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Foreword

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 8, *Ships and marine technology*, SC 4, *Outfitting and deck machinery.*

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Ships and marine technology — Offshore mooring chains

1 Scope

This document specifies the requirements for grades, materials, shapes, proportions, dimensions and tolerances of offshore mooring chains.

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 4967, *Steel — Determination of content of non-metallic inclusions — Micrographic method using standard diagrams*

ASTM A255, *Standard test methods for determining hardenability of steel*

ASTM E112, *Standard test methods for determining average grain size*

ASTM E381, *Standard method of macroetch testing steel bars, billets, blooms, and forgings*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19901-7:2013 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
mooring chain
component used for positioning and mooring of offshore structures composed of *chain links* (3.2) and *accessories* (3.3)

3.2
chain link
closed, link shaped components of *mooring chain* (3.1), including common stud link, common studless link, enlarged link and end link

3.3
accessory
detachable connectors used for joining different chain components, including *joining shackle(3.8)* and *end shackle(3.9)*

3.4
common stud link
common mooring *chain link* (3.2) with stud

3.5
common studless link
common mooring *chain link* (3.2) without stud

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3.6
enlarged link
strengthened link that connects a common link and the *end link* (3.7)

3.7
end link
link that joins *mooring chains* (3.1) and shackles

3.8
joining shackle
accessories used for joining *chain links* (3.2) or other accessories, including "D" type LTM joining shackle, "D" type LTM end joining shackle, Kenter type joining shackle and "H" type LTM joining shackle

3.9
end shackle
accessories used for attaching the *mooring chain* (3.1) to mooring equipment

Note 1 to entry: It usually refers to LTM end shackle.

3.10
LTM shackle
long term moored "D" type joining shackle, "D" type end joining shackle and end shackle with the bolt fastened by nut

3.11
nominal diameter
diameter of the common link

4 Grade

4.1 The mooring chain is classified by tensile strength into five grades: R3, R3S, R4, R4S and R5.

4.2 The mechanical properties of mooring chain for each grade are given in Table 1.

4.3 The proof load and breaking load of mooring chains for each grade are given in Table 2.

5 Materials

5.1 The steel used for manufacturing of mooring chains is classified into five grades: R3, R3S, R4, R4S and R5.

5.2 Mechanical properties for materials of each grade shall meet the requirements of base materials specified in Table 1.

5.3 The steel shall be manufactured by an electric progress or one of the basic oxygen processes or any other process involving secondary refining. The austenite grain size shall be 6 or finer in accordance with ASTM E112.

5.4 Steel grades R4S and R5 shall be vacuum degassed.

5.5 For steel grades R4S and R5, the following test results shall be supplied by steel mills to the mooring chain or accessory manufacturer:

a) Each heat shall be examined for non-metallic inclusions according to ISO 4967 or equivalent standards.

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