

**PRODUCT MANUAL FOR**  
**Safety Glass — Specification**  
**Part 1 Architectural, Building and General Uses**  
**ACCORDING TO**  
**IS 2553 (Part 1) : 2018**

*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.	<b>Product</b>	:	IS 2553 (Part 1) : 2018
	<b>Title</b>	:	Safety Glass — Specification Part 1 Architectural, Building and General Uses
	<b>No. of Amendments</b>	:	Nil
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	No specific requirement.
b)	<b>Grouping guidelines</b>	:	Please refer ANNEX – <u>A</u> .
c)	<b>Sample Size</b>	:	13 pieces
3.	<b>List of Test Equipment</b>	:	Please refer ANNEX – <u>B</u>
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer ANNEX – <u>C</u> .
5.	<b>Possible tests in a day :</b>		
	Dimensional and visual tests such as thickness, dimensions, squareness, determination of defects, resistance to impact, boil and bake, fracture and adhesion tests		
6.	<b>Scope of the Licence :</b>		
	Licence is granted to use Standard Mark as per IS 2553 (Part 1) : 2018 with the following scope:		
	<b>Name of the product</b>	Safety Glass — Specification Part 1 Architectural, Building and General Uses	
	<b>Type of Safety Glass</b>	Toughened (Tempered) / Laminated	
	<b>Nominal Thickness</b>	From ... mm up to and including ... mm	
	<b>Applicable requirements</b>	<b>optional</b>	Surface compression, mechanical strength – four point bending test, humidity test

## **ANNEX A**

### **Grouping Guidelines**

IS 2553 (Part 1):2018 classifies safety glass into 2 types: Toughened (Tempered) and Laminated Safety Glass. Accordingly, the following grouping guidelines based on nominal thickness and type of glass, shall be followed for processing applications for grant of licence and extension in scope of licence:

- i) For covering all nominal thicknesses in a range within the scope of licence, samples of the highest and lowest nominal thicknesses may be drawn for testing.
- ii) However, separate samples to be drawn for toughened (tempered) safety glass and laminated safety glass to cover each type of glass in the scope.
- iii) Licence may be granted or change in scope may be allowed for covering all the thicknesses within the range if the samples are found passing in testing.
- iv) However, it shall be ensured that the firm is having all the necessary manufacturing and testing facilities for the manufacture and testing of the varieties to be covered in the licence.
- v) During the operation of the licence, samples of all varieties covered in the scope of licence shall be drawn by rotation.

## **ANNEX B**

### **List of Test Equipment**

#### ***Major test equipment required to test as per the Indian Standard***

S.no.	Tests used in with Clause Reference		Test Equipment
	Cl. No.	Test	
1)	5.1.2	Distribution of Allowable Defects	<ul style="list-style-type: none"><li>i. Arrangement for determination of optical faults as per Annex C of IS 14900:2018 - (A screen bearing an assembly of black and white stripes (zebra) consisting of a translucent white background with parallel black stripes, lit from behind with white daylight fluorescent tubes., support frame etc.)</li><li>ii. Arrangement for determination of spot faults as per Annex D of IS 14900:2018 (a point source projector and a screen, distortion gauge etc)</li></ul>
2)	5.2.1, 5.3.1, 5.2.3, 5.3.2	Thickness, Dimensions, squareness and edge displacement	<ul style="list-style-type: none"><li>i. Vernier calipers and micrometer (<math>LC \leq 0.1</math> mm)</li><li>ii. Measurement Tape</li><li>iii. Measurement Table (Flat surface, preferably backlit)</li><li>iv. Spirit Balance</li></ul>
3)	5.2.3	Fragmentation Test (6.1 of IS 17004)	<ul style="list-style-type: none"><li>i. Pointed steel tool (hammer of about 75 g mass, a spring loaded centre punch, or other similar appliance with a hardened point)</li><li>ii. Test table with arrangement for holding the specimen at the edges (for example, by a small frame, adhesive tape etc)</li><li>iii. Vernier calipers, measurement tape/scale, protractor, frame (for particle count)</li></ul>
4)	5.2.4	Flatness	<ul style="list-style-type: none"><li>i. Arrangement for measurement of overall bow, straight metal ruler or a stretched wire (as per 5.2 of IS 17004)</li><li>ii. Apparatus for Measurement of Wave and Roller Wave- straight edge and feeler gauges (as per 5.3 of IS 17004)</li><li>iii. Apparatus for Measurement of Edge Lift - feeler gauge (For Horizontally Toughened Glass Only) (as per 5.4 of IS 17004)</li><li>iv. Apparatus for Measurement of Local Distortion - feeler/taper gauge (For Vertically Toughened Glass Only) (as per 5.5 of IS 17004)</li></ul>

S.no.	Tests used in with Clause Reference		Test Equipment
	Cl. No.	Test	
5)	5.2.5.1	Resistance to shock	Apparatus for ball drop test, steel ball (6.2.1 of IS 17004)
6)	5.2.5.2, 5.3.8	Resistance to human impact	Test apparatus for resistance to human impact (6.4 of IS 17004)
7)	5.2.6	Surface compression (optional)	Surface Compression Test equipment using polaroscopic method (6.5 of IS 17004)
8)	5.2.7	Mechanical Strength — Four Point Bending Test (Optional)	Mechanical Strength Test — Four Point Bending Test equipment (6.3 of IS 17004)
9)	5.3.3	Light Stability Test	Light Stability Test apparatus (7.6 of IS 17004)
10)	5.3.4	Boil and Bake Tests (7.1 of IS 17004)	i. Thermometer ii. Hot Water tank with means of maintaining water temperature at 100 +0/-2°C iii. hot air oven capable of maintaining 100 ± 2°C iv. Arrangement to store samples vertically
11)	5.3.5	Fracture and adhesion test	Apparatus for Fracture and adhesion test as per either method 1 or method 2 of 6.2.2 of IS 17004
12)	5.3.6	Defects in the central area	i. Arrangement to place specimen in vertical position with sunlight incident ii. Matte grey screen
13)	5.3.7	Humidity test (optional)	iii. Humidity chamber capable of maintaining temperature of 50 + 5°C and relative humidity of up to 100 percent with temperature and humidity indicators

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

**b) The least count, range, and other specifications of the equipment, reagents etc shall be as specified in the standard**

**ANNEX C**  
**SCHEME OF INSPECTION AND TESTING**  
**FOR CERTIFICATION OF SAFETY GLASS**  
**PART-1 ARCHITECTURAL, BUILDING AND GENERAL USES**  
**ACCORDING TO IS 2553 (Part 1):2018**  
**(Fourth Revision)**

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. **PACKING AND MARKING** -The Standard Mark as given in Schedule of the license shall be marked on each piece of safety glass provided always that the safety glass thus marked conforms to all the requirement of the specification. The packing and marking shall be done as per the provisions of the Indian Standard. In addition, the licence no. CM/L-\_\_\_ and details of BIS website shall be marked at an appropriate place as follows: "For details of BIS certification please visit [www.bis.gov.in](http://www.bis.gov.in)"
4. **CONTROL UNIT** – For the purpose of this scheme, all the safety glass of same nominal thickness and type and manufactured by the same method under similar conditions in a day shall constitute a control unit.
5. **LEVELS OF CONTROL** - The tests as indicated in Table 1 and the Levels of Control specified therein shall be carried out on the whole production of the factory covered by this scheme and appropriate record 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 the Certification Mark of the Bureau.
  - 5.1 All production which conforms to the Indian Standard and covered in the licence should be marked with Standard mark.
  - 5.2 Each control unit shall be individually tested to determine its conformity or otherwise according to Table 1.
    - 5.2.1 In the beginning of the production run each control unit shall be tested till 5 consecutive control units pass all the requirements of the Indian Standard. Thereafter every 7<sup>th</sup> control unit shall be taken up for testing. In case of any failure all control units subsequently manufactured shall be tested till three consecutive control units pass the test.
6. **REJECTION** - 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. A separate record shall be maintain in giving information relating to the rejection of the production not conforming to the requirement of the specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the specification.

**SCHEME OF INSPECTION AND TESTING  
OF SAFETY GLASS  
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**TABLE 1: LEVEL OF CONTROL**

(1)					(2)	(3)		(4)
Test Details					Test equipment requirement R:required (or) S: Sub-contracting permitted	Levels of Control		Remarks
Sl.No.	Clause	Requirements	Test Method			No. of Samples	Frequency	
			Clause	Reference				
1.	5.1.1	General	5.1.1	IS 2553 (Part 1):2018	R	Each piece	-	Visual
2.	5.1.2	Distribution of Allowable Defects	4.4 and 4.5	IS 14900	R	Each piece	-	Visual. No testing required if glass is ISI marked as per IS 14900
	<b>5.2</b>	<b>Requirements specific to Flat Toughened (Tempered) Safety Glass</b>						
3.	5.2.1	Thickness	5.1	IS 17004	R	5 percent but not less than 5 pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 5 percent and repeat the tests. None of these samples shall fail.
4.	5.2.2	Dimensions and Squareness	5.2.2	IS 2553 (Part 1):2018	R	5 percent but not less than 5 pieces	Each Control Unit	-DO-

5.	5.2.3	Fragmentation Test	6.1	IS 17004	<b>R</b>	2 pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 2 samples from the lot and repeat the test. None of these 2 samples shall fail.
6.	5.2.4	Flatness	5.2.4	IS 2553(Pt-1):2018	<b>R</b>	5 percent but not less than 5 pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 5 percent and repeat the tests. None of these samples shall fail.
7.	5.2.5	Resistance to Impact	6.2.1, 6.4.5.2	IS 17004	<b>R</b>	2 pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 2 samples from the lot and repeat the test. None of these 2 samples

								shall fail.
8.	5.2.6	Surface Compression (Optional)	6.5	IS 17004	<b>S</b>	As agreed between manufacturer and purchaser		
9.	5.2.7	Mechanical Strength - Four Point Bending Test (Optional)	6.3	IS 17004	<b>S</b>	As agreed between manufacturer and purchaser		
10.	5.2.8	Fabrication in Glass	5.2.8	IS 2553(Pt-1):2018	<b>R</b>	5 percent but not less than 5 pieces	Each Control Unit	
11.	5.2.9	Edge Working of Glass for toughening	5.2.9	-do-	<b>R</b>	-do-	-do-	
	5.3	<b>Requirements Specific to Laminated Safety Glass</b>			<b>R</b>			
12.	5.3.1	Thickness	4.2 & Table 1	IS 17004	<b>R</b>	5 percent but not less than 5 pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 5 percent and repeat the tests. None of these samples shall fail.
14.	5.3.2	Dimensions, Squareness and Edge Displacement	5.3.2	IS 2553 (Pt-1):2018	<b>R</b>	5 percent but not less than 5 pieces	Each Control Unit	-DO- (applicable to cut sizes)
15.	5.3.3	Light stability test	7.6	IS 17004	<b>R</b>	Three pieces	Three months	All samples shall pass. In case of any single failure, draw another 3 samples from the



								lot and repeat the test. None of these 3 samples shall fail
16.	5.3.4	Boil and Bake Tests	7.1.1, 7.1.2	IS 17004	R	-do-	Each Control Unit	All samples shall pass. In case of any single failure, draw another 3 samples from the lot and repeat the test. None of these 3 samples shall fail.
17.	5.3.5	Fracture and adhesion test	6.2.2	-do-	R	Three pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 3 samples from the lot and repeat the test. None of these 3 samples shall fail.
18.	5.3.6	Defects in the Central Area	5.3.6.7	IS 2553 (Pt-1):2018	R	Three pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 3

								samples from the lot and repeat the test. None of these 3 samples shall fail.
19.	5.3.7	Humidity Test (optional)	7.2	IS 17004	<b>S</b>	As agreed between manufacturer and purchaser		
20.	5.3.8	Resistance to Human Impact Test	6.4	IS 17004	<b>R</b>	2 pieces	Each Control Unit	All samples shall pass. In case of any single failure, draw another 2 samples from the lot and repeat the test. None of these 2 samples shall fail.
21.	5.3.9	Working on Glass after lamination	5.3.9	IS 2553 (Pt-1):2018	<b>R</b>	5 percent but not less than 5 pieces	Each Control Unit	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled 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 to BO head.