INTERNATIONAL STANDARD

ISO 3434

Second edition
1992-12-15

Shipbuilding and marine structures — Heated glass panes for ships' rectangular windows

Construction navale et structures maritimes — Vitrages chauffants pour fenêtres rectangulaires de navires

Reference number
ISO 3434:1992(E)

Contents

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Annex

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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 3434 was prepared by Technical Committee ISO/TC 8, *Shipbuilding and marine structures*, Sub-Committee SC 8, *Windows and side scuttles*.

This second edition cancels and replaces the first edition (ISO 3434:1979), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

Shipbuilding and marine structures — Heated glass panes for ships' rectangular windows

1 Scope

This International Standard specifies construction characteristics, optical qualities and heating circuit, dimensions for interchangeability (outer dimensions and glass thickness), tests, marking and designation of heated glass panes for ships' rectangular windows (H series: see ISO 3903:—, subclause 4.1.3).

It includes the conditions with which they are required to comply to ensure the safety of ships in times of frost or snow, particularly during manoeuvres in port.

Heated glass panes are used on ships principally for the windows of wheel-houses and bridges, and also in enclosed locations used for look-out and manoeuvring purposes. This International Standard specifies heated glass panes which are intended for use at temperatures down to − 40 °C.

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 indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 554:1976, *Standard atmospheres for conditioning and/or testing — Specifications.*

ISO 614:1989, *Shipbuilding and marine structures — Toughened safety glass panes for rectangular windows and side scuttles — Punch method of non-destructive strength testing.*

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

ISO 3903:—[1], *Shipbuilding and marine structures — Ships' ordinary rectangular windows.*

ISO 5779:1987, *Shipbuilding — Ordinary rectangular windows — Positioning.*

IEC 92-101:1980, *Electrical installations in ships — Part 101: Definitions and general requirements.*

IEC 529:1989, *Degrees of protection provided by enclosures (IP Code).*

3 Optical requirements

3.1 Requirements

When fixed in a window which is installed on board a ship, heated glass panes shall comply with the optical requirements in 3.2 and 3.3.

All the optical requirements shall apply whether the temperature control gear is cyclic or whether the heated glass pane is equipped with a temperature-regulating device (for example a thermostat).

However, these optical qualities are not required at the periphery of the glass pane within a band 50 mm wide measured from the edge of the window frame.

1) To be published. (Revision of ISO 3903:1977)

3.2 Visibility

Heated glass panes shall ensure perfect visibility in all weathers, avoiding the formation of mist or frost, in relation to the power loading (see table 5). They shall, in addition, ensure maximum efficiency of the windscreen wipers when operating in conditions of frost or snow. They shall not cause any significant reduction in the resolving power of the eye or of binoculars when a distant object is observed at normal incidence through the glass.

Tinted glass shall not be used.

When discrepancies of interpretation about visibility arise, they are subject to agreement between purchaser and manufacturer.

3.3 Deterioration in colour

Heated glass panes shall not cause any marked deterioration in perception of colour, in particular of beacons and lights on buoys.

When discrepancies of interpretation about deterioration in colour arise, they are subject to agreement between purchaser and manufacturer.

4 Construction of glass pane

4.1 General

A complete mountable heated glass pane that meets the requirements of this International Standard is a component unit, consisting of a laminated glass pane and a firmly mounted device for the electrical connection.

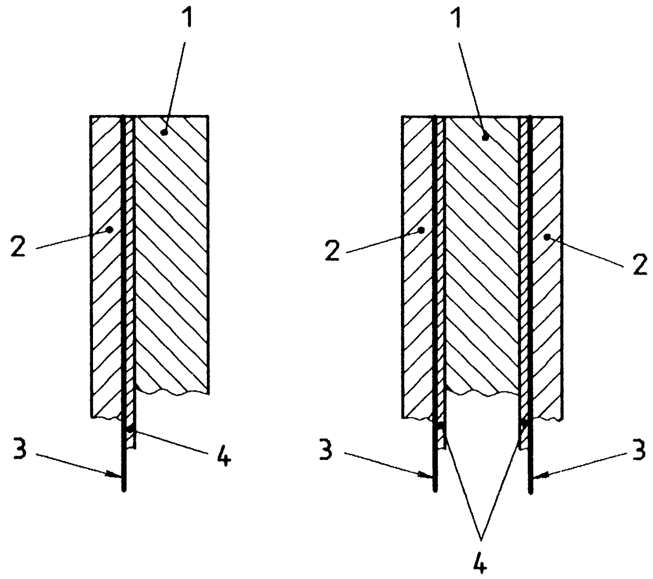
4.2 Composition, types and materials

The composition of the laminated glass pane shall be as shown in figure 1 and table 1.

A distinction is made between type A, with two glass panes, and type B, with three glass panes.

Table 1 — Components of heated glass pane

Component No. (see figure 1)	Term
1	Carrier pane
2	Cover pane
3	Heating element
4	Inter-layer



Type A, with two glass panes

Type B, with three glass panes

Figure 1 — Cross-section of heated glass panes (not to scale)

4.2.1 Carrier pane

4.2.1.1 The carrier pane shall have the glass pane thickness specified in ISO 3254 with regard to the location of the rectangular window in the ship as specified in ISO 5779.

The maximum allowable pressure of the carrier pane shall be as given in ISO 3903.

4.2.1.2 This carrier pane shall be manufactured from clear toughened safety glass in accordance with ISO 3254.

4.2.2 Cover pane

The cover pane carries or protects the heating element. It is thinner than the carrier pane. The material shall be clear toughened or semi-toughened safety glass.

4.2.3 Heating element

The heating element consists of a thin wire, a transparent conductive film or a transparent conductive coating.

4.2.4 Inter-layer

The inter-layer consists of a thin plastics material (foil) of 0,76 mm minimum thickness.

4.3 Protection of edges

In order to avoid any penetration of humidity or any other form of chemical attack between the layers of the laminate, and to protect the edges against impact as well as to ensure durable electrical insulation, the periphery of the glass pane shall be protected by materials such as silicone, rubbers, polysulfides or similar, compatible with the plastics inter-layers of the laminate.

This edge protection shall be bonded to the edge and not thicker than 3 mm (see figure 2).

Dimensions in millimetres

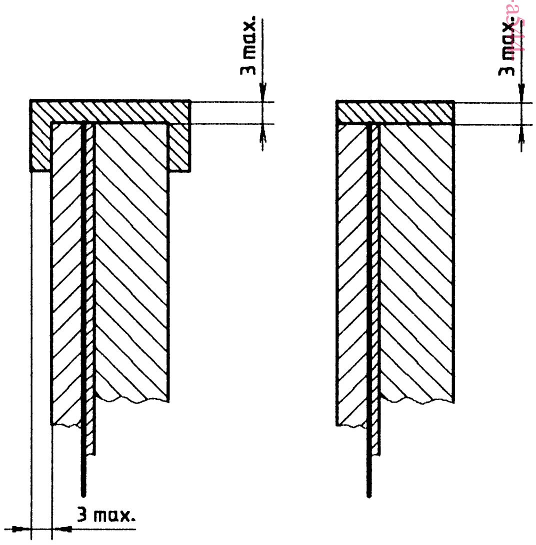


Figure 2 — Protection of edges

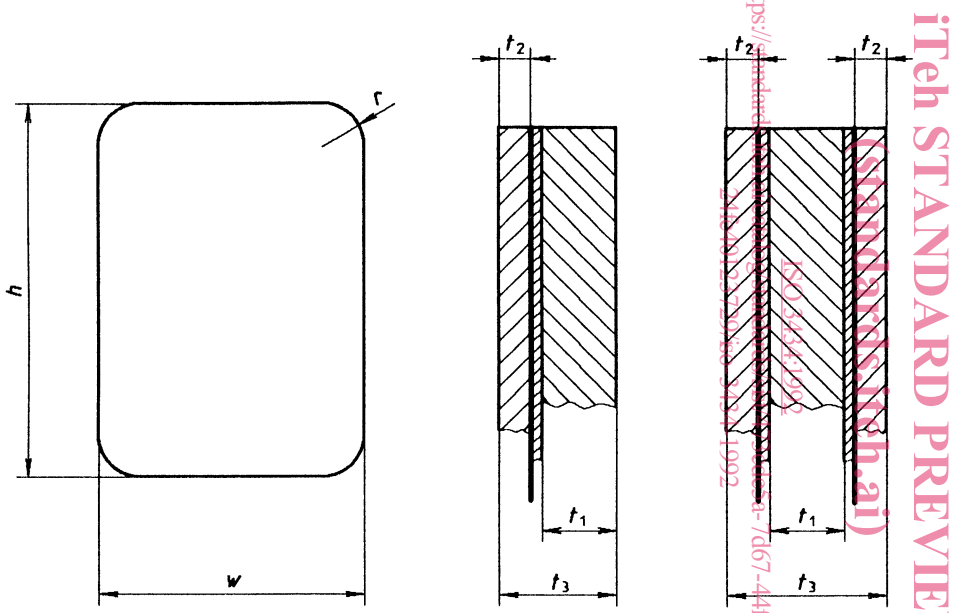
4.4 Dimensions

4.4.1 Main dimensions and thicknesses

The main dimensions of a heated glass pane shall be as shown in figure 3, and given in tables 2 and 3.

The dimensions w, h, r and t_1 shown in figure 3 are in accordance with ISO 3254. For the carrier pane using thickness t_1, glass panes in accordance with ISO 3254 shall be used.

NOTE 1 Thickness t_1 is the designating thickness for heated glass panes.



t_1 = nominal thickness of carrier glass pane
t_2 = nominal thickness of cover glass pane

Figure 3 — Dimensions of heated glass pane

Table 2 — Outer dimensions

Dimensions in millimetres

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

1) In accordance with ISO 3903:1992, table 2.
2) Clear light dimension of window.

Table 3 — Thicknesses of glass pane

Dimensions in millimetres

Window		Thicknesses[1]					
Code No.[2]	Nominal size[3]						
		t_3 type A [4]	13	15	17	20	24
		t_3 type B [4]	18	20	22	25	29
		t_1 [5]	8	10	12	15	19
		t_2	4	4	4	4	4
1	300 × 425		X	X			
2	355 × 500		X	X			
3	400 × 560		X		X		
4	450 × 630		X		X		
5	500 × 710			X		X	
6	560 × 800			X		X	
7	900 × 630				X		X
8	1 000 × 710				X		X
9	1 100 × 800					X	

1) Standardized sizes are marked with X.
2) In accordance with ISO 3903:—, table 2.
3) Clear light dimension of window.
4) See figure 1.
5) See NOTE 1 in 4.4.1.