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Inland navigation vessels — Connections and assembled hoses for the transfer of potable water

bsi.

National foreword

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Fahrzeuge der Binnenschifffahrt - Anschlüsse und Schlauchleitungen für das Bunkern von Trinkwasser

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European foreword

This document (EN 16865:2016) has been prepared by Technical Committee CEN/TC 15, "Inland navigation vessels", the secretariat of which is held by DIN.

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Introduction

This European standard has been developed to specify hygienically perfect, standard pipelines and connections for the transfer and receipt of potable water on the supply side (bunker boats, onshore plant or similar) and the consumer side (inland navigation vessel).

The connection consists of a pipe, a rapid coupling device both on the supply and consumer side with appropriate dummy couplings. This will allow simple handling and secure transfer of potable water. Using this standard will prevent unsuitable pipes being used on the supply side and dirt getting into the potable water bunker on the consumer side by using pipes without couplings in openings that are level with the deck. Dirt, micro-organisms and insects are prevented from penetrating by using dummy couplings on both sides.

1 Scope

This European standard specifies the design, dimensions and technical requirements for connections and pipelines for storing potable water for inland navigation vessels.

These are:

— a fixed connection on the supply side;

— pipeline;

— a fixed connection on the consumer side;

— a connection for retrofitting inland navigation vessels that have a closure device level with the deck (internal pipe thread pursuant to EN ISO 228-1), consisting of a connecting part with a threaded connection and fixed coupling.

Necessary measures to prevent electrostatic charge and overfilling are not governed by the standard.

National regulations apply to drinking water supply plants. The requirements of this European standard supplement these regulations.

2 Normative references

The following documents cited in whole or in part in this document are required for the application of this document. For dated references, only the edition referred to applies. For undated references, the latest version of the document referred to applies (including all amendments).

DIN 14302, *PN 16 aluminium alloy C pressure coupling*

DIN 14307-1, *PN 16 aluminium alloy C fixed coupling with sealing ring for pressure operation*

DIN 14311, *PN 16 aluminium alloy C dummy coupling for pressure and suction operation*

EN 10220, *Seamless and welded steel tubes – Dimensions and masses per unit length*

EN 22768-1, *General Tolerances — Part 1: Tolerences for linear and angular dimensions without records of individual tolerances (ISO 2768-1:1989)*

EN ISO 228-1, *Pipe threads where pressure-tight connections are not made on the thread – Part 1: Dimensions, tolerances and designations (ISO 228-1)*

EN ISO 9093-1, *Small craft – Seacocks and through-hull fittings – Part 1: Metallic parts (ISO 9093-1)*

ISO 14726, *Ships and marine technology — Identification colours for the content of piping systems*

3 Terms and definitions

The following terms apply to the application of this document.

3.1
potable water
Water for human consumption as specified in Council Directive 98/83/EG (see [8])

[SOURCE: EN 13443-2:2005+A1:2007, 3.12]

3.2
pipeline
Pipe with a pipe connection on both sides or with a pipe connection on one side and a fixed connection on the other side

3.3
pipe connector
Pipeline fitting consisting of a pipe clamp, a pipe coupling and a dummy coupling

3.4
fixed connection
A permanently installed fitting consisting of a threaded pipe connection, fixed coupling and dummy coupling

4 Technical requirements

4.1 General information

General tolerances: ISO 2768— c

The requirements relate to the design, dimensions and configuration of the connections.

4.2 Components

4.2.1 General information

The position of the connection and the dimensions and specifications as set out under Paragraph 4 - Paragraph 7 shall be observed for the connection.

On the supply side, there are the following versions:

— Fixed connection to connect a pipeline;

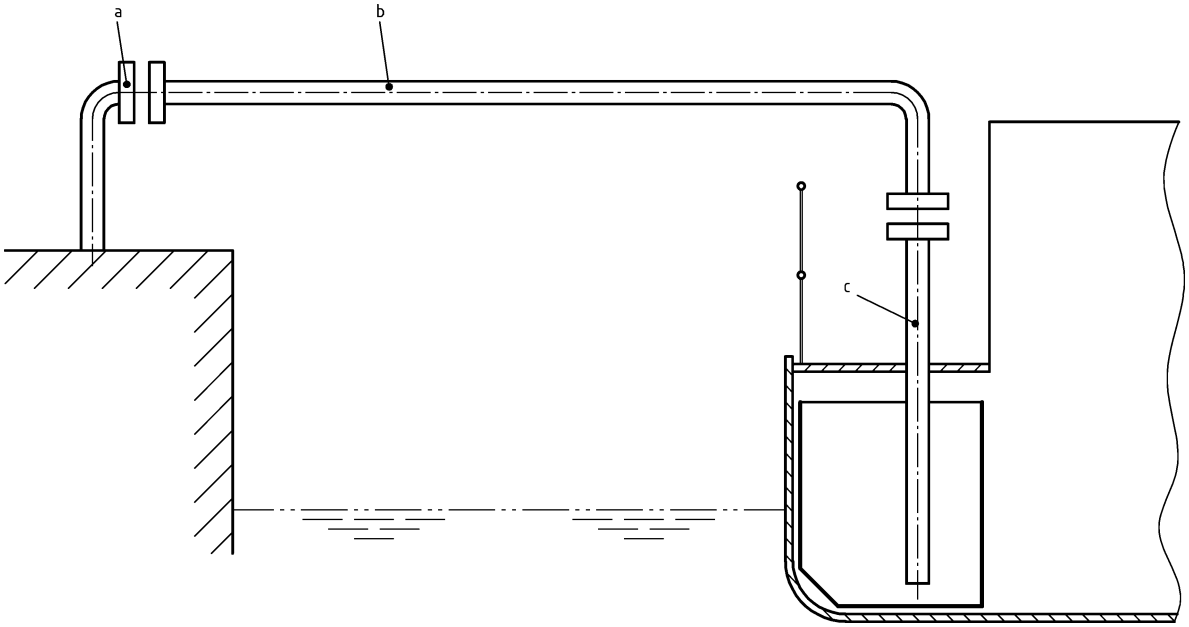
— Permanently connected pipeline.

On the consumer side there are the following versions:

— Fixed connection;

— Retrofitting connection.

The overviews in Figure 1 and Figure 2 provide examples of connections for storing potable water.



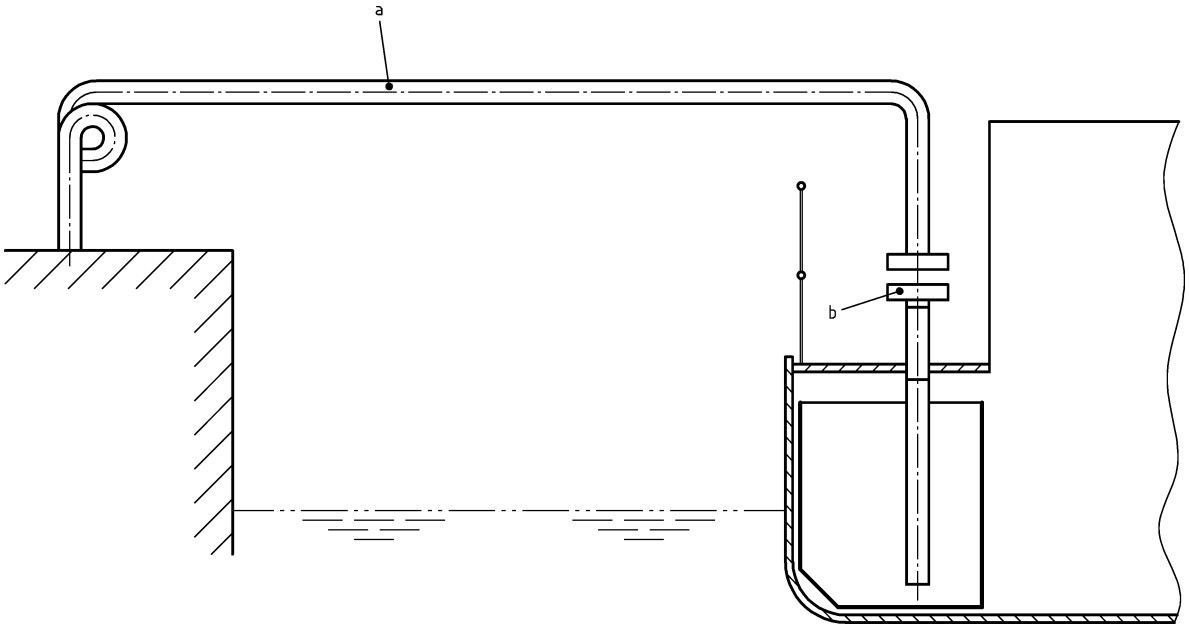
Key

a Fixed connection on the supply side.

b Pipeline.

c Fixed connection on the consumer side.

Figure 1 — Overview of potable water transfer, here the example has a fixed connection on the supply side, a pipeline and a fixed coupling on the consumer side



Key

a Permanently connected pipeline on the supply side.

b Retrofitting connector.

Figure 2 — Overview of potable water transfer, here the example has a fixed pipeline connected on the supply side and a retrofitting coupling on the consumer side

4.2.2 Fixed connection

4.2.2.1 General information

The fixed connection, see Figure 3, shall consist of a threaded pipe connection, a C coupling with dimensions as per DIN 14307-1 as a fixed coupling and a dummy coupling.

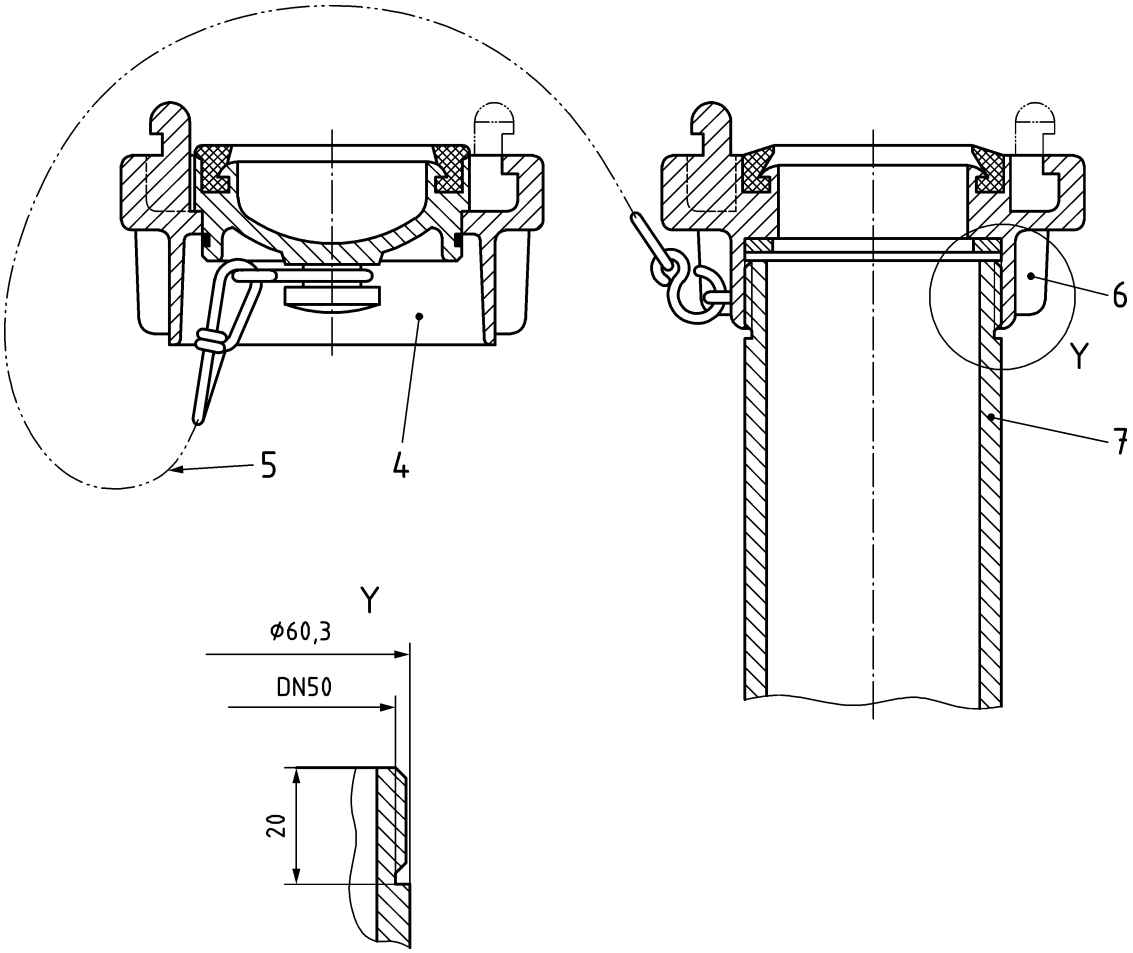
4.2.2.2 Fixed connection on the supply side

The C coupling on the supply side, 4.2.2.1, shall be permanently connected to the threaded pipe connection.

4.2.2.3 Fixed connection on the consumer side

The C coupling on the consumer side, 4.2.2.1, shall be permanently connected to a threaded pipe connection. The pipe shall be fitted with an ISO 228 – G 2 A pipe thread 20 mm long (DN 50). The pipe connection shall be welded firmly to the superstructure, the deck or the pipeline system and in such a way that its end is at least 300 mm above the deck. The C coupling shall be permanently attached to the pipe connection.

Dimensions in millimetres

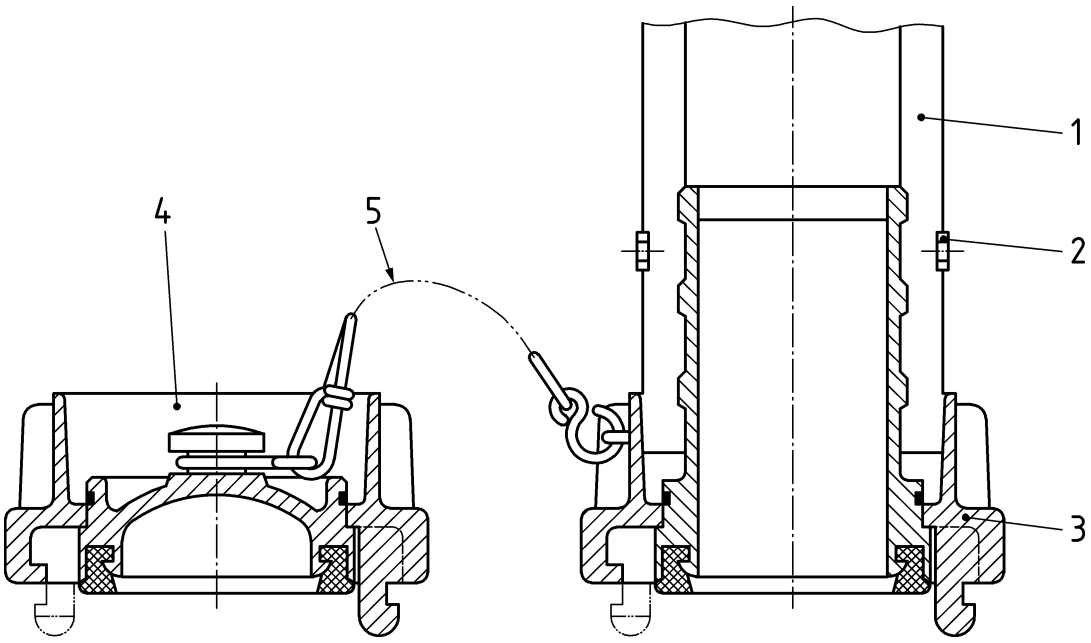


Key
Item no. see parts list Table 1

Figure 3 — Fixed connection

4.2.3 Pipe connector

The pipe connector, see Figure 4, shall consist of a C coupling with dimensions as per DIN 14302, that is attached to the pipe by a pipe clamp as per 4.2.5 and a dummy coupling.



Key
Item no. see parts list Table 1

Figure 4 — Pipe connection

4.2.4 Dummy coupling

Each fixed and pipe coupling shall be fitted with a dummy coupling with dimensions as per DIN 14311 that shall be attached to the relevant coupling so that it cannot be detached, e.g. with a chain and an S hook.

It shall be possible to lock dummy couplings that are not secured against unauthorised access in the closed position.

4.2.5 Pipe

The pipe shall meet the requirements set out in 5.3.

4.2.6 Retrofitting connection

The fixed coupling on the consumer side on inland navigation vessels that have a screw connection for receiving potable water shall be connected using a retrofitting connection, see Figure 5. The connection consists of:

— a C coupling with dimensions as per DIN 14307-1;

— a connecting part consisting of a pipe of at least 300 mm long with 20 mm long ISO – 228 G 2 A pipe threads on both sides (DN 50);

— a dummy coupling

— if necessary, a reducing coupling or a reducing bracket.

The connector shall be firmly welded or cemented to the screw connection.

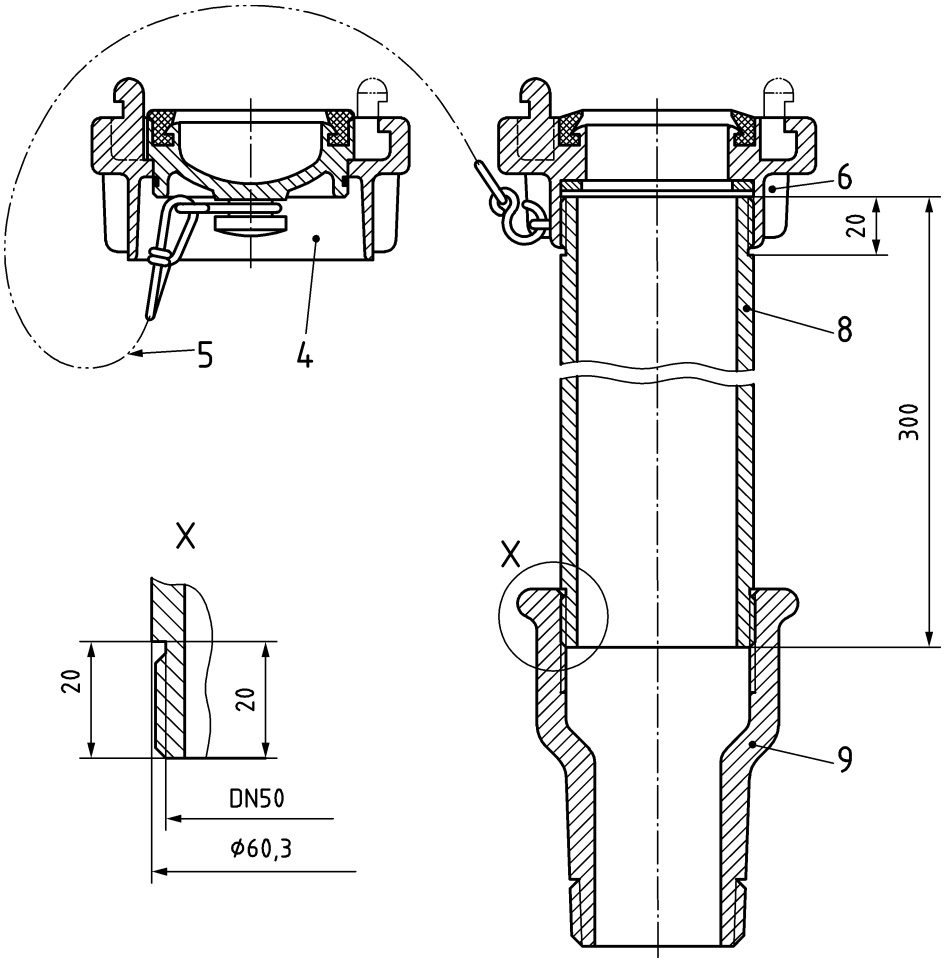
Designs:

Design A: No reducing coupling – Deck closure complies with pipe thread ISO 228 G 2 A;

Design B: With reducing coupling – Deck closure does not comply with pipe thread ISO 228 G 2 A;

Design C: With reducing bracket for special connections, e.g. for connection running horizontally from the deck superstructure.

Dimensions in millimetres



Key
Item no. see parts list Table 1

Figure 5 — Retrofitting connection

Table 1 — Parts list

Item no.	Designation	Picture	Remarks
1	Pipe	4	See 4.2.5
2	Pipe clamp	4	As per EN ISO 9093-1
3	Pipe coupling	4	With dimensions as per DIN 14302
4	Dummy coupling	3, 4, 5	With dimensions as per DIN 14311
5	Undetachable connection	3, 4, 5	Connected permanently to items 3 and 4, e.g. with a chain and S hook.
6	Fixed coupling	3, 5	With dimensions as per DIN 14307-1
7	Pipe with thread connection	3	Pipe thread ISO 228 — G 2 A (l = 20 mm) Pipe as per EN 10220 or equivalent
8	Connector	5	Pipe thread on both sides ISO 228 — G 2 A (l = 20 mm) Pipe as per EN 10220 or equivalent (l = 300 mm)
9	Reducing coupling or reducing bracket	5	Not required with a deck closure with a nominal width as per DN 50

4.3 Dimensions

The nominal size for the coupling is 52 = C.

Dimensions for reducing couplings or brackets are set out in Table 2.

Table 2 — Dimensions for reducing couplings or brackets (item 9)

Nominal deck closure size	Pipe thread as per EN ISO 228-1 D	d_1 mm	d_2 −0,2 −0,4 mm	h_2 0 −0,4 mm	Reducing coupling DN mm
1 1/4	ISO 228 — G 1 1/4 A	Ø 42,4	Ø 50	18	32
1 1/2	ISO 228 — G 1 1/2 A	Ø 49,3	Ø 57	18	40
2	ISO 228 — G 2 A	Ø 60,3	Ø 70	20	Not required
2 1/2	ISO 228 — G 2 1/2 A	Ø 76,1	Ø 86	20	65

4.4 Connection configuration

4.4.1 The connection shall be easily accessible and the configuration shall allow a pipe with a bend radius of 500 mm to be easily connected.

4.4.2 The fixed coupling on the consumer side shall be attached to the pipe (item 7 or 8) in such a way that even when the connection is hidden, it is easy to attach the pipe coupling and lock it securely. There shall be enough space available for operating.

4.4.3 The connection shall be protected when it is installed so that no damage can occur during onboard operations and it shall not restrict passageways alongside it.

4.4.4 The fixed coupling shall be permanently connected to the ship, e.g. by cementing. The connector shall be permanently connected to the ship, e.g. by welding or cementing.

5 Materials

5.1 General information

Any materials coming into contact with potable water shall be hygienically harmless and shall not affect the quality of the potable water pursuant to Directive 98/83/EG.

5.2 Pipe with thread connection and connector

Pipe material manufactured as per EN 10220 or equivalent.

5.3 Pipe

The pipe shall be

— suitable for an operating pressure of 1.2 MPa (12 bar);

— impermeable to light;

— resistant to a temperature range of −20 °C to +60 °C;

— UV-resistant;

— abrasion-resistant;

— resistant to commercially available cleaning and disinfection agents.

6 Instructions for use

Instructions for cleaning and disinfection shall be attached to the pipe.

7 Description

7.1 Supply side connection for storing potable water

A supply side connection for storing potable water shall be labelled with:

Supply side connection – potable water EN 16865

7.2 Pipeline for storing potable water

A consumer side pipeline for storing potable water with a length of 20 m (20) shall be labelled with:

Pipeline – potable water EN 16865 — 20

7.3 Consumer side connection for storing potable water

A consumer side connection for storing potable water shall be labelled with:

Consumer side connection – potable water EN 16865

7.4 Retrofitting connection

A design B (B) retrofitting connection for a connection level with the deck with a nominal width as per DN 40 (40) shall be labelled as:

Connection – potable water EN 16865 — B 40

8 Labelling

8.1 Pipe

The pipe shall be blue and marked with a green strip for potable water.

8.2 Connection for storing potable water

The connection for storing potable water shall be marked permanently

a) by coloured markings on the pipe connection, item 7 or on the connector, item 8 in the colours blue-green blue as per ISO 14726 and
b) by a plate, engraved or overlaid script, font size at least 7 mm.

Figure 6 — Plate for labelling the potable water connection

The plate, see Figure 6, shall be fitted in the immediate vicinity of the potable water connection. It shall be supplemented by an additional plate labelled as Potable water connection in the respective national language. Both plates shall be combined with each other.

Bibliography

[1] DIN 86202, *PN 16 copper zinc alloy C pressure coupling for use on ships*

[2] DIN 86204, *PN 16 copper zinc alloy C fixed coupling for use on ships*

[3] DIN 86206, *PN 16 copper zinc alloy C dummy coupling for use on ships*

[4] EN 13443-2:2005+A1:2007, *Water conditioning inside buildings — Mechanical filters — Part 2: Particle rating 1 µm to less than 80 µm — Requirements for performance, safety and testing*

[5] ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

[6] DVGW VP 549, *Pipes for time restricted transport for potable water — Requirements and testing*

[7] DVGW VP 550, *Pipe fittings for pipes for time restricted transport of potable water — Requirements and testing*

[8] Directive 98/83/EG of the Council dated 3 November 1998 regarding the quality of water for human consumption

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