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Ships and marine technology — Design requirements for international ballast water transfer connection flange

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Contents

Page

Foreword

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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).

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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.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 3, *Piping and machinery*.

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.

Introduction

It is recognized that transfer of ballast water between a ship and a shore-side facility, or another ship, can be necessary to manage ballast water treatment.

In order for ships and shore facilities to connect the ballast water transfer piping in an efficient manner, a standardized interface flange is necessary. This type of connection would be similar to the international fire main ship/shore connection required by the International Convention for the Safety of Life at Sea (SOLAS).

The need for a standardized international flange for ballast water transfer systems has been presented to the International Maritime Organization (IMO) Marine Environmental Protection Committee (MEPC). A standard transfer connection will help enable efficient transfer of ballast water between ships and facilities in accordance with the Guidelines of the International Maritime Organization (IMO Resolution MEPC.153(55) – G5).

Ships and marine technology — Design requirements for international ballast water transfer connection flange

1 Scope

This document specifies the material requirements and dimensions of an international flange for the transfer of ballast water between a ship and a shore reception facility, or between ships.

It does not address any reconfiguration of the ship's ballast water piping system necessary to connect to the shore-side, e.g. construction of piping from the ship lower machinery levels to the main deck transfer area.

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 terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
international flange for ballast water transfer systems
pipe fitting installed on both the ship and shore side of a ballast water transfer system, having standardized dimensions to facilitate worldwide connectivity

3.2
maximum allowable working pressure
highest stress to which a piping system component can be subjected, based on materials, thickness and design calculations

4 Abbreviated terms

DN	diameter nominal
PN	pressure nominal
MAWP	maximum allowable working pressure

5 Materials and equipment

5.1 General

International flanges for ballast water transfer systems shall be flat-faced and of steel or equivalent material construction. Flanges shall be galvanically compatible with the piping system to which they are installed. All other parts of the system shall be constructed of materials suitable for the service

intended. Fasteners shall be of corrosion-resistant materials that are galvanically compatible with the material of the flange.

Flanges shall be designed and manufactured in accordance with the dimensions specified in Clause 7.

To meet the dimensional and pressure-rating requirements of this document, the flanges should meet the design and testing requirements of a recognized national or international flange standard, such as DIN 2632, DIN 2633, BS EN 1092, ASME B16.5, JIS B2220, GB/T 2501 or other equivalent design standard.

5.2 Pressure rating

The flange shall have a minimum pressure rating of not less than 1 MPa (145 psig).

NOTE Normally, a flange of at least a PN 10 rating satisfies this requirement.

5.3 Non-metallic materials

Gaskets and associated parts shall be of materials suitable for the MAWP and seawater service.

5.4 Accessories

The international flange for ballast water transfer systems shall be supplied with eight bolts and the corresponding nuts and washers.

6 Workmanship

Welding personnel shall be qualified in accordance with recognized standards, and welding materials in accordance with recognized standards shall be utilized.

7 Dimensions

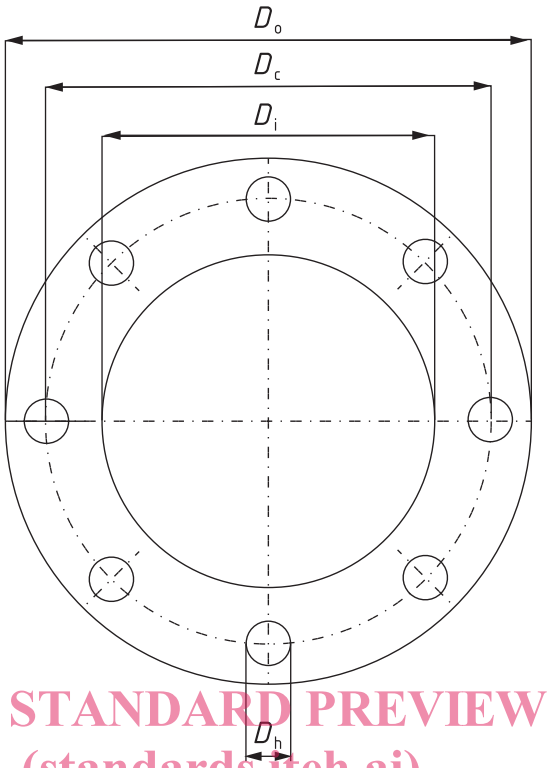
7.1 The dimensions of the international flange for ballast water transfer systems shall be in accordance with Table 1 and Figure 1. Bolt holes shall be evenly spaced (i.e. the centres of the 8 holes are 45 degrees apart for DN 200).

Variations in the inside and outside diameter are acceptable depending on the type of flange connection design. The bolt circle diameter (D_c) shall be as specified in Table 1.

Table 1 — Standard dimensions for the international flange for ballast water transfer systems (DN 200)

Description	Dimension (mm)
Outside diameter (D_o)	340
Inside diameter (D_i)	218 - 222 (see 7.1 for allowable variations)
Bolt circle diameter (D_c)	295
Bolt hole diameter (D_h)	22
Flange thickness (t)	24 (minimum)
Bolts and nuts diameter	20

7.2 Larger flanges and piping diameters can be required for high-capacity ballast water transfer systems. Annex A specifies the dimensions of DN 300 flanges.



Key

D_o outside diameter
D_c bolt circle diameter
D_i inside diameter
D_h bolt hole diameter

Figure 1 — Example of international ballast water shore connection flange

NOTE 1 The flange bolt holes can be provided with a notched connection to the outside edge of the flange to allow for minor adjustments during connection. This alternative design is described in Annex B.

NOTE 2 The number of bolt holes and therefore the spacing between holes (in degrees) will change as the flange diameter is increased.

EXAMPLE A twelve-bolt flange, such as in Annex A, will have bolt holes equally spaced 30 degrees apart.

8 Marking

Flanges shall be permanently marked in English with the following minimum information:

a) manufacturer name;

b) PN number (e.g. PN 10) and nominal diameter (DN 200);

c) a reference to this document, i.e., ISO 23055.