

**BS 9530: 1988**

UDC 621.315.2.683 + .002.4 : 620.1

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British Standard Specification for
**Cable fitting accessories of assessed quality for
circular electrical connectors: generic data,
methods of test and rules for the preparation of
detail specifications**

Accessoires de câbles de qualité assurée pour connecteurs électriques circulaires: données génériques, méthodes d'essai et règles pour la préparation des spécifications particulières

Gütebestätigte Kabelzubehörteile für runde Steckverbinder; Fachgrunddaten, Prüfverfahren und Richtlinien bei der Erstellung von Bauartspezifikationen

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Foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Committee and is the generic specification for accessories for circular electrical connectors as defined by BS 9520 in a system of standards for electronic components of assessed quality.

This British Standard calls for the use of substances and/or test procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and in no way absolves either the supplier or the user from statutory obligations relating to health and safety at any stage of manufacture or use.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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Section one. Principles and procedures

1.1 General matters

1.1.1 Scope

This British Standard specifies requirements and methods of test for cable fitting accessories for use with circular electrical connectors as defined by BS 9520 and which are intended primarily for use in telecommunication and allied electronic equipment.

It also prescribes rules for the preparation of detail specifications.

This standard should be read and used in conjunction with BS 9520, and such general details and definitions given in that standard as are appropriate to this standard apply unless otherwise stated herein.

1.1.2 Related documents

This standard makes reference to the following documents:

- BS 308 Engineering drawing practice
- BS 969 Specification for limits and tolerances on plain limit gauges
- BS 2011 (IEC 68) Basic environmental testing procedures
- BS 3763 (ISO/R 1000) The International System of units (SI)
- BS 3939 (IEC 617) Guide for graphical symbols for electrical power, telecommunications and electronics diagrams
- BS 4000 Specification for sizes of paper and board
- BS 4727 Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms
- BS 5772 (IEC 512) Specification for basic testing procedures and measuring methods for electromechanical components for electronic equipment
- BS 5775 Specification for quantities, units and symbols
- BS 6001 Sampling procedures for inspection by attributes
- BS 9000 General requirements for a system for electronic components of assessed quality
- BS 9520 Specification for electrical connectors of assessed quality for d.c. and low frequency application: generic data and methods of test
- British Standard 3G 100 Specification for general requirements for equipment for use in aircraft
- British Standard G 202 Specification for design and performance requirements for aircraft electrical plugs and sockets for d.c. and low frequency a.c. applications
- British Standard G 210 Specification for PTFE insulated equipment wires (with silver plated copper conductors)
- British Standard G 212 Specification for general requirements for aircraft electrical cables
- British Standard G 221 Specification for Minyvin type electric cables (metric units)

British Standard G 222 Specification for Efglas type electric cables (metric units)

IEC 130-1 Connectors for frequencies below 3 MHz
Part 1 General requirements and measuring methods

NOTE. When reference to an IEC Publication or ISO Recommendation is given in parentheses the British Standard is identical in technical content with the IEC Publication or ISO Recommendation except where deviation(s) are indicated in the British Standard.

1.1.3 Terminology

For the purposes of this British Standard, the definitions of general electrical and telecommunication terms given in the appropriate Part of BS 4727, and of accessory, connector and mounting terms given in 1.1.3.2, 1.1.3.3 and 1.1.3.5, respectively of BS 9520 : 1983 apply, together with the following.

1.1.3.1 family. A group of electronic components which predominantly displays a particular physical attribute and/or fulfils a specific function.

1.1.3.2 type. A basic item, e.g. cover, stowage housing (shell), cable outlet, shroud, potting mould, etc.

1.1.3.3 pattern. A design covered by an individual detail specification.

1.1.3.4 range. The sizes available within a pattern relative to the connector housing (shell), body, or contact arrangement, etc.

1.1.3.5 style. Configurations within a range, e.g. cable outlet straight, cable outlet 90°, etc.

1.1.3.6 variant. An individual accessory, within a style, having a feature or features different from the standard accessory.

1.1.3.7 specimen. An individual accessory in a sample.

1.1.3.8 characteristic. A quality or feature peculiar to, or inherent in, the design of an accessory, e.g. its shape, mass, etc.

1.1.3.9 maximum operating temperature. The maximum operating temperature of an accessory and/or the associated connector.

1.1.3.10 rating. A limiting value placed on a particular function of an accessory at stated conditions of use with a specified pattern of connectors.

1.1.3.11 service life. The life of the relevant specified pattern of accessories.

1.1.4 Letter symbols, signs and abbreviations

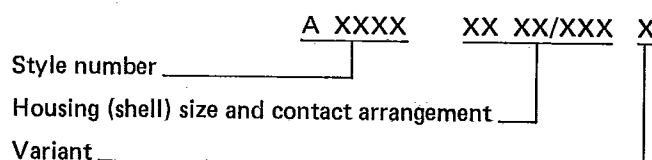
The letter symbols, signs and abbreviations which are employed in all documents applicable to electronic components covered by this standard shall comply either with BS 5775 or shall be derived in accordance with the principles of that standard.

1.1.5 Graphical symbols

The graphical symbols employed in all standards and documents applicable to electronic components covered by this specification shall comply with BS 3939 or shall be derived in accordance with the principles of that standard.

1.1.6 Accessory reference numbers

The accessory reference number shall consist of two groups of digits and a letter suffix to identify an individual accessory as follows.



Style number: 'A' indicates an accessory, followed by the last four digits of the specification number.

Housing (shell) size and contact arrangement: This group consists of two plus two/three digits indicating housing (shell) size and contact arrangement (in accordance with appendix A of relevant connector detail specification).

NOTE 1. Where the contact arrangement is not applicable to an accessory, e.g. items without an internal grommet, covers, stowage, housings, etc., two/three digits may be replaced with '00' or '000' respectively.

Variant: The suffix letter is a letter denoting any variation from the basic specification, e.g. plating finish (in accordance with clause 4 of the relevant detail specification), e.g. O = standard accessory; X = customer special requirement.

NOTE 2. Secondary suffix letters may be required to identify wire/cable accommodation ranges or other variables.

Example accessory reference numbers:

A 001 16 00 O

A 001 20 41 X

Where an accessory is supplied with the connector, an abbreviated accessory reference number is combined with the connector reference number as follows (deleting connector variant letter, accessory generic specification number and housing (shell) size contact arrangement).

Example reference numbers:

Connector: C 1234 20 41 MNO

Accessory: A 001 20 41 O

Combined: C 1234 20 41 MN 001 O

1.1.7 Marking of the accessory

As far as is practicable, the following particulars shall be legibly and durably marked on each accessory in the following order of importance:

- the manufacturer's factory identification code;

- the date code (see clause 22 of BS 9000 : Part 1 : 1981);

- the individual reference number (see 1.1.6).

1.1.8 Marking of the package

The particulars required by 1.1.7 and the following additional information shall be marked on the package. If transparent packaging is used, the information shall be marked on a label which can be read without opening the package:

- BS accessory detail specification number, e.g. BS 9530 001;
- any additional marking as required in the relevant detail specification, and/or the user's purchase order.

1.1.9 Ordering information

The following information shall be stated by the purchaser on his order form when ordering accessories to this standard:

- BS accessory detail specification number;
- accessory reference number (see 1.1.6);
- details of any special requirements, e.g. customer variants;
- accessory to be supplied with a specified related connector (when applicable);
- requirement for assembly instructions.

1.1.10 Drawings

The detail specification shall contain outline drawings showing dimensions relating to interchangeability and installation generally in accordance with 2.1.5 of BS 9520 : 1983.

1.1.11 Eligibility for qualification approval

The primary stage of manufacture is defined as manufacture of the piece parts.

This stage and all subsequent operations shall be carried out under the direct surveillance of an approved chief inspector.

NOTE. Where this first stage of manufacture is carried out by a sub-contractor approval may be granted provided that in each case the supervising inspectorate is satisfied that equivalent disciplines apply. (See also 8.2.1 of BS 9000 : Part 1 : 1981.)

1.1.12 Structurally similar components

In the case of accessories with common design features it will usually be possible, for qualification sampling inspection and test purposes, to regard them as structurally similar in this respect. This will permit a reduction in the

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number of specimens but may be subject to the requirement that any inspection or test sequence shall include at least one specimen of each component which that sequence is intended to cover. In such cases the manufacturer shall state the ground on which structural similarity is claimed.

1.1.13 Delayed delivery

Accessories held for a period exceeding 5 years (unless otherwise specified in the detail specification) following acceptance inspection shall be re-examined for group A inspection, excluding subgroup A5.

1.1.14 Supplementary procedures for qualification approval

Not applicable.

1.1.15 Certified test records

Certified test records (CTRs) shall be prepared by the manufacturer for full assessment level accessories. They are not required for the basic assessment level. (See BS 9520.)

Certified test records shall be in the form shown in appendix C of BS 9000 : Part 1 : 1981 and shall be printed on international size A4 paper complying with BS 4000. When the relevant accessory detail specification requires that attributes information shall be recorded, the total number of rejected accessories shall be recorded without reference to the parameter for which the rejection was made.

1.1.16 Standard ratings and characteristics

Standard ratings and characteristics shall be as in the appropriate connector detail specification except where otherwise prescribed in the accessory detail specification.

1.1.17 Unchecked parameters

If the manufacturer quotes additional parameters to those given in the detail specification, such parameters shall not be used for inspection purposes and no guarantee shall be given as to their accuracy.

1.1.18 Procedure to be followed in the event of failure at group CD or group D inspection

In the event of failure at group CD or group D inspection, the procedure followed shall be in accordance with 20.11 of BS 9000 : Part 1 : 1981.

1.1.19 Release before completion of group B tests

When the conditions for reduced inspection described in BS 6001 have been satisfied for all group B tests, the manufacturer is permitted to release components before the completion of such tests.

1.2 Test procedures

1.2.1 Measurement conditions

Unless otherwise specified, all tests shall be carried out under standard atmospheric conditions for testing as specified in BS 2011.

NOTE 1. For the subsequent recovery periods, where measurements are to be completed within a specified period, specimens measured early and failing to meet the requirements may be measured again before that period expires.

Tests involving successive measurements shall be made on the same samples throughout the series.

Where accessories are required to be fitted to connectors for test purposes, mating specimens of BS 9000 approved patterns of connectors, with which the accessories are primarily intended for use, shall be used.

It is permitted that tests for qualification or quality maintenance purposes be carried out in conjunction with the testing of connectors for which the accessory is primarily intended for use.

Where an approved connector is specified for mating with the accessory under test, the dimensions of the mating connector shall be in accordance with the appropriate drawings.

NOTE 2. The tests specified in 1.2.2 to 1.2.6 are not intended to be applied in the order listed, but as shown in the test schedule in section four of this standard.

1.2.2 Visual examination

The specimens shall be examined visually, using a device having a magnification of two to four diameters.

The following features shall be examined.

- (a) workmanship and finish, which shall be satisfactory;
- (b) marking, which shall be in accordance with 1.1.6 of this standard and 1.1.6 of BS 9520 : 1983;
- (c) permanence of marking (not easily removed by rubbing with fingers);
- (d) mechanical damage, movement or displacement of parts such as would impair operation.

1.2.3 Dimensioning and gauging

1.2.3.1 Dimensions, outline

Dimensions shall be checked and shall comply with the outline drawing in the detail specification. (See appendix A.)



1.2.3.2 Dimensions, detail and material

The piece parts prescribed in the detail specification shall be checked and shall comply with the relevant manufacturing drawings. Measured dimensions shall be recorded.

1.2.3.3 Gauging procedure: mechanical compatibility gauging

Where compatibility gauges are prescribed on the control drawings the relevant specimens shall accept the gauges.

1.2.4 Electrical test procedures**1.2.4.1 General**

Where applicable, accessories shall be fitted to connectors in accordance with 1.2.1.

1.2.4.2 Housing (shell) electrical continuity

Housing (shell) electrical continuity shall be in accordance with 1.2.4.3 of BS 9520 : 1983.

1.2.4.3 Shielding effectiveness

1.2.4.3.1 Screen continuity. The screen series resistance shall be within the maximum limits prescribed in the detail specification when measured in accordance with appendix B.

1.2.4.3.2 Electromagnetic compatibility (EMC). Test under consideration.

1.2.4.4 Insulation resistance

The insulation resistance shall be not less than that specified in the detail specification when measured in accordance with 1.2.4.4 of BS 9520 : 1983.

1.2.5 Mechanical test procedures**1.2.5.1 General**

Where applicable, accessories shall be fitted to connectors in accordance with 1.2.1.

1.2.5.2 Mass

The mass of the specimen shall be measured as specified in 1.2.5.2 of BS 9520 : 1983 and shall be within the limit stated in the detail specification.

1.2.5.3 Cable clamping

Cable, when clamped, shall comply with 1.2.5.8 of BS 9520 : 1983 using the smallest and largest cable bundle as given in the detail specification for each size of accessory.

1.2.5.4 Compass safe distance

Compass safe distance shall be in accordance with 1.2.5.12 of BS 9520 : 1983.

1.2.5.5 Locking wire pull-out

When tested in accordance with appendix C, the locking wire hole shall remain intact, i.e. there shall be no tearing open of the material from the bore to the outer surface of the component.

1.2.5.6 Accessory thread strength

When tested in accordance with appendix D, there shall be no breakage or other damage to the accessory or its attachment nut such as would impair performance, when it is visually examined.

1.2.5.7 External bending moment

When tested in accordance with appendix E, there shall be no breakage or other damage such as would impair performance.

1.2.6 Environmental test procedures**1.2.6.1 General**

Where applicable, accessories shall be fitted to connectors in accordance with 1.2.1.

1.2.6.2 Bump

The bump test shall be carried out in accordance with 1.2.6.2 of BS 9520 : 1983 and shall comply with the requirements therein.

1.2.6.3 Vibration, general

The vibration, general test shall be carried out in accordance with 1.2.6.3.1 of BS 9520 : 1983 and shall comply with the requirements therein.

1.2.6.4 Vibration, airframe

The vibration, airframe test shall be carried out in accordance with 1.2.6.3.2 of BS 9520 : 1983 and shall comply with the requirements therein.

1.2.6.5 Shock

The shock test shall be carried out in accordance with 1.2.6.4 of BS 9520 : 1983 and shall comply with the requirements therein.

1.2.6.6 Rapid change of temperature

The rapid change of temperature test shall be carried out in accordance with 1.2.6.8 of BS 9520 : 1983 and shall comply with the requirements therein.

1.2.6.7 Damp heat (steady state)

The damp heat steady state test shall be carried out in accordance with 1.2.6.15 of BS 9520 : 1983 and shall comply with the requirements therein.

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The corrosion, salt mist test shall be carried out in accordance with 1.2.6.17 of BS 9520 : 1983 and shall comply with the requirements therein.

1.2.6.9 Sealing, immersion

The sealing, immersion test shall be carried out in accordance with 1.2.6.14 of BS 9520 : 1983 and shall comply with the requirements therein.

1.2.6.10 Resistance to fluids

When tested in accordance with appendix F, under visual examination the identification marks shall be legible and there shall be no mechanical damage, movement or displacement of parts such as would impair operation.

1.2.6.11 Dry heat

The dry heat test shall be carried out in accordance with test 11i of BS 5772 : Part 6 : 1979 and shall comply with the requirements therein.

Section two. Rules for the preparation of detail specifications

2.1 General information

Detail specifications for accessories shall be used in conjunction with this British Standard. Detail specifications describe the accessories and indicate their applications but do not contain test schedules.

Test schedules are given in tables 1, 2 and 3, and reference shall be made in the detail specifications to the appropriate table. For ratings and characteristics, the detail specifications shall make reference to the appropriate clauses in the detail specification for the connectors with which the accessories are primarily intended to be used.

The requirements for acceptance inspection are as stated in section four.

An example detail specification is given in appendix A including minimum requirements in all dependent detail specifications, except where otherwise stated.

NOTE. Inclusion of additional information such as drawings, notes, etc., needed for the clarification of the detail specification is permissible. This information is not required to be verified by the inspection procedure. (See also Circular Letters No. 15 and No. 16.) The following should be included:

'NOTE. Galvanic corrosion may occur if connector/assembly combinations having dissimilar metal finishes are used.'

2.2 Originator of the detail specification

The name of the originator of the detail specification, i.e. the British Standards Institution or an individual manufacturer, shall be stated.

2.3 Detail specification number

The number of the detail specification, the issue number and date of issue shall be stated. (Specification numbers will be allocated by BSI in accordance with BS 9000.)

2.4 Tools

The detail specification shall refer, where applicable, to tools recommended by the manufacturer for assembling accessories to connectors.