



उत्पाद मैनुअल
सुरक्षा उपयोगी काँच – विशिष्टि भाग 3 सौर उपयोग के लिए
IS 2553 (भाग 3): 2019 के अनुसार

PRODUCT MANUAL
SAFETY GLASS — SPECIFICATION
PART 3 Solar Applications
ACCORDING to IS 2553 (Part 3):2019

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	मानक संख्या IS No.	:	IS 2553 (Part 3): 2019
	शीर्षक Title	:	Safety Glass for Solar Application
	संशोधनों की संख्या No. of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	As per Cl 4.1 Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence /Factory Surveillance
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer ANNEX –A

c)	नमूने का परिमाण Sample Quantity	:	Actual Size: 05 Nos. Cut Size 360 mm x 1100 mm: 04 Nos. Cut Size 610 mm x 610 mm: 02Nos Note 1: During the operative period of one year, one factory sample and one market sample shall be drawn for all test (excluding optional tests). Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	घोषित मान Declared Values	:	1. Thickness 2. Application 3. Method of toughening Note: This section indicates declared values to be specified against a parameter (to be specified in Test Requests) to enable testing of sample against the requirement and determine its conformity
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	(A) Dimension (Length, width, thickness) (B) Squareness (C) Flatness- Overall Bow Local distortion Roller wave (D) Fragmentation test (E) Resistance to shock (Ball drop test) (F) Mechanical strength (four point Bend test) (G) Anti-reflective coating Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 2553 (Part 3):2019 with the following scope:		
	Name of the product	Safety Glass for Solar application	
	Thickness	From ... mm up to and including ... mm	
	Application	Photovoltaic Modules and/or Solar Flat Plate collector	
	Method of toughening	Vertical Toughened Glass and/or Horizontal Toughened Glass	

ANNEX A

Grouping Guidelines

Safety Glass intended for use with solar application as per IS 2553 (Part 3) are classified as given below:

(a) Based on application

Photovoltaic Modules
Solar Flat Plate collector

(b) Based on toughening of Glass

Vertical Toughened Glass
Horizontal Toughened Glass

(c) Based on Thickness:

Less than 5mm
Greater than 5mm

For considering GoL/CSoL, every variety of Safety Glass is required to be tested.

However, while considering grant of licence/inclusion of additional varieties, it shall be ensured that the applicant/licensee has got the complete manufacturing and testing facilities for all the varieties intended to be covered.

Scope of licence shall be restricted based on the manufacturing and testing facilities available.

During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible

ANNEX – B

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests Used In With Clause Reference		Test Equipment/Chemical
	Cl. No.	Test	
1	4.2	Dimension Test and Squareness	i. Vernier calipers and micrometer ($LC \leq 0.1\text{mm}$) ii. Measurement Tape iii. Measurement Table (Flat surface, preferably backlit) iv. Spirit Balance
2	4.2	Flatness	i. Arrangement for measurement of overall bow, straight metal ruler or a stretched wire(as per 5.2 of IS 17004) ii. Apparatus for Measurement of Wave and Roller Wave- straight edge and feeler gauges(as per 5.3 of IS 17004) iii. Apparatus for Measurement of Local Distortion - feeler/taper gauge (For Vertically Toughened Glass Only) (as per 5.5 of IS 17004)
3	4.2	Fragmentation test	Spring Loaded Centre punch or hammer-75 g, Adhesive tape, set up as per Cl. 6.1 of IS 17004, Vernier calipers, measurement tape/scale, protractor, frame (for particle count)
4	4.2	Resistance to shock (ball Drop test)	Hardened Steel ball and the fixture set up as per Cl. 6.2.1 of IS 17004
5	4.2	Mechanical strength test	Four Point Bend strength test set up as per cl.no 6.3 of IS 17004
6	4.2	Hail test	Apparatus for test as per 10.17 of IS 14286

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : Quantity of safety glass for Solar Application, of the same variety [variety as defined in Scope of licence] manufactured by the same method and under similar conditions in a day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid

NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each piece of glass, provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements:** The material shall also be marked with the following additional requirement on each piece of glass

a) “For BIS certification details please visit www.bis.gov.in”

4. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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
(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Subcontracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4.1	Raw Material	-	IS 5437 IS 14900	S	One	Each consignment	a) Conformance required as per 'extra clear patterned glass' type of IS 5437 (for photovoltaic modules). b) Conformance required to IS 14900 or 'extra clear patterned glass' type specified of IS 5437 (for solar flat plate collector). c) No testing is required if material is accompanied by manufacturer's/ supplier's test certificate indicating conformity or is ISI marked
4.2	Dimension	-	IS 2553 (Part 3)	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
4.2	Squareness	-	IS 2553 (Part 3)	R			
4.2	Flatness- Overall Bow Local distortion Roller wave	5.2 5.5 5.3	IS 17004	R			

4.2	Fragmentation test	6.1	IS 17004	R	One	Each Control Unit	
4.2	Resistance to shock (Ball drop test)	6.2.1	IS 17004	R	One	Each Control Unit	
4.2	Mechanical strength (four point Bend test)	6.3	IS 17004	R	One	Each Control Unit	
4.2	Hail Test (optional)	10.17	IS 14286	S	Optional Test		