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ISO 17325-1

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Ships and marine technology — Marine environment protection — Oil booms —

Part 1: Design requirements

Navires et technologie maritime — Protection de l'environnement marin — Barrages de rétention de pétrole —
Partie 1: Exigences de conception

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Foreword

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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. www.iso.org/directives

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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 2, *Marine environment protection*.

ISO 17325 consists of the following parts, under the general title *Ships and marine technology — Marine environment protection — Oil booms*:

— *Part 1: Design requirements*

The following parts are under preparation:

— *Part 2: Strength and performance requirements*

— *Part 3: End connectors*

— *Part 4: Auxiliary equipment*

Introduction

Oil booms can be classified in two major types:

— fence booms typically provide a stiffened barrier designed to float vertically in the water; and

— curtain booms are provided with flexible material for the underwater portion of the membrane (called the skirt).

There are other types of booms, such as special purpose booms and sorbent booms, which are not the subject of this part of the International Standard.

All parts of ISO 17325 will give some general guidelines for manufacturers as well as users with regard to subjects associated with producing, purchasing, and using such types of equipment. It will not define any specific type and size of boom for a particular application, as many variables have to be taken into consideration.

This part of ISO 17325 specifies the basic design requirements, general function, designations and marking of oil booms. It further specifies minimum information regarding design, dimensions and materials of oil booms to be provided by the manufacturer.

This International Standard has been developed after considering the below standards and national legislative requirements.

The American Society for Testing and Materials (ASTM) Committee F-20 has prepared two standards relating to boom connectors. ASTM F1093 specifies static laboratory tests of the strength of an oil spill response boom under tensile loading. ASTM F1523 provides a guide on the selection of a containment boom that may be used to control spills of oil and other substances that float on the water.

The Japanese Industrial Standard JIS F 9900 (Parts 1 and 2) provides the necessary conditions and specifications for the design, manufacture, etc. of oil booms.

Ships and marine technology — Marine environment protection — Oil booms —

Part 1: Design requirements

1 Scope

This part of ISO 17325 specifies the basic design requirements, general function, designations and marking of oil booms. It further specifies minimum information regarding design, dimensions and materials of oil booms to be provided by the manufacturer.

The intent of this International Standard is to assist manufacturers and facilitate user selection of booms by technical criteria. It does not purport to address all aspects of booms or safety concerns associated with boom use, nor does it define boom operational procedures. It is the responsibility of the user of this International Standard to establish the appropriate safety and health practices, and determine applicability of regulatory limitations.

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.

International Maritime Organization, Manual on Oil Pollution, Section IV, Combating Oil Spills, IMO 596E, London, 2004

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

ISO 505:1999, *Conveyor belts — Method for the determination of the tear propagation resistance of textile conveyor belts*

ISO 1817:2011, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 16165:2013, *Ships and marine technology — Marine environment protection — Terminology relating to oil spill response*

ISO 17325-2, *Ships and marine technology — Marine environment protection — Oil booms — Part 2: Strength and performance requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16165, ASTM F1093, and the following apply.

3.1
end connector
device attached to the boom used for joining boom sections to one another or to other accessory devices

3.2
gross buoyancy
weight of fresh water displaced by an entire boom section when totally submerged

3.3
oil containment boom
floating barrier used to control the movement of substances that float

3.4
operational draught
minimum vertical depth of the boom below the waterline in the working condition

3.5
operational freeboard
minimum vertical height of the boom above the waterline in the working condition

3.6
tensile strength
force required to stretch boom material to the point where it fails and tears apart

4 Boom design

4.1 Application

A boom is dedicated for use in water. As its main purpose is to control the movement and/or stop spreading of an oil slick and other substances on the water surface, it has to be both above and below the water surface.

4.2 Environmental considerations

Design and production of booms shall occur in the most environmentally friendly manner. The boom and its components shall not contain any substances of potential risk to health and/or the environment, e.g. lead and tributyltin (TBT), or any other substances regulated by international/national/local legislation.

4.3 Parts of booms

In general, a boom consists of, but is not limited to the following parts:

— boom wall;

— buoyancy chamber;

— skirt;

— tension member;

— ballast member;

— end connector;

— anchor points.

4.4 Types of booms

4.4.1 General

By intended application, booms can generally be categorized as follows.

4.4.2 Curtain boom

A boom which is supported by floatation that is symmetric in the vertical cross-section. The skirt is flexible in relation to the buoyancy chamber. High buoyancy to weight ratio gives good wave response.

Often it is used in offshore conditions. The boom material usually consists of PVC-, PU-, or rubber-coated synthetic fabrics.

4.4.3 Fence boom

A boom which consists of a self-supporting or stiffened membrane supported by floatation, which is rigid in the vertical cross-section, and usually has solid floats as buoyancy material. Fence booms are often used in areas with no or limited waves.

4.4.4 Fire resistant boom

A boom intended for containment of a burning oil slick and used for *in situ* burning. The main criterion of the boom is fire resistance of the boom material above the waterline. Although most of the fire resistant boom types will only be used once, some have a cooling system incorporated which could allow the boom to be used more times. Other fire resistant booms are made of stainless steel and can also be reused.

4.4.5 Shore sealing boom

A boom that, when grounded, seals against the shoreline. It is a special type of boom used in inter-tidal zones. It is normally designed with two lower parallel water chambers and one top air chamber. This design creates an oil tight seal when the boom is situated directly on the beach or river bank. The top air chamber ensures the boom will float when in the water.

5 Boom functions and configurations

5.1 General

Functions of booms are normally divided into the following categories.

5.2 Containment

A boom is used to keep the oil from uncontrolled or unintended movement during oil spill response scenarios.

5.3 Deflection

A boom that can be deployed before an oil slick reaches the shoreline in order to protect a specific location by guiding the oil slick into less sensitive areas or collection devices, such as skimmers.

5.4 Protection

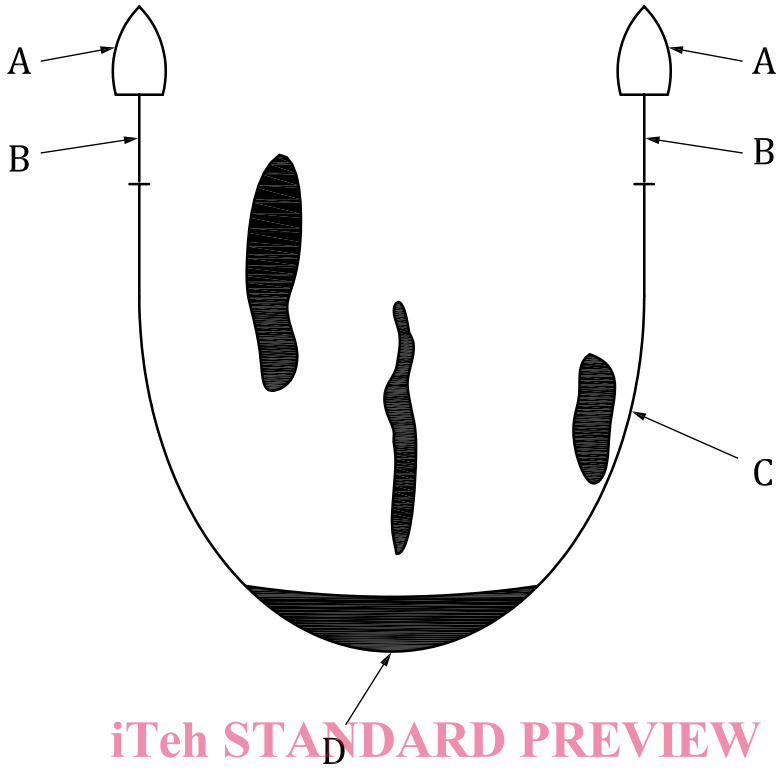
A boom is normally deployed around a potential spillage area.

5.5 Configurations

5.5.1 General

The following figures show basic boom configurations.

5.5.2 U-configuration

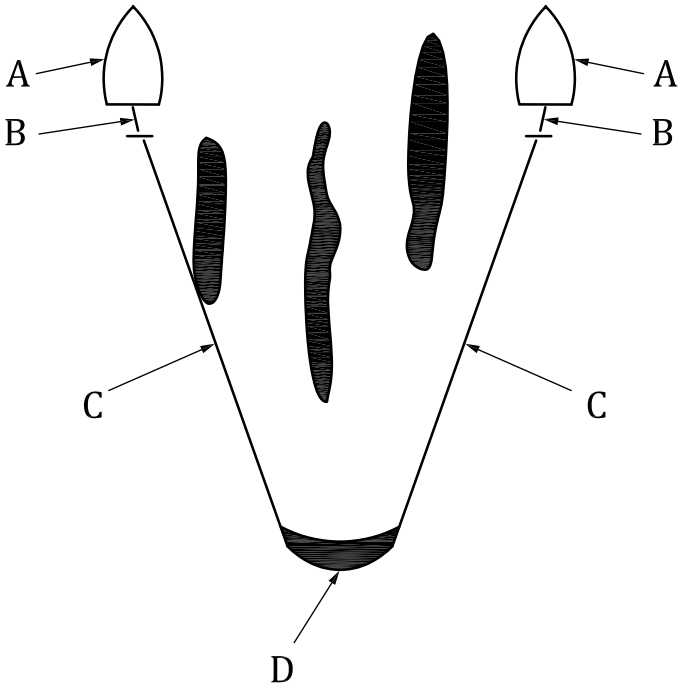


Key

A towing vessel(s)
B towing gear
C boom
D oil collection (accumulation) point

Figure 1 — U-configuration

5.5.3 V-configuration



Key

A towing vessel(s)
B towing gear
C boom
D oil collection (accumulation) point

Figure 2 — V-configuration