INTERNATIONAL STANDARD

ISO 3904

Second edition
1990-06-15

Shipbuilding and marine structures — Clear-view screens

Construction navale et structures maritimes — Hublots tournants

Reference number
ISO 3904:1990(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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 3904 was prepared by Technical Committee ISO/TC 8, *Shipbuilding and marine structures*.

This second edition cancels and replaces the first edition (ISO 3904:1976), clauses 4.2.4, 4.5.2 and 7, and table 3 of which have been technically revised.

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Shipbuilding and marine structures — Clear-view screens

1 Scope

This International Standard specifies the requirements for the design and construction (including dimensions, tolerances, materials and electrical equipment), as well as the designation and the installation, of clear-view screens, principally for use in ships.

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 48:1979, *Vulcanized rubbers — Determination of hardness (Hardness between 30 and 85 IRHD).*

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

IEC 34, *Rotating electrical machines* (all parts).

IEC 92, *Electrical installations in ships* (all parts).

3 Description

The purpose of a clear-view screen is to ensure clear vision in any weather condition or in heavy sea. Clear-view screens, according to this International Standard, consist of a metal main frame with a rapidly rotating glass disc driven by an electric motor.

Because of the rotation of the glass disc, spray, rain (heavy and light), hail, sleet and snow are thrown off immediately, and moisture does not cling to the screen, so that continuously clear vision through the glass disc is ensured.

4 Design and construction

4.1 Classification

The screens shall be classified by type, according to the position of the driving electric motor (see figure 1), as follows:

- **type A**: Driving motor mounted at the upper part of the main frame in an offset position;
- **type B**: Driving motor mounted at the side of the main frame in an offset position;
- **type C**: Driving motor mounted at the centre of the glass disc.

The motor is always mounted on the inner side of the clear-view screen.

4.2 Basic requirements

4.2.1 Drive

The drive of the glass disc shall be as follows:

- types A and B: by means of an endless driving belt;
- type C: direct.

4.2.2 Rotational speed

The rotational speed of the glass disc shall be not less than 1 600 r/min.

4.2.3 Operation

In order to ensure vibrationless and noiseless operation, the glass disc shall be balanced. Admissible mass excentricity in axial and radial directions is given in table 4.

4.2.4 Clearance

The distance (clearance) between the outside edge of the complete glass disc and the main frame of the clear-view screen shall not be greater than 2 mm.

4.2.5 Main frame

The height of the main frame shall be such as to ensure that it can be installed in glass panes with nominal thicknesses up to 19 mm, in accordance with ISO 3254.

4.2.6 Glass disc

See clause 6.

4.3 Main dimensions

The main dimensions of the screens shall be as given in table 1 and figure 1.

The figures do not define the construction; they are only intended to indicate the standardized dimensions.

Table 1 — Main dimensions of screen

Dimensions in millimetres

Type	A			B	C	
Nominal size[1)]	**280**	**330**	**380**	**280**	**300**	**350**
a max.	455	555	575	405	—	—
b max.	205	230	255	175	—	—
c max.	45	45	45	20	93	93
$d_1 \pm 0{,}5$	310	360	410	275	339	389
d_2	—	—	—	—	356	406

1) The nominal size is derived from the outside diameter of the glass disc: see table 4.

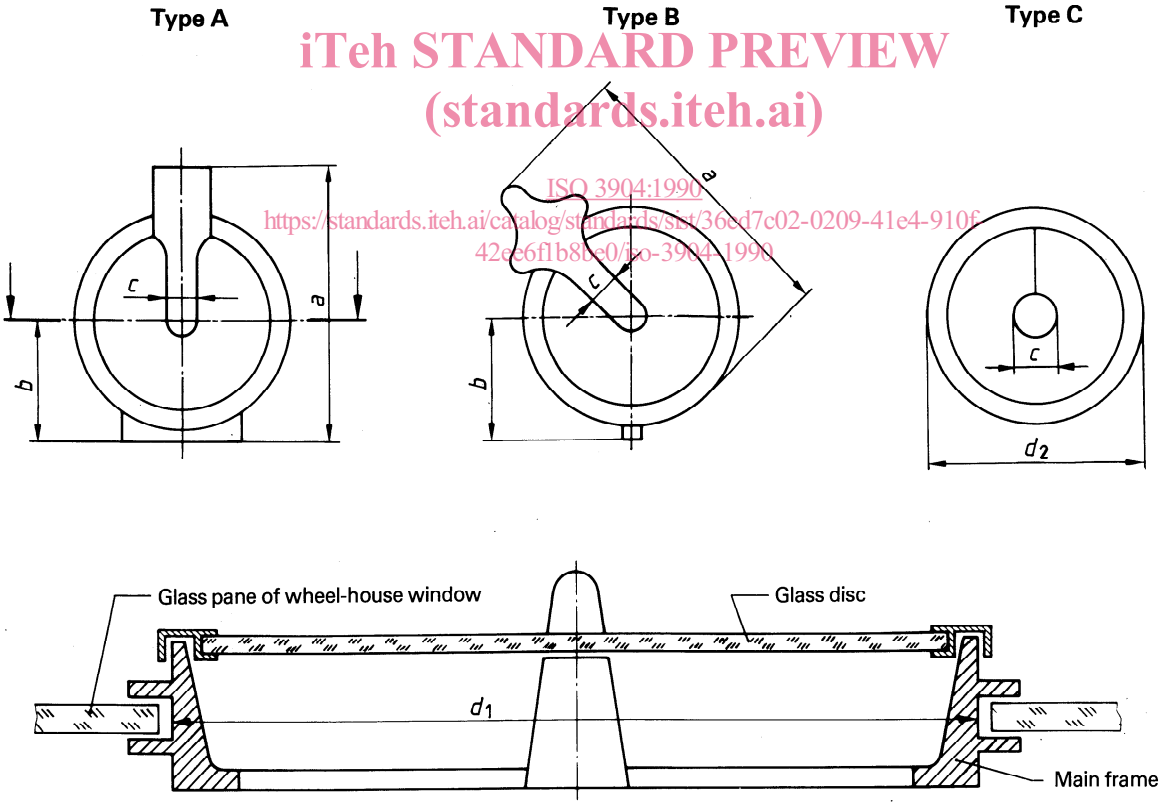

Figure 1 — Types and main dimensions of screen

4.4 Materials

4.4.1 Main frame

The main frame shall be manufactured from aluminium alloy or copper alloy having the minimum mechanical properties specified in table 2.

Table 2 — Mechanical properties of material for main frame

Code letters	Material	Tensile strength min.	Elongation min.
AL	Aluminium wrought alloy	140 N/mm²	3 %
CU	Copper alloy		

4.4.2 Other metal components

Metal components, other than the main frame, shall be manufactured from aluminium alloy, copper alloy, or corrosion-resistant steel.

4.4.3 Seals

The seals shall be made from natural or synthetic rubber, having the following properties:

— hardness 35 IRHD to 40 IRHD (IRHD = International Rubber Hardness Degrees), in accordance with ISO 48;

— seawater-resistant;

— ultra-violet light-resistant.

4.5 Electrical equipment

4.5.1 Cables, switchgear, control gear and transformers

The electrical equipment shall be in accordance with the requirements of IEC 92.

4.5.2 Electric motors

The electric motors shall be in accordance with the recommendations of IEC 34.

They need not be of totally enclosed construction (degree of protection IP 33 according to IEC 92) as they are situated inside the ship.

Motors shall be designed with a power output to ensure that the required speed specified in 4.2.2 is obtained in all weather conditions.

4.5.3 Current systems

See table 3.

Table 3 — Current systems

Supply	Voltage V	Frequency Hz	Identification number
d.c.	24	—	01
	110	—	02
	220	—	03
a.c. single phase	115	50	11
		60	12
	220	50	13
		60	14
a.c. three phase	115	50	31
		60	32
	220	50	33
		60	34

4.5.4 Radio-interference suppression devices

All clear-view screens shall be fitted with radio-interference suppression devices as generally provided on-board ships.

4.5.5 Provisions for de-icing

Normally de-icing means do not form part of the construction of a clear-view screen. Clear-view screens shall, however, be designed to ensure that, if desired, the subsequent installation of de-icing means may be carried out.

5 Designation

Complete clear-view screens conforming to this International Standard shall be designated as follows, in the order given:

a) denomination: "Clear-view screen";

b) number of this International Standard: ISO 3904;

c) type (4.1);

d) nominal size (table 1);

e) code letters of material of main frame (table 2);

f) current system identification number (table 3).

EXAMPLE

The designation for a clear-view screen type A of nominal size 330 mm, main frame made of copper alloy (CU), for a.c. three phase supply, voltage 220 V, with a frequency of 60 Hz (identification No. 34), is:

Clear-view screen ISO 3904 - A - 330 - CU - 34

6 Glass disc (designated by code letter Y)

6.1 Dimensions and tolerances

The glass disc shall meet the dimensions and tolerances shown in figure 2 and given in table 4.

6.2 Material

The glass disc shall be made of clear toughened safety glass in accordance with ISO 3254.

6.3 Designation

Glass discs for clear-view screens according to this International Standard shall be designated as follows, in the order given:

a) denomination: "Disc";

b) number of this International Standard: ISO 3904;

c) type: Y (clause 6);

d) outer diameter d_3 (table 4).

EXAMPLE

The designation for a glass disc (Y) of diameter d_3 = 330 mm is:

Disc ISO 3904 - Y - 330

7 Installation

Clear-view screens may be fitted in rectangular ships' windows (and wheel-house windows) or directly in metal walls.

The diameter, d_5, of the hole (cut-out) shall be as given in table 5. If clear-view screens are fitted in rectangular ships' windows the minimum distance, e, from the circumference of the hole to the dimensions of the clear light size of the window shall be as given in table 5 (see figure 3).

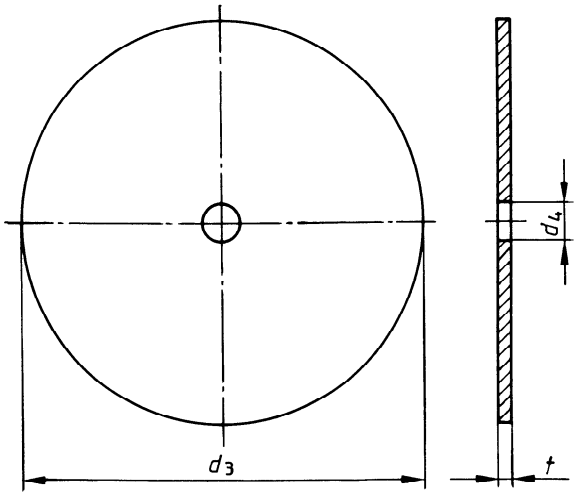

Figure 2 — Glass disc

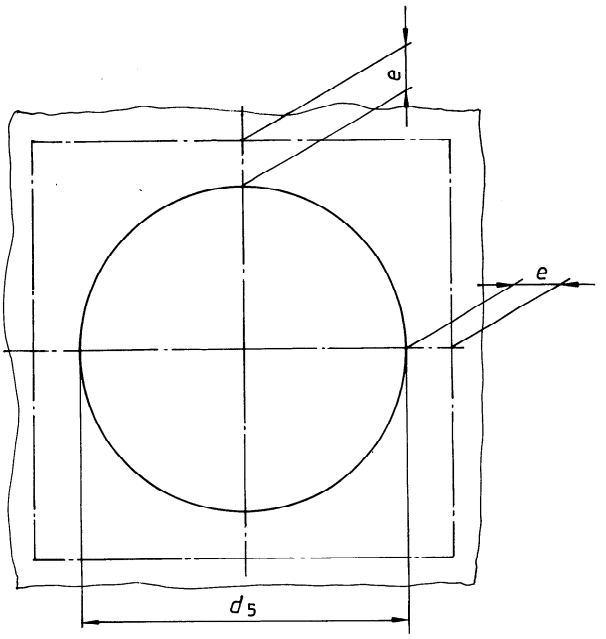

Figure 3 — Installation dimensions of screen

Table 4 — Main dimensions of glass disc

Dimensions in millimetres

d_3	± 0,5	280	300	330	350	380
d_4	± 0,5	26				
t	± 0,3	8				
Admissible bow in the middle of the disc	max.	0,5		0,6		0,7
Deviation from parallelism between the two surfaces of the disc	max.	0,2				
Admissible mass excentricity in axial direction	max.	0,5				
Admissible mass excentricity in radial direction	max.	0,7				

Table 5 — Installation dimensions of screen

Dimensions in millimetres

Type	A			B	C	
Nominal size	280	330	380	280	300	350
d_5	312 ± 1	362 ± 1	412 ± 1,25	278 ± 1	341 ± 1	391 ± 1
e min.	50	50	50	50	50	50

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Descriptors: shipbuilding, openings, side scuttles, specifications, dimensions, designation, installation.

Price based on 5 pages