



**उत्पाद मानुयल**  
**VENTILATION DUCTING- VINYL COATED, FLEXIBLE AND**  
**SEMI- RIGID**

**IS 3768:1996 के अनुसार**

**PRODUCT MANUAL FOR**  
**VENTILATION DUCTING- VINYL COATED, FLEXIBLE AND**  
**SEMI- RIGID ACCORDING TO IS 3768:1996**

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन (विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन में रीति और पारदर्शिता के सुसंगत सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

*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.*

|    |                                    |   |                                                                           |
|----|------------------------------------|---|---------------------------------------------------------------------------|
| 1. | उत्पाद<br>Product                  | : | IS 3768:1996                                                              |
|    | शीर्षक<br>Title                    | : | Ventilation Ducting – Vinyl coated, Flexible and Semi-rigid-Specification |
|    | संशोधन संख्या<br>No. of Amendments | : | 2                                                                         |

|    |                                                                                                                                                                                                                   |   |                                      |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------------------------|
|    |                                                                                                                                                                                                                   |   |                                      |
| 2. | <b>नमुनाकरण दिशा निर्देश</b><br><b>Sampling Guidelines:</b>                                                                                                                                                       |   |                                      |
| a) | <b>कच्चा माल</b><br><b>Raw material</b>                                                                                                                                                                           | : | No specific raw material requirement |
| b) | <b>समूहिकरण दिशा निर्देश</b><br><b>Grouping guidelines</b>                                                                                                                                                        | : | Please refer Annex-A                 |
| c) | <b>नमूने का परिमाण</b><br><b>Sample Size</b>                                                                                                                                                                      | : | 10 m                                 |
|    |                                                                                                                                                                                                                   |   |                                      |
| 3. | <b>परीक्षण उपकरणों की सूची</b><br><b>List of Test Equipment</b>                                                                                                                                                   | : | Please refer ANNEX – <u>B</u>        |
|    |                                                                                                                                                                                                                   |   |                                      |
| 4. | <b>निरीक्षण व परीक्षण स्कीम</b><br><b>Scheme of Inspection and Testing</b>                                                                                                                                        | : | Please refer ANNEX – <u>C</u>        |
|    |                                                                                                                                                                                                                   |   |                                      |
| 5. | <b>एक दिन में संभावित परीक्षण/Possible tests in a day :</b>                                                                                                                                                       |   |                                      |
|    | 1. Dimensions<br>2. Tensile Strength<br>3. Tear Strength                                                                                                                                                          |   |                                      |
| 6. | <b>एक दिन में संभावित परीक्षण/Scope of the Licence :</b>                                                                                                                                                          |   |                                      |
|    | IS 3652:1995 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है<br><b>“Licence is granted to use Standard Mark as per IS 3652:1995 with the following scope:</b> |   |                                      |

|  |                            |                        |
|--|----------------------------|------------------------|
|  | <b>Name of the product</b> | Ventilation ducting    |
|  | <b>Type</b>                | Flexible or Semi rigid |
|  | <b>Size</b>                | Nominal Diameter       |

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**Annex A**

**Grouping Guidelines**

IS 3768 : 1996 for specification for Ventilation ducting - Vinyl coated, Flexible and Semi – Rigid prescribes the following nominal Diameters:

a) 300mm; b) 400mm; c) 500mm; d) 600mm; e) 760mm; f) 900mm; and are of two types namely;

Flexible Ventilation Ducting and Semi - Rigid Ventilation Ducting.

To cover the various sizes in the scope of the license, the following guidelines have been prepared for grant of license/ inclusion of new variety in the license.

Nominal Diameter - 300 - 500 mm (Group I)

600 - 900 mm (Group II)

One sample from each group (preferably the highest size) from each type shall be tested for all requirements of the specification in order to cover the complete range of size. It shall however be ensured and recorded that the applicant /licensee has got complete manufacturing as well as testing facilities for the sizes required to be covered as per grouping.

BOs shall also ensure testing of sizes other than initially tested during operation of the license at the earliest possible.

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

| Sl. No. | Tests used in with Clause Reference                        | Test Equipment                                                                                                                                                   |
|---------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Dimensions (cl. 5.1)                                       | Vernier Callipers<br>Measuring tape<br>Oven<br>Weighing Balance<br>Steel Scale                                                                                   |
| 2       | Construction ( cl.5.3)                                     | Tensile testing machine<br>Vernier Callipers<br>Measuring tape<br>Steel Scale                                                                                    |
| 3       | Finished Fabric (cl.5.4)                                   | Oven<br>Weighing Balance                                                                                                                                         |
| 3       | Tensile Strength (cl. 5.5.1) and Tear Strength (cl. 5.5.2) | Tensile testing machine with attachment for tear strength test<br>Humidity Chamber                                                                               |
| 4       | Electrical Resistance Test (cl. 5.5.3)                     | Electrical Resistance Apparatus (Mega ohm meter, Base sheet, Electrode system), Conditioning Chamber (65±5 RH, 27±2°C), Anhydrous Polyethylene Glycol, Soft Soap |
| 5       | Flex Test (cl. 5.5.4)                                      | Flex testing machine, Conditioning Chamber                                                                                                                       |
| 6       | Coating Adhesion (cl.5.5.5)                                | Conditioning Chamber, Constant Rate of Elongation Machine (CRE) or Constant Rate of Traverse (CRT) Tensile Testing Machine                                       |
| 7       | Fire Resistance test (cl. 5.5.6)                           | Conditioning Chamber (65±5 RH, 27±2°C), Ethanol, Methanol, Barthel Burner, Stand for Flame Test, Draught Free Cabinet, Bare Copper Wire of 0.71 mm diameter      |
| 8       | Joint Rings (cl.5.7)                                       | Load Setup                                                                                                                                                       |

|   |                               |                                                                                                                                                   |
|---|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 8 | Assembled duct test (cl. 5.6) | Arrangement for Pressure test, Leakage test &<br>Suction test fitted with manometer along with<br>steel scale<br>Air compressor<br>Air flow meter |
|---|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|

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

## **ANNEX B**

### **Scheme of Inspection And Testing**

**1.0 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 equipments.

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

### **3.0 LABELLING and MARKING**

#### **3.1 PACKING**

Any suitable method of packing may be used as agreed to between purchaser and the supplier. The material shall be secularly packed so as to ensure its safe transportation.

#### **3.2 MARKING**

The following information shall be indelibly marked at a suitable position on each length of the ventilation ducting (marking shall be visible without unpacking or unwrapping the ducting):

- a) Name of the manufacturer or his recognized trade mark, if any.
- b) Name of the product, that is vinyl-coated, flexible or semi rigid, ventilation ducting;
- c) Month and year of manufacture/manufacture's batch number;
- d) Nominal diameter in mm and length in m;
- e) Made in India if required.

**4.0 CONTROL UNIT** - For the purpose of this Scheme, ventilation ducting of the same type and size manufactured under similar condition of production and from the same raw material produced in one shift shall constitute a control unit.

**5.0 LEVELS OF CONTROL** -The analysis and tests, as indicated in Table 1 and at the levels of control specified therein, shall be carried out on the whole production of the factory which is covered by this Scheme and appropriate records and charts maintained in accordance with Paragraph 2 above. All the production which conforms to the Indian Standard and covered by this licence shall be marked with BIS Standard Mark

**5.1** On the basis of test sand analysis results, the decision regarding conformity or otherwise, of a control unit to a given requirement shall be made.

**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 : LEVELS OF CONTROL**  
**(Para 4 of Scheme of Testing and Inspection)**

| TEST DETAILS |              |              |                  | Test equipment requirementR:required (or) S:Sub-contracting permitted | LEVELS OF CONTROL |           |         |
|--------------|--------------|--------------|------------------|-----------------------------------------------------------------------|-------------------|-----------|---------|
|              |              | TEST METHODS |                  |                                                                       |                   |           |         |
| Clause       | Requirements | Clause       | Reference of ISS |                                                                       | No. of Samples    | Frequency | Remarks |
| 5.1          | Dimensions   | 5.1.1& 5.1.2 | IS 3768:1996     | R                                                                     | Each duct         | Each duct |         |

|     |                     |                        |              |   |           |                  |                                                                                                                                                                                           |
|-----|---------------------|------------------------|--------------|---|-----------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5.2 | Quality of Material | 5.2.1 &<br>5.5         | IS 3768:1996 | S | one       | Each consignment | i) The raw material shall be received along with the test certificate.<br><br>ii) Performance requirements shall also be carried out in-house as per requirements specified in Clause 5.5 |
|     |                     | 5.2.2<br>(steel wire)  | IS 3768:1996 | S | One       | Each consignment | If in-house test facility for tensile strength of steel wire is not available, test certificate may be obtained from supplier or get it tested from any BIS/BIS recognised outside lab.   |
|     |                     | 5.2.2<br>(other tests) | IS 3768:1996 |   | Each duct | Each duct        |                                                                                                                                                                                           |

|       |                       |                                                         |                                 |   |           |                      |  |
|-------|-----------------------|---------------------------------------------------------|---------------------------------|---|-----------|----------------------|--|
| 5.3   | Construction          | 5.3.1, 5.3.2,<br>5.3.3, 5.3.4,<br>5.3.4.1,<br><br>5.3.5 | IS 3768:1996                    | R | Each duct | Each duct            |  |
|       |                       | 5.3.4.2                                                 | IS 3768:1996                    | R | one       | Each control unit    |  |
| 5.4   | Finished Fabrics      | 5.4.1, 5.4.2                                            | IS 3768:1996-                   | R | one       | Each consignment     |  |
| 5.5   |                       | <b>Performance Requirements</b>                         |                                 |   |           |                      |  |
| 5.5.1 | Tensile Strength      | 5.5.1                                                   | IS 3768<br><br>IS 7016 (Part 2) | R | one       | Each control unit    |  |
| 5.5.2 | Tear Strength         | 5.5.2                                                   | A-1 of IS 7016<br>(Part 3)      | R | one       | Each control unit    |  |
| 5.5.3 | Electrical Resistance | 5.5.3                                                   | Annex A of IS<br>3768           | R | one       | Each control<br>unit |  |
| 5.5.4 | Flex Test             | 5.5.4                                                   | IS 7016 (Part 4)                | R | one       | Each control<br>unit |  |
| 5.5.5 | Coating Adhesion      | 5.5.5                                                   | IS 7016 (Part 5)                | R | one       | Each control<br>unit |  |

|       |                                          |                       |                           |   |      |                   |  |
|-------|------------------------------------------|-----------------------|---------------------------|---|------|-------------------|--|
| 5.5.6 | Fire Resistance                          | 5.5.6                 | Annex B of IS 3768 : 1996 | R | one  | Each control unit |  |
| 5.6   |                                          | <b>Assembled Duct</b> |                           |   |      |                   |  |
| 5.6.1 | Pressure test                            | 5.6.1                 | Annex C of IS 3768 : 1996 | R | one  | Each control unit |  |
| 5.6.2 | Leakage test (Forcing)                   | 5.6.2                 | Annex C of IS 3768 : 1996 | R | one  | Each control unit |  |
| 5.6.3 | Suction Test(For Semi-Rigi Ducting only) | 5.6.3                 | Annex C of IS 3768 : 1996 | R | one  | Each control unit |  |
| 5.7   | Joint Rings                              | 5.7                   | IS 3768 : 1996            | R | four | Each control unit |  |

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only 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.