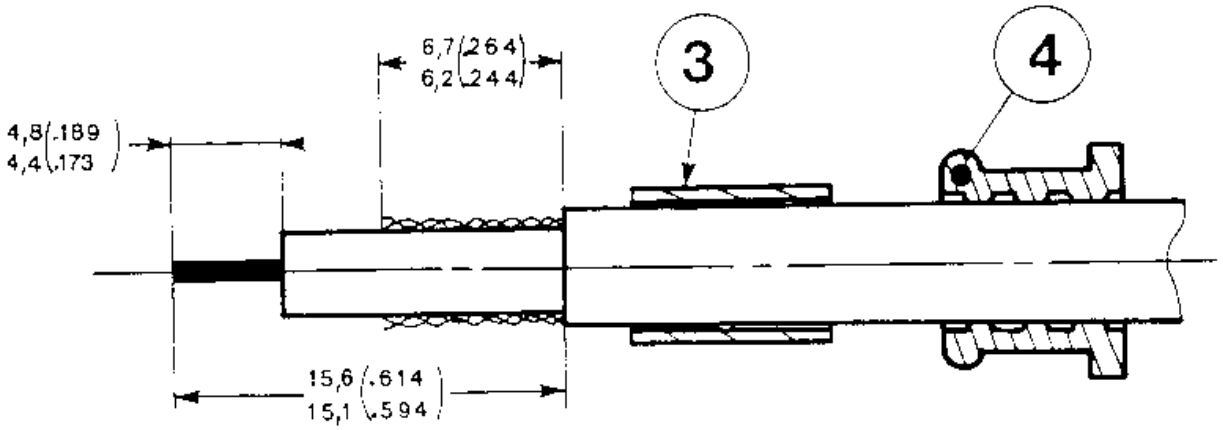


Figure 3

3) Comb the braid.

4) Insert inner conductor in barrel of inner contact and check that dielectric butts up against barrel and crimp (Tool No. M 22520/2-01 with positioner EN 4008-015 with selector No. 5).

5) Insert cable and inner contact into outer body. Till stop. Braid must be on the rear end of outer body and bottom the shoulder. See Figure 4.

6) Distribute the braid evenly around the rear of the outer body and put the ferrule on the braid till it touch the shoulder of outer body.

7) If some shield braid wires stay between ferrule and shoulder cut them. The ferrule must touch the outer body all around the rear face of its shoulder.

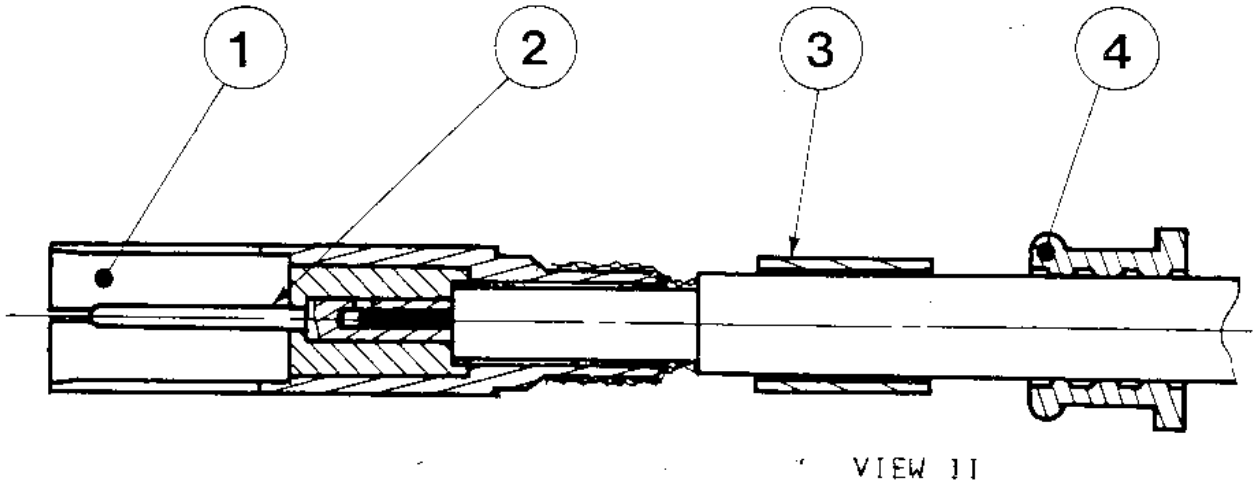


Figure 4

8) Crimp the ferrule with crimping tool M 22520/5-01 and dies M 22520/5-45B.

4.7 Tooling

4.7.1 Crimping tools

Conform to MIL-DTL-22520G, see Table 2.

These selector numbers given in Table 2 shall be used for qualification of the contacts and in service, unless otherwise specified by the user.

Table 2

Permissible cable group code	TR 6058 code	Tooling for crimping of centre contact			Tooling for crimping of contact outer body	
		Crimping tool	Positioner	Selector	Crimping tool	Positioner
A	XA, XG, XF, WM	M 22520/2-01	EN 4008-015	5	M 22520/5-01	M 22520/5-45B

It is the user responsibility if the parameters in Tables 2 and 3 are changed for service used.

4.7.2 Insertion/extraction tools

Conform to MIL-I-81969/28.

4.8 Tests

Tests according to EN 2591-100, see Table 3.

Table 3

<table>
<tr><th>EN 2591-</th><th>Designation of the test</th><th>Not applicable</th><th colspan="2">Applicable</th></tr>
<tr><th></th><th></th><th></th><th>According to EN 3155-001</th><th>Remarks</th></tr>
<tr><td>101</td><td>Visual examination</td><td></td><td>X</td><td>—</td></tr>
<tr><td>102</td><td>Examination of dimensions and mass</td><td></td><td>X</td><td>See 4.2.</td></tr>
<tr><td>201</td><td>Contact resistance - low level</td><td></td><td>X</td><td>Test temperature: ambient
<table><tr><th rowspan="2">Contact</th><th colspan="2">Maximum contact resistance
mΩ</th></tr><tr><th>Initial</th><th>After test</th></tr><tr><td>Central</td><td>10</td><td>15</td></tr><tr><td>Outer</td><td colspan="2">Not applicable</td></tr></table></td></tr>
<tr><td>202</td><td>Contact resistance at rated current</td><td></td><td>X</td><td>—
<table><tr><th rowspan="3">Contact</th><th colspan="3">Maximum contact resistance
mΩ</th><th rowspan="3">Rated current
A</th></tr><tr><th colspan="2">(25^{+3}_{0}) °C</th><th>(150^{+3}_{0}) °C</th></tr><tr><th>Initial</th><th>After test</th><th>After test</th></tr><tr><td>Central</td><td>10</td><td>15</td><td>17,5</td><td>1</td></tr><tr><td>Outer</td><td>1,5</td><td>2</td><td>2,15</td><td>7,5</td></tr></table></td></tr>
<tr><td>204</td><td>Discontinuity of contacts in the microsecond range</td><td></td><td>X</td><td>Method B
Duration of discontinuity: ≤ 0,1 µs
Test duration:
Throughout the duration of tests EN 2591-402 and EN 2591-403</td></tr>
<tr><td>206</td><td>Measurement of insulation resistance</td><td></td><td>X</td><td>Method C
Mated contacts
At ambient temperature: ≥ 5 000 MΩ
At 150 °C ≥ 2 000 MΩ</td></tr>
</table>

continued

Table 3 *(continued)*

EN 2591-	Designation of the test	Not applicable	Applicable	
			According to EN 3155-001	Remarks
207	Voltage proof test		X	Method C Proof test voltage at sea level: 750 VAC r.m.s. between central contact and outer contact. Proof test voltage at altitude: 125 VAC r.m.s. at 1,1 kPa pressure (33 000 m) Leakage current: 2 mA
212	Surface transfer impedance	X		—
221	Voltage Standing Wave Ratio (VSWR)		X	1,30: 1 max. from 0 MHz to 500 MHz
222	Insertion Loss (I.L.)		X	0,3 dB max. from 0 MHz to 500 MHz
301	Endurance at temperature		X	$T = (150\ ^{+5}_{0})$ °C Duration: 1 000 h
305	Rapid change of temperature		X	$T_A = (150\ ^{+5}_{0})$ °C $T_B = (-65\ ^{+5}_{0})$ °C
306	Mould growth		X	—
307	Salt mist		X	—
315	Fluid resistance		X	According to EN 3682-001.
402	Shock		X	Severity 30, Method A, See EN 3682-001 in relation with the figures in clause "Static load".
403	Sinusoidal and random vibration		X	According to EN 3682-001, clause "Vibrations".
406	Mechanical endurance		X	—
417	Tensile strength (crimped connection)		X	Cable according to TR 6058 code XA Central: > 53 N Outer: > 265 N
418	Gauge insertion/extraction forces (female contacts)		X	Gauge as described in Figure 5 and Table 4. **Insertion** Initial = 13,35 N max. After test = 16,7 N max. **Extraction** Initial = 1,11 N max. After test = 0,55 N max.
501	Soft solderability	X		—

continued

Table 3 *(concluded)*

EN 2591-	Designation of the test	Not applicable	Applicable	
			According to EN 3155-001	Remarks
503	Contact deformation after crimping		X	Cable size in accordance with Table 1. – Central contact concentricity tolerance shall not exceed 0,28 mm. – Central contact and outer body. Crimping zone shall not exceed 0,15 mm expansion.
508	Measurement of thickness of coating on contacts		X	The measured thickness shall be recorded.
509	Adhesion of coating on contacts		X	—
513	Magnetic permeability		X	—
514	Solderability of contacts with self-contained solder and flux		X	—

4.9 Gauge

See Figure 5 and Table 4.

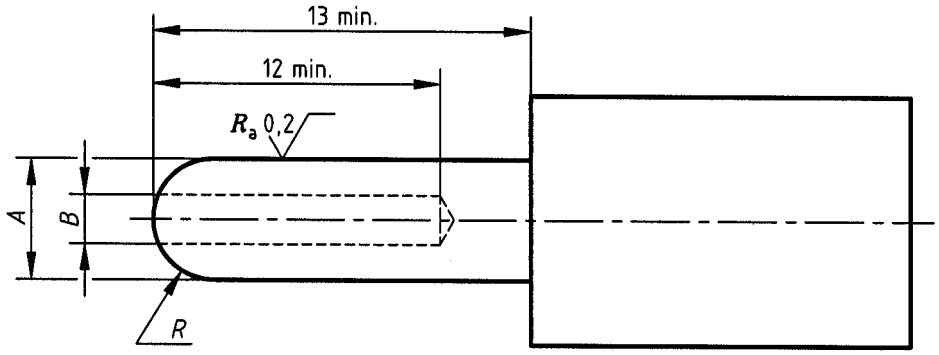


Figure 5

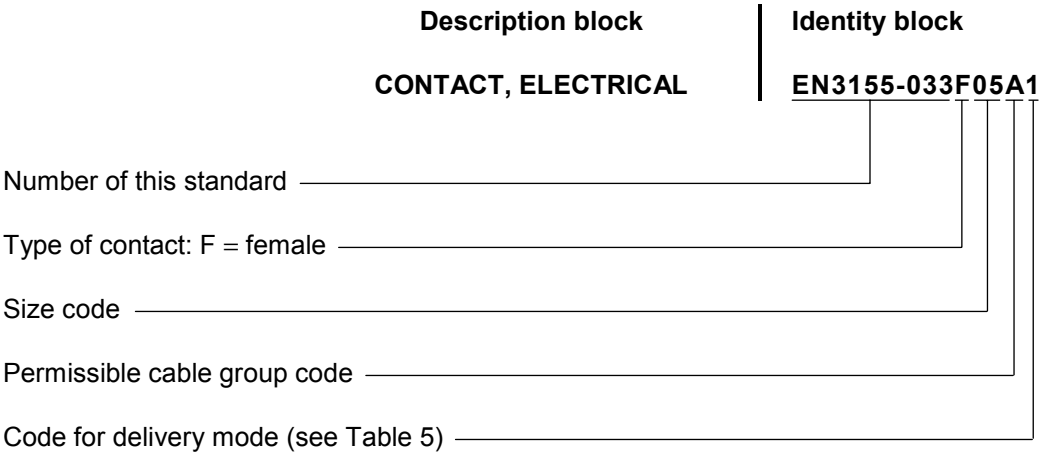
Table 4

Dimensions in millimetres

∅ A		B
Gauge min. 0 – 0,005	Gauge max. + 0,005 0	
5,56	5,61	1,5

5 Designation

EXAMPLE



NOTE If necessary, the code I9005 should be placed between the description block and the identity block.

Table 5

Code	Delivery mode
1	Without sleeve
2	With sleeve EN 4530-006

6 Marking

See EN 3155-001.

7 Delivery conditions

The contacts are packaged and identified individually. Conditioning shall provide protection of the contacts against any eventual damage.

Packaging shall include:

a) the manufacturer's name;

b) the designation defined in Clause 5;

c) the manufacturer's reference;

d) the manufacturing date code (year-week).

8 Technical specification

See EN 3155-001.

Bibliography

[1] EN 3155-002, *Aerospace series — Electrical contacts used in elements of connection — Part 002: List and utilization of contacts*

[2] EN 3155-032, *Aerospace series — Electrical contacts used in elements of connection — Part 032: Contacts, electrical, coaxial, 50 ohms size 5, male, type D, crimp, class R — Product standard*

[3] SAE-AS39029/99, *Contacts, electrical connector pin, crimp removable, coaxial, size 5 (for DOD C 83527 connectors)*[4]

[4] SAE-AS39029/100, *Contacts, electrical connector, socket, crimp removable, coaxial, size 5 (for DOD C 83527 connectors)*[4]

[4] Published by: Society of Automotive Engineers, Inc. (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001, USA.

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