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Ships and marine technology — Marine cranes — General requirements

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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).

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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 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 — General requirements

1 Scope

This document specifies the general requirements for marine cranes of metal construction.

This document is applicable to the following types of marine cranes:

— 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;

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

NOTE Marine cranes in other types can refer to this document.

This document is not applicable to the following:

— minimum ambient operating temperatures below –20 °C;

— maximum ambient operating temperatures above +45 °C;

— loads from accidents or collisions;

— lifting operations below sea level;

— 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 4301-4, *Cranes and related equipment — Classification — Part 4: Jib cranes*

ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

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ISO 4414, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

ISO 8502-3, *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)*

ISO 8503-1, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces*

ISO 12944-2, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments*

ISO 12944-5, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems*

ISO 16855, *Ships and marine technology — Loose gear of lifting appliances on ships — General requirements*

ISO 16856, *Ships and marine technology — Loose gear of lifting appliances on ships — Hooks*

ISO 16857, *Ships and marine technology — Loose gear of lifting appliances on ships — Shackles*

ISO 16858, *Ships and marine technology — Loose gear of lifting appliances on ships — Pulleys*

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

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

ISO 19359,[1)] *Ships and marine technology — Marine cranes — Design methods for drums*

ISO 19360, *Ships and marine technology — Marine cranes — Technical requirements for riging applications*

IEC 60034 (all parts), *Rotating electrical machines*

IEC 60204-32, *Safety of machinery — electrical equipment of machines — Part 32: Requirements for hoisting machines*

IEC 61892 (all parts), *Mobile and fixed offshore units — Electrical installations*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4306-1, ISO 3828, ISO 8431, ISO 19355, ISO 19356, ISO 19359, ISO 19360 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
marine crane
cranes mounted on ships (including floating docks) for handling equipment and stores, and intended for operating in harbour or sheltered water conditions, including deck cranes mounted on ships for handling cargo or containers, floating cranes or grab cranes mounted on barges or pontoons, engine room cranes and provision cranes, etc.

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3.2
deck crane
slewing crane mounted on a ship's deck and intended for loading and unloading the ship; capable of hoisting, luffing and slewing cargo, whose main structural components include pedestals, jibs and houses

Note 1 to entry: The two types of deck crane and their main components are given in Annex A.

3.3
harbour condition
condition where is no significant movement of the ship when handling cargo

4 General requirements

4.1 Overall design

4.1.1 General

4.1.1.1 The overall design of marine cranes is conducted according to generally recognized standards and industrial regulations.

4.1.1.2 The design of marine cranes shall recognize the operational requirements for such cranes and shall also comply with the regulations published by appropriate organizations, such as classification societies.

4.1.1.3 Applicable regulations are those issues by the responsible classification societies and national authorities.

4.1.2 Marine cranes with jibs are assigned classification grades in accordance with ISO 4301–4, as shown in Table 1.

Table 1 — Classification grades for marine cranes

Crane	Operating condition	Classification grade of the whole unit	Classification grade of mechanism			
			Hoisting mechanism	Luffing mechanism	Travelling mechanism	Slewing mechanism
Deck crane	Hooking	A4	M3	M3		M3
	Grabbing	A6	M5	M3		M3
Floating crane	Installation	A4	M4	M3		M3
Grab crane	Barging	A7	M7	M3		M6
Engine room crane	Maintenance	A1	M2		M2	
Provision crane	Handling provision	A2	M2	M2		M2
Classification grades such as A4 and M4 in the table shall be in accordance with ISO 4301–4.						

4.1.3 The following forces acting upon marine cranes shall be taken into consideration:

a) dead load;

b) the horizontal component of the dead load caused by the ship's inclination (heel and trim);

c) other unfavourable horizontal forces (e.g. moving inertia force, snow and ice);

d) the horizontal component of the hoisting load caused by the ship's inclination (heel and trim);

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