BRITISH STANDARD

BS 4678-1: 1971

Incorporating Amendment Nos. 1, 2 and 3

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Specification for

Cable trunking —

Part 1: Steel surface trunking

Co-operating organizations

The Electrical Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices' Technical Committee
Association of Consulting Engineers*
Association of Manufacturers of Domestic Electrical Appliances
Association of Mining Electrical and Mechanical Engineers
Association of Supervisory and Executive Engineers*
British Electrical and Allied Manufacturers' Association*
British Radio Equipment Manufacturers' Association
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The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committees entrusted with the preparation of this British Standard:

Aluminium Federation
British Electric Conduit Systems Manufacturers
British Plastics Federation
Confederation of British Industry
Light Metal Founders' Association
Zinc Development Association

This British Standard, having been approved by the Electrical Industry Standards Committee, was published under the authority of the Executive Board on
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Amendments issued since publication

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Contents

Foreword

This standard makes reference to the following British Standards:

BS 2989, *Specification for continuously hot-dip zinc coated and iron-zinc alloy coated steel: wide strip, sheet/plate and slit wide strip.*

BS 3382, *Specification for electroplated coatings on threaded components.*

BS 4678 has been prepared under the authority of the Electrical Industry Standards Committee.

The specification will be issued in a series of separate parts covering different types of trunking in steel, non-ferrous metal and plastic materials.

Because of the large number of different trunking systems at present being manufactured, it has not been possible to standardize details of all the ancilliary fittings in general use. The standard, therefore, is limited to the standardization of overall dimensions, to the broad details of construction and, for steel trunking, to classification according to the type of protective finish against corrosion applied. The external dimensions are in agreement with the recommendations for modular sizes made by the building industry.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

1.1 This British Standard specifies requirements for steel surface cable trunking and associated steel connectors, intended for the protection of cables in electrical installations.

1.2 The specification includes surface trunking having nominal sizes
of 38 mm × 38 mm to 300 mm × 300 mm. It does not relate to bench, flush floor, overhead lighting, skirting or underfloor (duct) trunking.

2 Definitions

2.1
metal cable trunking

a fabricated system of metal enclosures assembled together by means of connectors, for the protection of cables. Metal cable trunking is normally of square or rectangular cross section, of which one side is removable or hinged. Cable trunking may or may not have partitions or dividers

2.2
connector

a device for joining together lengths of cable trunking in line

2.3
external dimensions

are the external dimensions of the cable trunking body only, that is the width and depth not including any projections whatsoever by way of connectors, fixings, flanges, strengthening angles or stirrups, covers or cover fixings, or continuity strips

3 General requirements

3.1 Cable trunking shall be so designed and constructed as to permit the laying in of cables after the installation is completed, and to give reliable mechanical protection to the cables when the covers have been replaced.

3.2 Connectors shall provide reliable mechanical joints to the trunking.

3.3 The cable trunking, with and without covers fitted, shall provide adequate electrical continuity in accordance with the requirements of Clause **10**.

3.4 *Text deleted.*

4 General conditions for the tests detailed in Appendix A

4.1 Tests according to this specification are type tests.

4.2 Unless otherwise specified, tests shall be made at an ambient temperature of 20 ± 5 °C.

4.3 Each test shall be made on three samples.

4.4 Samples are deemed not to comply with the requirements of this specification if more than one sample fails any one of the tests. If one sample fails in a test, that test shall be repeated on a second set of three samples, all of which shall comply with the repeated test. If any sample fails in the retest then all the samples are deemed to have failed to comply with the requirements of this specification.

NOTE The applicant may submit, together with the first set of samples, the additional set which may be required should the first sample fail. The testing station will then, without further request, test the additional samples and will only reject if a further failure occurs. If the further set of samples is not submitted at the same time, a failure of one sample will entail a rejection.

5 Classification

Steel trunking and connectors are classified according to the type of protection against corrosion applied, as follows.

Class 1. Electroplated zinc having a minimum thickness of zinc coating of 0.0012 mm, inside outside.

Class 2. As Class I but with additional coating of stoved or air drying paint, applied at least to the external surface.

Class 3. Hot-dip zinc coated steel to BS 2989 [a] with a minimum coating designation of G275

[a] BS 2989, *"Specification for continuously hot-dip zinc coated and iron-zinc alloy coated steel: wide strip, sheet/plate and slit wide strip"*.

6 Marking

6.1 The body of each length of trunking shall be clearly and durably marked with:

1) the name or identification mark of the manufacturer or responsible vendor;

2) the number of this British Standard;

3) the class of finish.

6.2 The marking shall be easily legible and durable.

6.3 Compliance with the requirements of **6.1** and **6.2** shall be checked by inspection. Durability of marking shall be tested by the method described in **A.1**. After the test the marking shall remain legible.

NOTE 1 Marking may be achieved by, for example, stamping, printed adhesive labels or waterslide transfers.
NOTE 2 Attention is drawn to certification facilities offered by BSI; see the back cover of this standard.

7 Details of construction

7.1 Trunking and connectors shall be made from steel to the dimensions given in Clause **8** and shall be protected against corrosion in accordance with the requirements of Clause **9**.

7.2 If screws are used to secure the cover or the connector they shall not project internally in such a way as to cause damage to cable insulation. At least two screws shall be used to attach each connector to each section of trunking. Screws and other fixing devices for covers shall be capable of being removed and replaced six times without damage.

7.3 Screws shall be in accordance with the appropriate British Standard. If of steel they shall be protected against corrosion by a finish at least equal to the zinc coating specified in BS 3382-2[1)].

Electro-brass plated screws shall not be used.

7.4 Provision shall be made for securely fitting covers.

7.5 Where provision is made for partitions or dividers for the segregation of circuits, these shall be adequately secured to the main body of the trunking.

Except in the case where trunking is manufactured using two smaller trunkings attached together with a common cover, the following test shall be made to establish the security of fixing for partitions or dividers.

Three samples of trunking each 2 m long shall be securely fixed to a vertical surface, e.g. steel channel attached to a brick wall, in a horizontal plane in accordance with the manufacturer's instructions. Each divider or partition shall be subjected to an evenly distributed load of 0.13 kg per square centimetre of compartment cross-sectional area per metre length. The load shall consist of bare copper conductors of 2.5 mm^2 cross section. The load shall be applied for a period of 2 h, after which there shall be no detachment of the divider or partition from the trunking at its fixing point. Any permanent deflection of the divider or partition shall be ignored. Where a fold in the divider or partition is made to facilitate attachment, the test shall be repeated on new samples, with the deflection being made both towards the fold and away from the fold.

7.6 Knockouts intended for the acceptance of conduits, where provided, shall have a diameter equal to the nominal conduit diameter plus 0.25 mm, with a tolerance of + 0.5 mm, – 0.00 mm. Such knockouts shall be so located that locknuts or bushes, when clamped in position, will rest flat against the walls or base of the trunking when the cover is in position.

7.7 Where knockouts are provided, they shall be tested as described in **A.2**. After the test, the knockout shall not have moved visibly relative to the fitting.

7.8 If necessary, to meet the requirements for electrical continuity of Clause **10**, bonding links shall be provided and may be of any material which will minimize the possibility of electrolytic corrosion.

8 Dimension

8.1 Steel surface trunking sizes, body and cover thicknesses, and preferred lengths shall be as stated in Table 1.

8.2 Trunking to special order, having dimensions differing from those given in the first column of Table 1, shall be deemed to comply with this specification provided that it meets all its other requirements.

8.3 The tolerances on external dimensions shall be as stated in Table 2.

9 Resistance to corrosion

9.1 Trunking and connectors shall be adequately protected against corrosion both inside and outside and shall comply with one of the three classifications of Clause **5**.

9.1.1 Compliance shall be checked as follows.

a) Class 1 shall be checked for continuity of coating by inspection.

b) Class 2 shall be checked by the test of **A.3.1**, after which the external surface of the samples shall show no more than two blue coloured spots on each square centimetre of the surface and no spot shall have a dimension larger than 1.5 mm. Traces of rust on sharp edges, and yellowish film removeable by rubbing, shall be ignored.

c) Class 3 shall be checked by the test for coating mass designation G275 as specified in BS 2989[2)].

Traces of copper precipitation on screw threads, sharp edges and machined surfaces may be ignored.

[1)] BS 3382, "*Specification for electroplated coatings on threaded components" — part 2: "Zinc on steel components*".

[2)] BS 2989, "*Specification for continuously hot-dip zinc coated and iron-zinc alloy coated steel: wide strip, sheet/plate and slit wide strip*".

Table 1 — Sizes, body and cover thicknesses, and preferred lengths

Trunking external dimensions	Minimum nominal thickness of body with return flange	Minimum nominal thickness of body without return flange	Minimum nominal thickness of cover
mm	mm	mm	mm
38 × 38	1.0	1.0	1.0
50 × 38	1.0	1.0	1.0
50 × 50	1.0	1.0	1.0
75 × 50	1.2	1.2	1.2
75 × 75	1.2	1.2	1.2
100 × 50	1.2	1.2	1.2
100 × 75	1.2	1.2	1.2
100 × 100	1.2	1.4	1.2
150 × 50	1.2	1.4	1.2
150 × 75	1.2	1.4	1.2
150 × 100	1.2	1.4	1.2
150 × 150	1.4	1.6	1.2
200 × 100	1.6		1.4
225 × 50	1.6		1.4
225 × 75	1.6		1.4
225 × 100	1.6		1.4
225 × 150	1.6		1.4
225 × 225	1.6		1.4
300 × 50	1.6		1.4
300 × 75	1.6		1.4
300 × 100	1.6		1.4
300 × 150	1.6		1.4
300 × 300	2.0		1.6

Preferred lengths 3 m, minimum 2 m, maximum 3 m.
Partitions or dividers, nominal thickness 1.0 mm.

Table 2 — Dimensions and tolerances

Dimension	Tolerance	
mm	mm	
38	+ 5.0	
50	+ 5.0	
75	+ 5.0	
100	+ 6.0	
150	+ 7.5	– 0.0
200	+ 8.0	
225	+ 9.0	
300	+ 10.0	

Class 1, light protection, shall be checked for continuity of coating by inspection.

9.2 Screw threads and cut edges shall be excluded from the provisions of this clause.

10 Electrical continuity test

10.1 Ten manufacturing lengths of surface trunking shall be coupled together by connectors, with their continuity devices fitted where appropriate, in the manner of use as stated by the manufacturer.

10.2 They shall then be tested for continuity between the ends of the assembly as follows:

1) body to body with covers removed;

2) body to cover with covers fitted.

The resistance so measured shall in no case exceed 0.05 Ω.

Appendix A Tests

A.1 Test for durability of marking. Durability is checked by rubbing the marking by hand for 15 s with a piece of cloth soaked with petroleum spirit.

A.2 Test for knockouts. A steady load of 45 N is applied at right angles to the knockout by a punch having a 6 mm flat end resting on its surface. The end of the punch is applied at the weakest point on the surface of the knockout.

A.3 Tests for resistance to corrosion

A.3.1 *Class 2 protection.* Samples of trunking with Class 2 protection, after cleaning with a piece of cloth soaked in benzine and drying, are tested by immersion in a solution of 0.75 % potassium ferricyanide [$K_3Fe(Cn)_4$] and 0.25 % ammonium persulphate [$(NH_4)_2\ S_2O_8$] in water; a quantity of about 0.1 % of a suitable wetting agent (for instance, a salt of an alkylnaphthaline sulphonic acid) is added to the solution.

The solution and the samples are maintained at a temperature of 20 ± 1 °C.

Each sample is tested separately, a fresh solution being used each time.

After immersion for 5 min, the samples are removed from the solution and left to dry in air at room temperature.

A.3.2 *Text deleted.*

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