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## Large yachts — Navigational bridge visibility

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CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 12, *Large yachts*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The purpose for having a standard on bridge visibility for large yachts was triggered by the fact that the *International Convention for the Safety of Life at Sea* (SOLAS) of the International Maritime Organization (IMO) does not provide dedicated regulations for large yachts. Typically, large yachts are regulated by means of interpretations and one-off exemptions by the local surveyors. The statutory regulations do not give any unambiguous guidance or regulations for bridge visibility.

Hence, this document is considered as a way forward to create a clear and level playing field for the large yachts industry that builds the yachts according the applicable Yacht Code<sup>[2][3][12]</sup>. It is based on IMO SOLAS, Chapter V, IMO MSC Circ.982<sup>[1]</sup> and IMO MSC Circ.1350<sup>[5]</sup>. It also addresses some aspects of the “unconventional design” as mentioned in SOLAS, Chapter V, Regulation 22.3<sup>[12]</sup>.

The industry can benefit from this document in a way that suits the yacht design and considers the safe navigation of yachts. The document aims to enable users to save time in the designing and building of wheelhouses.

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# Large yachts — Navigational bridge visibility

## 1 Scope

This document specifies requirements for the field of vision from the defined working positions on the bridge of large yachts.

It is applicable to large yachts with a length of 24 m or over.

NOTE This document supports the aims of SOLAS, Chapter V, Regulation 22 [12].

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### **blind sector**

measured arc from a position that indicates an obstructed view of the sea surface by any fixed object outside or inside the wheelhouse

Note 1 to entry: See 5.6 to determine the *field of vision* (3.6) from a working position.

### 3.2

#### **bridge**

area from which the navigation and control of the yacht is exercised, including the wheelhouse and *bridge wings* (3.3)

### 3.3

#### **bridge wing**

part of the *bridge* (3.2), on both sides of the yacht's wheelhouse, which, in general, extends to the yacht's side

### 3.4

#### **external obstruction**

any loose item that is placed on the deck and that can be repositioned by the crew

### 3.5

#### **docking operation**

manoeuvring of the yacht alongside a berth, another yacht or other structure, and control of the mooring operations

### 3.6

#### **field of vision**

angular size of scenery being observable from a position within the yacht's *bridge* (3.2)

**3.7  
flybridge**  
open area on the highest deck that provides unobstructed views to the fore, the aft and the sides of the yacht and is equipped to be used for the working positions

**3.8  
glare**  
excessive demand for visual adaptation brought on by the retina's exposure to more light than it can tolerate

Note 1 to entry: It is produced when any luminance within the visual field is sufficiently greater than the luminance to which the eye is adjusted.

**3.9  
reflection**  
return of light from a surface, and production of an image by or as if by a mirror

**3.10  
height of eye**  
vertical distance of the centre of the eye above the finished interior floor of the bridge deck at a working position

**3.11  
helmsman**  
designated person who steers the yacht under way

**3.12  
length**  
distance from the forward side of the stem to the aftermost side of the stern including the bulwark, but without bowsprit, pulpit, flagpole and any other outfitting part

**3.13  
sunscreen**  
fabric that can be installed temporarily on all applicable *bridge* (3.2) windows in order to improve the visibility and reduce eye strain in bright sunshine

**3.14  
totally enclosed bridge**  
*bridge* (3.2) without open *bridge wings* (3.3), so that the bridge wings form an integral part of an enclosed wheelhouse

**3.15  
wheelhouse**  
enclosed area of the *bridge* (3.2)

**3.16  
window blind**  
opaque window-covering to keep light out of a certain space, i.e. to create privacy

**3.17.1  
conning position**  
position on the *bridge* (3.2) with a commanding view, used by navigators and pilots when commanding, manoeuvring and controlling the yacht's movements

**3.17.2  
additional conning station**  
workstation used for navigation, providing a commanding view with access to radar and navigational chart in addition to information required for conning, which can serve as an alternative conning station for the navigator or pilot when required



### 3.17.3 monitoring position

workstation from which the operating equipment and surrounding environment can be permanently observed in seated/standing position

### 3.17.4 steering position

position of the helmsman to manually steer the yacht

### 3.17.5 docking position

position of the navigator or pilot from where *docking operations* (3.5) are conducted and mooring operations can be supervised

### 3.17.6 navigating position

position on the *bridge* (3.2) where the navigator or pilot can make full appraisal of the situation in navigating the yacht

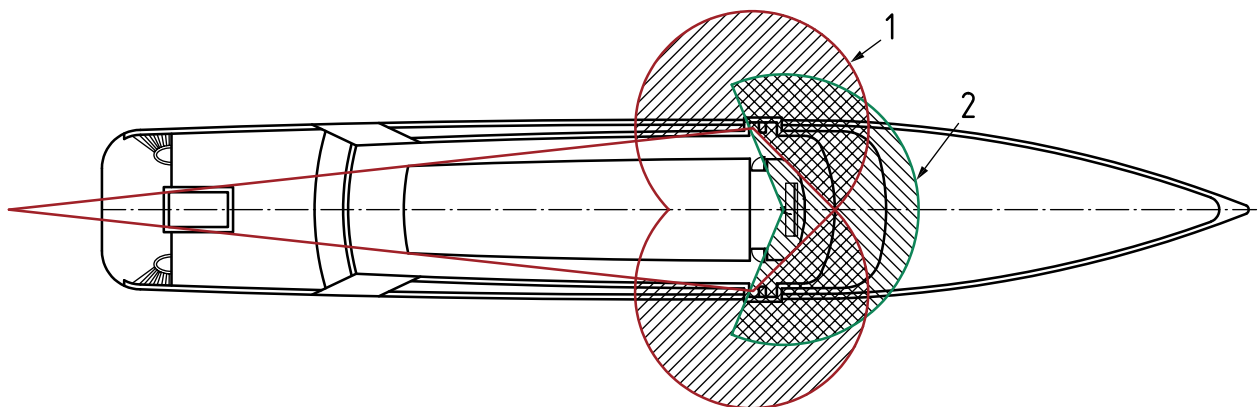
## 4 Bridge construction

### 4.1 Bridge position

A horizontal field of vision to the horizon of 360° (at 1 nautical mile distance) shall be obtained by using not more than two positions within the confines of the bridge (see Figure 1).

In case the nature of the yacht design complicates strict compliance with this requirement,

- a flybridge can be assigned as the conning position, which can typically, but not exclusively, be the case with sailing yachts, or
- a remote camera system can be used [see 5.8 iv)], or
- subject to the agreement of the Administration, the operator can apply for alternative options (see also ISO 8468).



#### Key

- field of view from the docking position
- field of view from the conning position

Figure 1 — Field of view around the yacht

#### 4.2 Lower edge of front windows

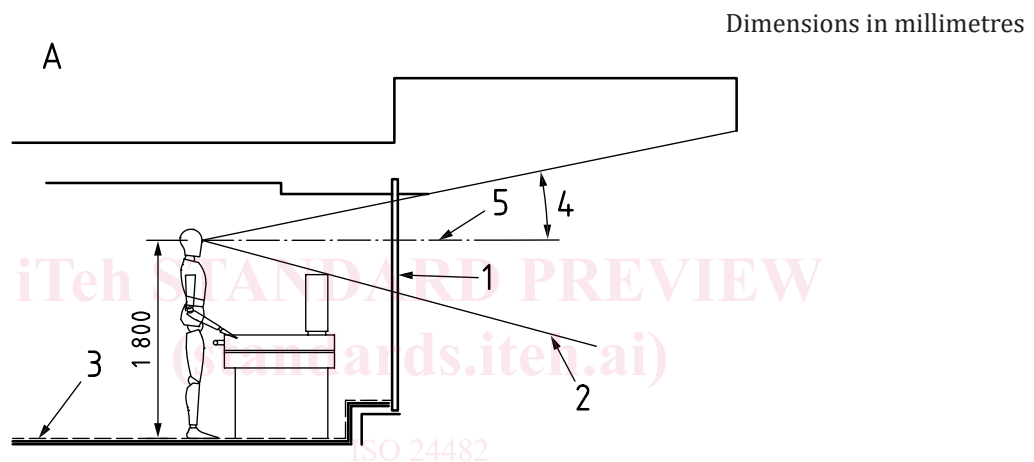
In no case shall the lower edge of front windows present an obstruction to the forward view as described in 5.5 (see Figure 2).

#### 4.3 Upper edge of front windows

The upper edge of the front windows should allow a forward view of the horizon for a person in a standing position with a height of eye (see 5.2) at the navigating and manoeuvring workstation, when the yacht is pitching in heavy seas (see Figure 2).

#### 4.4 Upper edge of navigational consoles

The upper edges of the navigational consoles shall not disrupt the visibility requirements as described in 5.5 (see Figure 2).



- Key**
- 1 window placed vertically
  - 2 vertical field of vision from the conning position below the horizontal plane
  - 3 finished deck surface
  - 4 vertical field of vision from the conning position above the horizontal plane
  - 5 height of eye
  - A wheelhouse centreline section

**Figure 2 — Geometry of the front window**

#### 4.5 Inclination of windows

In order to help avoid reflections that can hamper the view from the bridge, paragraphs a) to c) apply.

- a) The bridge front windows shall be inclined from the vertical plane top out, at an angle of not less than 10° and not more than 25° (see Figure 3).
- b) The rear (aft facing) and side windows may be inclined from the vertical plane top out, at an angle of not more than 25°. Deviation from this specification is accepted for windows in bridge wing doors.
- c) As an alternative to the above paragraphs a) and/or b), it is permitted to apply vertical windows (see Figure 2) and inclined windows from the vertical plane bottom out. The maximum angle from the vertical plane for a bottom out inclined window is 65°. Appropriate measures shall be taken to avoid adverse reflections, see Figure 4.

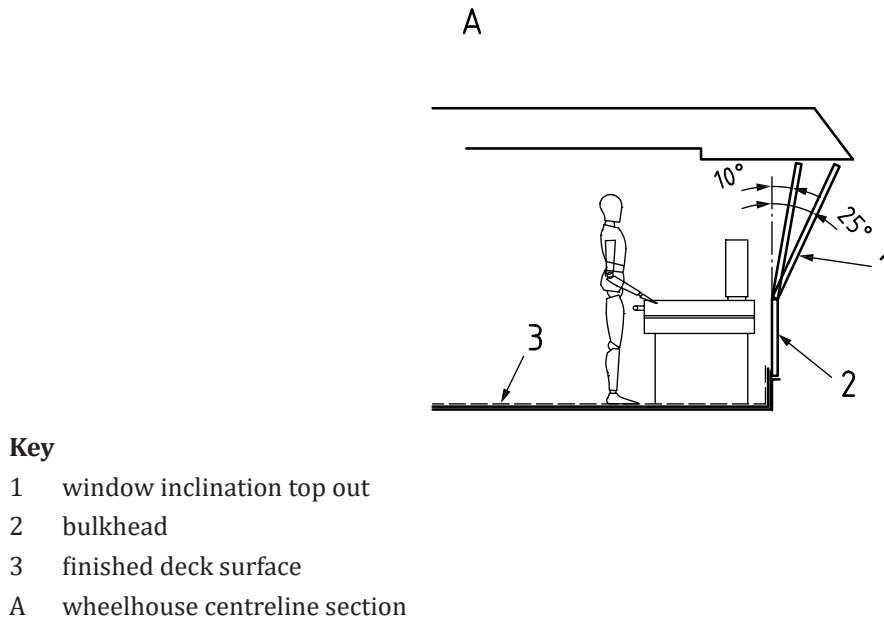


Figure 3 — Window inclination

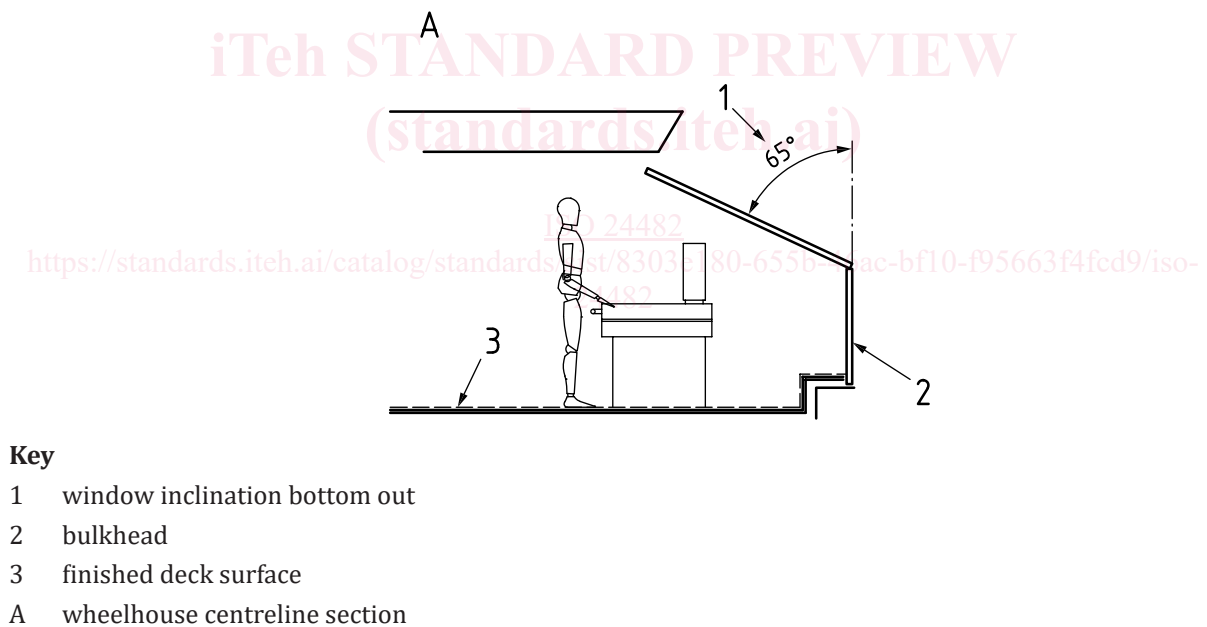


Figure 4 — Window inclination alternative

#### 4.6 Curved windows

Curved windows are allowed as long as visibility is not distorted. The distortion shall be checked in accordance with the testing procedure in 6.4.

#### 4.7 Window breadth

Bridge windows should be as large as practicable to sustain a safe lookout.