INTERNATIONAL STANDARD

ISO 614

Third edition
1989-09-15

Shipbuilding and marine structures — Toughened safety glass panes for rectangular windows and side scuttles — Punch method of non-destructive strength testing

Construction navale et structures maritimes — Verres de sécurité trempés pour hublots et fenêtres rectangulaires de navires — Méthode du poinçon pour les essais non destructifs de résistance

Reference number
ISO 614 : 1989 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 614 was prepared by Technical Committee ISO/TC 8, *Shipbuilding and marine structures.*

This third edition cancels and replaces the second edition (ISO 614 : 1976) : details for sheet glass in table 2 have been deleted, and figure 2 requirements simplified.

ISO 614 forms one of a series which also includes the following:

ISO 1095 : 1988, *Shipbuilding and marine structures — Toughened safety glass panes for side scuttles.*

ISO 3254 : 1989, *Shipbuilding and marine structures — Toughened safety glass panes for rectangular windows.*

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Printed in Switzerland

Shipbuilding and marine structures — Toughened safety glass panes for rectangular windows and side scuttles — Punch method of non-destructive strength testing

1 Scope

This International Standard specifies a method for the non-destructive strength testing of toughened safety glass panes for rectangular windows, complying with ISO 3254, and side scuttles, complying with ISO 1095.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 48 : —[1], *Rubber, vulcanized — Determination of hardness (hardness between* 10 *and* 100 IRHD*).*

ISO 1095 : 1988, *Shipbuilding and marine structures — Toughened safety glass panes for side scuttles.*

ISO 3254 : 1989, *Shipbuilding and marine structures — Toughened safety glass panes for rectangular windows.*

3 Test apparatus

The apparatus shall be of the appropriate form shown in figure 1, as follows:

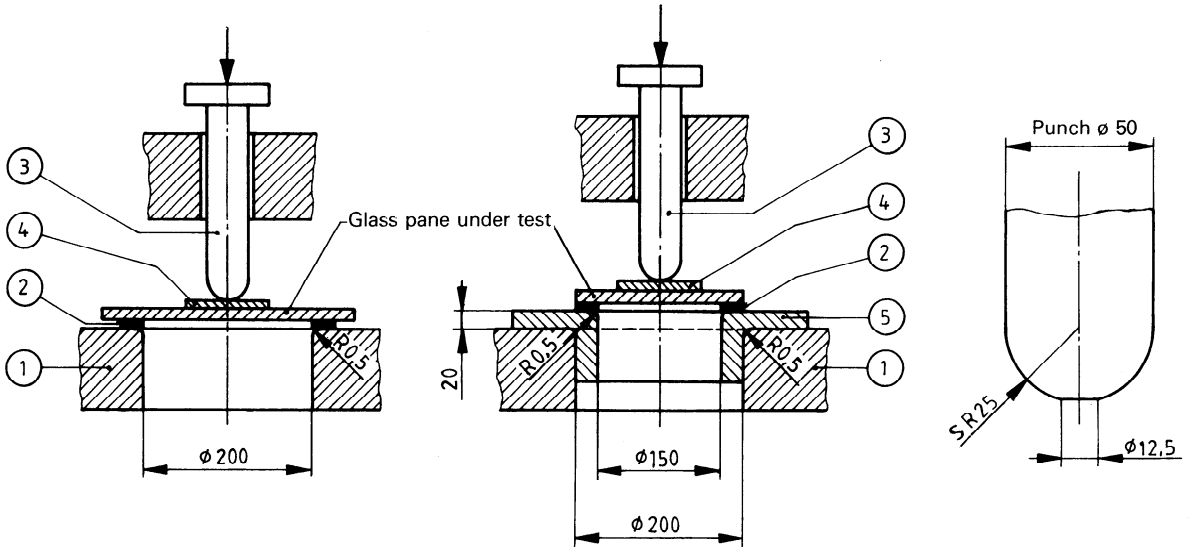
a) **Form A:** for glass panes of side scuttles of nominal size 250 mm and above, and for glass panes of rectangular windows of all sizes;

b) **Form B:** for glass panes of side scuttles of nominal size 200 mm.

The test apparatus shall also meet the requirements of table 1.

1) To be published. (Revision of ISO 48 : 1979, ISO 1400 : 1975 and ISO 1818 : 1975.)

Dimensions in millimetres



a) Form A

b) Form B

c) Details of punch (component No. 3)

Figure 1 — Form of test apparatus

Table 1 — Components of test apparatus

Component No. form A	Component No. form B	Part	Material	Specification	
1		Base plate	Steel	Thickness: sufficient to prevent deformation under pressure Surface: flat	
2		Flat ring	Rubber, hardness 40 to 60 IRHD[1)]	Internal diameter: form A: 200 mm form B: 150 mm, to be flush with the adaptor (component No. 5)	Thickness: 2 mm Width: 15 mm minimum
3		Punch	Steel	Lower part flattened so that the diameter of 12,5 mm is obtained	
4		Pad	Felt or fibre-board	Thickness: ≈ 5 mm for felt or ≈ 2 mm for fibre-board External diameter: ≈ 50 mm	
—	5	Adaptor	Steel	External diameter: to be flush with the hole in the base plate Internal diameter: 150 mm for glass panes of side scuttles of nominal size 200 mm	

1) IRHD = International Rubber Hardness Degrees: see ISO 48.

4 Procedure

4.1 Positioning of components

Place the glass pane on top of the flat ring, so that no edge is less than 25 mm from the edge of the hole in the ring. In the case of obscured glass, the obscured surface shall be upwards.

Position the punch (component No. 3) centrally over the flat ring.

Interpose a pad (component No. 4) between the glass pane and the punch.

4.2 Proof load

Apply a load to the punch, increasing steadily, at a rate of 1 000 N per second, until the appropriate proof load given in table 2 is reached.

Table 2 — Proof loads

Thickness of glass pane		Proof load with test apparatus	
nom. mm	tol. mm	Form A N	Form B N
6	± 0,2	3 400	3 500
8	± 0,3	6 500	6 700
10		10 200	11 000
12		15 500	—
15	± 0,5	24 000	—
19	± 1	33 400	—

Maintain the specified load for 5 s and then gradually remove the load.

4.3 Test result

The glass pane shall remain unbroken and shall show no signs of damage.

5 Marking

5.1 Toughened safety glass panes, tested in accordance with this International Standard, shall be marked as follows:

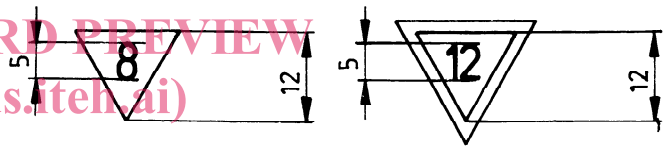
a) Clear glass panes: Single inverted equilateral triangle with the nominal thickness of the glass shown within the triangle.

b) Obscured glass panes: Double inverted equilateral triangle with the nominal thickness of the glass shown within the triangle.

NOTE — Marking is applied after the obscuring process but before toughening.

5.2 Markings shall have the minimum dimensions shown in figure 2.

Dimensions in millimetres



a) Clear glass b) Obscured glass

Figure 2 — Examples of markings

This page intentionally left blank

This page intentionally left blank

UDC 629.12.011.83 : 666.181 : 620.17

Descriptors: shipbuilding, windows, rectangular windows, portholes, glass, safety glass, heat-treated glass, tests, non-destructive tests, marking.

Price based on 3 pages