

JIS C8305 Rigid steel conduits

1. Scope

This Japanese Industrial Standard specifies rigid steel conduits, (here-after referred to as the "conduit tubes") used for protecting electric wires in electrical wiring work.

Remarks The following Standards are cited in this Standard

JIS B 0204 Screw Threads for Rigid Metal Conduits and Fittings

JIS G 3132 Hot Rolled Carbon Steel Strip for Pipes and Tubes

JIS G 3141 Cold Rolled carbon Steel Sheets and Strip

JIS H 0401 Methods of Test for Hot Dip Galvanized Coatings

JIS S 6006 Pencils and Colored Penciles

IS Z 2371 Methods of Neutral Salt Spray Testing

JIS Z 8401 Rules for Tounding off of Numerical Values

World standard Comparative Table

| | | KS | JIS | BS |
|-------------------------|---|--------|--------|-------|
| Grade number | | D 8401 | C 8305 | 31.40 |
| Designation of Grade | thin rigid steel conduit tubes | G16 | G 16 | B |
| | | G22 | G 22 | B |
| | | G28 | G 28 | B |
| | | G36 | G 36 | B |
| | | G42 | G 42 | B |
| | | G54 | G 54 | B |
| | | G70 | G 70 | B |
| | | G82 | G 82 | B |
| | | G92 | G 92 | B |
| | | G104 | G 104 | B |
| | threadless rigid steel conduit tubes | C19 | C 19 | A |
| | | C25 | C 25 | A |

| | | | | |
|--|--|-----|------|---|
| | | C31 | C 31 | A |
| | | C39 | C 39 | A |
| | | C51 | C 51 | A |
| | | C63 | C 63 | A |
| | | C75 | C 75 | A |
| | | E19 | E 19 | A |
| | | E25 | E 25 | A |
| | | E31 | E 31 | A |
| | | E39 | E 39 | A |
| | | E51 | E 51 | A |
| | | E63 | E 63 | A |
| | | E75 | E 75 | A |

2. Type

Conduit tubes are classified into three types of thick rigid steel conduit tubes, thin rigid steel conduit tubes and threadless rigid steel conduit tubes.

3. Bending performance

When a conduit tube is subjected to the test of 9.1, the variation in outside diameter shall be 20 % of the original outside diameter, and no separation or split of the welded seam shall take place and no crack or peeling off shall develop on the galvanized surface or coated film.

4. Corrosion-resistance

The rust prevention given to conduit tubes shall comply with the relevant items described below.

- The surface treated by galvanizing or thermal spraying shall not reach the end point when subjected to the uniformity test of 9.2.1.
- No white corrosion product shall be produced on the surface electrically galvanized and chromated, when the salt-spray test of 9.2.2. is carried out
- Neither blister, peeling off, nor rust shall develop on the coated surface when the salt-spray test of 9.2.2 is carried out.

5. Properties of coated film

The inside surfaces of conduit tubes which have been treated deterrent to rusting by means of coating shall not cause breakage of coated film or any flaw when subjected to the test of 9.3

6. Dimension, mass, effective length of threaded part and tolerance on outside diameter and mass

- a) The dimension, mass effective length of threaded part and tolerances on outside diameter and mass of a conduit tube shall be as given in Table 1, 2 and 3
- b) In general, the length shall be 3660mm and the tolerance shall be ± 5 mm, However, the length may be changed according to the agreement between the parties concerned with acceptance.

Table 1 Dimension, mass, effective length of threaded part and tolerances on outside diameter and mass of thick rigid steel conduit tubes

| Designation | Outside diameter mm | Tolerance on outside diameter mm | Thickness mm | Mass (¹)(²) Kg/m | Effective length of threaded part mm | |
|-------------|------------------------|---|-----------------|--|---|------|
| | | | | | Max. | Min. |
| G 16 | 21.0 | ± 0.3 | 2.3 | 1.06 | 19 | 16 |
| G 22 | 26.5 | ± 0.3 | 2.3 | 1.37 | 22 | 19 |
| G 28 | 33.3 | ± 0.3 | 2.5 | 1.90 | 25 | 22 |
| G 36 | 41.9 | ± 0.3 | 2.5 | 2.43 | 28 | 25 |
| G 42 | 47.8 | ± 0.3 | 2.5 | 2.79 | 28 | 25 |
| G 54 | 59.6 | ± 0.3 | 2.8 | 3.92 | 32 | 28 |
| G 70 | 75.2 | ± 0.3 | 2.8 | 5.00 | 36 | 32 |
| G 82 | 87.9 | ± 0.3 | 2.8 | 5.88 | 40 | 36 |
| G 92 | 100.7 | ± 0.4 | 3.5 | 8.39 | 42 | 36 |
| G 104 | 113.4 | ± 0.4 | 3.5 | 9.48 | 45 | 39 |

Note

(¹) The mass given in Tables 1 and 2 indicates the mass not including that of threaded part.

(²) Tolerance on mass per one bundle of conduit tubes (within 50 kg) shall be -7 %. No tolerance on plus side is specified. In the calculation of tolerance on mass, the difference of actual mass and calculated mass is divided by the calculated mass and expressed in percentage. The value of mass is calculated from the following formula, by taking the mass of a cm steel as 7.85 g, and rounded off to three significant figures in accordance with JIS Z 8401.

$$W = 0.02466t(D - t)$$

Where W : mass of conduit tube, kg/m

T : thickness of conduit tube, mm

D : outside diameter of conduit tube, mm

Table 2 Dimension, mass and tolerances on outside diameter and mass of threadless rigid steel conduit tubes

| Designation | Outside diameter mm | Tolerance on outside diameter mm | Thickness mm | Mass (¹)(²) Kg/m | Effective length of threaded part mm | |
|-------------|------------------------|---|-----------------|--|---|------|
| | | | | | Max. | Min. |
| C 19 | 19.1 | ±0.2 | 1.6 | 0.690 | 14 | 12 |
| C 25 | 25.4 | ±0.2 | 1.6 | 0.939 | 17 | 15 |
| C 31 | 31.8 | ±0.2 | 1.6 | 1.19 | 19 | 17 |
| C 39 | 38.1 | ±0.2 | 1.6 | 1.44 | 21 | 19 |
| C 51 | 50.8 | ±0.2 | 1.6 | 1.94 | 24 | 22 |
| C 63 | 63.5 | ±0.35 | 2.0 | 3.03 | 27 | 25 |
| C 75 | 76.2 | ±0.35 | 2.0 | 3.66 | 30 | 28 |

Table 3 Dimension, mass and tolerances on outside diameter and mass of threadless rigid steel conduit tubes

| Designation | Outside diameter mm | Tolerance on outside diameter mm | Thickness mm | Mass (¹)(²) Kg/m |
|-------------|------------------------|--|-----------------|--|
| E 19 | 19.1 | ±0.15 | 1.2 | 0.530 |
| E 25 | 25.4 | ±0.15 | 1.2 | 0.716 |
| E 31 | 31.8 | ±0.15 | 1.4 | 1.05 |
| E 39 | 38.1 | ±0.15 | 1.4 | 1.27 |
| E 51 | 50.8 | ±0.15 | 1.4 | 1.71 |
| E 63 | 63.5 | ±0.25 | 1.6 | 2.44 |
| E 75 | 76.2 | ±0.25 | 1.6 | 3.30 |

7. Appearance

7.1 Conduit tubes shall be practically straight and their both ends shall be cut perpendicular to their axes and chamfered.

7.2 The inside and outside surfaces of conduit tubes shall be smooth and of good finish, and the inside surfaces shall particularly be free from projections detrimental to practical service.

8. Materials and manufacture

8.1 Materials

The materials for conduit tubes shall be the steel strips specified in JIS G 3132, or JIS G 3141, or steel strips at least equivalent thereto, or those galvanized.

8.2 Manufacture

8.2.1 Conduit tubes are made by electric resistance welding

8.2.2 Both ends of a conduit tube shall be cut at right angles to the tube axis and chamfered.

8.2.3 Both ends of a thick rigid steel conduit tube and thin rigid steel conduit tube shall have external threads () The inspection of the thread shall be carried out in the similar way to that specified in JIS B 0204.

Note () The inspection of the thread shall be carried out in the similar way to that specified in JIS B 0204

8.2.4 The inside and outside surfaces of conduit tubes shall be treated deterrent to rusting by means of galvanizing (including the ones galvanized by hot dipping, thermal spraying or electrically and then chromated). The rust prevention of inside surfaces and threaded parts may, however, be accomplished by coating.

9. Test

9.1 Bending test

9.1.1 Test piece A tube of suitable length shall be cut from the conduit tube to be as the test piece.

9.1.2 Test method

The test piece shall be bent at ordinary temperature by means of a rolling bender through 90° with the appropriate inside radius given in Table 4. In this procedure, the welded seam shall be positioned at about 45° from the inside of this bent.

Table 4 Bending test

| Type | Designation | Inside radius |
|---|----------------------|--------------------------------------|
| Thick rigid steel conduit tubes | G16 | 4 times the outside diameter of tube |
| | G22 | |
| | G28 | 5 times the outside diameter of tube |
| Thin rigid steel conduit tubes and threadless rigid steel conduit tubes | C19, C25 E19, E25 | 4 times the outside diameter of tube |

Remarks

If agreed between the parties concerned with delivery, conduit tubes of diameters other than listed in Table 4 may be tested using the inside radius of bending and the correlating variation rate in the diameter of conduit tube from its original outside diameter which are determined by the parties.

9.2 Corrosion-resistance test

9.2.1 Uniformity test.

- a) Test piece A tube of 60mm or more in length shall be cut from the conduit tube to be as the test piece.
- b) Test method The test method shall follow the provision of 4. (copper sulphate test method) of JIS H 0401. However, the number of times of immersion is three.

9.2.2 Salt-spray test

- a) A tube of about 150mm or more in length shall be cut from the conduit tube, one half of the tube is cut and opened, and the cut edges are covered with paint or wax by a width of 5mm toward the test surface, to form the test piece.

The welded seam shall be positioned almost at the center of test surface.

- b) The test method shall follow the provision of JIS Z 2371. However, the salt-spray operation consisting of continuous 8 hours spray and 16 hours rest is repeated twice and then 8 hours spray is carried out.

9.3 Coated film test

- 9.3.1 Test piece A tube of suitable length shall be cut from the conduit tube to be as the test piece.

9.3.2 Test method The test method of coated film shall be as follows

- a) The lead of a hardness H pencil specified in JIS S 6006 shall be sharpened as shown in Fig. 1, to form a plane at right angles to the lengthwise direction.

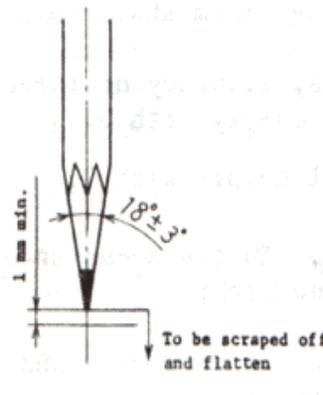


Fig 1 Sharpening of pencil

- b) The pencil thus prepared shall be moved to scratch the test surface, keeping an angle of about 45° to the surface, in the direction shown in Fig 2. The length of the scratched lines shall be at least 20mm each and the number of the lines shall be at least three.

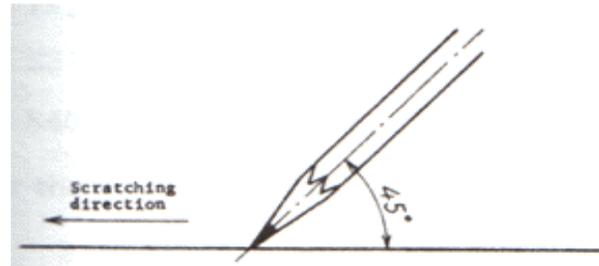


Fig 2 Test method

Remarks

The load in scratching shall be about 9.8 N.

10. Inspection

10.1 Type inspection

- a) The bending performance shall comply with 3.
- b) The corrosion resistance shall comply with 4.
- c) The property of coated film shall comply with 5.
- d) The dimensions, mass, accuracy of thread and effective length of threaded part shall comply with 6.
- e) The appearance shall comply with 7.

10.2 Acceptance inspection

In the acceptance inspection, the following requirements shall be complied with

- a) The dimensions, accuracy of thread and effective length of threaded part shall comply with 6.
- b) The appearance shall comply with 7.

11. Marking

The following items shall be marked indelibly on each conduit tube which has been accepted by the inspection

- a) Designation of conduit tube
- b) Manufacturer's name or its abbreviation