



SLOVENSKI STANDARD
SIST EN ISO 15749-3:2004
01-september-2004

Šifra standarda: SIST EN ISO 15749-3:2004
Naslov: Črnila za tiskanje - Del 3: Sanitarna odvodnjava, odvodnjava za vakuumski sistem (ISO 15749-3:2004)

Ships and marine technology - Drainage systems on ships and marine structures - Part 3: Sanitary drainage, drain piping for vacuum system (ISO 15749-3:2004)

Schiffe und Meerestechnik - Entwässerungsanlagen auf Schiffen und Seebauwerken - Teil 3: Sanitär-Entwässerung, Abflussleitungen im Vakuumsystem (ISO 15749-3:2004)
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Navires et technologie maritime - Installations de drainage sur navires et structures maritimes - Partie 3: Drainage sanitaire, conduits de décharge au système de vide (ISO 15749-3:2004)
<https://standards.iteh.ai/catalog/standards/sist/d1c06a01-2a37-45c7-80da-f76173af8498/sist-en-iso-15749-3-2004>

Ta slovenski standard je istoveten z: EN ISO 15749-3:2004

ICS:

47.020.30 Sistemi cevi Piping systems

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 15749-3

May 2004

ICS 47.020.30

English version

Ships and marine technology - Drainage systems on ships and
marine structures - Part 3: Sanitary drainage, drain piping for
vacuum system (ISO 15749-3:2004)

Navires et technologie maritime - Installations de drainage
sur navires et structures maritimes - Partie 3: Drainage
sanitaire, conduits de décharge au système de vide (ISO
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Schiffe und Meerestechnik - Entwässerungsanlagen auf
Schiffen und Seebauwerken - Teil 3: Sanitär-
Entwässerung, Abflussleitungen im Vakuumsystem (ISO
15749-3:2004)

This European Standard was approved by CEN on 16 April 2004.

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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 Central Secretariat has the same status as the official versions.

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

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

EN ISO 15749-3:2004 (E)**Foreword**

This document (EN ISO 15749-3:2004) 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 2004, and conflicting national standards shall be withdrawn at the latest by November 2004.

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

Endorsement notice

The text of ISO 15749-3:2004 has been approved by CEN as EN ISO 15749-3:2004 without any modifications.

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INTERNATIONAL
STANDARD

ISO
15749-3

First edition
2004-05-01

**Ships and marine technology —
Drainage systems on ships and
marine structures —**

Part 3:

**Sanitary drainage, drain piping for
vacuum systems**

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(standards.iteh.ai)

*Navires et technologie maritime — Installations de drainage sur navires
et structures maritimes —*

SIST EN ISO 15749-3:2004

Partie 3: Drainage sanitaire, conduits de décharge au système de vide

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Reference number
ISO 15749-3:2004(E)

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Published in Switzerland

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ISO 15749-3:2004(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15749-3 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 3, *Piping and machinery*.

ISO 15749 consists of the following parts, under the general title *Ships and marine technology — Drainage systems on ships and marine structures*: **(standards.iteh.ai)**

- *Part 1: Sanitary drainage-system design* [SIST EN ISO 15749-3:2004](https://standards.iteh.ai/catalog/standards/sist/en-iso-15749-3-2004)
- *Part 2: Sanitary drainage, drain piping for gravity systems* <https://standards.iteh.ai/catalog/standards/sist/dfc60ab1-2a19-45c7-a9da-f76173af8498/sist-en-iso-15749-3-2004>
- *Part 3: Sanitary drainage, drain piping for vacuum systems*
- *Part 4: Sanitary drainage, sewage disposal pipes*
- *Part 5: Drainage of decks, cargo spaces and swimming pools*

Ships and marine technology — Drainage systems on ships and marine structures —

Part 3: Sanitary drainage, drain piping for vacuum systems

1 Scope

This part of ISO 15749 applies to the design of sanitary drain lines in vacuum systems on ships and marine structures.

For planning and basic requirements, see ISO 15749-1.

2 Normative references

The following referenced documents are indispensable for the application 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.

IMO Resolution A.753 (18), *Guidelines for the application of plastic pipes on ships*¹⁾

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

ISO 264, *Unplasticized polyvinyl chloride (PVC) fittings with plain sockets for pipes under pressure — Laying lengths — Metric series*

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

ISO 9329-1, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steels with specified room temperature properties*

ISO 9330-1, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steel tubes with specified room temperature properties.*

ISO 15749-1, *Ships and marine technology — Drainage systems on ships and marine structures — Part 1: Sanitary drainage-system design*

ISO 15749-4, *Ships and marine technology — Drainage systems on ships and marine structures — Part 4: Sanitary drainage, sewage disposal pipes*

1) Published by International Maritime Organization, London.
Available from IMO Secretariat, Publications Section, 101-104 Piccadilly, London W1V, United Kingdom.

ISO 15749-3:2004(E)**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in ISO 15749-1 apply.

4 Vacuum system**4.1 Functional description**

The vacuum drainage system operates as follows:

- wastewater is collected from water closets, urinals, and bidets or from other drainage items in branch lines or manifolds;
- the wastewater is carried by means of the vacuum to a wastewater collector tank or a sewage treatment plant.

The wastewater is evacuated in the form of a “plug” (sewage plug) owing to a pressure difference in the pipes before and behind the plug.

4.2 Description

4.2.1 Drain lines in the vacuum system commence at the drain of a drainage item.

Vacuum-operated water closets have an integrated vacuum mechanism, other drainage items are connected to a separate vacuum valve via a short non-vacuum line.

Drain lines in the vacuum system terminate at a vacuum-generating unit.

4.2.2 The wastewater is conveyed through pressure pipes from the vacuum generation unit to a collector tank or sewage treatment plant.

NOTE The vacuum-generating unit may also be integrated into the collector tank or sewage treatment plant.

4.2.3 The sewage disposal pipes downstream of the collector tank or sewage treatment plant are not part of the vacuum system.

For the design of these and other pressure pipes, ISO 15749-4 is applicable.

Figure 2 of this standard shows an example of a vacuum-operated drainage system with drain lines.

4.2.4 Depending on the ship type, its architecture, arrangement of ship's rooms and number of persons, one, two or more vacuum sewage systems, which serve separate sections of a ship, can be provided.

4.3 Operating pressure

The operating pressure is between 0,4 bar and 0,7 bar absolute pressure (corresponding to a permissible negative pressure of between – 0,3 bar and – 0,6 bar).

4.4 Drainage items**4.4.1 Vacuum-operated water closet**

A water closet fitted with a mechanism for drain and flush valve control shall be provided.

The water volume for one flushing operation is approximately 1,2 litres.

4.4.2 Urinals and bidets

These sanitary drainage items do not have built-in vacuum mechanisms and shall therefore be connected to a separate vacuum mechanism (vacuum valve) via connecting lines.

4.4.3 Washbasins and other drainage items

These sanitary drainage items do not have built-in vacuum mechanisms and shall therefore be connected to a separate vacuum mechanism (vacuum valve) via connecting lines.

5 Pipes

Depending on the location, the following pipes shall be used for vacuum drain lines and vent lines:

- steel pipes in accordance with 5.1;
- steel pipes and CuNiFe pipes with spigot and socket joints, hereinafter referred to as spigot and socket pipes;
- CuNiFe pipes in accordance with 5.3;
- PVC-U pipes in accordance with 5.4; plastic pipes shall be approved in accordance with IMO-Resolution A.753 (18);
- pipes with low flame spread and smoke emission properties are at the discretion of the classification society.

For nominal bores see Table 1.

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Table 1 — Nominal bores for drain lines

Type of pipe	Steel and CuNiFe pipes	PVC-U and spigot and socket pipes
Nominal bore, NB	40	40
	50	50
	100	—

5.1 Steel pipes

The following types of pipes are applicable:

- seamless steel pipes in accordance with ISO 4200 and ISO 9329-1, of S 235 JR;
- welded steel pipes in accordance with ISO 4200 and ISO 9330-1, of S 235 JR;
- threaded pipes in accordance with ISO 65, of S 185.

For outside diameter and wall thickness see Table 2.