

BS ISO 17357-1:2014



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Ships and marine technology — Floating pneumatic rubber fenders

Part 1: High pressure

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National foreword

This British Standard is the UK implementation of ISO 17357-1:2014. Together with BS ISO 17357-2:2014 it supersedes BS ISO 17357:2002, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee SME/32/-/4, Ships and marine technology - Outfitting and deck machinery.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Ships and marine technology — Floating pneumatic rubber fenders —

Part 1: High pressure

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Partie 1: Haute pression



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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.

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 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

ISO 17357-1 together with ISO 17357-2 cancels and replaces ISO 17357:2002.

ISO 17357 consists of the following parts, under the general title *Ships and marine technology — Floating pneumatic rubber fenders*:

- *Part 1: High pressure*
- *Part 2: Low pressure*

Introduction

This International Standard has been developed to provide guidelines on the quality and performance of all floating pneumatic rubber fenders. Floating pneumatic rubber fenders can play an important role in a ship's safe berthing operation and this International Standard is seen as a technical reference to ensure necessary product standards.

Essentially there are two main types of floating pneumatic rubber fender, defined as either high or low pressure fenders. Although manufactured using different techniques, both high and low pressure fenders work by the same principle. The resistance to berthing vessel momentum is provided by a reaction pressure due to compression of the air inside the fender when deformed by the vessel's hull. The kinetic energy of the berthing vessel is absorbed during the work done to compress the air inside the fender. Fenders are sized according to the expected duty of the fender in terms of the energy absorption (EA) requirements which will be at the most basic level, a function of the vessel mass and velocity.

Throughout this International Standard, the minimum essential criteria are identified by the use of the keyword "shall". Recommended criteria are identified by the use of the keyword "should", and while not mandatory are considered to be of primary importance in providing serviceable, economical, and practical connectors. Deviation from the recommended criteria should occur only after careful consideration, extensive testing, and thorough service evaluation have shown alternative methods to be satisfactory.

The documents in the Bibliography provide information on the usage of the fenders.

Ships and marine technology — Floating pneumatic rubber fenders —

Part 1: High pressure

1 Scope

This part of ISO 17357 specifies the material, performance, and dimensions of high-pressure floating pneumatic rubber fenders, which are intended to be used for the berthing and mooring of a ship to another ship or berthing structure. It also specifies the test and inspection procedures for high-pressure floating pneumatic rubber fenders.

This part of ISO 17357 does not address any safety hazards associated with its use. It is the user's responsibility to establish appropriate safety and health practices and determine the applicability of regulatory limitations before using this part of ISO 17357.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 34-1:2010, *Rubber, vulcanized or thermoplastic — Determination of tear strength — Part 1: Trouser, angle and crescent test pieces*

ISO 37:2011, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 188:2011, *Rubber, vulcanized or thermoplastic — Determination of compression set*

ISO 815-1:2008 *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

ISO 1382:2012, *Rubber — Vocabulary*

ISO 1431-1:2012, *Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 1: Static strain test*

ISO 7619-1:2010, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 12236:2006, *Geosynthetics — Static puncture test (CBR test)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1382:2012 and the following apply.

3.1

high pressure floating pneumatic rubber fender

fender which is made of synthetic-cord-reinforced rubber sheet with compressed air inside, at initial pressure of 50 kPa or 80 kPa, to enable it to float on the water and work as a shock absorber between two ships, or between ships and berthing structures when they come alongside each other on the water

3.2

outer rubber

rubber layer that covers the outside of the fender to protect the cord layers and the inner liner rubber from abrasion and other external forces

3.3

inner rubber

liner of a rubber membrane that seals the pressurized air inside the fender

3.4

synthetic-tyre-cord layer for reinforcement

layer made of synthetic-tyre-cord fabric, which maintains the internal air pressure of the fender

Note 1 to entry: As the main fibres of the synthetic-tyre-cord fabric are not braided like synthetic canvas fabric or synthetic belt fabric, there are advantages for its fatigue-resistance performance and pressure-holding performance. See [Annex A](#).

3.5

bead ring

steel ring which is placed at one end (or both ends) of the fender and holds the end of cord layers

Note 1 to entry: See [Annex B](#).

3.6

flange opening

steel flange which is mounted on the fender, to which an air valve or safety valve can be adapted

Note 1 to entry: See [Annex B](#).

3.7

guaranteed energy absorption

energy that the fender can absorb without permanent deformation or failure

3.8

reaction force

force produced by a fender reacting to a compressive force

Note 1 to entry: It is equal to the force of the air pressure of the fender multiplied by the contact area of the fender to the ship or berthing structure.

3.9

initial internal pressure

air pressure at which an uncompressed fender operates

3.10

endurable pressure

inner pressure at which a fender bursts

3.11

net-type fender

fender which is covered by a protection net consisting of either chain, wire, or fibre and usually with tyres or rubber sleeves

3.12

sling-type fender

fender which is designed to be used without a protection net