

**AMENDMENT NO. 2 November 2023**

**TO**

**IS 2553 (Part 1): 2018 SAFETY GLASS – SPECIFICATION PART 1:  
ARCHITECTURAL, BUILDING AND GENERAL USES**

*(Fourth Revision)*

*(Page 3, clause 5.2.3)* – Insert the following notes under the clause **5.2.3**:

‘NOTES:

1. This method is applicable for flat toughened safety glasses only. For curved toughened safety glasses see 5.2.3.1.
2. In case, the tempering furnace is not capable of handling the glass having surface area greater than or equal to 0.36 m<sup>2</sup>, then the fragmentation test shall be carried out using the glass samples of actual sizes.’

*(Page 3, clause 5.2.3)* – Insert a sub clause **5.2.3.1** under the clause **5.2.3**:

**‘5.2.3.1** *Fragmentation test for curved toughened (tempered) safety glass*

For fragmentation characteristics, the curved toughened (tempered) safety glass shall be tested and evaluated in accordance with test method given in Annex E.’

*(Page 6, clause 5.2.5.1)* –Insert a new para at the end of clause **5.2.5.1**:

‘For glasses of thickness less than 5 mm, ball drop test shall be carried out as prescribed in 6.2.1 of IS 17004, using a steel ball of mass (227 ± 2) g. Also, in case, the tempering furnace is not capable of handling the glass sizes greater than or equal to (610 x 610) mm, then the test shall be carried out using the actual glass samples’.

(Page 20, Annex D) – Insert the following new **Annex E** after **Annex D**:

### **Annex E**

(Clause 5.2.3.1)

## **FRAGMENTATION TEST FOR CURVED TEMPERED (TOUGHENED) SAFETY GLASS**

### **E-1 GENERAL**

The fragmentation test determines whether the glass breaks in the manner prescribed for a thermally toughened safety glass.

### **E-2 AREA AND NUMBER OF TEST SPECIMENS**

**E-2.1** The minimum area of the test specimen shall be 0.36 m<sup>2</sup> without any holes, notches or cut-outs. However, in case the tempering furnace is not capable of handling this glass size, then the test shall be performed on actual glass product.

**E-2.2** Five specimens shall be tested.

### **E-2.3 Test Procedure**

Each test specimen shall be impacted, using a pointed steel tool, positioned at 1/3 distance from the edge on the longest line joining the centre and the edge of the test specimen, until breakage occurs. Examples of steel tools used for testing are a hammer of about 75 g mass, a spring loaded centre punch, or other similar appliance with a hardened point. The radius of curvature of the impact point should be approximately 0.2 mm.

The test piece to be tested shall not be rigidly secured; it may however be fastened on an identical test piece by means of adhesive tape applied all-round the edge. In order to prevent scattering of the fragments, cover the exterior surface of the glass cover with a thin, clear, plastic adhesive tape (i.e., packaging tape), overlapping the tape edges slightly. Make sure the tape is evenly applied and completely covering the glass on each side so that the fragments remain interlocked after breakage.

### **E-2.4 ASSESSMENT OF FRAGMENTATION**

The particle count and measuring of the dimensions of the largest particle shall be made between 3 min to 5 min after fracture. An area of radius 100 mm, centred on the impact point, and a border of 25 mm, round the edge of the test specimen shall be excluded from the assessment.

The particle count shall be made in the region of coarsest fracture (the aim being to obtain the minimum value). The particle count shall be made by placing a mask of  $(50 \pm 1)$  mm  $\times$   $(50 \pm 1)$  mm on the test piece or by any other suitable method. The number of crack-free particles within the square shall be counted. A particle is ‘crack-free’ if it does not contain any cracks which run from one edge to another.

For Comments Only

Glass, Glassware & Laboratoryware Sectional Committee, CHD 10

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The particle count determination of glass sheet shall be completed within 5 minutes of the fracture of that glass. No magnifying lens or other aid to vision (except spectacles if normally worn) shall be used when making the particle count as described below.

All particles wholly contained within the area of the mask/square shall be counted as one particle each and all the particles which are partially within the mask/square shall be counted as 1/2 particle each.

**E-2.4.1** *Minimum values from the particle count*

In order to classify a glass as a thermally toughened safety glass, the particle count of each test specimen shall not be less than the values given in Table 14.

**Table 14 Minimum particle count values**

(Clause E-2.4.1)

<b>SI No.</b>	<b>Nominal Thickness (mm)</b>	<b>Minimum Particle Count (Number)</b>
(1)	(2)	(3)
i.	3 to 3.5	15
ii.	4 to 12	40
iii.	15 to 25	30

**E-2.4.2** *Selection of the longest particle*

The longest particle shall be chosen from the body of the test specimen. It shall not be in the excluded area.

**E-2.4.3** *Maximum length of longest particle*

In order to classify the glass as thermally toughened soda lime silicate safety glass, the length of the longest particle shall not exceed 100 mm.