



उत्पाद मैनुअल  
आई एस 3480: 1966 के अनुसार  
विद्युत तारों के लिए लचीले स्टील के नाली के लिए

दस्तावेज संख्या - पी एम/आई एस 3480 / 2/ अगस्त 2021

भारतीय मानक ब्यूरो की स्कीम-I (अनुरूपता मूल्यांकन) विनियम, 2018 के तहत यह उत्पाद मैनुअल प्रमाणीकरण के प्रचालन में रीति और पारिश्रिता की सुसंगतता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसी द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस प्रमाणीकरण लाइसेंस/ प्रमाणपत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज का उपयोग किया जा सकता है।

**PRODUCT MANUAL FOR  
FLEXIBLE STEEL CONDUITS FOR ELECTRICAL WIRING  
ACCORDING to IS 3480: 1966**

Document No.- PM/ IS 3480/ 2/ August 2021

*This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.*

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SPECIFICATION FOR FLEXIBLE STEEL CONDUITS FOR  
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|    |                                         |   |                                               |
|----|-----------------------------------------|---|-----------------------------------------------|
| 1. | <b>Product</b>                          | : | IS 3480: 1966                                 |
|    | <b>Title</b>                            | : | Flexible steel conduits for electrical wiring |
|    | <b>No. of Amendments</b>                | : | Two                                           |
| 2. | <b>Sampling Guidelines:</b>             |   |                                               |
| a) | <b>Raw material</b>                     | : | Strip Steel As per Cl 3.1 of IS 3480          |
| b) | <b>Grouping guidelines</b>              | : | Please refer <a href="#">ANNEX – A</a>        |
| c) | <b>Sample Size</b>                      | : | 15m conduit                                   |
| 3. | <b>List of Test Equipment</b>           | : | Please refer <a href="#">ANNEX – B</a> .      |
| 4. | <b>Scheme of Inspection and Testing</b> | : | Please refer <a href="#">ANNEX – C</a> .      |
| 5. | <b>Possible tests in a day</b>          | : | Please refer <a href="#">ANNEX - D</a>        |
| 6. | <b>Scope of the Licence :</b>           |   |                                               |
|    | Name of the Product                     |   | Flexible steel conduits for electrical wiring |
|    | Nominal Sizes                           |   | Upto and including ____ mm                    |

**ANNEX A**

**Grouping Guidelines**

1. For considering GOL/CSoL of Flexible Steel Conduits for Electrical Wiring as per IS 3480:1966, conduits of the largest size in each group as given below shall be drawn for testing:

| <b>Group</b> | <b>Nominal Sizes of Conduits</b> |
|--------------|----------------------------------|
| I            | 6.5mm, 10mm, 16mm, 25mm          |
| II           | 40mm, 63mm, 100mm                |

2. The Firm shall declare the varieties they intend to cover in the Licence. The Scope of Licence may be restricted based on the manufacturing and testing capabilities of the manufacturer.
3. During the operation of the Licence, BO shall ensure that all the varieties covered in the Licence are tested in rotation to the extent possible.

**ANNEX B****List Of Test Equipment***Major test equipment required to test as per the Indian Standard*

| <b>Sr. No.</b> | <b>Tests used in with Clause Reference</b> | <b>Test Equipment</b>                                    |
|----------------|--------------------------------------------|----------------------------------------------------------|
| 1              | Cl 3.1- Thickness of coating               | Coating Thickness Gauge                                  |
| 2              | Cl 5.1 and Table 1- Dimensions             | Vernier Calliper, Micrometer                             |
| 3              | Cl 6.1, 8.4- Tensile Strength              | Measuring Scale, Measuring Tape, Tensile Testing Machine |
| 4              | Cl 6.2, 8.5 –Flexibility                   | Formers                                                  |
| 5              | Cl 8.6 – Bend fracture test                | Compression Test Apparatus                               |
| 6              | Cl 6.3, 8.7- Crushing Strength             | Compression Test Apparatus                               |
| 7              | Cl 8.4- Linear Breaking Test               | Tensile Testing Machine, Digital Stop Watch              |

*The above list is indicative only and may not be treated as exhaustive.*

## **ANNEX C**

### **Scheme Of Inspection And Testing**

**1. LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

**1.1** The manufacturer shall prepare a calibration plan for the test equipment.

**2. TEST RECORDS** – The manufacturer shall maintain test records for the tests carried out to establish conformity.

**3. LABELLING AND MARKING** – As per the requirements of IS 3480: 1966.

**4. CONTROL UNIT** – All conduits of the same size manufactured in one day shall constitute a control unit.

**5. LEVELS OF CONTROL** - The tests as indicated in column 1 of [Table 1](#) and the levels of control in column 3 of [Table 1](#), shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

**6. REJECTIONS** – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

**TABLE 1**

| (1)          |                              |                      |         | (2)                                                                          | (3)               |                                              |
|--------------|------------------------------|----------------------|---------|------------------------------------------------------------------------------|-------------------|----------------------------------------------|
| Test Details |                              |                      |         | Test equipment requirement<br>R: required (or) S: Sub- contracting permitted | Levels of Control |                                              |
| Cl.          | Requirement                  | Test Methods         |         |                                                                              | No. of Sample     | Frequency                                    |
|              |                              | Cl.                  | Ref     |                                                                              |                   |                                              |
| 3            | Material                     | 3.1                  | IS 3480 | -                                                                            | -                 | Shall be ISI marked                          |
| 4            | Construction and Workmanship | 4.1, 4.2, 4.3        |         | R                                                                            | Each Conduit      |                                              |
| 5.1          | Dimensions                   | 5.1, 8.3 and Table 1 |         | R                                                                            | Three             | Every hour                                   |
| 6.1          | Tensile Strength             | 6.1, 8.4             |         | R                                                                            | Three             | Each control unit                            |
| 6.2          | Flexibility                  | 6.2, 8.5             |         | R                                                                            | Three             | Each control unit                            |
| 6.3          | Crushing Strength            | 6.3, 8.7             |         | R                                                                            | Three             | Conduits of same size manufactured in a week |
| 8.6          | Bend Fracture Test           | 8.6                  |         | R                                                                            | Three             | Conduits of same size manufactured in a week |

Note-1: Levels of control given in column 3 are recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

**ANNEX D**

**Possible Tests in a day**

- a. Dimensions as per Cl 5.1
- b. Tensile Strength as per Cl 6.1 and 8.4
- c. Flexibility as per Cl 6.2 and 8.5
- d. Crushing Strength as per Cl 6.3 and 8.7
- e. Bend Fracture Test as per Cl 8.6