

International Standard



4146

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

Shipbuilding — Inland vessels — Manholes

Construction navale — Bateaux de navigation intérieure — Trous d'homme

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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 4146 was developed by Technical Committee ISO/TC 8, *Shipbuilding*, and was circulated to the member bodies in March 1978.

It has been approved by the member bodies of the following countries :

Austria	Ireland	Spain
Belgium	Italy	Turkey
Brazil	Korea, Rep. of	United Kingdom
Bulgaria	Mexico	USSR
Czechoslovakia	Netherlands	Yugoslavia
France	Poland	
India	Romania	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Germany, F.R.
Japan
Sweden

Shipbuilding — Inland vessels — Manholes

1 Scope and field of application

This International Standard specifies the types, principal dimensions and technical requirements for manholes used in inland vessels.

2 Manhole types

Manholes shall be classified as type A, B, C, D or E according to their shape and design, as follows :

- A — round, low
- B — round, flush
- C — oval, low
- D — oval, flush
- E — oval, high

Structural details of manholes are shown in figures 1, 2, 3, 4 and 5.

NOTE — The choice of manholes for every concrete ship lies within the competence of the designer.

3 Dimensions

3.1 The size of a manhole is determined by its clear dimensions, namely :

- for round manholes : diameter D
- for oval manholes : dimensions $L \times B$

3.2 The principal dimensions of manholes shall correspond to those indicated in tables 1, 2 and 3.

4 Technical requirements

4.1 Covers and flanges of manholes shall be manufactured from weldable steel having a yield point of not less than 235 N/mm².

4.2 Packings of manholes shall meet the requirements for their intended use and shall be resistant to the action of the environment to which they are to be exposed.

4.3 Checking of manholes for tightness shall be carried out after their assembly on the vessel, simultaneously with testing of the compartment.

4.4 Bolts and nuts shall conform to the requirements of national standards.

4.5 Each manhole cover shall be provided with two M16 bolts to facilitate removal of the cover.

5 Marking

At the place indicated in the respective figure, each cover shall be marked to show the designation of the manhole (see clause 6).

6 Designation

The designation of the manhole includes its type, dimensions, cover thickness and the number of this International Standard.

Examples :

Manhole A 450 × 10 ISO 4146

for a round, low manhole, diameter $D = 450$ mm, with cover of thickness $S = 10$ mm.

Manhole E 500 × 400 × 24 ISO 4146

for an oval, high manhole with dimensions $L \times B = 500$ mm × 400 mm, with cover of thickness $S = 24$ mm.

7 Dimensions and numbers of fasteners

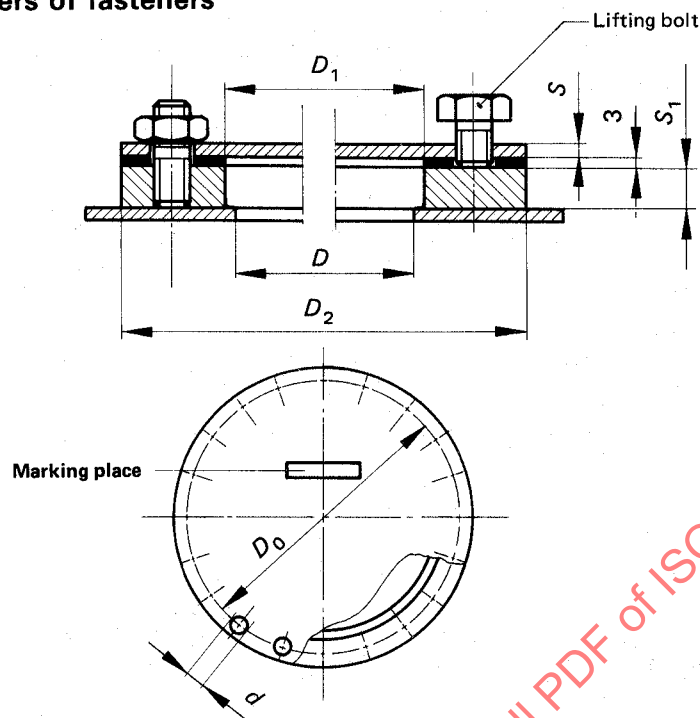


Figure 1 — Shape and principal dimensions of manholes, type A

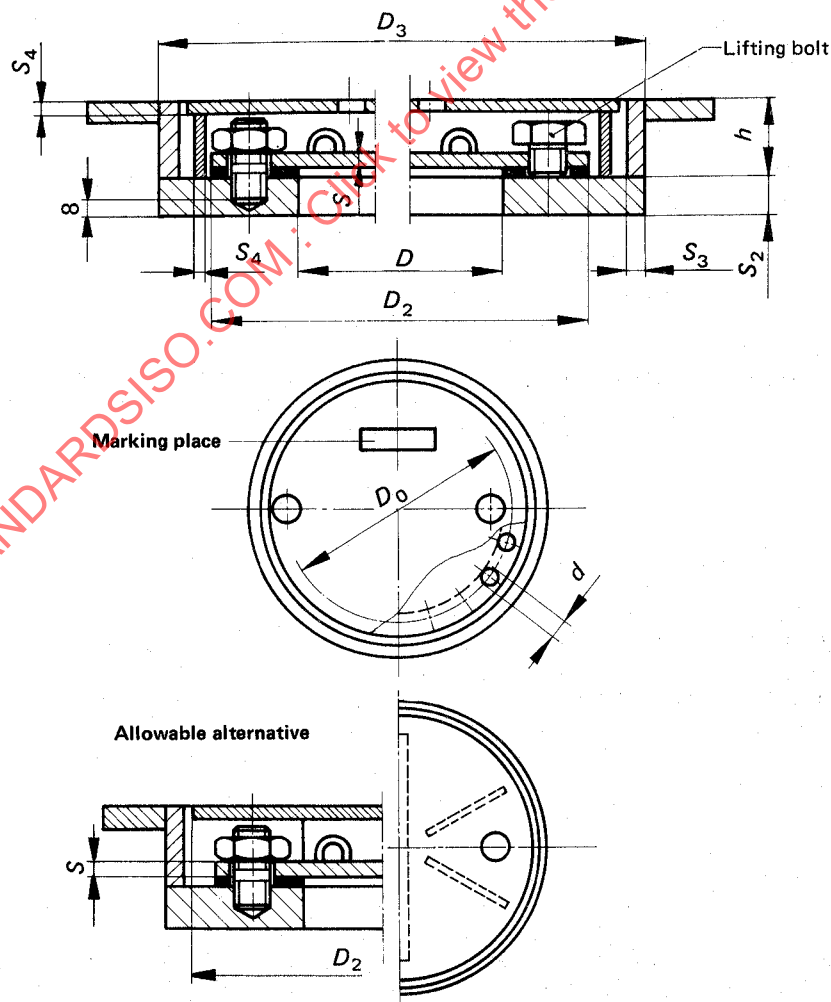


Figure 2 — Shape and principal dimensions of manholes, type B

Table 1 — Manholes, types A and B — Dimensions and number of fasteners

Dimensions in millimetres

D	D ₀	D ₁	D ₂	D ₃	d	h	S ₁	S ₂	S ₃	S ₄	Stud-bolt with nut		S	
											Number	Size		
400	465	420	510	566	18	41	16	28	11	4	26	M16	4 6 8	
				572									10	
	475		530	596	22	53	20	32	14	8	20	M20	12 14	
				606					18				16 18	
	450	515	470	560	616	18	41	16	28	11	4	28	M16	4 6 8
					622									10
525		580		646	22	53	20	32	14	8	20	M20	12 14	
				654					18				16 18	
500		565	520	610	666	18	41	16	28	11	4	30	M16	4 6 8
					672									10
	575			630	694	22	53	20	32	14	8	up to 24	M20	12 14
					702					18				16 18
	600	665	620	710	766	18	41	16	28	11	4	34	M16	4 6 8
					722									10
675		730		796	22	53	20	32	14	8	up to 24	M20	12 14	
				804					18				16 18	

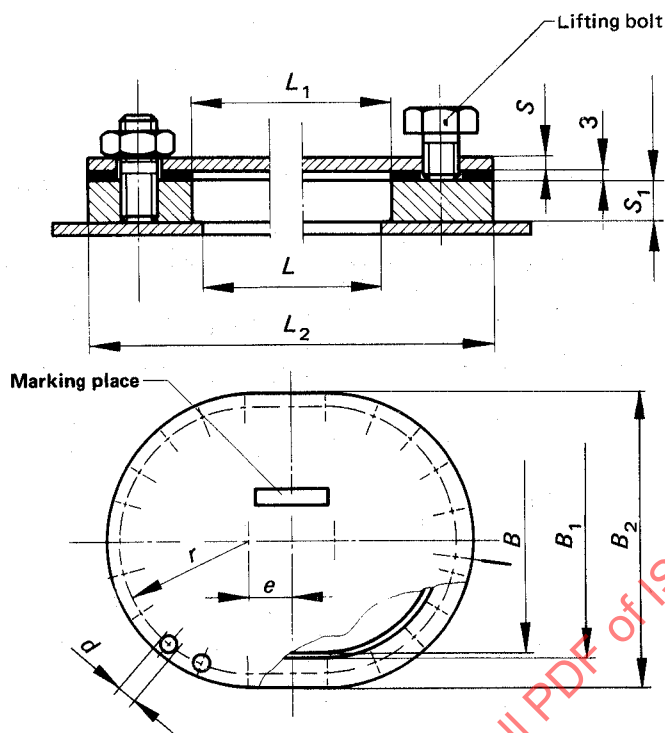


Figure 3 — Shape and principal dimensions of manholes, type C

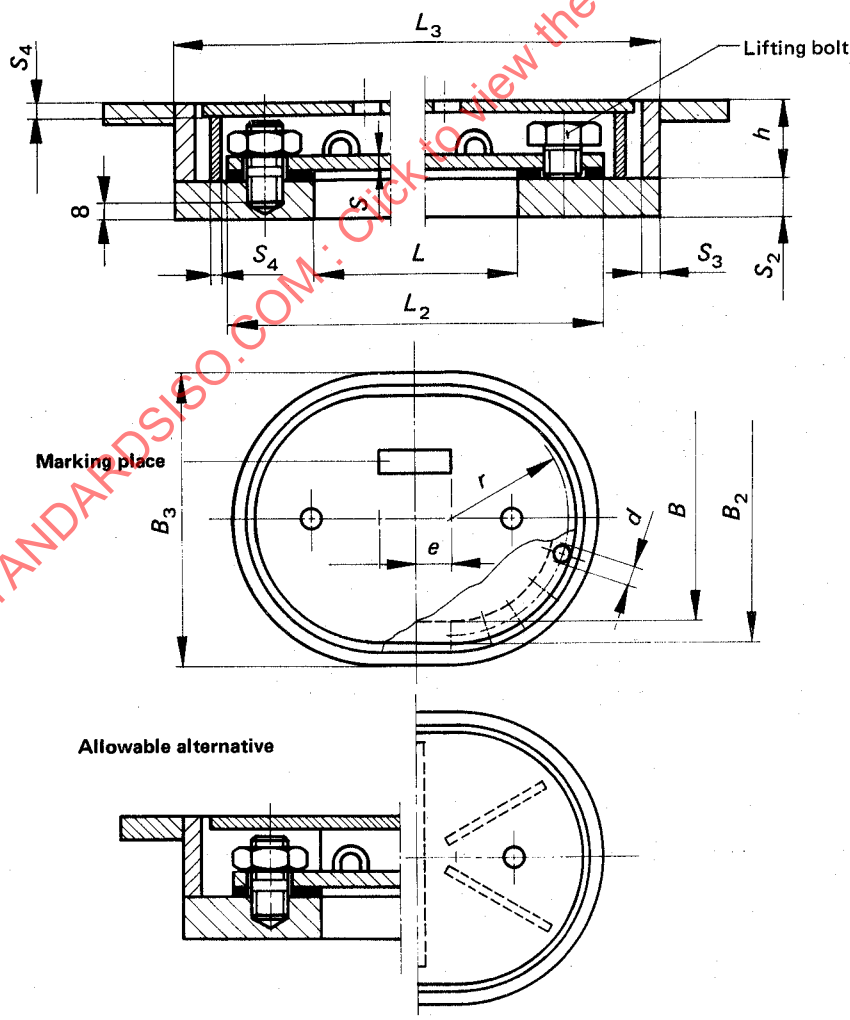


Figure 4 — Shape and principal dimensions of manholes, type D

Table 2 — Manholes, types C and D — Dimensions and number of fasteners

Dimensions in millimetres

Dimensions in millimetres																					
$L \times B$	B_1	B_2	B_3	L_1	L_2	L_3	d	e	h	r	S_1	S_2	S_3	S_4	Stud-bolt with nut		S				
															Number	Size					
450×350	370	460	516	470	560	616	18	50	41	208	16	28	11	4	26	M16	4				
			522			622											6				
		480	546		646	22	58		213	20	32	18	20	8	20	M20	12				
			544		654												14				
			558		658												16				
			578		678												68	20	22		
																		24	26		
																		28	30		
		500×400	420		510	566	520		610	666	18	50	41	233	16	28	11	4	28	M16	4
						572				672											6
530	596			696	22	58		238	20	32	18		8	up to 24	M20	8					
	604			704												14					
	608			708												16					
	628			728												63	20	22			
																	24	26			
																	28	30			
600×450	470			560	616	620		710	766	18	75		41	258	16	28	11	4	32	M16	4
					622				772												6
		580	646	796	22		58	263	20	32		18	20	8	24	M20	12				
			654	804													14				
			658	808													16				
			678	828													63	20	22		
																		24	26		
																		28	30		