

Rules

for the preparation of

Detail specifications

for ELECTRICAL EDGE SOCKET CONNECTORS OF
ASSESSED QUALITY - FULL AND BASIC ASSESSMENT
LEVEL

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RULES FOR THE PREPARATION OF DETAIL
SPECIFICATION FOR ELECTRICAL EDGE
SOCKET CONNECTORS OF ASSESSED QUALITY
FULL AND BASIC ASSESSMENT LEVEL

Revised text

Clause 4.1.1 Full assessment level. Delete the existing item (b) and substitute the following:

'(b) The minimum sample for subgroups D2 to D9* inclusive is 60 specimens with mated boards or accessories. The minimum number of specimens for each of the subgroups D2, D3, D4, D5, D6 is 15 samples with mated boards or accessories and the minimum number of specimens for groups D7, D8 and D9 is five samples with mated boards or accessories.

There are two alternative means of taking samples for the tests in all these groups.

All tests may be carried out using new samples for each group of tests only.

The alternative is the test pattern arrangement as shown in appendix B.

However, if the appendix B test pattern is used, in all cases the tests in D2 and D3 shall have been completed before the samples are taken for the tests in D4, D7, D8 and D9.

A possible third arrangement is a combination of the first method and the alternative.'

Appendix A. Example detail specification. In appendix B of this example detail specification:

for test group D2, insert 'D8' in the blank box between D7 and D8 in the right-hand column;

for test group D6, delete the line across the columns between S6000 35-45 DTAC XX and S6000 70-80 ALAD XX. Delete 'D8' in the right-hand column;

insert the following new note:

'NOTE 3. Tests in groups D2 and D3 shall be completed before the samples are used in tests in D4, D7, D8 and D9'.

STANDARD RULES FOR THE PREPARATION OF DETAIL
SPECIFICATIONS FOR ELECTRICAL EDGE SOCKET
CONNECTORS OF ASSESSED QUALITY - FULL ASSESSMENT
LEVELS

1. INTRODUCTION

This British Standard contains the rules for the preparation of detail specifications for edge socket connectors for frequencies below 3 MHz. It is supplementary to BS 9520: 'Electrical connectors of assessed quality for frequencies below 3 MHz: Generic data and methods of test' and reference to that publication is necessary. An example of a typical detail specification is included herein.

2. SCOPE

This British Standard prescribes those special rules which, in conjunction with the general rules contained in section two of BS 9520 : 1974 are required for the preparation of detail specifications for edge socket connectors of assessed quality for frequencies below 3 MHz. Provision is made to include those connector ranges providing a mating accessory simulating the printed board edge.

3. GENERAL

3.1 Contacts Connectors with contacts which differ in being replaceable or non-removable with solder, wire-wrap, crimp, etc., terminations may be included in any one detail specification.

(3.2

The type of contact shall be indicated in the title of the connector specification, and for replaceable contacts the direction of release and removal from the connector, e.g. front release rear removable, shall be stated.

Replaceable contacts are those which are capable of being replaced for connector repair or maintenance purposes.

3.2 Assessment level. The detail specification shall show the relevant assessment level, basic or full. Each detail specification shall refer to only one assessment level.

3.3 Title. Typical examples of connector titles and method of presentation on the front page of a detail specification are as follows:

ELECTRICAL CONNECTORS
FULL ASSESSMENT LEVEL
MULTI-CONTACT EDGE SOCKET
DOUBLE SIDED CLOSED ENDED WITH NON-REMOVABLE SOLDER CONTACTS
ENVIRONMENTAL CATEGORY: 55/125/21

ELECTRICAL CONNECTORS
BASIC ASSESSMENT LEVEL
MULTI-CONTACT EDGE SOCKET
SINGLE SIDED OPEN ENDED WITH REAR RELEASE FRONT REMOVABLE CRIMP CONTACTS
ENVIRONMENTAL CATEGORY: 10/070/04

3.4 Pattern number. The pattern number of a connector or range of connectors shall consist of the relevant detail specification number without the letters BS, e.g. pattern 9526 N001.

3.5 Description of the connector and intended application. The description of the connector shall make reference to contact pitch, printed board thickness, single or double sided, open or closed ended, method of location, polarization, coding, contact type (replaceable or non-removable) contact finish, and termination style (solder, crimp, wire-wrap, etc.).

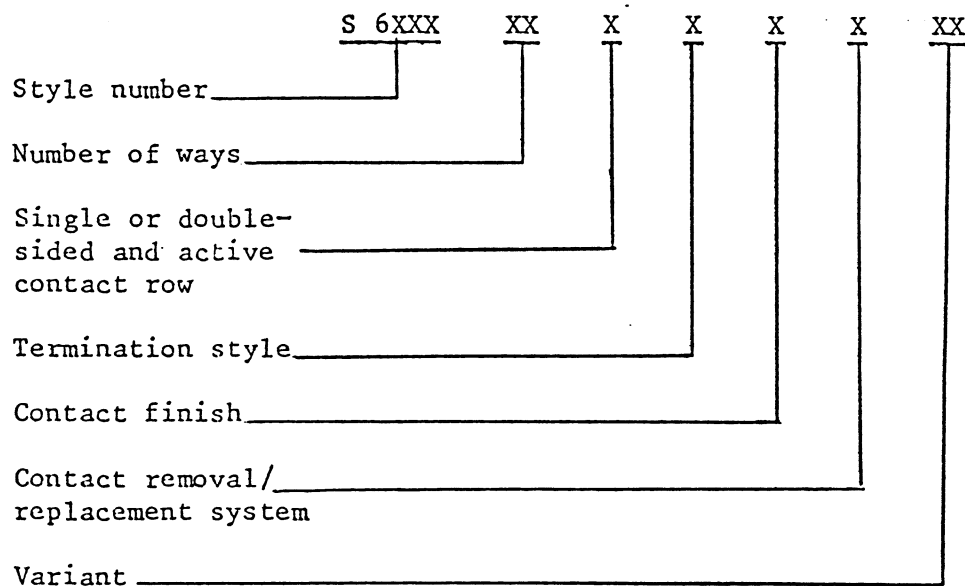
For connectors having replaceable contacts the manner of insertion, release and removal of the contacts shall be stated. Specifications defining connectors produced by more than one manufacturer shall state whether replaceable contacts of different manufacture are interchangeable. If not, a note shall be included stating that replacement contacts must be identical to the originals.

Where compliance with the detail specification is dependent on a full complement of contacts being fitted and/or by the use of dummy contacts or unwired contacts, this shall be stated.

The description of intended application shall make reference to the major performance characteristics of the connector, such as environmental category and assessment level, and attention may also be drawn to particular uses.

See also 2.1.3 of BS 9520.

3.6 Marking of the connector and package. The detail specification shall state that the marking shall be in accordance with 1.1.6 of BS 9520. The individual reference number required by 1.1.6(3) of BS 9520: 1974 consists of abbreviations to identify individual connectors. It is not intended that this reference number shall describe every feature of the connector. An explanation of the reference shall be included in each detail specification similar to the following:



Style number:

A letter S, denoting single-part edge socket connector or mating accessory, followed by four digits. The first digit of the style number is the same as the first digit of the block of control drawing numbers allocated to this particular type of connector, i.e. 6. A typical description of a style is S 6XXX: Multi-contact, closed and edge socket connector, with moulded body and fixing flanges.

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Number of ways:

Digits denoting the number of contacts along one side of the connector, e.g. 08, 14, 86 etc.

Single or double-sided and active contact row:

A = single sided, side A active, single row of terminations
B = single-sided, side B active, single row of terminations
E = single-sided, side A active, double row of terminations
F = single-sided, side B active, double row of terminations
D = double-sided, both sides active
L = opposing contacts linked

Termination style:

C = crimp
E = edge-board solder
S = solder spill for wire
W = wire wrap
T = through-board solder, short spill
L = through-board solder, long spill
R = through-board solder, right-angle spill

Contact finish:

A = hard acid gold D = nickel
B = silver E = palladium
C = tin F = rhodium
(or alloys for each in which they are the major constituents)

Contact removal/
replacement/system:

Letters denoting direction of contact removal and replacement
A = rear release/front removable/
replaceable contacts
B = rear release/rear removable/
replaceable contacts
C = front release/front removable/
replaceable contacts
D = front release/rear removable/
replaceable contacts
0 = non-replaceable contacts

Variant:

Digits to denote any variation from the basic specification, e.g. termination style, contact finish, moulding, replacement parts etc. Detail specification shall designate variants. Where no variation exists 00 shall be used.

NOTE. Application of the above letter references is mandatory but not exhaustive. Additional letters may be used in the detail specification if necessary.

Example reference number: S 6000 55 B W A B XX

Packaging shall include the manufacturer's assembly and contact replacement instructions. Full instructions for the removal and replacement of contacts and keys must be provided by the manufacturer. Packages of replacement parts shall include an outline drawing showing salient dimensions.

3.7 Ordering information. For ordering information see 2.4 of BS 9520: 1974.

3.8 Drawings. The detail specification shall contain in appendices, drawings as required by 2.1.4 and appendix A of BS 9520: 1974. In addition, the edge details of mating printed boards shall be shown and also details of any mating accessories. Each outline drawing shall bear a reference to the corresponding control drawing, if any.

3.9 Ratings (including limiting conditions of use). The following ratings shall be stated (in accordance with 1.1.12 of BS 9520) and the conditions under which they apply.

3.9.1 Electrical. A recommended maximum working current per individual contact (in isolation) at specified ambient temperatures.

Maximum working current per contact through all contacts simultaneously at specified ambient temperatures.

Working and proof voltages shall be given for stated air pressure(s).

3.9.2 Environmental

Environmental classification

*Low air pressure severity

*Vibration severity

*Shock severity

*Acceleration severity

*Bump severity

3.9.3 Endurance

Mechanical

High temperature - long term at stated current and temperature

High temperature - short term, no electrical load and at upper temperature severity.

* To be included by the specification writer if appropriate to the intended application

3.10 Characteristics. The following characteristics shall be stated (in accordance with 1.1.12 of BS 9520) and the conditions under which they apply. Initial and final values shall both be stated where differences after conditioning are permitted.

3.10.1 Electrical

Maximum contact resistance
Minimum insulation resistance

3.10.2 Mechanical

Connector engaging and separating forces
*Contact retention (in insert) (moulding): test load
Contact holding force
*Guide key (locating) retention: test load
*Static load (mating): test load
*Insert (moulding) ageing

3.10.3 Fluid resistance. The detail specification shall state the fluids to which resistance is claimed. See appendix E of BS 9520.

3.11 Certified test records (for full assessment level only). See appendix C of BS 9000 for example of layout.

3.12 Additional information. Additional drawings, notes etc. needed for the clarification of the detail specification may be given. This information is not required to be verified by the inspection requirements.

4. QUALITY ASSESSMENT PROCEDURE

4.1 Selection of specimens. The specimens for each subgroup should contain representative styles and sizes of connectors and mating boards or accessories, including the largest size for which approval is sought.

4.1.1 Full assessment level

(a) For subgroup D0, one specimen of each piece part of the connector range submitted for approval. For subgroup D1, three specimens of connectors for each termination style. However this may be modified by agreement with the Supervising Inspectorate, provided an approved sampling plan is appended to the detail specification.

* Where applicable.

(b) The minimum sample for subgroups D2 to D9* inclusive is 60 specimens with mated boards or accessories. The minimum number of specimens for each of the subgroups D2, D3, D4, D5 and D6 is fifteen with mated boards or accessories; and subgroup D3 samples may be used for subgroup D4. For subgroups D7, D8 and D9* it is five specimens with mated boards or accessories. Specimens for D7 and D9* may be taken from the D2 test samples. Specimens for D8 shall be taken from the D6 test samples.

4.1.2 Basic assessment level

(a) For subgroup D0, one specimen of each piece part required for the connector range submitted for approval. For subgroup D1, three specimens of connectors for each termination style. However this may be modified by agreement with the Supervising Inspectorate, provided an approved sampling plan is appended to the detail specification.

(b) The minimum sample for subgroups D2 to D6 inclusive is 30 specimens with mated boards or accessories. The minimum number of specimens for each of the subgroups D2, D3, D5 and D6 is 15 with mated boards or accessories. Subgroup D2 samples may be used for subgroup D6, and subgroup D3 samples may be used for subgroup D5.

4.2 Information to be given in the detail specification. The following information shall be included in the detail specification in a clause entitled 'Quality assessment procedure', or elsewhere at the discretion of the specification writer.

4.2.1 Acceptance criteria for group D

Subgroups D0, D1, D4(ii), D8 and D9	- No failure allowed
Remaining subgroups	- One failure allowed in each subgroup

4.2.2 Qualification approval. Group C tests need not be carried out if similar tests, at the same or increased severity are carried out in group D.

4.2.3 Quality conformance inspection. When group D tests are due, similar tests in group C need not be performed.

* For D9, one specimen connector is required for each fluid specified and a larger sample will be required if more than five fluids are specified. The extra specimens may be taken from subgroup D5.

5. INSPECTION REQUIREMENT

The mandatory tests in each group and subgroup for the full and basic assessment levels are given with the relevant inspection levels and acceptance quality levels (AQLs) in tables 1 and 2. A detail specification shall contain, as a minimum, these tests, inspection levels and acceptance quality levels. The tests in any subgroup shall be performed in the order given in the inspection requirements. Table 3 lists the comparative requirements of tables 1 and 2.

TABLE 1. MANDATORY INSPECTION REQUIREMENTS FOR FULL ASSESSMENT LEVEL

Samples subjected to tests in subgroups marked '(D)' shall not be accepted for release under BS 9000 (see 2.6.5 of BS 9000: Part 1).

The wire or cables to be used in the test shall be prepared in accordance with the relevant detail specification. Extruded PTFE covered wires and cables are preferred. (To ensure that the wiring operation has been carried out satisfactorily, it is advisable to apply insulation and contact resistance tests.)

Inspection	BS 9520: 1974 reference and conditions of test
GROUP A	To be applied on a sampling basis lot-by-lot, except subgroup A0. Subgroups A2 and A3 are not applicable.
<u>Subgroup A0</u>	<u>100 % inspection</u>
Visual examination	1.2.2.(1)
<u>Subgroup A1</u>	<u>Inspection level S-3, AQL 1.5 %</u>
Visual examination	1.2.2.(2)
<u>Subgroup A4</u>	<u>Inspection level S-3, AQL 1.5 %</u>
Voltage proof	1.2.4.4 Method A or B shall be prescribed Duration = 5 s
<u>Subgroup A5</u>	
<u>CTR information</u>	1.1.11 The result from the test in subgroup A1 shall be reported as attributes information

Inspection	BS 9520: 1974 reference and conditions of test	
GROUP B	To be applied on a sampling basis lot-by-lot. Subgroups B3 to B7 are not applicable. Connectors shall have contacts fitted and wired as required for tests.	
<u>Subgroup B1</u>	<u>Inspection level S-4, AQL 1.5 %</u>	
Insulation resistance	1.2.4.3	Method A or B shall be prescribed
Engaging and separating force, connector	1.2.5.2	Gauges to be prescribed in the detail specification
Contact holding force	1.2.5.8	With 10 sizings. Gauges to be prescribed in the detail specification
<u>Subgroup B2 (D)</u>	Specimens from subgroup B1 may be used. <u>Inspection level S-4, AQL 4 %</u>	
Soldering*	1.2.6.6	
Contact resistance	1.2.4.1(1)	Gauges to be prescribed in the detail specification
<u>Subgroup B8</u>		
CTR information	1.1.11	Results from the tests in subgroups B1 and (as applicable) in B2 shall be reported as attributes information
GROUP C	To be applied on a sampling basis at three-monthly intervals. Subgroups C2, C3 and C4 are not applicable. The issue number of the manufacturing drawing shall be checked against that on the approval certificate.	
<u>Subgroup C1</u>	<u>Inspection level S-3, AQL 4 %</u>	
Dimensions outline	1.2.3.1	
<u>Subgroup C5 (D)</u>	<u>Inspection level S-3, AQL 4 %</u>	
Mechanical endurance	1.2.7.1	250 operations (at not exceeding 15 operations per minute). Gauges to be prescribed in the detail specification.

* Applicable only to terminations intended to be soldered.

Inspection	BS 9520: 1974 reference and conditions of test	
<u>Subgroup C5 (D) cont'd</u>		
High temperature endurance	1.2.7.2	Duration = 250 h, at upper temperature severity. No electrical load and unmated During the conditioning, the following measurements shall be made:
Insulation resistance	1.2.4.3	Method B. Unmated and at upper temperature severity. Measured 8 times at intervals of not less than 24 h
<u>Final measurements</u>	After 1 1/2 h - 2 h recovery	
Contact resistance	1.2.4.1(1)	Gauges to be prescribed in the detail specification
Voltage proof	1.2.4.4	Method B
Engaging and separating force connector	1.2.5.2	Gauges to be prescribed in the detail specification
Visual examination	1.2.2(3) 1.2.2(4)	
<u>Subgroup C6</u>		
CTR information	1.1.11	The results from the final measurements in subgroup C5 shall be reported as attributes information The contact resistance and insulation resistance results at the conclusion of the test in subgroup C5 shall be reported as measurements information
GROUP D	Subgroup D5 to be applied at yearly intervals. Remaining subgroups to be applied at three-yearly intervals The issue number of the manufacturing drawing shall be checked and recorded.	
<u>Subgroup D0</u>		
Dimensions, detail and materials	1.2.3.2	Identical piece parts used in different type number connectors need not be rechecked

Inspection.....	BS 9520: 1974 reference and conditions of test	
<u>Subgroup D1</u>	For sample size see clause 4 of this standard	
Dimensions, outline	1.2.3.1	
Mass*	1.2.5.1	Including contacts
<u>Subgroup D2 (D)</u>	For sample size see clause 4 of this standard	
Insert (moulding) ageing†	1.2.5.10	Three insertions and withdrawals with replacement contacts using tools prescribed in the detail specification
Contact retention (in insert) (moulding)‡	1.2.5.3	
Robustness of terminations§	1.2.6.5	Detail specification shall prescribe applicable tests
Termination torsion		Test as prescribed in the detail specification
Guide key (locating) retention¶		Test as prescribed in the detail specification
Static load (mating)		Test as prescribed in the detail specification
Moulding strength		Test as prescribed in the detail specification
<u>Subgroup D3 (D)</u>	For sample size see clause 4 of this standard	
Bump	1.2.6.1	
Vibration	1.2.6.2	
<u>Final measurements</u>		
Visual examination	1.2.2.(4)	
Contact resistance	1.2.4.1(1)	Gauges to be prescribed in the detail specification

* This test shall be carried out for initial Qualification Approval only.

† Applicable only to connectors having removable contacts.

‡ Applicable only to connectors having non-removable contacts.

§ Not applicable to connectors having contacts with crimp or through-board solder terminations.

|| Where applicable.

¶ Applicable only to connectors having contacts with wire-wrap terminations.

Inspection	BS 9520: 1974 reference and conditions of test
<u>Subgroup D4 (i) (D)</u>	For sample size see clause 4 of this standard
Rapid change of temperature	1.2.6.7 Upper and lower temperature severities
Climatic sequence	1.2.6.11
<u>Final measurements</u>	1.2.6.11 As applicable. To be prescribed in the detail specification
<u>Subgroup D4 (ii) (D)</u>	Sample - One specimen of the largest size connector
Flammability	1.2.6.8
<u>Subgroup D5 (D)</u>	For sample size see clause 4 of this standard
Contact resistance	1.2.4.1(1)
Rapid change of temperature	1.2.6.7 Upper and lower temperature severities
Damp heat, steady state	1.2.6.14 Duration = 21/56 day (as applicable)
<u>Final measurements</u>	1.2.6.14 As applicable. To be prescribed in the detail specification
<u>Subgroup D6 (D)</u>	For sample size see clause 4 of this standard
Mechanical endurance	1.2.7.1 250 operations (at not exceeding 15 operations per minute). Gauges to be prescribed in detail specification
High temperature endurance	1.2.7.2 Duration = 1000 h at temperature and current prescribed in detail specification. The temperature of the specimen shall be maintained and the following measurements made:
Insulation resistance	1.2.4.3 Method B. Mated and at upper temperature severity
<u>Final measurements</u>	After 1 1/2 h - 2 h recovery
Contact resistance	1.2.4.1(1) Gauges to be prescribed in the detail specification
Voltage proof	1.2.4.4 Method B

(Subgroup D6 (D) cont'd)



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Inspection	BS 9520: 1974 reference and conditions of test
<u>Subgroup D6 (D) cont'd</u>	
Engaging and separating force, connector	1.2.5.2 Gauges to be prescribed in the detail specification
Visual examination	1.2.2(3) 1.2.2(4)
<u>Subgroup D7 (D)</u>	For sample size see clause 4 of this standard
Mould growth	1.2.6.15 Duration = 28 days
<u>Final measurements</u>	
Insulation resistance	1.2.6.15(1) Method A or B shall be prescribed
Visual examination	1.2.6.15(2)
Voltage proof	1.2.6.15(8) Method A or B shall be prescribed
<u>Subgroup D8 (D)</u>	For sample size see clause 4 of this standard
Industrial atmosphere*	1.2.6.20
<u>Final measurements</u>	
Contact resistance	1.2.6.20(1)
Visual examination	1.2.6.20(2)
<u>Subgroup D9 (D)</u>	Sample size - One connector for each fluid specified
Fluid resistance	1.2.6.19
<u>Final measurements</u>	
Engaging and separating force, connector	1.2.5.2 Gauges to be prescribed in the detail specification
Contact resistance	1.2.4.1(1) Gauges to be prescribed in the detail specification
Insulation resistance	1.2.4.3 Method A or B shall be prescribed

* If declared applicable.

Inspection	BS 9520: 1974 reference and conditions of test	
Subgroup D10		
CTR information	1.1.11	The results from the final measurements in subgroups D3, D4, D5, D6, D7, D8 and D9 shall be reported as attributes information The contact resistance and insulation resistance results at the conclusion of the tests in subgroup D5 and D6 shall be reported as measurements information
TABLE 2. MANDATORY INSPECTION REQUIREMENTS FOR BASIC ASSESSMENT LEVEL Samples subjected to tests in subgroups marked '(D)' shall not be accepted for release under BS 9000 (see 2.6.5 of BS 9000: Part 1). The wire or cables to be used in the test shall be prepared in accordance with the relevant detail specification. Extruded PTFE covered wires and cables are preferred. (To ensure that the wiring operation has been carried out satisfactorily, it is advisable to apply insulation and contact resistance tests.)		
Inspection	BS 9520: 1974 reference and conditions of test	
GROUP A	To be applied on a sampling basis lot-by-lot Subgroups A0, A2 to A5 not applicable	
Subgroup A1	Inspection level S-3, AQL 1.5 %	
Visual examination	1.2.2(1) 1.2.2(2)	
GROUP B	To be applied on a sampling basis lot-by-lot Subgroups B3 to B8 are not applicable Connectors shall have contacts fitted and wired as required for tests	
Subgroup B1	Inspection level S-3, AQL 1 %	
Insulation resistance	1.2.4.3	Method A or B shall be prescribed
Voltage proof	1.2.4.4	Method A or B shall be prescribed Duration = 5 s
Engaging and separating force, connector	1.2.5.2	Gauges to be prescribed in the detail specification