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Ships and marine technology — Thermally toughened safety glass panes for windows and side scuttles

Navires et technologie maritime — Verres de sécurité trempés thermiquement pour fenêtres et hublots

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 8, *Ship design*.

This third edition cancels and replaces the second edition (ISO 21005:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Annex A: deleted factor α from equation for rectangular windows;

— Annex A: replaced factor α in equation for side scuttles with value 1,21.

Ships and marine technology — Thermally toughened safety glass panes for windows and side scuttles

1 Scope

This document specifies materials and finish, dimensions for interchangeability, tolerances, parallelism and flatness, testing, marking and designation of thermally toughened safety glass panes for windows complying with ISO 3903 and side scuttles complying with ISO 1751.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 614, *Ships and marine technology — Toughened safety glass panes for rectangular windows and side scuttles — Punch method of non-destructive strength testing*

ISO 1751, *Ships and marine technology — Ships' side scuttles*

ISO 3903, *Ships and marine technology — Ships' ordinary rectangular windows*

ISO 6345, *Shipbuilding and marine structures — Windows and side scuttles — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6345 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org

3.1
batch of glass panes
quantity of glass panes of the same nominal size and nominal thickness, produced in the same process under consistent controlled conditions

4 Material

Thermally toughened safety glass shall be manufactured of plate glass, either float or polished.

5 Finish

The finished glass pane shall meet the strength requirement of ISO 614. If the finishing method used on the glass pane lowers its strength below the strength required by ISO 614 for the untreated plate, either the finishing method needs to be changed or a thicker glass pane shall be used.

6 Dimensions and tolerances

6.1 Dimensions, thicknesses and nominal sizes

6.1.1 Ordinary rectangular windows

The thicknesses of glass panes for windows complying with the requirements of ISO 3903 are shown in Figure 1 and given in Table 1.

Dimensions in millimetres

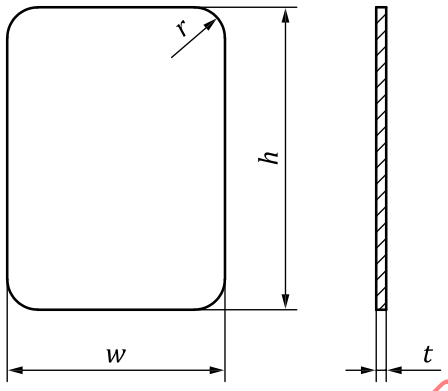


Figure 1 — Dimensions of glass pane

Table 1 — Dimensions of glass panes for ordinary rectangular windows

Dimensions in millimetres

Nominal size	Width		Height		Radius	Thickness[a]				
						t				
$w_1 \times h_1$	*w*		*h*		*r*	8	10	12	15	19
	min.	max.	min.	max.		±0,3	±0,3	±0,3	±0,5	±1
300 × 425	314	318	439	443	58	F	F	—	—	—
355 × 500	369	373	514	518	58	F	F	—	—	—
400 × 560	414	418	574	578	58	F	F	E	—	—
450 × 630	464	468	644	648	108	F	F	E	—	—
500 × 710	514	518	724	728	108	—	F	F	E	—
560 × 800	574	578	814	818	108	—	F	F	E	—
900 × 630	916	920	646	650	109	—	—	F	F	E
1 000 × 710	1 016	1 020	726	730	109	—	—	F	F	E
1 100 × 800	1 116	1 120	816	820	109	—	—	—	F	—

[a] Type E for heavy-type window, Type F for light-type window in accordance with ISO 3903.

6.1.2 Side scuttles

The diameters, *d*, and the thicknesses, *t*, of thermally toughened safety glass panes for side scuttles complying with the requirements of ISO 1751 are shown in Figure 2 and given in Table 2.

The nominal sizes given in Table 2 are the clear light diameters of the side scuttles.

Dimensions in millimetres

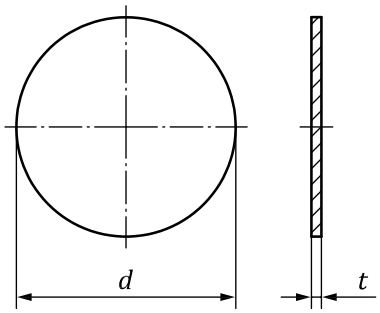


Figure 2 — Dimensions of glass panes for side scuttles

Table 2 — Dimensions of glass panes for side scuttles

Dimensions in millimetres

Nominal size d_1	Diameter d		Thickness[a] t					
	min.	max.	8 ±0,3	10 ±0,3	12 ±0,3	15 ±0,5	19 ±1	25 ±1
200	213	215	B, C	A	—	—	—	—
250	263	265	B, C	B	A	—	—	—
300	316	319	C	B	B	A	—	—
350	366	369	C	C	B	A	—	—
400	416	419	C	C	B	B	A	—
450	466	469	—	C	C	B	B	A

[a] Type A for heavy-type side scuttle, Type B for medium-type side scuttle and Type C for light-type side scuttle in accordance with ISO 1751.

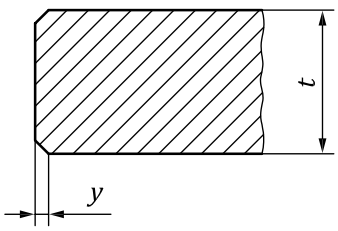
6.1.3 Other dimensions

Dimensions other than those listed in 6.1.1 and 6.1.2 may be agreed on between the parties concerned. The thickness shall be calculated in accordance with Annex A.

6.2 Edges

All edge work shall be smooth ground and carried out before toughening the glass. See Figure 3.

Dimesions in millimetres



Key

1 mm < y < 2 mm

Figure 3 — Glass edges

7 Parallelism

The deviation from parallelism between the two surfaces of a clear glass pane shall not exceed the value given in Figure 4.

Dimensions in millimetres

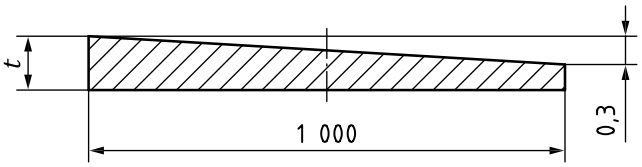


Figure 4 — Parallelism

8 Flatness

The tolerance on flatness in glass panes shall not exceed that shown in Figure 5.

Dimensions in millimetres

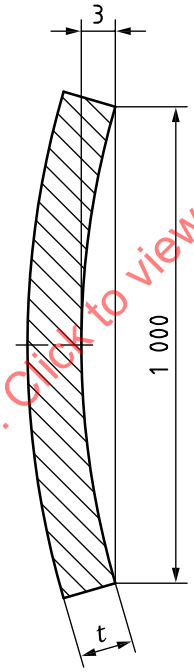


Figure 5 — Flatness

9 Testing

The glass panes shall be tested in accordance with ISO 614.

9.1 Sampling of glass panes

Each batch of glass panes shall be tested separately.

Where a batch consists of four glass panes or less, each of the glass panes shall be tested.

Where a batch consists of more than four glass panes, the test shall be carried out on a random sample of four glass panes, or on 2 % of the batch, whichever figure is the greater.

9.2 Acceptance conditions

The following acceptance conditions are specified:

a) The tested glass panes shall remain unbroken and shall show no signs of damage.

b) If each sample glass pane tested remains unbroken, the whole batch shall be accepted.

c) If one sample glass pane breaks during the test, a complete re-test shall be carried out on a further sample taken from the same batch.

d) If

— more than one glass pane breaks in the first test, or

— a further glass pane breaks in the re-test,

the batch shall be rejected.

9.3 Marking

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