

INTERNATIONAL STANDARD



3904

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

Shipbuilding — Clear view screens

Construction navale — Hublots tournants

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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 3904 was drawn up by Technical Committee ISO/TC 8, *Shipbuilding*, and was circulated to the Member Bodies in September 1975.

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

Australia	Germany	Romania
Austria	India	Spain
Belgium	Italy	Sweden
Bulgaria	Japan	Turkey
Canada	Korea, Dem. P. Rep. of	U.S.S.R.
Czechoslovakia	Mexico	Yugoslavia
France	Netherlands	

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

Poland
United Kingdom

Shipbuilding — Clear view screens

1 SCOPE AND FIELD OF APPLICATION

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 REFERENCES

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

ISO 3254, *Shipbuilding — Toughened safety glass panes for ships' rectangular windows*.

IEC Publication 34, *Rotating electrical machines*.

IEC Publication 92, *Electrical installations in ships*: Parts 1 (Amendment No. 1), 3, 4 and 5.

IEC Publication 144, *Degrees of protection of enclosures for low-voltage switchgear and controlgear*.

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 disk driven by an electric motor.

Because of the rotation of the glass disk, 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 disk is ensured.

4 DESIGN AND CONSTRUCTION

4.1 Classification

The screens shall be classified by types, according to the position of the driving electric motor, as follows:

- **type A**: Driving motor mounted at the upper part of the main frame in off-set position;

- **type B**: Driving motor mounted at the side of the main frame in off-set position;

- **type C**: Driving motor mounted at the centre of the glass disk.

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

4.2 Basic requirements

4.2.1 Drive

The drive of the glass disk shall be as follows:

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

4.2.2 Speed of rotation

The speed of rotation of the glass disk shall be not less than 1 600 rev/min.

4.2.3 Operation

In order to ensure vibrationless and noiseless operation the glass disk shall be balanced. Admissible unbalance 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 disk and the main frame of the clear view screen shall be as small as possible.

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 (see ISO 3254).

4.2.6 Glass disk

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

Type	Dimensions in millimetres					
	A			B	C	
Nominal size*	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 ± 0,5	310	360	410	275	339	389
d ₂	—	—	—	—	356	406

* The nominal size is derived from the outside diameter of the glass disk. See table 4.

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 letter	Material	Tensile strength min.	Elongation min.
AL	aluminium wrought alloy	140 N/mm ²	3 %
CU	copper alloy		

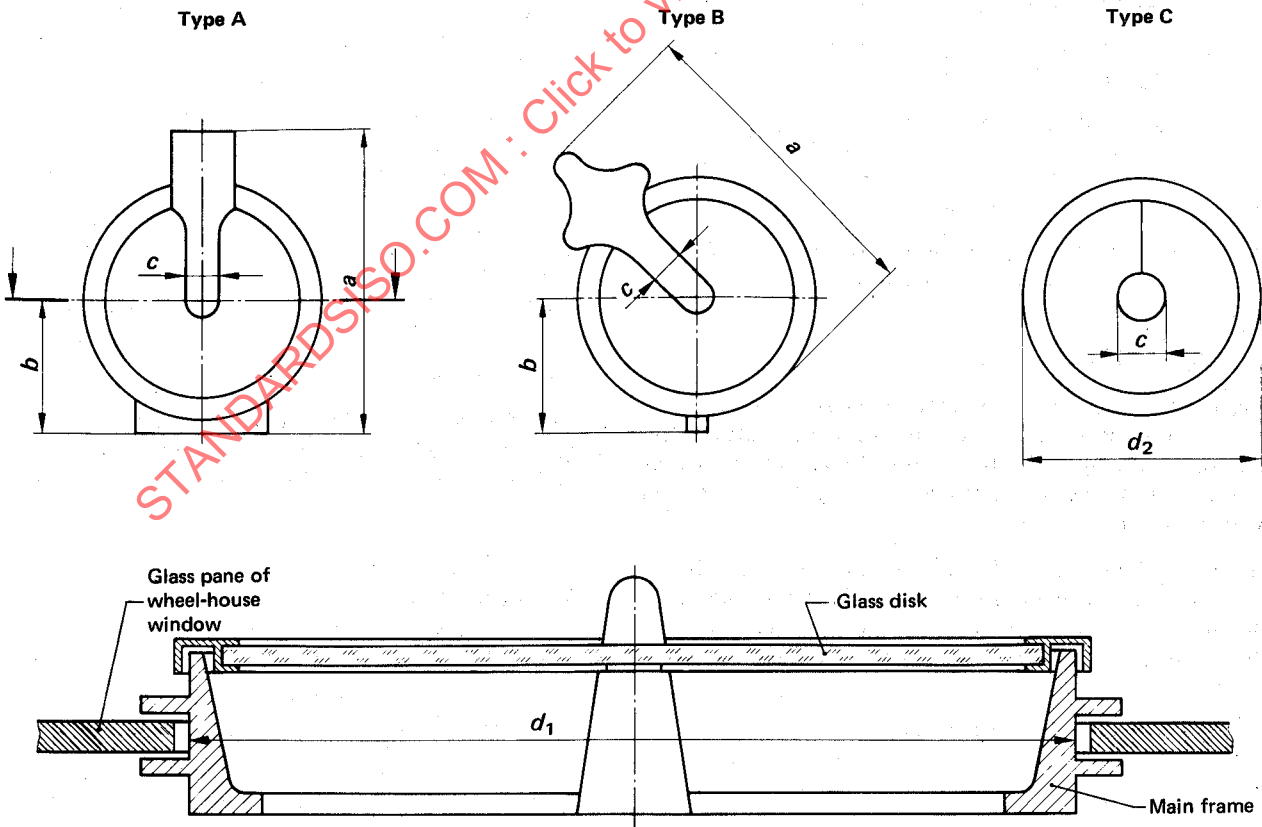


FIGURE 1 – Types and main dimensions

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 to 40 IRHD¹⁾;
- 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 Publication 92, parts 3, 4 and 5.

4.5.2 Electric motors

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

They need not be of totally enclosed construction (degree of protection IP 33 according to IEC Publication 144) 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.

They shall be suitable for operation on d.c. supply, a.c. supply single phase or three phase with a frequency of 50 or 60 Hz; see table 3.

4.5.3 Current systems

See table 3.

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 should, however, be designed to ensure that, if desired, the subsequent installation of de-icing means may be carried out.

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
	115	50	31
		60	32
a.c. three phase	220	50	33
		60	34
	220/380	50	35
		60	36
	440	50	37
		60	38

5 DESIGNATION

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

Number of this International Standard : ISO 3904;

Type (4.1);

Nominal size (table 1);

Material of main frame (table 2);

Current system (table 3).

Example :

The designation for a clear view screen type A of nominal size 330, 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

1) IRHD = International Rubber Hardness Degrees, see ISO 48.

6 GLASS DISK (designated by the code letter Y)

6.1 Dimensions and tolerances

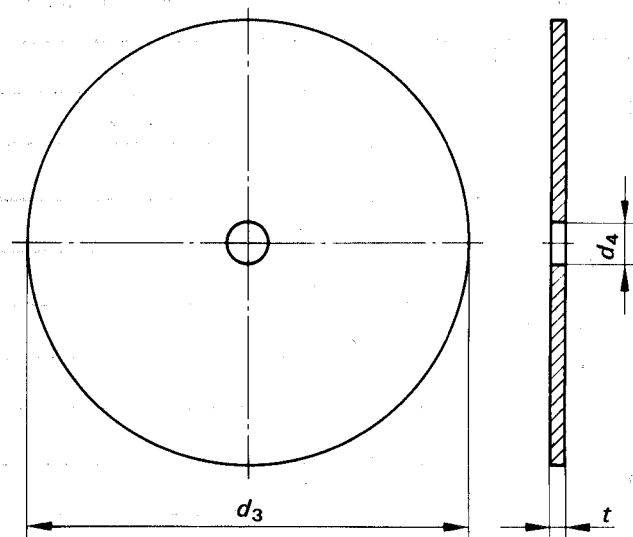


FIGURE 2 – Glass disk

TABLE 4 – Main dimensions

Dimensions in millimetres

d_3	$\pm 0,5$	280	300	330	350	380
d_4	$\pm 0,5$	26				
t	$\pm 0,3$	8				
Admissible bow in the middle of the disk max.		0,5		0,6		0,7
Deviation from parallelism between the two surfaces of the disk max.		0,2				
Admissible unbalance in axial direction max.		0,5				
Admissible unbalance in radial direction max.		0,7				

6.2 Material

Clear toughened safety glass according to ISO 3254.

6.3 Designation

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

Number of this International Standard : ISO 3904;

Type Y (clause 6);

Outer diameter d_3 (table 4)

Example :

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

Disk 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) in the glass pane of the window or in the wall, and 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.

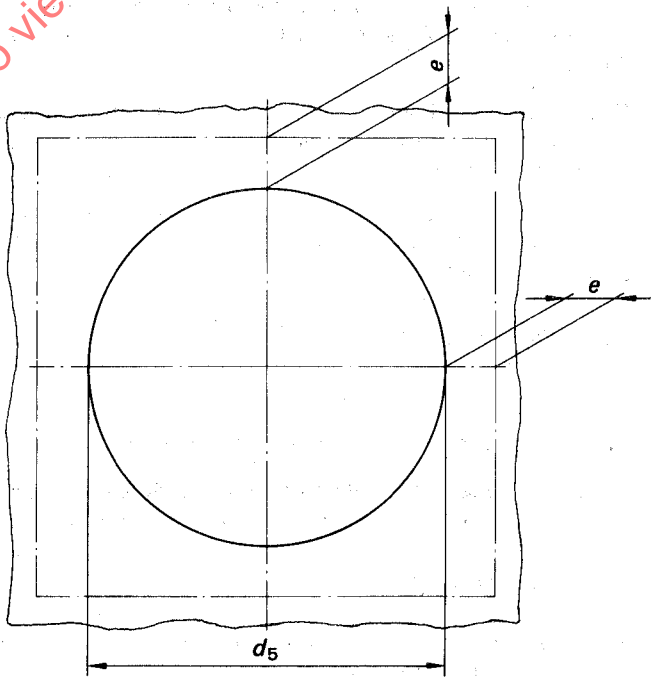


TABLE 5 – Installation dimensions