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

Part 4: Auxiliary equipment

Navires et technologie maritime — Protection de l'environnement marin — Barrages de rétention de pétrole —

Partie 4: Équipement auxiliaire

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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 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 2, *Marine environment protection*.

A list of all parts in the ISO 17325 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In addition to consideration of physical limitations and individual circumstances, the successful application (deployment) of booms very much depends on the use of matching accessories, referred to as auxiliary equipment for the purpose of this document.

This document gives general guidelines for manufacturers as well as users with regard to producing, purchasing and using the most common auxiliary equipment for oil booms. This document does not define any specific type and size for a particular application, as so many variables have to be taken into consideration.

This document has been developed after considering the referred relevant standards.

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

Part 4: Auxiliary equipment

1 Scope

This document specifies basic requirements for the design, layout and application of boom accessories, referred to as auxiliary equipment for the purpose of this document. This document does not purport to address all safety concerns, if any, associated with its use. However, it is the responsibility of the user of this document to establish the appropriate safety and health procedures, and to determine the applicability of regulatory limitations.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 668, *Series 1 freight containers — Classification, dimensions and ratings*

ISO 1161, *Series 1 freight containers — Corner and intermediate fittings — Specifications*

ISO 1496-1, *Series 1 freight containers — Specification and testing — Part 1: General cargo containers for general purposes*

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

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 General requirements

Oil boom auxiliary equipment shall be used exclusively with the equipment for which it is specifically designated. Any use other than the designated application requires a careful examination of the acting forces and safety aspects as well as the manufacturers'/suppliers' approval.

On request, the manufacturer shall provide calculations of material strength and dimensions indicating the forces anticipated with intended application. Nevertheless, it is exclusively the users' responsibility to keep the applied forces within the limits given by the manufacturer.

Nameplates of all auxiliary equipment shall mention its maximum gross and net weight including all components installed on it.

5 Boom reels

5.1 General

Boom reels (see Figure 1) are also referred to as boom winders or boom drums. They usually combine the function of a storage device and a deployment/recovery aid. The most common design consists of a horizontal axle with two lateral flanges. But certain types of booms require a vertical axle with only a bottom flange.

The materials that constitute the reel shall be oil resistant and sea water resistant and shall not be susceptible to deterioration under intended application.

Suitable soil protection canvasses shall be supplied with oil boom reels to prevent abrasion wear on the oil boom and secondary ground pollution resulting from recovery of a contaminated oil boom.

A protective canvas shall be constructed of a material that prevents deterioration due to oil and UV exposure.

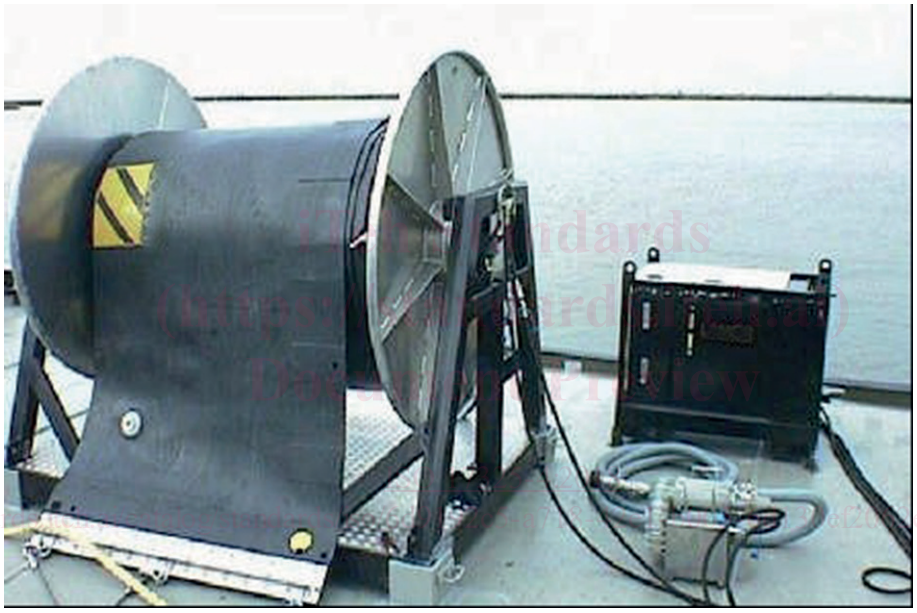

Figure 1 — Example of a boom reel

5.2 Basic design requirements

Oil boom reels shall have sufficient structural strength to withstand forces according to the intended application and the additional forces resulting from wind, current, waves, towing and potential extended recovery height for boom retrieval as well as from impacts associated with transportation. See ISO 17325-1 for applicable formulas.

For safety reasons, the lateral flanges shall have no openings of such size that would cause the boom or components to injure operating personnel or block the drum.

In order to prevent capsizing of a boom reel during boom recovery or deployment in currents or in cooperation with a towing vessel, the design of the base frame and axle brackets shall achieve a centre of gravity, which even in a completely filled condition is well below the drum's horizontal axis.

5.3 Operational considerations

Directly hand operated reels are not permissible. Manual operation may be provided only by means of double acting, self-locking gears, requiring a maximum driving force of 250 N. For safe use, hydraulic operation utilizing double acting, self-locking motors are recommended.

The boom reel shall have a brake which withstands 1,25 times the maximum torque acting on it during intended boom deployment and retrieval. As a safety feature, the brake shall allow, at higher forces, the boom to unwind from the reel. The strength of the connection between boom and reel drum shall be less than the force needed to capsize the winder. This shall prevent the reel from being pulled into the water in case of unintended unwinding of the boom.

The maximum lifting torque required is generally defined by the maximum force needed to retrieve the boom when it is being rolled up on the reel. Torque is equal to the force on the boom times the moment arm (distance).

Consider the maximum force acting on the boom and the reel due to:

— height above the water when deployed;

— pull by a towing vessel;

— current, wind and wave drag on the boom while deploying and retrieving.

Specify this maximum calculated torque and a safety factor of at least 1,25[5].

If a boom reel is equipped with its own hydraulic control, for safety reasons it shall be placed on the opposite side of the boom ballast. The hydraulic control shall automatically return to neutral when released.

5.4 Transport and lifting

Additional devices securing the boom reel for transport shall be designed in a way that their unintended interference during deployment and retrieval is impossible.

Base frames preferably shall be designed according to ISO 668 and shall incorporate corner fittings according to ISO 1161 for stowage on multiple transport vehicles. Forklift pockets shall be provided on all four sides, to prevent capsizing during forklift transport according to ISO 1496-1.

If necessary, special lifting gear shall be provided by the manufacturer. Designated lifting points shall be provided and designed according to the boom reel's maximum total gross weight taking into consideration a safety factor of at least 3,0.

Even higher safety factors are required for specific items, such as shackles, chain, wire, and/or ropes, according to material used.

The lifting points shall provide a stable lifting position. The same lifting points should be useable also for safety lashing during transport, boom deployment and retrieval.

"Working load limit" (WLL)[10] should replace "safe working load" (SWL).

6 Inflator for inflatable booms

6.1 General

Each inflatable oil boom needs to be filled with the appropriate air pressure in order to ensure full operational functionality. Thus, the air flow, delivery pressure and filling connector of the inflator need to be adapted to the requirements of the individual boom to which it belongs.

Excessive filling pressure does not only damage the boom, but will partially or completely adversely impact its effectiveness.

See Figures 2 and 3.

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Figure 2 — Example of inflator (air blower), carried on back

Figure 3 — Example of inflator (air blower), hydraulic driven

6.2 Operational considerations

For protection of personnel, during filling of a boom segment or chamber with air, the boom shall be secured to prevent intended slipping.

Sufficient work space and lengths of air hose are indispensable for both safe and quick inflating operation.

Some inflators can also be used as deflators to speed up retrieval of the booms.

Since operation of inflators is associated with excessive noise, hearing protection is recommended.