उत्पाद मैन्युअल
सुरक्षा उपयोगी काँच — विशिष्टि भाग 1 वास्तुकला, भवन और सामान्य उपयोग
भारतीय मानक 2553 (Part 1):2018 के अनुसार

PRODUCT MANUAL
FOR
SAFETY GLASS – SPECIFICATION
PART 1 ARCHITECTURAL, BUILDING
AND GENERAL USES
ACCORDING to IS 2553 (Part 1):2018

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 underScheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations,2018 for variousproducts. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	**मानक संख्या** **IS No.**	:	IS 2553 (Part 1):2018
	शीर्षक **Title**	:	सुरक्षा उपयोगी काँच – विशिष्टि भाग 1 वास्तुकला, भवन और सामान्य उपयोग Safety glass – Specification Part 1 architectural, building and general uses.
	संशोधनों की संख्या **No. of amendments**	:	03
2.	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चा माल** **Raw material**	:	The allowable defects (spot faults, linear faults, reams, strings, lines, optical faults) in flat annealed glass used in the manufacture of safety glass shall not exceed the limits specified in 4.4 and 4.5 of IS 14900. *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 to Annex-A.
c)	**नमूने का परिमाण** **Sample Quantity**	:	1. For Toughened (Tempered) Safety Glass (For Thickness 5 mm and above: Actual Size - 05 Nos. (Min Area of Glass = 0.36 m^2) 610 X 610 mm cut size samples - 04 Nos. 1938 X 876 mm cut size samples - 06 Nos. 2. For Toughened (Tempered) safety Glass (For Thickness below 5 mm): Actual Size = 05 Nos. (Min Area of Glass = 0.36 m^2) 3. For spherically curved toughened safety glass, a sample of actual product may be drawn for testing of dimensional requirements of Cl. 5.2.2.3.4. 4. For Laminated Safety Glass: Actual Size - 05 Nos. 300 X 300 mm cut size samples - 15 Nos. 1938 X 876 mm cut size samples - 06 Nos. Note: Quantities specified above are for mandatory tests, if optional tests are required to be tested, additional quantity is required to be sent accordingly. *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)	**परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर** **Parameters to be Declared in Test Request**	:	1. Type of Safety Glass — Flat Toughened / Curved Toughened (other than Spherical) / Curved Toughened (Spherical) / Laminated 2. Nominal thickness and dimensions. 3. For spherically curved glass — declared nominal crown height. 4. Optional requirements claimed (Surface compression / Mechanical strength – four-point bending / Humidity test), if any. *Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.*
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**	
	All tests except Humidity test and Light Stability test (unless the long exposure has already been completed and only the final observation / measurement is to be witnessed). *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 1): 2018 with the following scope:	
	Name of the product	Safety glass – Specification Part 1 architectural, building and general uses
	Type	1. Flat Toughened (Tempered), and/or 2. Curved Toughened (Tempered) - Other than Spherical / Spherical, and/or 3. Laminated
	Nominal thickness	From …… mm up to and including …… mm
	Applicable optional requirements	Surface compression / Mechanical strength – four point bending / Humidity test / Without optional requirements

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ANNEX-A

GROUPING GUIDELINES

1. IS 2553 (Part 1):2018 classifies safety glass into following types:
    A. Toughened (Tempered) Safety Glass
        i. Flat
        ii. Curved
            a. Spherically
            b. Other than spherically
    B. Laminated Safety Glass

2. 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:
    A. Each of the following types shall be tested separately for coverage in the scope of the licence.
        i. Flat Toughened
        ii. Curved Toughened (other than Spherical)
        iii. Curved Toughened (Spherical)
        iv. Laminated
    B. For covering all nominal thicknesses in a range within the scope of licence, samples of the highest and lowest nominal thicknesses of a particular type of safety glass shall be drawn for testing.
    C. For change in scope by inclusion of additional thickness of a type already covered, only the new extreme thickness (lowest or highest) of that type needs to be tested.
    D. If a type of safety glass has been tested including an optional requirement, the same type may also be covered in the scope without that optional requirement.

3. However, while considering grant of licence/change in scope of licence, it will be ensured that the applicant/licensee has got the complete manufacturing and testing facilities, as applicable for all the varieties intended to be covered.

4. During operation of the licence, BOs shall ensure that all the samples are tested for all applicable requirements on the product, and varieties covered in the licence are tested in rotation.

ANNEX - B

LIST OF TEST EQUIPMENT

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sr. No.	Cl. No.	Test	Test equipment
1.	5.1.2	Distribution of Allowable Defects	1. Arrangement for determination of optical faults as per Annex C of IS 14900:2018 2. Arrangement for determination of spot faults as per Annex D/E/F of IS 14900:2018
2.	5.2.1, 5.2.2, 5.3.1, 5.3.2	Thickness, Dimensions, squareness and edge displacement	1. An instrument of the calliper/micrometre type
3.	5.2.2.3.1	Shape accuracy, girth and length	1. Gauge or a 1:1 scale template 2. Flexible steel tape of 1 mm scale interval 3. Steel tape or Straightedge of 1 mm scale interval
4.	5.2.2.3.2	Edge straightness deviation	1. Straightedge ruler, with 0.1 mm intervals
5.	5.2.2.3.4	Dimensional requirements specific for spherically curved toughened glasses	1. Hard flat surface 2. Any calibrated ruler or vernier, thread or depth gauge in millimetres
6.	5.2.3	Fragmentation Test	1. Pointed steel tool 2. Test table
7.	5.2.4	Flatness	1. Arrangement for measurement of overall bow (as per 5.2 of IS 17004) 2. Apparatus for Measurement of Wave and Roller Wave (as per 5.3 of IS 17004) 3. Apparatus for Measurement of Edge Lift (as per 5.4 of IS 17004) 4. Apparatus for Measurement of Local Distortion (as per 5.5 of IS 17004)
8.	5.2.5.1	Resistance to shock	Apparatus for ball drop test (as per 6.2.1 of IS17004)
9.	5.2.5.2, 5.3.8	Resistance to human impact	Test apparatus for resistance to human impact (as per 6.4 of IS 17004)

10.	5.2.6	Surface compression (optional)	Arrangement as per 6.5 of IS 17004
11.	5.2.7	Mechanical Strength — Four Point Bending Test (Optional)	Arrangement as per 6.3 of IS 17004.
12.	5.3.3	Light Stability Test	Arrangement as per 7.6 of IS 17004
13.	5.3.4	Boil and Bake Tests (7.1 of IS17004)	1. Vessel of boiling water as per Note under 7.1.1 of IS 17004 2. White diffused background 3. Hot air oven
14.	5.3.5	Fracture and adhesion test	Apparatus for Fracture and adhesion test as per 6.2.2 of IS 17004
15.	5.3.6	Defects in the central area	1. Arrangement to place specimen as per 5.3.6.7 of IS 2553 (Part 1) 2. Matte grey screen
16.	5.3.7	Humidity test (optional)	1. Humidity chamber 2. Arrangement for Inspection of the samples at a distance between 300 mm and 500 mm in front of a white diffused background.

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

ANNEX - C
SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) 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 (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 **RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT**:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: *All 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.*

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommendedlevels of control are given in Table 1. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

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.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirementsof the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

i) Shared testing resources like common facility,

ii) Cluster based testing facility,

iii) Sub-contracting to outside laboratories which may either be:

a) BIS recognised/empanelled laboratories, or

b) Any accredited laboratory as per ISO/IEC 17025

2.1 **TEST RECORDS**- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted

at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark, as given in the Schedule of the licence, shall be incorporated (including BIS licence no. CM/L_____) legibly and indelibly on each piece as well as packet of Safety glass, provided always that the glass so marked, conform to every requirement of the specification.

3.1 Packing and marking shall be done as per the provision of the Indian Standard. In addition, either each piece or each packet of Safety glass shall also be marked with the following additional requirement:

a) BIS website details: "For BIS certification details please visit www.bis.gov.in"

4. REJECTION - 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

(Recommended Levels of Control by BIS - For Guidance Only)

(1)				(2)	
Test Details				**Levels of Control**	
Clause	*Requirement*	*Test Methods*		*No. of Sample*	*Frequency*
		Clause	*Reference*		
5.1.2	Distribution of Allowable Defects	4.4 and 4.5	IS 14900	Each piece	-
5.2	**Requirements specific to Toughened (Tempered) Safety Glass**				
5.2.1	Thickness	5.1	IS 17004	One sample	Each Control Unit
5.2.2	Dimensions and Squareness	5.2.2	IS 2553 (Part 1): 2018	-do-	-do-
5.2.2.3	**Dimensional tolerances for Curved Toughened (Tempered) Safety Glass**				
5.2.2.3.1	Shape accuracy, girth and length	5.2.2.3. 1	IS 2553 (Part 1): 2018	-do-	-do-
5.2.2.3.2	Edge Straightness Deviation	5.2.2.3. 2	-do-	-do-	-do-
5.2.2.3.3	Maximum Cross-Curve deviation	5.2.2.3. 3	-do-	-do-	-do-
5.2.2.3.4	Dimensional requirements specific for spherically curved toughened glasses	5.2.2.3.4	-do-	-do-	-do-
5.2.3	Fragmentation Test	6.1	IS 17004	-do-	-do-
5.2.4	Flatness	5.2, 5.3, 5.4 and 5.5	-do-	-do-	-do-
5.2.5.1	Resistance to Shock	6.2.1	-do-	-do-	-do-
5.2.5.2	Resistance to human impact	6.4.5.2	-do-	-do-	-do-
5.2.5.2	Surface Compression (Optional)	6.5	-do-	As agreed between manufacturer and purchaser	
5.2.7	Mechanical Strength- Four Point Bending Test (Optional)	6.3	-do-	-do-	
5.2.8	Fabrication in Glass	5.2.8	IS 2553 (Part 1): 2018	One sample	Each Control Unit
5.2.9	Edge Working of Glass for toughening	5.2.9	-do-	-do-	-do-
5.3	**Requirements Specific to Laminated Safety Glass**				
5.3.1	Thickness	5.1	IS 17004	One sample	Each Control

					Unit
5.3.2	Dimensions, Squareness and Edge Displacement	5.3.2	IS 2553 (Part 1): 2018	-do-	-do-
5.3.3	Light stability test	7.6	IS 17004	-do-	Once in a month
5.3.4	Boil and Bake Tests	7.1.1, 7.1.2	-do-	-do-	Each control unit
5.3.5	Fracture and adhesion test	6.2.2	-do-	-do-	-do-
5.3.6	Defects in the Central Area	5.3.6.7	IS 2553 (Part 1): 2018	-do-	-do-
5.3.7	Humidity Test (optional)	7.2	IS 17004	As agreed between manufacturer and purchaser	
5.3.8	Resistance to Human Impact Test	6.4	-do-	One sample	Each Control Unit
5.3.9	Working on Glass after lamination	5.3.9	IS 2553 (Part 1): 2018	-do-	-do-