



**उत्पाद मैनुअल**  
**आई एस 14871:2000 के अनुसार**  
**फाइबर प्रबलित सीमेंट के उत्पाद - छत व क्लैडिंग के लिए लम्बी नालीदार**  
**या आसमान काट की चादरों के लिए**

दस्तावेज संख्या - पी एम/ आई एस 14871/2/ अप्रैल 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 लाइसेंसि 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**  
**PRODUCTS IN FIBRE REINFORCED CEMENT —**  
**LONG CORRUGATED OR ASYMMETRICAL SECTION SHEETS AND**  
**FITTINGS FOR ROOFING AND CLADDING**  
**ACCORDING TO IS 14871 : 2000**

Document No.- PM/ IS 14871/2/April 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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|    |                                                                                                       |   |                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------|
| 1. | <b>Product</b>                                                                                        | : | IS 14871 : 2000                                                                                                                     |
|    | <b>Title</b>                                                                                          | : | PRODUCTS IN FIBRE REINFORCED CEMENT —<br>LONG CORRUGATED OR ASYMMETRICAL<br>SECTION SHEETS AND FITTINGS FOR ROOFING<br>AND CLADDING |
|    | <b>No. of Amendments</b>                                                                              | : | 02                                                                                                                                  |
| 2. | <b>Sampling Guidelines:</b>                                                                           |   |                                                                                                                                     |
| a) | <b>Raw material</b>                                                                                   | : | As per clause 5.1 of IS 14871 : 2000                                                                                                |
| b) | <b>Grouping guidelines</b>                                                                            | : | Please refer <a href="#">ANNEX – A</a>                                                                                              |
| c) | <b>Sample Size</b>                                                                                    | : | Three sheets/fittings                                                                                                               |
| 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>                                                                      |   |                                                                                                                                     |
|    | Complete testing shall be carried out in factory as the licence is operated on factory testing basis. |   |                                                                                                                                     |
| 6. | <b>Scope of the Licence</b>                                                                           | : | Please refer <a href="#">ANNEX – D</a>                                                                                              |

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**ANNEX - A**

**Grouping Guidelines**

1. Fibre reinforced cement long corrugated or asymmetrical section sheets and fittings for roofing and cladding as per IS 14871 : 2000 are classified based on nominal height of corrugation, minimum breaking load in bending and thickness as given below:
  - Category : A / B / C / D
  - Class : 1 to 10
  - Thickness : Type A / Type B
2. Standard dimensions such as length, overall width, effective nominal thickness of sheet, depth and pitch of corrugation shall be declared by manufacturer.
3. Considering the above, following grouping guidelines for GoL/CSoL have been developed:
  - a) One sample of sheet from each category, class and thickness type having highest length and width shall be tested for all requirements to cover sheets of that particular classification, for all sizes upto and including the length and width tested.
  - b) One sample fitting of any size shall be tested to cover fitting of all sizes.
4. 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.
5. During the operation of the Licence, BO shall ensure that all 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>Sl No.</b> | <b>Tests used in with Clause Reference</b>                                                                                                           | <b>Test Equipment</b>                                                                                                                                                                                                                                                                                                                          |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1             | Dimensions (Clause 5.4.1)                                                                                                                            | <ul style="list-style-type: none"> <li>- Smooth flat surface for testing of sheets</li> <li>- Steel scale/ tape</li> <li>- Micrometer with hemispherical head</li> <li>- Rectangular caliper blocks</li> <li>- Rectangular frame with corrugated ends and two straight sides</li> <li>- Depth gauge as per Fig 5 of IS 14871 : 2000</li> </ul> |
| 2             | Mechanical characteristics <ul style="list-style-type: none"> <li>- Breaking load (Clause 5.4.2.1)</li> <li>- Deflection (Clause 5.4.2.2)</li> </ul> | <ul style="list-style-type: none"> <li>- Bending test machine as per C-1.2.1 of IS 14871 : 2000</li> <li>- Water tank</li> <li>- Arrangement for measurement of deflection during the test</li> </ul>                                                                                                                                          |
| 3             | Impermeability (Clause 5.4.3.1)                                                                                                                      | <ul style="list-style-type: none"> <li>- Frame as per Fig 9 of IS 14871 : 2000</li> <li>- Steel scale/ Vernier caliper</li> </ul>                                                                                                                                                                                                              |
| 4             | Frost resistance (Clause 5.4.3.2)                                                                                                                    | <ul style="list-style-type: none"> <li>- Freezer</li> <li>- Thawing equipment</li> <li>- Water bath</li> </ul>                                                                                                                                                                                                                                 |
| 5             | Apparent density (Clause 5.4.3.3)                                                                                                                    | <ul style="list-style-type: none"> <li>- Ventilated oven</li> <li>- Weighing balance</li> </ul>                                                                                                                                                                                                                                                |
| 6             | Warm water (Clause 5.4.3.4)                                                                                                                          | <ul style="list-style-type: none"> <li>- Hot water bath capable to maintain temperature of <math>60 \pm 2</math> °C</li> <li>- Bending test machine as per C-1.2.1 of IS 14871 : 2000</li> </ul>                                                                                                                                               |
| 7             | Heat-Rain (Clause 5.4.3.5)                                                                                                                           | <ul style="list-style-type: none"> <li>- Frame as per D-5.2.1 of IS 14781 : 2000</li> <li>- Heating device as per D-5.2.2 of IS 14781 : 2000</li> <li>- Water sprinkling arrangement as per D-5.2.3 of IS 14781 : 2000</li> </ul>                                                                                                              |

***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 requirement of IS 14871:2000

**4. CONTROL UNIT** – All sheets of same thickness type, category, class, size and thickness and all fitting of same size manufactured in a day from similar composition and under similar conditions 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.

**5.1** All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

**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)<br>S: Sub-contracting permitted | Levels of Control                 |                                                                                             |                                                                                        |
| Cl.          | Requirement                   | Test Method                |           |                                                                                | No. of Sample                     | Frequency                                                                                   | Remarks                                                                                |
|              |                               | Clause                     | Reference |                                                                                |                                   |                                                                                             |                                                                                        |
| 5            | Sheets                        |                            |           |                                                                                |                                   |                                                                                             |                                                                                        |
| 5.1          | General composition           | 5.1                        | IS 14781  | -                                                                              | One                               | Each consignment                                                                            | No further testing is required if accompanied with the Test Certificate or ISI marked. |
| 5.2          | General Appearance and Finish | 5.2                        | IS 14781  | -                                                                              | One percent with minimum 5 sheets | Each control Unit                                                                           | @                                                                                      |
| 5.4          | Characteristics               |                            |           |                                                                                |                                   |                                                                                             |                                                                                        |
| 5.4.1        | Dimensions                    | 5.4.1.1 to 5.4.1.4 Annex B | IS 14781  | R                                                                              | One percent with minimum 5 sheets | Each control Unit                                                                           | @                                                                                      |
| 5.4.2        | Mechanical Characteristics    |                            |           |                                                                                |                                   |                                                                                             |                                                                                        |
| 5.4.2.1      | Breaking Load                 | 5.4.2.1, Table 1, Annex C  | IS 14781  | R                                                                              | Three                             | Each control Unit                                                                           | -                                                                                      |
| 5.4.2.2      | Deflection                    | 5.4.2.2, Annex C           | IS 14781  | R                                                                              | Three                             | Once in five years or whenever there is change in formulation and/or method of manufacture. |                                                                                        |
| 5.4.3        | Physical Characteristics      |                            |           |                                                                                |                                   |                                                                                             |                                                                                        |
| 5.4.3.1      | Impermeability                | 5.4.3.1, Annex D           | IS 14781  | R                                                                              | Three                             | Once in five years or whenever there is change in formulation and/or method of manufacture. |                                                                                        |
| 5.4.3.2      | Frost Resistance              | 5.4.3.2, Annex D           | IS 14781  | R                                                                              | Three                             | This test may be conducted as per requirement of purchaser                                  |                                                                                        |
| 5.4.3.3      | Apparent Density              | 5.4.3.3, Annex D           | IS 14781  | R                                                                              | Three                             |                                                                                             |                                                                                        |
| 5.4.3.4      | Warm Water                    | 5.4.3.4, Annex D           | IS 14781  | R                                                                              | Three                             |                                                                                             |                                                                                        |

|              |                                 |                           |          |   |                                     |                                                            |                                                                                        |
|--------------|---------------------------------|---------------------------|----------|---|-------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 5.4.3.5      | Heat Rain                       | 5.4.3.5, Annex D          | IS 14781 | R | Three                               |                                                            |                                                                                        |
| <b>6</b>     | <b>Fittings</b>                 |                           |          |   |                                     |                                                            |                                                                                        |
| 6.1          | Composition                     | 6.1, 5.1                  | IS 14781 | - | One                                 | Each consignment                                           | No further testing is required if accompanied with the Test Certificate or ISI marked. |
| 6.2          | General Appearance and Finish   | 6.2                       | IS 14781 | - | One percent with minimum 5 fittings | Each control Unit                                          | @                                                                                      |
| <b>6.3</b>   | <b>Characteristics</b>          |                           |          |   |                                     |                                                            |                                                                                        |
| 6.3.1        | Dimensions **                   | 6.3.1                     | IS 14781 | R | One percent with minimum 5 fittings | Each control Unit                                          | @                                                                                      |
| <b>6.3.2</b> | <b>Physical Characteristics</b> |                           |          |   |                                     |                                                            |                                                                                        |
| 6.3.2.1      | Frost Resistance                | 6.3.2.1, 6.3.2.2, Annex D | IS 14781 | R | Three                               | This test may be conducted as per requirement of purchaser |                                                                                        |
|              |                                 |                           |          |   |                                     |                                                            | #                                                                                      |

@ In case of failure, All sheets shall be checked and defective sheets/fittings from the control unit shall not be marked.

# Applicable for fittings to be used with sheets meant for Frost Resistant applications.

\*\*These tests may to be conducted in accordance with Annex B to the extent feasible against the dimension and tolerances declared by the manufacturer. This test may also be conducted by having permanent test structures for each variety where the sheets and fittings are mated and checked for compatibility and interchangeability.

Note-1 : 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.

**ANNEX - D****Scope of the Licence :**

|                                                                                         |                                                                                                                            |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| “Licence is granted to use Standard Mark as per IS 14871:2000 with the following scope: |                                                                                                                            |
| Name of the product                                                                     | PRODUCTS IN FIBRE REINFORCED CEMENT — LONG CORRUGATED OR ASYMMETRICAL SECTION SHEETS AND FITTINGS FOR ROOFING AND CLADDING |
| <b>Sheets</b>                                                                           |                                                                                                                            |
| Type                                                                                    | Type A/ Type B                                                                                                             |
| Class                                                                                   | Class 1 to 10                                                                                                              |
| Category                                                                                | Category A/B/C/D                                                                                                           |
| Dimensions                                                                              | Length ----, Overall width -----                                                                                           |
| Applicable optional tests                                                               |                                                                                                                            |
| <b>Fittings</b>                                                                         |                                                                                                                            |
| Dimensions                                                                              |                                                                                                                            |
| Frost resistance test<br>(If applicable)                                                |                                                                                                                            |