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# INTERNATIONAL STANDARD 3434

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## Shipbuilding — Heated glass panes for ships' windows

*Construction navale — Vitrages chauffants pour fenêtres de navires*

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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 3434 was drawn up by Technical Committee ISO/TC 8, *Shipbuilding*, and circulated to the Member Bodies in April 1974.

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

Austria	Italy	Spain
Belgium	Japan	Sweden
Czechoslovakia	Mexico	Thailand
Finland	Netherlands	Turkey
France	Norway	United Kingdom
India	Poland	U.S.S.R.
Israel	Romania	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Germany

# Shipbuilding — Heated glass panes for ships' windows

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the characteristics of heated glass panes for ships' windows and the conditions with which they shall 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.

## 2 REFERENCE

ISO 3254, *Shipbuilding — Toughened safety glass panes for ships' rectangular windows*.<sup>1)</sup>

## 3 CONSTRUCTION

Heated glass panes are generally laminated clear plate toughened glass composed of two or more thicknesses separated by transparent plastic material, there being :

- a) one glass pane of the thickness specified for ships' ordinary windows, taking into account the dimensions and the location on board ship;
- b) one glass pane 4 or 6 mm thick, placed on the inside or the outside and carrying a heating element consisting of a wire or continuous film placed between the glass and the transparent plastic material (see note).

NOTE — The laminate may possibly include an additional plate glass.

## 4 DIMENSIONS

The dimensions of heated glass panes shall be in accordance with those specified in ISO 3254.

It should be noted, however, that at present it is difficult to exceed a dimension of 2 m X 1 m for a heated glass pane.

## 5 PERIPHERAL PROTECTION

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, the periphery of the glass pane shall be protected by materials such as silicone, rubbers, polysulphides or similar, compatible with the plastic inter-layers of the laminate.

## 6 OPTICAL QUALITIES

Heated glass panes shall ensure a perfect visibility in all weathers, avoiding the formation of mist or frost. They shall, in addition, ensure the maximum efficiency of the windscreen wipers when operating in conditions of frost or snow.

Heated glass panes shall not cause any marked deterioration in colours, in particular of beacons and lights on buoys, or any reduction in the resolving power of the eye or of binoculars when a distant object is observed at normal incidence through the glass.

These properties shall apply when the glass is being used as a heated glass window.

The same requirement shall apply if the temperature control gear is cycling or if the heated glass 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 glass pane.

## 7 CHARACTERISTICS OF THE HEATING CIRCUIT

### 7.1 Power loading

The following power loading is specified for devices used for de-misting and de-frosting of glasses in waters situated outside the polar regions :

- de-misting : 8,5 W/dm<sup>2</sup> ± 10 %
- de-frosting : 16 W/dm<sup>2</sup> ± 10 %

1) At present at the stage of draft.

Higher power loading is required for navigation in polar regions and in such cases the manufacturers shall be consulted.

### 7.2 Electrical supply

The feed circuit of the heating circuit shall be suitable for the voltage available on the ship and may be either a.c. or d.c.

This information shall be provided by the purchaser at the time of ordering.

### 7.3 Connections and electrical insulation

Moisture proof connection boxes shall be installed between the heating circuit and the feed circuit. These boxes may be placed either on the glass or the frame of the window.

In both cases, all necessary precautions shall be taken concerning insulation and earthing of the installation.

A gasket of 3 mm minimum thickness shall electrically insulate the glass pane edges from the window frame rebate.

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