INTERNATIONAL STANDARD

ISO 3903

Second edition
1993-02-15

Shipbuilding and marine structures — Ships' ordinary rectangular windows

Construction navale et structures maritimes — Fenêtres rectangulaires de type courant pour navires

Reference number
ISO 3903:1993(E)

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

Printed in Switzerland

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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 3903 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 3903:1977), of which it constitutes a technical revision.

Annexes A and B form an integral part of this International Standard.

Shipbuilding and marine structures — Ships' ordinary rectangular windows

1 Scope

This International Standard specifies the classification of ordinary rectangular windows for ships (series, types and models), and gives the dimensions for interchangeability and construction, materials, tests, marking and designation of these windows.

NOTE 1 This International Standard is based on the experience of ships' window and glass manufacturers, shipbuilders and authorities who apply to ships the Regulations of the *International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974)*, with Amendments, 1981, and of the *International Convention on Load Lines, 1966*.

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 261:1973, *ISO general purpose metric screw threads — General plan.*

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 1207:1992, *Slotted cheese head screws — Product grade A.*

ISO 1580:1983, *Slotted pan head screws — Product grade A.*

ISO 2009:1983, *Slotted countersunk flat head screws (common head style) — Product grade A.*

ISO 2010:1983, *Slotted raised countersunk head screws (common head style) — Product grade A.*

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

ISO 3434:1992, *Shipbuilding and marine structures — Heated glass panes for ships' rectangular windows.*

ISO 3902:1990, *Shipbuilding and marine structures — Gaskets for rectangular windows and side scuttles.*

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

ISO 5797-1:1989, *Shipbuilding and marine structures — Windows and side scuttles for fire-resistant constructions — Specifications — Part 1: "B" class divisions.*

ISO 6345:1990, *Shipbuilding and marine structures — Windows and side scuttles — Vocabulary.*

ISO 7045:1983, *Cross-recessed pan head screws — Product grade A.*

ISO 7046-2:1990, *Cross-recessed countersunk flat head screws (common head style) — Grade A — Part 2: Steel of property class 8.8, stainless steel and non-ferrous metals.*

ISO 7047:1983, *Cross-recessed raised countersunk head screws (common head style) — Product grade A.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 6345 apply.

4 Classification

Rectangular windows shall be classified by series, types, models and nominal sizes in accordance with 4.1 to 4.4 respectively.

NOTE 2 A survey of standardized rectangular windows is given in 4.5 and table 3.

Further classification characteristics are the material classes (see 6.1 and table 13).

4.1 Series

4.1.1 Regular series (N)

Rectangular windows of the regular series shall contain a toughened safety glass pane that meets the requirements of ISO 3254.

4.1.2 Fire-resistant series (P)

Rectangular windows of the fire-resistant series shall be provided for installation in "A"[1] or "B" class divisions, containing a glass pane that meets the requirements of ISO 5797-1.

Modifications to the construction and installation of the glassholder and main frame, as well as additional testing and marking, shall be in accordance with ISO 5797-1.

4.1.3 Heated series (H)

Rectangular windows of the heated series shall contain a heated glass pane in accordance with ISO 3434.

NOTE 3 Modifications of the construction of glassholder or main frame are to be observed; see 5.1.2.

4.2 Types

Ships' ordinary rectangular windows may be of two types:

— Type E: Heavy-type rectangular window;

— Type F: Light-type rectangular window.

4.3 Models

Models shall be designated according to the following principal characteristics:

— opening or non-opening model;

— opening direction of glassholder;

— type of fastening.

The various combinations of these, which are in accordance with the definitions in ISO 6345, are laid down in table 1.

4.4 Nominal sizes

The nominal size is defined by the clear light dimension for width w_1 and height h_1 of the rectangular window, in millimetres, and is identified by a code number: see table 2.

4.5 Survey of types, models and sizes

A survey is given in table 3 for all rectangular windows standardized in this International Standard. It applies to window series N (regular), P (fire-resistant) and H (heated).

The illustrations given in table 3 do not define the construction; they are simplified examples for information only.

1) "A" class divisions will form the subject of a future part 2, ISO 5797-2.

Table 1 — Principal characteristics of models

Opening or non-opening	Opening direction			Fastening: bolted (B)	Fastening: welded (W)	Model designation code
opening	inwards (I)	side-hinged	left-hand (L)	B	—	ILB
				—	W	ILW
			right-hand (R)	B	—	IRB
				—	W	IRW
		top-hinged (T)		B	—	ITB
				—	W	ITW
	outwards (O)	side-hinged	left-hand (L)	B	—	OLB
				—	W	OLW
			right-hand (R)	B	—	ORB
				—	W	ORW
		top-hinged (T)		B	—	OTB
				—	W	OTW
non-opening (NO)				B	—	NOB
				—	W	NOW

Table 2 — Nominal sizes

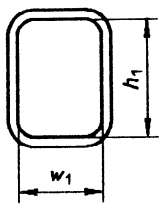
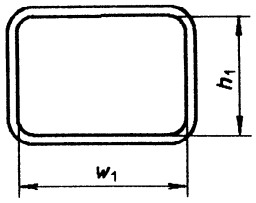
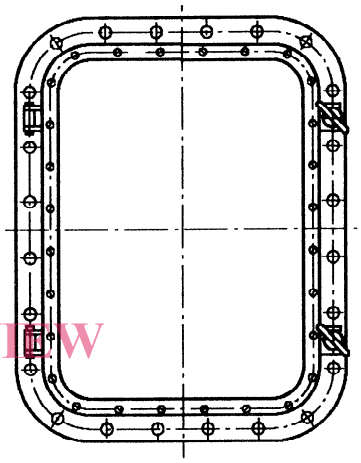
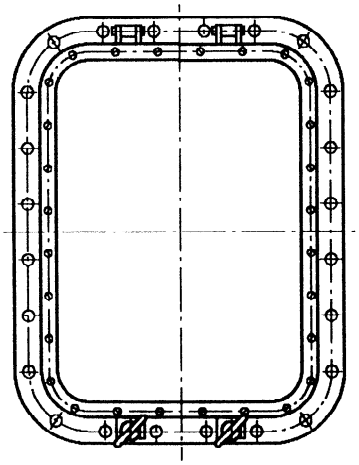
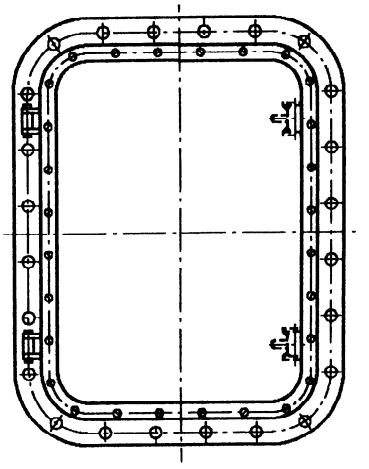
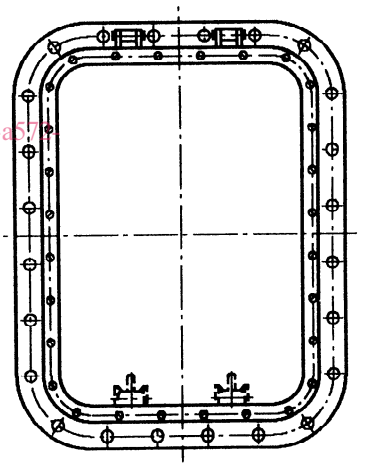
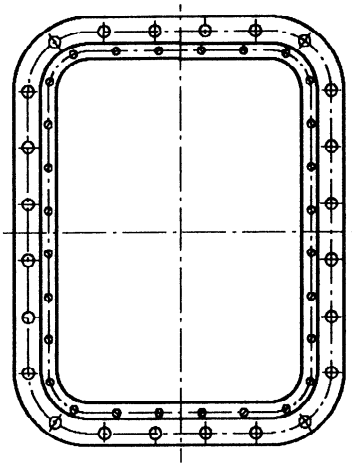
Code No.	Nominal size $w_1 \times h_1$ mm × mm	Illustration
1 2 3 4 5 6	300 × 425 355 × 500 400 × 560 450 × 630 500 × 710 560 × 800	
7 8 9	900 × 630 1 000 × 710 1 100 × 800	

Table 3 — Survey of rectangular windows

Type (see 4.2)	Model (see 4.3) bolted	Model (see 4.3) welded	Nominal sizes by code No. (see 4.4)	Illustration (shown are bolted windows)
Inwards opening side-hinged windows				
E	ILB	—	1 to 6	
	—	ILW		
	IRB	—		
	—	IRW		
F	ILB	—		
	—	ILW		
	IRB	—		
	—	IRW		
Inwards opening top-hinged windows				
E	ITB	—	4 to 8	
	—	ITW		
F	ITB	—	4 to 9	
	—	ITW		

Type (see 4.2)	Model (see 4.3) bolted	Model (see 4.3) welded	Nominal sizes by code No. (see 4.4)	Illustration (shown are bolted windows)
Outwards opening side-hinged windows				
E	OLB	—	1 to 6	
	—	OLW		
	ORB	—		
	—	ORW		
F	OLB	—		
	—	OLW		
	ORB	—		
	—	ORW		
Outwards opening top-hinged windows				
E	OTB	—	4 to 8	
	—	OTW		
F	OTB	—	4 to 9	
	—	OTW		

Type (see 4.2)	Model (see 4.3) bolted	Model (see 4.3) welded	Nominal sizes by code No. (see 4.4)	Illustration (shown are bolted windows)
Non-opening windows				
E	NOB	—	1 to 8	
F	—	NOW	1 to 9	

5 Technical requirements

5.1 General

Rectangular windows of all series, types, models and nominal sizes shall be manufactured to the requirements (dimensions, materials, etc.) given in this International Standard. They shall be capable of meeting the test requirements specified in clause 7.

5.1.1 Rectangular windows for fire-resistant constructions

In addition, for rectangular windows for fire-resistant constructions, the glassholder and the main frame shall be made of a material that keeps its mechanical characteristics at the temperatures given in ISO 5797-1.

They shall be designed so that temperature gradients do not cause stresses in the glass which could result in rupture.

5.1.2 Heated rectangular windows

For heated rectangular windows, deviations in the design of glassholder or main frame based on the thickness of the heated glass pane (see ISO 3434) and the electrical connection shall be taken into consideration.

5.2 Dimensions

5.2.1 Main dimensions

The main dimensions of rectangular windows shall be as given in figure 1 and tables 4 and 5. The correlation between nominal sizes and types and models shall be as given in table 3.

NOTE 4 Figure 1 does not define the construction of any series, type, model or size of rectangular window; it is given for the indication of standardized dimensions only. The illustration shows an inwards opening side-hinged rectangular window.

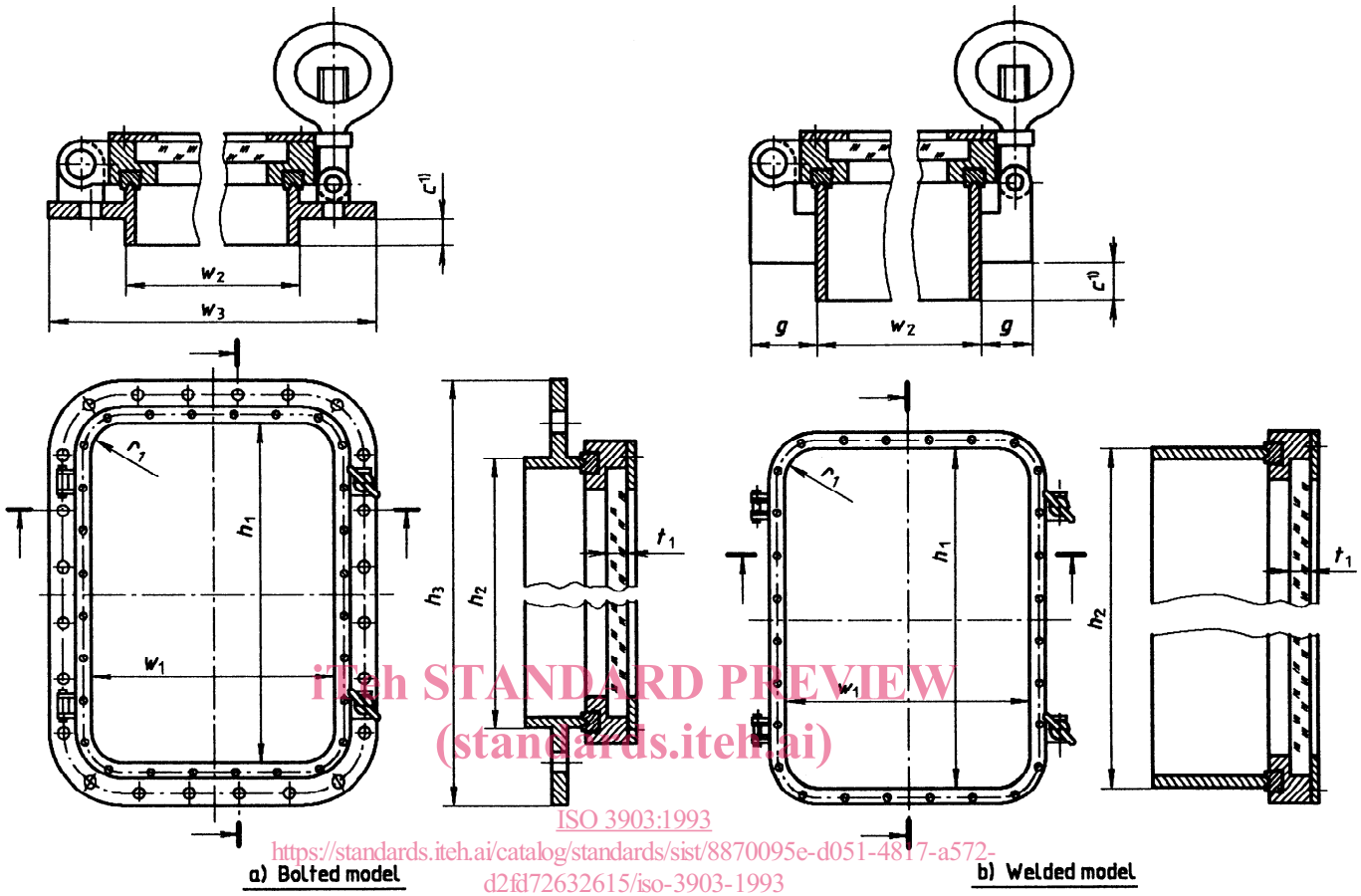
5.2.2 Corner radii

The basic radius is the corner radius r_1 of the clear light size (see table 4).

The values of the other radii shall be as follows:

— spigot outside corner radius and welding-in main frame outside corner radius: $r_2 = r_1 + 24$ mm;

— flange outside corner radius: $r_3 = r_1 + 65$ mm max.



1) For the spigot height (dimension *c*), see 5.2.3 and table 6.

Figure 1 — Main dimensions of rectangular window

Table 4 — Main dimensions and number of fasteners

Dimensions in millimetres

Code No.	Nominal size $w_1 \times h_1$	w_2 ± 2	h_2 ± 2	w_3 max.	h_3 max.	g max.	r_1 1)	Minimum number of fasteners 2)
1	300 × 425	348	473	430	555	41	50	4
2	355 × 500	403	548	485	630	41	50	4
3	400 × 560	448	608	530	690	41	50	4
4	450 × 630	498	678	580	760	41	100	4
5	500 × 710	548	758	630	840	41	100	6
6	560 × 800	608	848	690	930	41	100	6
7	900 × 630	948	678	1 030	760	41	100	6
8	1 000 × 710	1 048	758	1 130	840	41	100	8
9	1 100 × 800	1 148	848	1 230	930	41	100	8

1) For corner radii r_2 and r_3, see 5.2.2.

2) The number of fasteners includes only closing devices and hinges with round holes: see 5.6.