INTERNATIONAL STANDARD

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Ships and marine technology — Marine environment protection: performance testing of oil skimmers —

Part 3: High viscosity oil

Navires et technologie maritime — Protection de l'environnement marin: essais de performance des écumeurs du pétrole —
Partie 3: Pétrole haute densité

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Contents

Page

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 21072-3 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 2, *Marine environment protection*.

ISO 21072 consists of the following parts, under the general title *Ships and marine technology — Marine environment protection: performance testing of oil skimmers*:

— *Part 1: Moving water conditions*

— *Part 2: Static water conditions*

— *Part 3: High viscosity oil*

Introduction

ISO 21072 standardizes performance testing of oil skimmers used in marine pollution control.

Some oil skimmers have previously been performance tested under non-standard conditions and procedures, with declared performance parameters being of limited value to the end user, especially under field conditions.

ISO 21072 provides for carrying out and recording the results of full-scale tests for a skimmer under a variety of test conditions.

Ships and marine technology — Marine environment protection: performance testing of oil skimmers —

Part 3: High viscosity oil

1 Scope

This part of ISO 21072 specifies a methodology for establishing quantitative performance data for oil skimmers for recovery of oil with high viscosity, so the end user can objectively judge, compare and evaluate the design and performance of different skimmers. The methodology applies to testing in a basin and requires control of oil properties and oil slick characteristics.

The method is applicable to all types of skimmer provided that the equipment dimensions are within the physical limitations of the test basin. The test procedure provides full-scale test results for the unit tested, under controlled conditions, and for one or more classes of highly viscous oil. Attention is drawn to the care required when applying the test results to predict a realistic skimmer performance under field conditions.

For dedicated/inbuilt systems the test procedures outlined in this part of ISO 21072 are only applicable to the skimming device as such, not the entire skimming system.

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.

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

ISO 21072-1, *Ships and marine technology — Marine environment protection: performance testing of oil skimmers — Part 1: Moving water conditions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16165, ISO 21072-1 and the following apply.

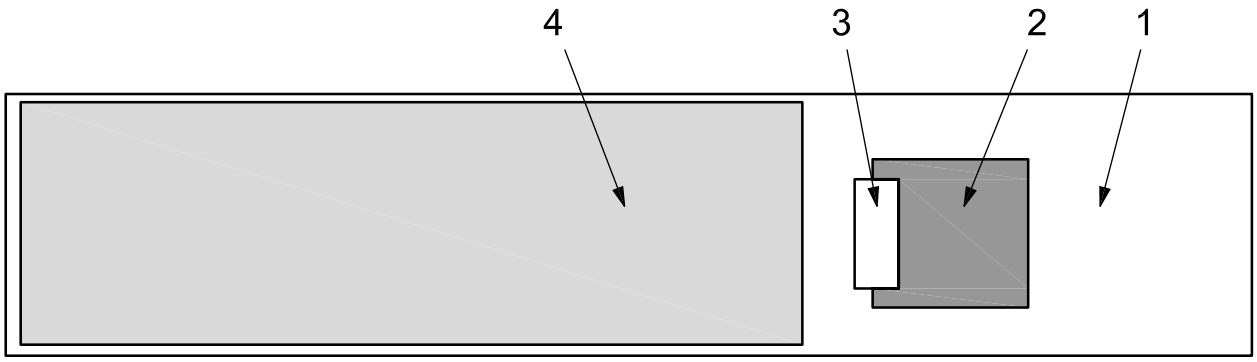
3.1
high viscosity oil
oil that due to its properties does not readily flow to a skimmer

4 Test facility requirements

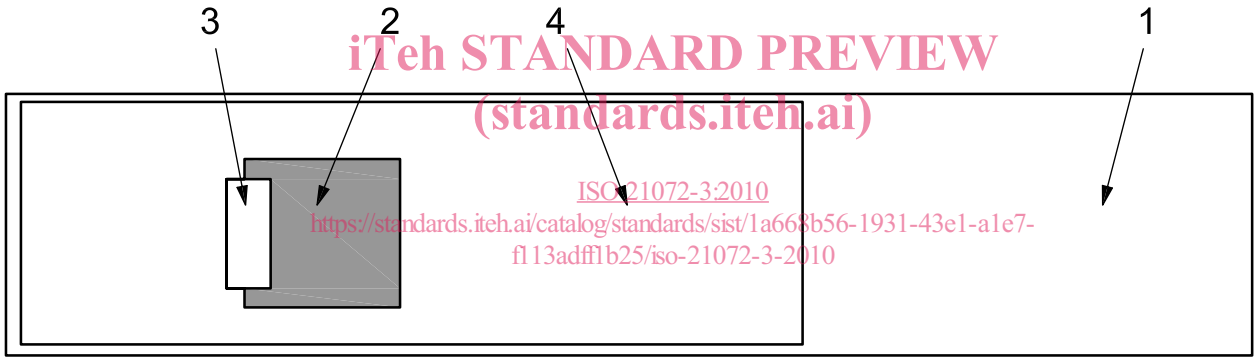
4.1 General

This part of ISO 21072 is applicable to any test arrangement that allows for the control and monitoring of the test conditions specified.

Figure 1 gives examples of test arrangements.



a) Test tank set-up prior to commencement of test and under test conditions



b) Skimmer moving through oil slick under test conditions

Key

1 skimmer body
2 pick-up/entrance of oil to skimmer
3 test oil
4 removable barrier

Figure 1 — Examples of test arrangements

The test facility shall be designed and equipped to control the parameters listed in 4.2 to 4.5.

4.2 Oil properties

The facility shall be able to maintain the oil properties for the duration of the test. Analytical equipment shall be available for measuring oil properties (see 9.1).

4.3 Air and water temperature

Testing may be carried out at any water temperature, provided that requirements with respect to oil properties are met. The facility shall be able to maintain the water temperature in the test basin at a selected test temperature with maximum variation of ± 2 °C throughout the testing period.

4.4 Oil slick thickness

The test facility shall incorporate means of measuring oil slick thickness before and after the test, with an accuracy of at least ± 20 %.

4.5 Measuring tanks

In order to provide for sufficient replicates during the test process, the test facility shall incorporate a sufficient number of calibrated tanks for accurately measuring fluid recovery rate, oil recovery rate, and water uptake. The tank volumes shall correspond to the expected recovery rate of the unit to be tested so as to provide data collection periods of sufficient duration and with sufficient measuring accuracy (see 10.1).

5 Clearance requirements

Throughout testing, to minimize any effect on oil flow to the unit or otherwise impede normal operation, there shall be sufficient clearance between the skimmer and the tank walls and any containment device.

The side clearance shall at all times be at least 50 % of the extreme width (diameter or equivalent dimension) of the skimmer under test.

The clearance between the unit and the tank floor shall be sufficient to not interfere with normal operation of the skimmer.

6 Test parameters

6.1 General

Testing shall establish quantitative performance data for the unit as a function of the following parameters:

— test oil properties;

— oil slick thickness;

— skimmer operating parameters;

— debris interference;

— forward movement of skimmer through slick.

6.2 Test oil properties

Viscosity is the main property for the test oil, regardless of the water content, provided that testing is carried out with oils meeting the specifications given in Table 1.

Oil and emulsion viscosity shall be reported at shear rates 1,10 s^{-1}.

All oils and emulsions may be reused provided that the properties of the test fluids remain within the ranges given in Table 1.