



**PRODUCT MANUAL FOR
GLASS FIBRE REINFORCED PLASTIC (GRP)
PANEL TYPE DOOR SHUTTERS FOR INTERNAL USE
ACCORDING TO IS 14856: 2000**

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.	Product	:	IS 14856 : 2000
	Title	:	GLASS FIBRE REINFORCED PLASTIC (GRP) PANEL TYPE DOOR SHUTTERS FOR INTERNAL USE
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	Please refer ANNEX- A
b)	Grouping guidelines	:	Please refer ANNEX- B
c)	Sample Size	:	Door Shutters: 5 nos Raw materials as per clause 5 of IS 14856
3.	List of Test Equipment	:	Please refer ANNEX – C
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – D
5.	Possible Tests in a day	:	Please refer ANNEX – E
6.	Scope of Licence	:	Please refer ANNEX – F

BUREAU OF INDIAN STANDARDS
Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002

ANNEX- A**Details of Raw Materials**

Raw Material	Indian Standard
Glass Fibre Chopped Strand Mat (CSM)	IS 11551:1996
Glass Fibre Rovings	IS 11320:1997
Isophthalic Resin	IS 6746:1994
Curing Agents	Cl 5.4 of IS 14856:2000
Fillers and Additives	Cl 5.5 of IS 14856:2000
Auxiliary Chemical	Cl 5.6 of IS 14856:2000
Pigments	Cl 5.7 of IS 14856:2000
Base Blocks	Cl 5.8 of IS 14856:2000
Polyurethane Foam	Cl 5.9 of IS 14856:2000

ANNEX B**Grouping Guidelines**

1. Glass Fibre Reinforced Plastic (GRP) Panel Type Door Shutters as per IS 14856 are classified as given below:

- a) **Size and Type Designation -**

Modular (with Designation of Doors) - 8 DS 20 / 8 DS 21 / 9 DS 20 / 9 DS 21 / 10 DS 20 / 10 DS 21 / 12 DT 20 / 12 DT 21

(D - Door, S - Single shutter, T - Double leaf shutter)

Non-Modular – Sizes other than modular sizes as agreed to between the manufacturer and the purchaser may also be permitted.

- b) **Thickness of Stile & Rail:** Thickness of stiles and rails shall be 30 mm or 35 mm.

2. Considering the above, the following groups have been evolved for GoL/ CSoL:

Group	Designation
I	8 DS 20, 8 DS 21
II	9 DS 20, 9 DS 21
III	10 DS 20, 10 DS 21
IV	12 DT 20, 12 DT 21

3. For Modular sizes - GRP Panel Type Door Shutters of highest Size Designation from each group, for each thickness of stiles & rails shall be tested for all the requirements to cover door shutters of all Designations in that group for that particular thickness of stiles & rails. For example, if shutter of designation 9 DS 21 of thickness 35 mm is tested, then scope of licence may include door shutters of 9 DS 21 and 9 DS 20 of thickness of stiles & rails 35 mm.
4. For Non-modular sizes - GRP Panel Type Door Shutters of any Size (width & height) for each thickness of stiles & rails shall be tested for all requirements to cover door shutters of Non-modular sizes upto and including that Size (width & height) for that particular thickness of stiles & rails.
5. The Firm shall declare the varieties of GRP Panel Type Door Shutters they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer
6. During the operation of the Licence, BO shall ensure that all the types and sizes covered in the Licence are tested in rotation, to the extent possible.

ANNEX - C**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, Sizes and Tolerances, Location of Fittings and Accessories Squareness test – Clause 7.1, 8, 10.2.1	<ul style="list-style-type: none"> • Measuring Tape • Vernier Calliper • Micrometre • Feeler Gauge • Right Angle (arm-500mm)
2	Determination of Fibre glass content – Clause 10.1 and Annex-B	<ul style="list-style-type: none"> • Crucible • Muffle furnace • Oven • Desiccator with silica gel • Standard Sieve of 200 mesh size (required if sample contains filler and or colouring agents) • Weighing balance
3	Determination of Barcol Hardness – Clause 10.1 and Annex-C	<ul style="list-style-type: none"> • Barcol Impressor as per Fig 3 of IS 14856
4	Determination of tensile strength – Clause 10.1 and Annex-D	<ul style="list-style-type: none"> • Cutting saw (carbide tipped fine toothed circular saw or nylon bonded carborundum wheel) • abrasive paper • UTM • Cleaning solvent • Stop watch • Air conditioner • Cold hardening epoxy resin
5	Determination of bending strength, Determination of elastic modulus in bend – Clause 10.1 and Annex-E and Annex-F	<ul style="list-style-type: none"> • UTM with U Shaped block mandrel & U Shaped supports • Measuring Tape and Vernier calliper • Deflection gauge • Air conditioner
6	Determination of Water Absorption – Clause 10.1 and Annex-G	<ul style="list-style-type: none"> • Provision for hanging the sample in water without touching the sides • Air conditioner • Weighing balance • Clean Cloth/ Filter paper • Vernier Calliper, Micrometre
7	Determination of Fire retardancy – Clause 10.1 and Annex-H	<ul style="list-style-type: none"> • Bunsen burner • Provision to fix the sample horizontally at one end • Stop watch • Vernier Calliper/ Scale

8	General Flatness test – Clause 10.2.2	<ul style="list-style-type: none"> • Arrangement for vertical mounting of the door shutter • Fixture with Plumb bob/any other suitable device (fig 1 of IS 4020 (Pt 3)) • Feeler gauge • Straight edge
9	Local Planeness Test – Clause 10.2.3	<ul style="list-style-type: none"> • Straight Edge or any other suitable measuring device • Feeler gauge
10	Impact Indentation test– Clause 10.2.4	<ul style="list-style-type: none"> • Impact indentation assembly for dropping steel ball from 750 mm height • Dial Gauge or Depth gauge • Steel ball (50 mm Dia, 500 gms weight) • Frame placing door shutter horizontally
11	Edge Loading test – Clause 10.2.5	<ul style="list-style-type: none"> • Arrangement for vertical hinging or pivoted support at one longitudinal end of door shutter • Weights (100 Kg in steps of 20 Kg) • Stop watch • Dial gauge • Protractor, Vernier Calliper
12	Shock Resistance test – Clause 10.2.6	<ul style="list-style-type: none"> • Arrangement for vertically hinging the shutter to door frame • Arrangement for hanging rope as pendulum • Steel scale, measuring scale • Rope with leather sand bag (weighing 5 kg) • Rope with leather sand bag (weighing 30 kg)
13	Buckling test – Clause 10.2.7	<ul style="list-style-type: none"> • Arrangement for vertically hinging the shutter to door frame & securing top free corner • Loading assembly with pulley (40 Kg weight - in steps of 10 Kg) as per fig 1 of IS 4020 (Pt 9) • Steel scale • Angle protractor
14	Slamming test – Clause 10.2.8	<ul style="list-style-type: none"> • Arrangement for fixing the door horizontally and hardwood strips or • Arrangement for fixing the door vertically and arrangement to apply force of 15 Kg (150 N) perpendicular to the door • Stop watch • Angle protractor
15	Misuse test – Clause 10.2.9	<ul style="list-style-type: none"> • Misuse test assembly with angle protector, hard wood strip (50 mm * 50 mm) as per IS 4020 (Pt 11)

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

ANNEX D

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 equipments.

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 14856: 2000.

4. CONTROL UNIT - Glass Fibre Reinforced Plastic (GRP) panel type door shutters for internal use, having the same size and construction manufactured in a week, with the same raw materials 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 Standards 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 R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	Material	5.1	IS 14856 & IS 11551	S	One	Each Consignment No further testing is required, if material received with test certificate or ISI Marked.	
		5.2	IS 14856 & IS 11320	S	One		
		5.3	IS 14856 & IS 6746	S	One		
		5.9	IS 14856	S	One		
6	Construction	6.1 to 6.5	IS 14856	R	One	Every day's production	
7	Dimensions of components & Tolerances	7.1 & Table 1	IS 14856	R	One	Each Control unit	
	Sizes and types of door shutters & Tolerances.	7.2, 7.3 & Table 2	IS 14856	R	Each shutter		
8	Location of Fittings and Accessories	8.1 to 8.3	IS 14856	R	Five	Each Control unit	
9	Finish	9.1 to 9.4	IS 14856	--	Each finished shutter		The inspection shall be carried out at a well-lighted place.
10.1	Tests on GRP Laminate (without removing gel coat)	10.1.1, Table 3 (Annex B to Annex H)	IS 14856	R	One	Each Control unit	In case of failure, the entire control unit shall be rejected.
10.2.1	Dimensions and Squareness test	10.2.1	IS 14856 & IS 4020 (Part 2)	R	Five	Every day's production	Sample shall be drawn at regular intervals. In case of failure, the whole production of the day shall be checked for the requirement & only those found confirming to the Standard may be considered for marking.
10.2.2	General flatness test	10.2.2	IS 14856 & IS 4020 (Part 3)	R	Five	Each control unit	
10.2.3	Local Planeness test	10.2.3	IS 14856 & IS 4020 (Part 4)	R	Five	Each control unit	

10.2.4	Impact Indentation test	10.2.4	IS 14856 & IS 4020 (Part 5)	R	One	Every 1000 shutters of same construction & size or part thereof manufactured in six months	These tests shall also be conducted for every change in design. In case of failure, marking shall be stopped and cause of failure shall be investigated. After taking corrective actions, two samples shall be tested and marking may be resumed if these two samples pass.
10.2.5	Edge Loading test	10.2.5	IS 14856 & IS 4020 (Part 7)	S	One	Once in a year for each construction and size of shutter	
10.2.6	Shock resistance test	10.2.6	IS 14856 & IS 4020 (Part 8)	S	One		
10.2.7	Buckling test	10.2.7	IS 14856 & IS 4020 (Part 9)	S	One		
10.2.8	Slamming test	10.2.8	IS 14856 & IS 4020 (Part 10)	R	One	Each control unit	In case of failure of sample, twice the number of samples from next two control units shall be tested and control units shall be accepted on passing of retested samples. Original frequency for testing may be resumed on passing of both control units.
10.2.9	Misuse test	10.2.9	IS 14856 & IS 4020 (Part 11)	S	One	Once in a year for each construction and size of shutter	These tests shall also be conducted for every change in design. In case of failure, marking shall be stopped and cause of failure shall be investigated. After taking corrective actions, two samples shall be tested and marking may be resumed if these two samples pass.

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.

ANNEX – E

Possible Tests in a Day

- Dimensions and Squareness test - Clause 10.2.1
- General Flatness test – Clause 10.2.2
- Local Planeness Test – Clause 10.2.3
- Impact Indentation test – Clause 10.2.4
- Edge Loading test – Clause 10.2.5
- Shock Resistance test – Clause 10.2.6
- Buckling test – Clause 10.2.7
- Slamming test – Clause 10.2.8
- Misuse test – Clause 10.2.9
- Barcol Hardness – Clause 10.1 and Annex-C
- Tensile Strength - Clause 10.1 and Annex-D
- Bending strength – Clause 10.1 and Annex-E
- Determination of elastic modulus – Clause 10.1 and Annex-F
- Determination of Fire retardancy – Clause 10.1 and Annex-H

ANNEX-F**SCOPE OF LICENCE**

Licence is granted to use Standard Mark as per IS 14856 : 2000 with the following scope	
Name of the product	Glass Fibre Reinforced Plastic (GRP) Panel type Door Shutters for internal use
Designation	<ul style="list-style-type: none"> • Modular sizes with designation of doors (8 DS 20, 8 DS 21, 9 DS 20, 9 DS 21, 10 DS 20, 10 DS 21, 12 DT 20, 12 DT 21) • Non-Modular sizes with Width X Height (in mm) of door
Thickness of Stiles & Rails	30, 35 mm