INTERNATIONAL STANDARD 3254

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Shipbuilding — Toughened safety glass panes for ships' rectangular windows

Construction navale — Verres de sécurité trempés pour fenêtres rectangulaires de navires

First edition — 1975-12-15

UDC 629.12.011.83 : 691.615

Ref. No. ISO 3254-1975 (E)

Descriptors : shipbuilding, glass, safety glass, windows.

Price based on 5 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

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.

International Standard ISO 3254 was drawn up by Technical Committee ISO/TC 8, *Shipbuilding*, and circulated to the Member Bodies in October 1973.

It has been approved by the Member Bodies of the following countries :

Australia	India	Portugal
Austria	Israel	Romania
Belgium	Italy	Spain
Czechoslovakia	Japan	Sweden
Egypt, Arab Rep. of	Mexico	Thailand
Finland	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Norway	U.S.S.R.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Bulgaria
Poland

Printed in Switzerland

Shipbuilding — Toughened safety glass panes for ships' rectangular windows

1 SCOPE AND FIELD OF APPLICATION

This International Standard gives definitions and specifies materials and finish, dimensions for interchangeability, tolerances, parallelism and flatness, maximum pressure heads, testing, marking and designation of clear and obscured toughened safety glass panes for ships' rectangular windows.[1)]

2 REFERENCES

ISO 614, *Shipbuilding — Non-destructive strength testing of toughened safety glasses for ships' side scuttles and rectangular windows — Punch method.*[2)]

ISO 3903, *Shipbuilding — Ships' ordinary rectangular windows.*[3)]

3 DEFINITIONS

For the purposes of this International Standard, the following definitions apply.

3.1 safety glass : Glass which, if fractured, gives fragments which are less liable to cause severe cuts than fragments of ordinary glass.

3.2 toughened safety glass : Glass which has been converted to safety glass by subjection to a process of heating and rapid cooling so that, if fractured, it disintegrates into small pieces and, in addition, its liability to fracture under the action of external forces or changes of temperature is greatly reduced.

4 MATERIAL

Toughened safety glass in the following kinds of manufacture :

— plate glass, float or polished (code letter : Y), or

— sheet glass (code letter : Z).

5 FINISH

Clear . . . . . (code No. 1), or

obscured . . . . . (code No. 2)

for example frosted on one side.

NOTE — The process of obscuring transparent glass has to be effected before the procedure of toughening.

6 DIMENSIONS AND TOLERANCES

6.1 Main dimensions and thicknesses

The nominal thicknesses t of toughened safety glass panes for ships' rectangular windows complying with the requirements of ISO 3903 are given in table 1. These thicknesses apply to clear glass panes and to glass panes with an obscured surface on one side.

1) For wheelhouse windows with dimensions other than those given in this International Standard, see the annex.

2) Under revision.

3) At present at the stage of draft.

TABLE 1

Dimensions in millimetres

Window		w		h		r	t*				
No.	Nominal size	min.	max.	min.	max.		8	10	12	15	19
1	300 × 425	314	318	439	443	58	X	X	(X)	(X)	
2	355 × 500	369	373	514	518	58	X	X	(X)	(X)	
3	400 × 560	414	418	574	578	58	X		X		(X)
4	450 × 630	464	468	644	648	108	X		X		(X)
5	500 × 710	514	518	724	728	108		X		X	
6	560 × 800	574	578	814	818	108		X		X	
7	900 × 630	914	918	644	648	108			X		X
8	1 000 × 710	1 014	1 018	724	728	108			X		X
9	1 100 × 800	1 114	1 118	814	818	108				X	

* X for clear glass panes and obscured glass panes. (X) for obscured glass panes only.

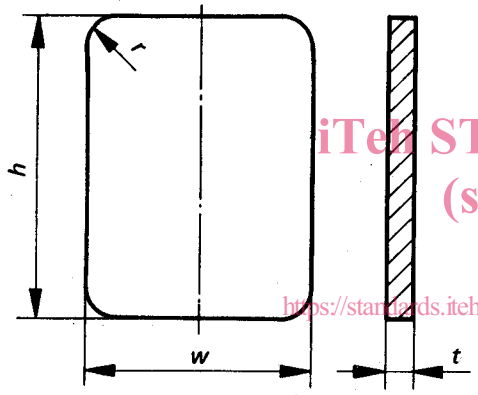

FIGURE 1 – **Toughened safety glass pane**

Nominal size = clear light dimensions of window

w = width of glass pane

h = height of glass pane

r = radius of glass pane corner

t = nominal thickness of glass pane

6.2 Tolerances on thickness

TABLE 2

Values in millimetres

t	Tolerance	
	Plate glass	Sheet glass
8	± 0,3	± 0,5
10		± 0,6
12		± 0,7
15	± 0,5	± 1,0
19	± 1,0	

6.3 Edges

All edges shall be arrissed and finished to remove sharpness and roughness. Edges of glass panes of nominal thickness over 12 mm shall be either ground flat and arrissed or finished by some other such process, providing the finished size conforms to the dimensional tolerances specified in table 1. The width s and depth y of the arris shall not exceed the dimensions given in table 3. Arrissing and/or grinding shall be carried out before toughening the glass.

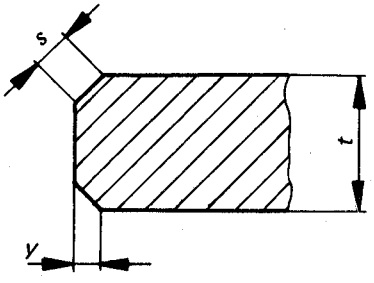

FIGURE 2 – **Glass edges**

TABLE 3

Dimensions in millimetres

t	s max.	y max.
8 10	1,4	1,0
12 15 19	2,0	1,4

7 PARALLELISM

The deviation from parallelism (f) between the two surfaces of a clear glass pane shall not exceed the values given in tables 4 and 5.

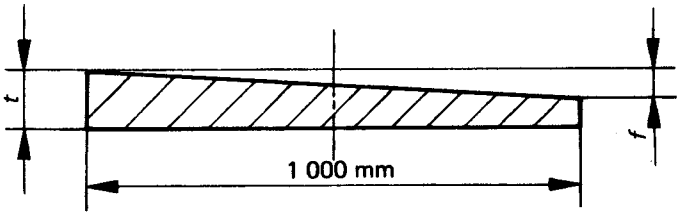

FIGURE 3 – **Parallelism**

7.1 Parallelism related to material

TABLE 4

Dimensions in millimetres

t	f	
	Plate glass	Sheet glass
8	0,2	0,4
10		0,6
12		
15		
19		

7.2 Parallelism according to location in ship

TABLE 5

Dimensions in millimetres

t	f	
	Cabins	Wheelhouses Observation rooms Public rooms
8	0,4	0,2
10	0,6	
12		
15		
19		

8 FLATNESS

Bow in glass panes shall not exceed the value given in figure 4.

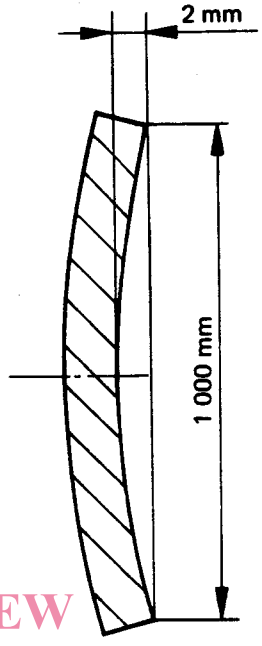

FIGURE 4 – **Flatness**

9 MAXIMUM PRESSURE HEADS

The maximum pressure heads H to which clear toughened safety glass panes glazed on all four edges shall be subjected are given in table 6.

TABLE 6

Window		Maximum pressure heads H in metres				
No.	Nominal size	for glass thickness t in millimetres				
		8	10	12	15	19
1	300 × 425	6,3	9,9	–	–	–
2	355 × 500	4,5	7,1	–	–	–
3	400 × 560	3,6	–	8,0	–	–
4	450 × 630	2,8	–	6,3	–	–
5	500 × 710	–	3,6	–	8,0	–
6	560 × 800	–	2,8	–	6,4	–
7	900 × 630	–	–	3,2	–	8,1
8	1 000 × 710	–	–	2,5	–	6,4
9	1 100 × 800	–	–	–	3,1	–

NOTES

1 The maximum pressure head H is expressed in metres of water column (1 $mH_2O \approx 1\ N/cm^2$).

2 The values of H to be taken into consideration are those given in the regulations of the Classification Societies for the parts of the ship in which the windows are to be fitted.

3 When an obscured toughened glass pane is fixed with the obscured surface facing outwards, it is not necessary to use thicker glass than that given for clear glass panes. However, the glass pane may become transparent when wet.

4 When an obscured toughened glass pane is fixed with the obscured surface facing inwards, then the pressure head obtained from table 6 shall be reduced by 45 %, which means that glass of two thicknesses greater than for clear glass panes shall be used.

5 The maximum pressure heads to which glass panes for wheelhouse windows, not in sizes given in table 6 and again glazed on all four edges, shall be subjected can be calculated using the method given in the annex.

10 TESTING

Each glass pane shall be tested in accordance with ISO 614.

11 MARKING

Each glass pane shall be marked as indicated in ISO 614.

12 DESIGNATION

Glass panes conforming to this International Standard shall be designated by the following indications, in the order given :

- number of this International Standard
- window number (table 1)
- nominal thickness of the glass pane (table 1)
- material (clause 4)
- finish (clause 5)

Example :

The designation for a toughened safety glass pane for window No. 6 (nominal size 560 mm × 800 mm) and nominal thickness $t = 10$ mm, made of sheet glass (Z), finish clear (1) is :

Glass pane ISO 3254 – 6 – 10 – Z1

ANNEX

MAXIMUM PRESSURE HEADS – WHEELHOUSE WINDOWS

Where one or both dimensions of a wheelhouse window are different from those given in table 6, the maximum allowable pressure shall be determined using the following formula :

$$H = \frac{4\,000\,t^2}{\beta\,b^2}$$

where

H is the design pressure head, in metres of water column;

t is the nominal thickness of the glass pane, in millimetres;

β is the factor obtained from the graph in figure 5;

b is the minor dimension of the window, in millimetres.

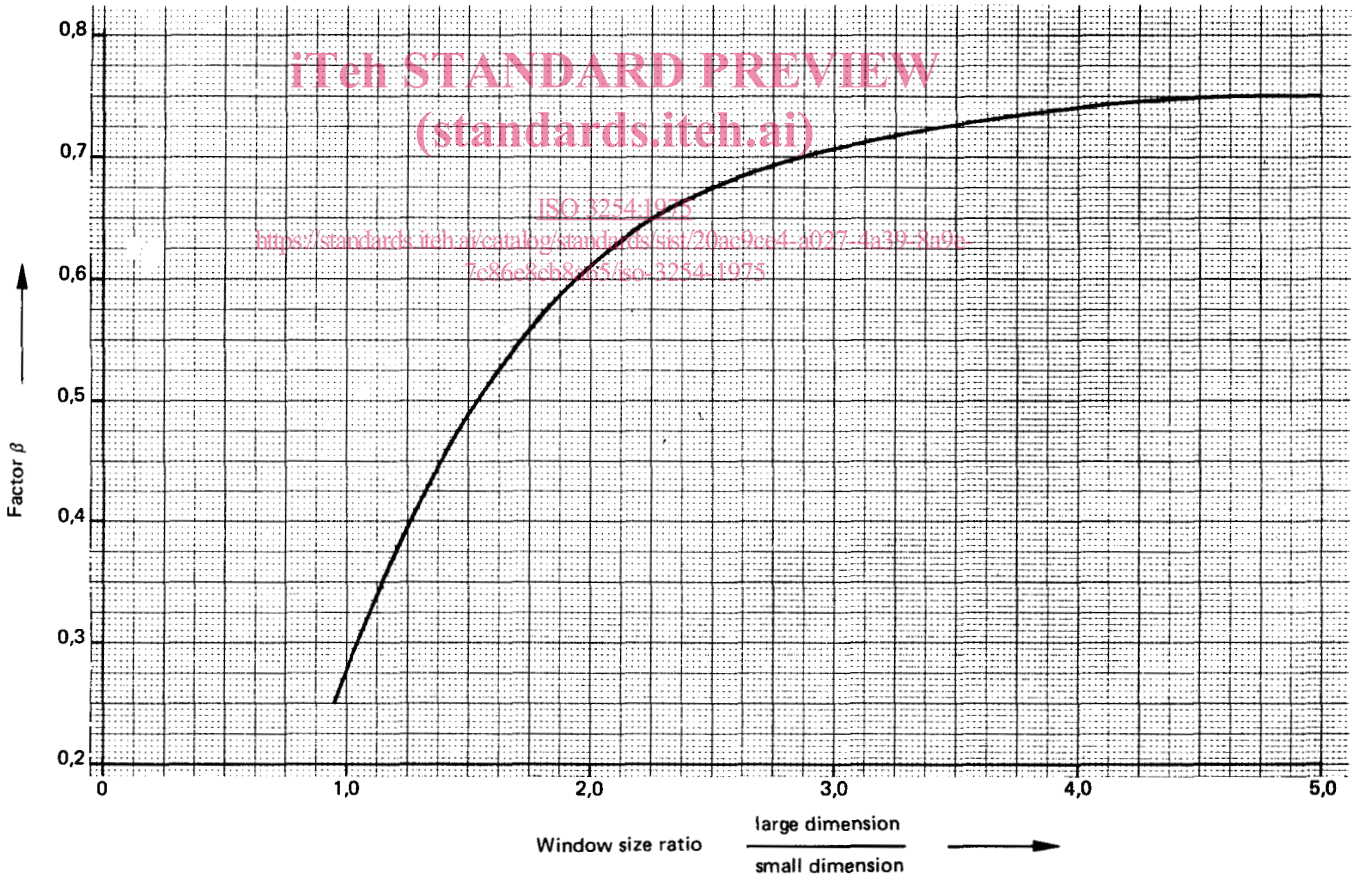

FIGURE 5 – **Curve for the determination of factor β based on window size ratio**