

**Skeppsteknik – Färskvattenförråd i fartyg
och marina konstruktioner –
Del 1: Planering och utförande
(ISO 15748-1:2002)**

**Ships and marine technology – Potable water
supply on ships and marine structures –
Part 1: Planning and design
(ISO 15748-1:2002)**

Europastandarden EN ISO 15748-1:2002 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 15748-1:2002.

The European Standard EN ISO 15748-1:2002 has the status of a Swedish Standard. This document contains the official English version of EN ISO 15748-1:2002.

Dokumentet består av 31 sidor.

Upplysningar om **sakinnehållet** i standarden lämnas av SIS, Swedish Standards Institute, tel 08 - 555 520 00.

Standarder kan beställas hos SIS Förlag AB som även lämnar **allmänna upplysningar** om svensk och utländsk standard.

Postadress: SIS Förlag AB, 118 80 STOCKHOLM
Telefon: 08 - 555 523 10. *Telefax:* 08 - 555 523 11
E-post: sis.sales@sis.se. *Internet:* www.sisforlag.se

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 15748-1

May 2002

ICS 47.020.30

English version

**Ships and marine technology - Potable water supply on ships
and marine structures - Part 1: Planning and design
(ISO 15748-1:2002)**

Navires et technologie maritime - Approvisionnement en
eau potable sur navires et structures maritimes - Partie 1:
Planification et conception (ISO 15748-1:2002)

Schiffe und Meerestechnik - Trinkwasser-
Versorgungsanlagen auf Schiffen und Seebauwerken -
Teil 1: Planung und Konstruktion (ISO 15748-1:2002)

This European Standard was approved by CEN on 1 May 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Capacity requirements	8
5 Sanitary requirements.....	8
6 Potable water supply systems	9
7 Technical requirements	10
8 Pipelines	10
9 Pipes and pipe dimensions	12
10 Fittings and pipe joints	12
11 Fittings	12
12 Protective fittings	13
13 Pumps	13
14 Potable water tanks	14
15 Potable water heating plants	16
16 Sterilization of potable water.....	19
17 Layout of piping.....	21
18 Calculation principles	24
19 Testing and flushing of pipelines	24
Annex A (informative) Explanations.....	25
Annex B (informative) Appropriate pipe dimensions	26
Annex C (informative) Inspection and maintenance of filters	28
Bibliography	29

Foreword

This document (EN ISO 15748-1:2002) has been prepared by Technical Committee ISO/TC 8 "Ships and marine technology" in collaboration with Technical Committee CEN/TC 300 "Sea-going vessels and marine technology", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2002, and conflicting national standards shall be withdrawn at the latest by November 2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

NOTE FROM CMC The foreword is susceptible to be amended on reception of the German language version. The confirmed or amended foreword, and when appropriate, the normative annex ZA for the references to international publications with their relevant European publications will be circulated with the German version.

Endorsement notice

The text of the International Standard ISO 15748-1:2002 has been approved by CEN as a European Standard without any modifications.

Ships and marine technology — Potable water supply on ships and marine structures —

Part 1: Planning and design

1 Scope

This part of ISO 15748 applies to the planning, design and configuration of potable water supply systems on ships, stationary or floating marine structures and inland navigation vessels.

This part of ISO 15748 specifies the minimum requirements for potable water supply systems to be met in order to protect the potable water and to maintain its quality.

It also provides hints on components to be used and on laying of the pipelines.

NOTE The transfer of potable water and the regulations to be observed are not covered by this part of ISO 15748. The transfer of potable water is subject to special regulations.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 15748. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 15748 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO 65, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1*

ISO 161-1, *Thermoplastics pipes for the conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 274, *Copper tubes of circular section — Dimensions*

ISO 426-2, *Wrought copper-zinc alloys — Chemical composition and forms of wrought products — Part 2: Leaded copper-zinc alloys*

ISO 1127, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length*

ISO 1635, *Wrought copper and copper alloys — Round tubes for general purposes — Mechanical properties*

ISO 4200, *Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length*

ISO 5620-1, *Shipbuilding and marine structures — Filling connection for drinking water tanks — Part 1: General requirements*

ISO 14726-1, *Ships and marine technology — Identification colours for the contents of piping systems — Part 1: Main colours and media*

ISO 14726-2¹⁾, *Ships and marine technology — Identification colours for the contents of piping systems — Part 2: Additional colours for different media and/or functions*

ISO 15748-2, *Ships and marine technology — Potable water supply on ships and marine structures — Part 2: Method of calculation*

SOLAS 1974, *International Convention for the Safety of Life at Sea, 1974*

3 Terms and definitions

For the purposes of this part of ISO 15748, the following terms and definitions apply.

3.1

potable water supply system

system for the generation, treatment, transfer, conveyance, storage, transport and distribution of potable water

3.2

water treatment plant

equipment for treating potable water whilst maintaining potable water properties, e.g. using filters, dosage plants, ion exchangers, disinfecting plants

3.3

potable water heaters

appliances used to heat potable water without affecting its properties for consumption apart from a change in temperature, e.g. continuous-flow water heaters, storage heaters

3.4

apparatus

collective term for technical installations making use of and/or transforming potable water

EXAMPLE

- distillation and sterilization apparatus;
- large-scale cooking equipment, dosage plant;
- pressurized water reservoirs, water heaters;
- dishwashers, coffee machines, as well as devices of all kinds forming part of the potable water system or connected temporarily or permanently to it, except for supply and circulating pumps.

3.5

water

collective term for all types of water used for water supply

1) To be published

3.6
raw water
untreated water

NOTE Raw water and sea water are considered equivalent.

3.7
freshwater
water originally intended for human consumption and use on board as potable water but also used for certain technical purposes and for sanitary-hygienic needs

3.8
potable water
water suitable for human consumption and use in compliance with the quality requirements laid down in the applicable statutory provisions, defined in this part of ISO 15748 as:

- a) water from a central public potable water supply;
- b) water converted from sea water by evaporation at temperatures exceeding 80 °C;
- c) water converted from sea water by evaporation at temperatures below 80 °C, and which has additionally been sterilized;
- d) water generated by reverse osmosis;
- e) hot potable water heated in suitable water heaters.

3.9
cold water
cold potable water at temperatures between 5 °C and 25 °C

NOTE The upper temperature limit may be higher e.g. in the tropics.

3.10
hot water
hot potable water at temperatures between 50 °C and 90 °C, usually up to 60 °C

3.11
mixed water
hot and cold potable water mixed by means of a mixer tap

3.12
potable water line
pipeline exclusively carrying potable water

3.13
supply line
entire potable water pipeline system downstream of the discharge (supply) pump

3.14
water main
section of piping between the discharge pump and the point where the cold water line branches off from the line leading to the central water heater

3.15
distribution line
section of the supply line downstream of the watermain

3.16
ring line
distribution line providing bidirectional water supply by way of loop-type installation

3.17

hot-water ring line

distribution line for unidirectional supply only with water circulation by means of a circulating pump to feed back unused hot water to the water heater

3.18

circulating line

section of the cold/hot-water ring line without dispensing point, via which unused cold water is fed back to the suction side of the supply pump or unused hot water is fed back to the water heater

3.19

trunk line

riser

vertical section of the supply line branching off from a distribution line

NOTE Deck lines and dispensing lines branch off from trunk lines.

3.20

deck line

section of the supply line branching off from the trunk line within one deck

3.21

service line

single feed line

section of the supply line leading from the deck line to the consumer

3.22

pump discharge line

discharge line downstream of the discharge outlet of a pump

3.23

pump return line

line through which water is fed to the pump

3.24

service fitting/outlet fitting

fitting for shutting off, releasing and controlling the volume flow at the end of a supply line, the outlet side thereof being in accordance with the service function, e.g. equipment valve, outlet valve, flush valve, mixer tap

3.25

safety fitting

fitting to protect system parts against inadmissible pressure and temperature transgressions, e.g. safety valves

3.26

protective fitting

fitting to protect the water characteristics in the piping system, e.g. vacuum breakers in connection with non-return valves, pipe disconnectors

3.27

filter

device for extraction of solid matter from potable water

3.28

calculation flow

assumed flow at the service fitting taken as calculation basis:

$$\dot{V}_R = (\dot{V}_{\min} + \dot{V}_0)/2$$

where

\dot{V}_R is the calculation flow, expressed in litres per second;

\dot{V}_{\min} is the minimum flow, expressed in litres per second;

\dot{V}_0 is the peak flow, expressed in litres per second.

3.29

sum flow

sum of the calculation flows for all water-consuming units served via one cross-section

3.30

peak flow

flow decisive for hydraulic calculation, taking into consideration probable simultaneous water withdrawals during operation

3.31

closed continuous flow heater

water heater resistant to pressure wherein the water is heated whilst passing the heater, with or without storage

3.32

open storage heater

pressureless water heater, heating and storing water in a container which is part of the storage heater

4 Capacity requirements

On ships, marine structures and inland waterway craft, pure potable water shall always be available in sufficient quantity. The potable water supply system shall be sized and designed accordingly.

Depending on needs, sufficiently sized potable water storage tanks and/or plants for the conversion of sea water to potable water shall be provided.

Any accommodation areas on ships and marine structures that are not provided with a dispensing facility from a central potable water supply shall be equipped with a sufficiently sized potable water container.

5 Sanitary requirements

5.1 Potable water

The quality of the potable water shall be such that its consumption and use will not affect human health, particularly as far as pathogenic microorganisms are concerned; i.e. potable water

- shall be free of pathogenic microorganisms;
- shall be as sterile as possible;
- should be palatable (it shall be colourless, clear, cool, odourless and acceptable with respect to taste);
- may only contain traces of dissolved minerals.

As far as health considerations are concerned, the potable water characteristics shall comply with the potable water regulations stated by the authorized national governmental bodies.

5.2 Protection of the potable water, maintenance of the potable water quality

5.2.1 Potable water supply systems shall be fitted with a means of sterilizing water transferred from land-based facilities or water stored on board for a prolonged period of time.

5.2.2 It is not permissible to connect potable water lines to lines or facilities carrying water which is not potable (e.g. cooling freshwater lines); there shall be a hygienically reliable separation between these lines, which may be achieved, e.g.

- by means of a free air line;
- by means of an indirect connection via the storage units (water supply via a free air line);
- by means of a pipe disconnecter;
- by means of a back flow preventer.

5.2.3 Potable water dispensing points where a backflow of water is possible shall be secured by means of protective fittings in accordance with 3.26.

5.2.4 Any material, auxiliary material or protective coating used shall be safe from a hygienic and physiological point of view, and shall be sufficiently resistant to any physical, chemical or corrosive stress to be anticipated. It shall not release any substances which may influence the digestibility, taste, smell or colour of the potable water. If applicable, the coating shall comply with the requirements of national authorities.

Pressurized components shall not be negatively influenced by water temperatures of up to 90 °C. For service fittings the maximum temperature is 70 °C.

5.2.5 Internal corrosion shall be prevented as far as possible by selecting and using materials that are suitable for potable water (cold or hot) and that are compatible with each other.

5.2.6 Compressed-air cushions directly contacting the water surface inside the pressurized reservoir shall not impair the quality of the potable water.

5.2.7 Plastics and other non-metallic materials shall conform to the requirements and recommendations concerning the suitability of these materials to potable water, stated by the authorized national bodies.

6 Potable water supply systems

A potable water supply system includes all facilities, piping and apparatus serving to transfer, store, treat, transport or dispense potable water. Also included in this definition are facilities serving to produce potable water, e.g. distillation from sea water.

If the potable water is conveyed through apparatus and facilities that will impair its alimentary quality as defined by the regulations, the potable water system terminates at the assigned safety fitting. The following components may be included in potable water supply systems:

- potable water tanks;
- transfer, operating and service lines;
- pumps;
- pressurized water reservoirs;
- potable water heaters;