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Ships and marine technology — Flange connection for fuel and lubrication oil bunkering — Basic dimensions and technical requirements

PROOF/ÉPREUVE

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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.

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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.

Ships and marine technology — Flange connection for fuel and lubrication oil bunkering — Basic dimensions and technical requirements

1 Scope

This document specifies the basic dimensions of PN 10 flanged connections for bunker fuel and lubricating oil transfer to ships from bunkering vessels or onshore facilities, and the technical requirements for the design of such connections.

This document is not applicable to connections of the ship's fuel system for the reception of liquefied natural gas.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4014, *Hexagon head bolts — Product grades A and B*

ISO 4032, *Hexagon regular nuts (style 1) — Product grades A and B*

ISO 7005-1, *Pipe flanges — Part 1: Steel flanges for industrial and general service piping systems*

ISO 7091, *Plain washers — Normal series — Product grade C*

ISO 7483, *Dimensions of gaskets for use with flanges to ISO 7005*

3 Terms and definitions

No terms and definitions are listed in this document.

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/

4 Classification

4.1 The flange connections are classified as follows depending on the medium:

— Type F – flange connections for bunker fuel reception;

— Type L – flange connections for lubricating oil reception.

4.2 The flange connections are classified as follows depending on the execution (arrangement):

— Execution 1 – blind flange without handle;

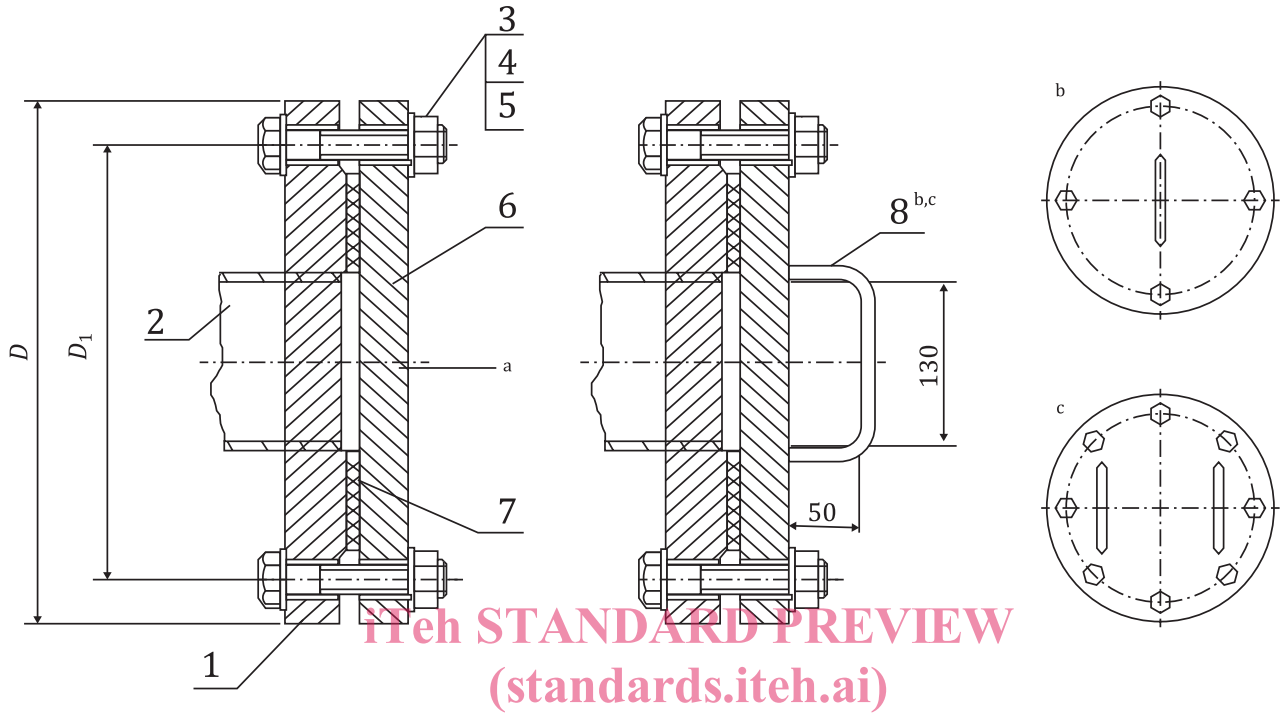
— Execution 2 – blind flange with one handle;

— Execution 3 – blind flange with two handles.

5 Basic dimensions

5.1 The main dimensions of the flange connections shall be as shown in Figure 1 and in Table 1.

Dimensions in millimetres



Key

1	receiving flange	7	gasket
2	pipe	8	handle
3	bolt		
4	nut	a	Execution 1 (blind flange without handle).
5	washer	b	Execution 2 (one handle).
6	blind flange	c	Execution 3 (two handles).

Figure 1 — Flange connections for bunker fuel and lube oil transfer

Table 1 — Basic dimensions of flange connections

Dimensions in millimetres

Execution	Nominal diameter	Outside diameter	Diameter between the centres of the bolt holes	Number of handles on a blind flange	Bolts		
					Number of bolts		Thread
	DN	D	D_1		Type F	Type L	
1	50	165	125	—	4	4	M16
2	100	220	180	1	8	8	
	150	285	240			—	M20
3	200	340	295	2			
	250	395	350		12		
	300	445	400				

5.2 The dimensions of the main parts of the flange connections for receiving bunker fuel and lube oil shall be as shown in Figures 2 to 5 and in Tables 2 and 3. The inner diameter D_2 may vary according to the flange design.

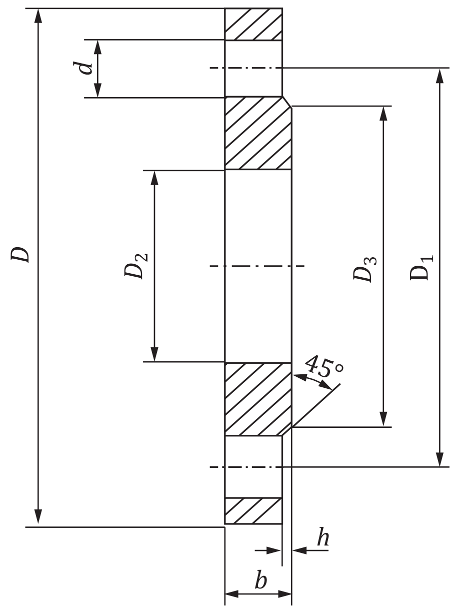


Figure 2 — Bunker fuel and lube oil transfer flange

Table 2 — Basic dimensions of type F and type L flanges

Dimensions in millimetres

<table>
<tr><th colspan="2">Nominal diameter
DN</th><th rowspan="2">Outside diameter
D</th><th rowspan="2">Diameter between the centres of bolt holes
D_1</th><th rowspan="2">Flange inner diameter
D_2</th><th rowspan="2">Diameter protrusion
D_3</th><th rowspan="2">Flange thickness
b</th><th rowspan="2">Thickness of ledge
h</th><th rowspan="2">Diameter of bolt holes
d</th><th colspan="2">Number of bolt holes</th></tr>
<tr><th>Flange</th><th>Tube</th><th>Type F</th><th>Type L</th></tr>
<tr><td rowspan="3">50</td><td>32</td><td rowspan="3">165</td><td rowspan="3">125</td><td>43,5</td><td rowspan="3">102</td><td rowspan="3">20</td><td rowspan="6">3</td><td rowspan="6">18</td><td rowspan="3">4</td><td rowspan="3">4</td></tr>
<tr><td>40</td><td>49,5</td></tr>
<tr><td>50</td><td>61,5</td></tr>
<tr><td rowspan="3">100</td><td>65</td><td rowspan="3">220</td><td rowspan="3">180</td><td>77,5</td><td rowspan="3">158</td><td rowspan="3">22</td><td rowspan="6">8</td><td rowspan="3">8</td></tr>
<tr><td>80</td><td>90,5</td></tr>
<tr><td>100</td><td>116</td></tr>
<tr><td rowspan="2">150</td><td>125</td><td rowspan="2">285</td><td rowspan="2">240</td><td>141,5</td><td rowspan="2">212</td><td rowspan="3">24</td><td rowspan="4">3</td><td rowspan="5">22</td><td rowspan="5">—</td></tr>
<tr><td>150</td><td>170,5</td></tr>
<tr><td>200</td><td>200</td><td>340</td><td>295</td><td>221,5</td><td>268</td></tr>
<tr><td>250</td><td>250</td><td>395</td><td>350</td><td>276,5</td><td>320</td><td rowspan="2">26</td><td rowspan="2">12</td></tr>
<tr><td>300</td><td>300</td><td>445</td><td>400</td><td>327,5</td><td>370</td><td>4</td></tr>
</table>

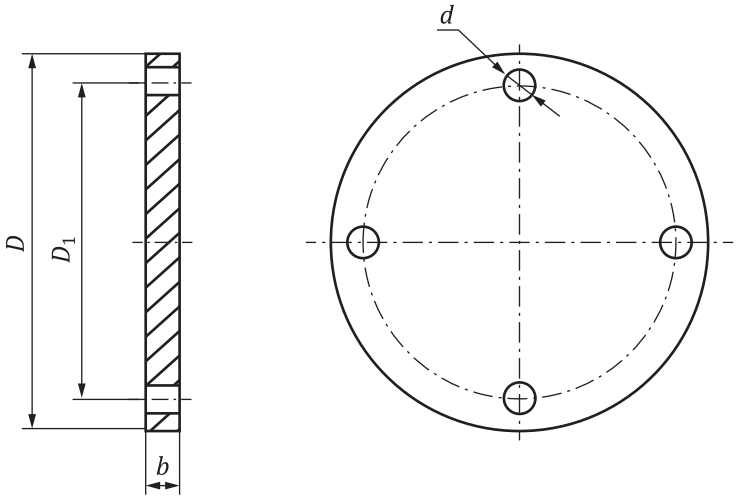
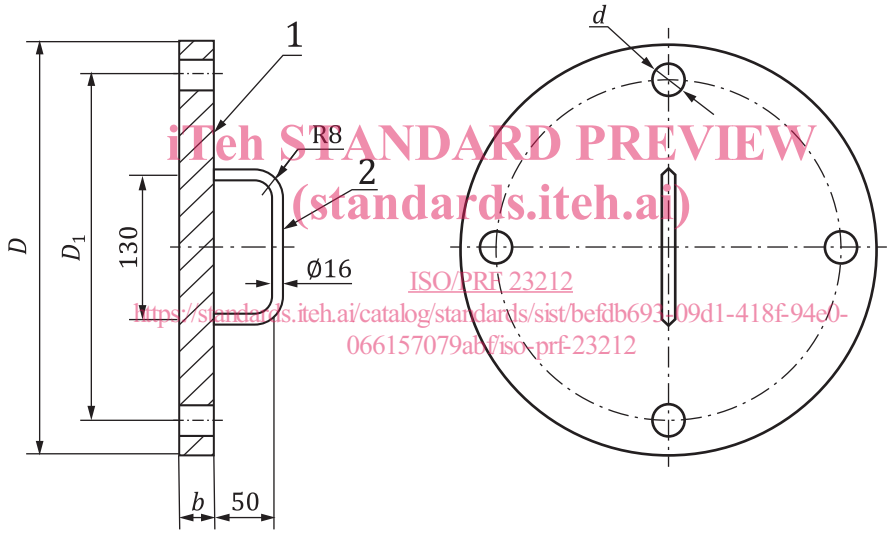


Figure 3 — Blind flange execution 1

Dimensions in millimetres



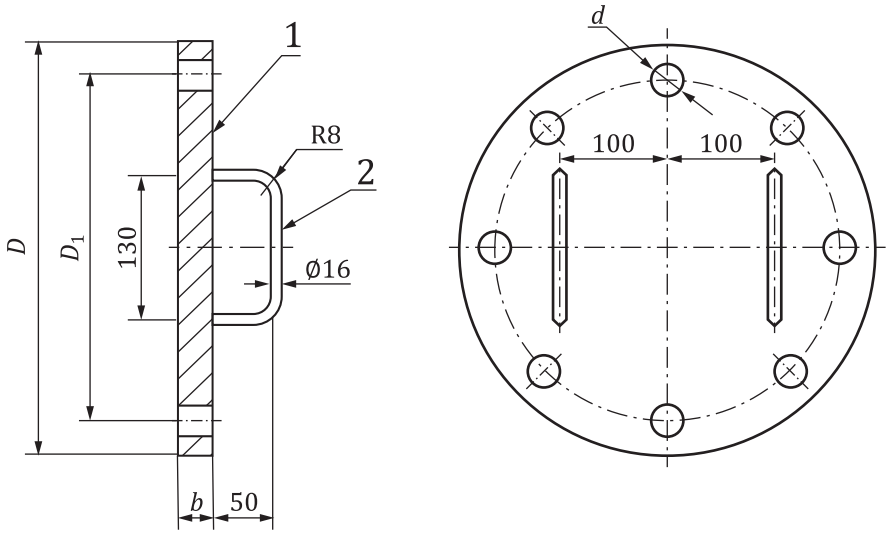
Key

1 blind flange

2 handle

Figure 4 — Blind flange execution with one handle, DN 100 to DN 150, execution 2

Dimensions in millimetres



Key

1 blind flange

2 handle

Figure 5 — Blind flange with two handles, DN 200 to DN 300, execution 3

Table 3 — Basic dimensions blind flange

Dimensions in millimetres

Execution	Nominal diameter	Outside diameter	Diameter between the axes of the bolt holes	Flange thickness	Diameter of bolt holes	Number of holes under bolts		Number of handles of staples
	DN	D	D_1	b	d	Type F	Type L	
1	50	165	125	18	18	4	4	—
2	100	220	180	20		8	8	1
	150	285	240	22	22		—	1
3	200	340	295	24				2
	250	395	350	26		12		
	300	445	400					

6 Technical requirements

6.1 Dimensions

6.1.1 The dimensions of the flange connections and the main connections shall be in accordance with Clause 5.

6.1.2 The dimensions of the sealing surfaces of the flange connections shall be in accordance with ISO 7005-1.

6.1.3 The dimensions of the flat gaskets shall be in accordance with ISO 7483.

6.2 Pressure rating

The flange shall have a minimum pressure rating of not less than 1 MPa.

6.3 Fasteners

Fasteners shall be in accordance with Table 4.

Table 4

Nominal diameter DN	Hexagon head bolts conforming to ISO 4014	Hexagon nuts, normal, conforming to ISO 4032	Washers conforming to ISO 7091
50	M16×70 - 8.8	M16 - 6	16 - 100 HV
100			
150	M20×80 - 8.8	M20 - 6	20 - 100 HV
200	M20×90 - 8.8		
250			
300			

6.4 Materials

6.4.1 Flanges should be made of steel with a tensile strength of at least 400 MPa, or of a material with an equivalent strength. The quality of the material used to make the flanges shall be confirmed in the manufacturer's certificate.

6.4.2 Fasteners: bolts, nuts and washers shall be made of steel, the strength class of which shall be at least as indicated in Table 4.

6.4.3 Gaskets should be made of an elastic material, resistant to oil products, ensuring the tightness of flange connections at an ambient temperature from –40 °C to +50 °C. Sheet gaskets are acceptable.

6.5 Coatings

6.5.1 Painting of external surfaces of flanges should be made consistent with the ship pipelines of the fuel or lube oil system, as applicable.

6.5.2 Bolts, nuts and washers shall have an anti-corrosion coating applied. If fasteners are manufactured from corrosion-resistant materials, a coating is not required.

6.6 Marking

6.6.1 The marking of the flanges for fuel and lube oil should contain the following elements:

1) name or trademark of the manufacturer;
2) a reference to this document, i.e. ISO 23212;
3) type designation and execution;
4) nominal diameter, DN;
5) nominal pressure, P_N;
6) grade of flange material.

