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Ships and marine technology — Marine cranes — Design requirements for low temperature operation

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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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

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Ships and marine technology — Marine cranes — Design requirements for low temperature operation

1 Scope

This document specifies the requirements for design, construction, safety, performance, acceptance test and operation of marine cranes for low temperature operation.

This document is applicable to marine cranes of the following types, which are exposed to and operated in low temperatures:

— deck cranes mounted on ships for handling cargo or containers in harbour or sheltered water conditions;

— floating cranes or grab cranes mounted on barges or pontoons for operating in harbour conditions or sheltered water conditions;

— engine room cranes and provision cranes, etc. mounted on ships (including floating docks) for handling equipment and stores in harbour conditions.

This document is not applicable to the following:

— minimum ambient operating temperatures no less than –20 °C;

— maximum ambient operating temperatures above +45 °C;

— transport, assembly, dismantling and decommissioning of cranes;

— lifting accessories, i.e. any item between the crane and the load;

— lifting operations involving more than one crane;

— hand powered cranes;

— emergency rescue operations;

— shore-side cargo handling cranes;

— portable cranes on board;

— lifting appliances for lifeboats, liferafts accommodation ladders and pilot ladders;

— launching appliances for survival craft and rescue boats;

— gangways, accommodation and pilot ladders and their handling appliances.

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 19354, *Ships and marine technology — Marine cranes — General requirements*

ISO 19355, *Ships and marine technology — Marine cranes — Structural requirements*

ISO 19356, *Ships and marine technology — Marine cranes — Test specification and procedures*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4306-1, ISO 3828 and the following 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

3.1
mean daily low temperature
MDLT
mean value of the daily low temperature for each day of the year over a minimum of ten-year period

Note 1 to entry: A data set acceptable to the administration may be used if ten years of data is not available.

3.2
polar service temperature
PST
temperature specified for a ship which is intended to operate in low air temperature, which shall be set at least 10 °C below the lowest *MDLT* (3.1) for the intended area and season of operation in polar waters

3.3
marine crane intend to operate in low temperature
crane which is intended to work in the areas where the lowest *mean daily low temperature (MDLT)* (3.1) is below –10 °C

3.4
design service temperature
DST
temperature specified for a ship which is intended to judge the performance of material, machinery and system in low air temperature

Note 1 to entry: Note1 to entry: It is usually decided by the ship-owner according to the use and service condition of the ship. It shall be set at least 10 °C below the lowest *MDLT* (3.1) for the intended area and season of operation in polar waters.

Note 2 to entry: Design service temperature (DST) equal to *polar service temperature (PST)* (3.2).

4 Design parameters of cranes

4.1 Design classification grade

The classification grade of low temperature operating cranes may be in accordance with ISO regulations on common marine cranes.

4.2 Design temperature

Design temperature would decide the steel grade. Hydraulic, electric and lubrication system should be reliable for cranes operated at design temperature and the cranes should stay undamaged at the minimum anticipated temperature.

Design temperature of cranes for low temperature operation is equal to the polar service temperature (PST) of the intended ship.

PST should be decided by ship-owner or ship designer according to mean daily low temperature (MDLT) of the intended operation area. PST would be obtained with reliable temperature records excluding those which occurred at a rate below 2,5 %.

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