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Ships and marine technology — Deck machinery — Accommodation ladder winches

Navires et technologie maritime — Auxiliaires de pont — Treuils pour échelles de coupée

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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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Lifesaving and fire protection*.

This second edition cancels and replaces the first edition (ISO 7364:1983), which has been technically revised.

Ships and marine technology — Deck machinery — Accommodation ladder winches

1 Scope

This International Standard specifies requirements and characteristics of ships' accommodation ladder winches provided with hydraulic, pneumatic, electric or manual drive.

This International Standard is applicable to the design and test of accommodation ladder winches.

This International Standard does not include requirements for the prime mover used to operate the winch.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2408, *Steel wire ropes for general purposes — Minimum requirements*

ISO 3828, *Shipbuilding and marine structures — Deck machinery — Vocabulary and symbols*

ISO 5488:2015, *Ships and marine technology — Accommodation ladders*

IEC 60092-401, *Electrical installations in ships — Part 401: Installation and test of completed installation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3828 and the following apply.

3.1
nominal size
used as a designation of a winch in accordance with this International Standard

Note 1 to entry: The nominal size corresponds to the drum load as given in Table 1.

3.2
drum load
maximum rope tension in the rope or ropes at the drum exit either when the winch is hoisting an unloaded accommodation ladder at the nominal speed, with the rope or ropes wound on the drum in a single layer, or when the winch is placing the accommodation ladder in its stowage position

3.3
holding load
in static mode of the winch, the maximum rope tension in the rope or ropes at the drum exit in a single layer, shall be at least three times the *drum load* (3.2)

3.4 Types of winches

3.4.1
right-hand winch
winch where the reduction gear or drive of the drum is on the right-hand side of the drum, in relation to an observer situated on the side of the motor or power supply

Note 1 to entry: See Figure 1.

3.4.2
left-hand winch
winch where the reduction gear or drive of the drum is on the left-hand side of the drum, in relation to an observer situated on the side of the motor or power supply

Note 1 to entry: See Figure 1.

3.4.3
symmetrical double drum winch
winch where the reduction gear or drive of the drums is between symmetrically situated drums

Note 1 to entry: See Figure 1.

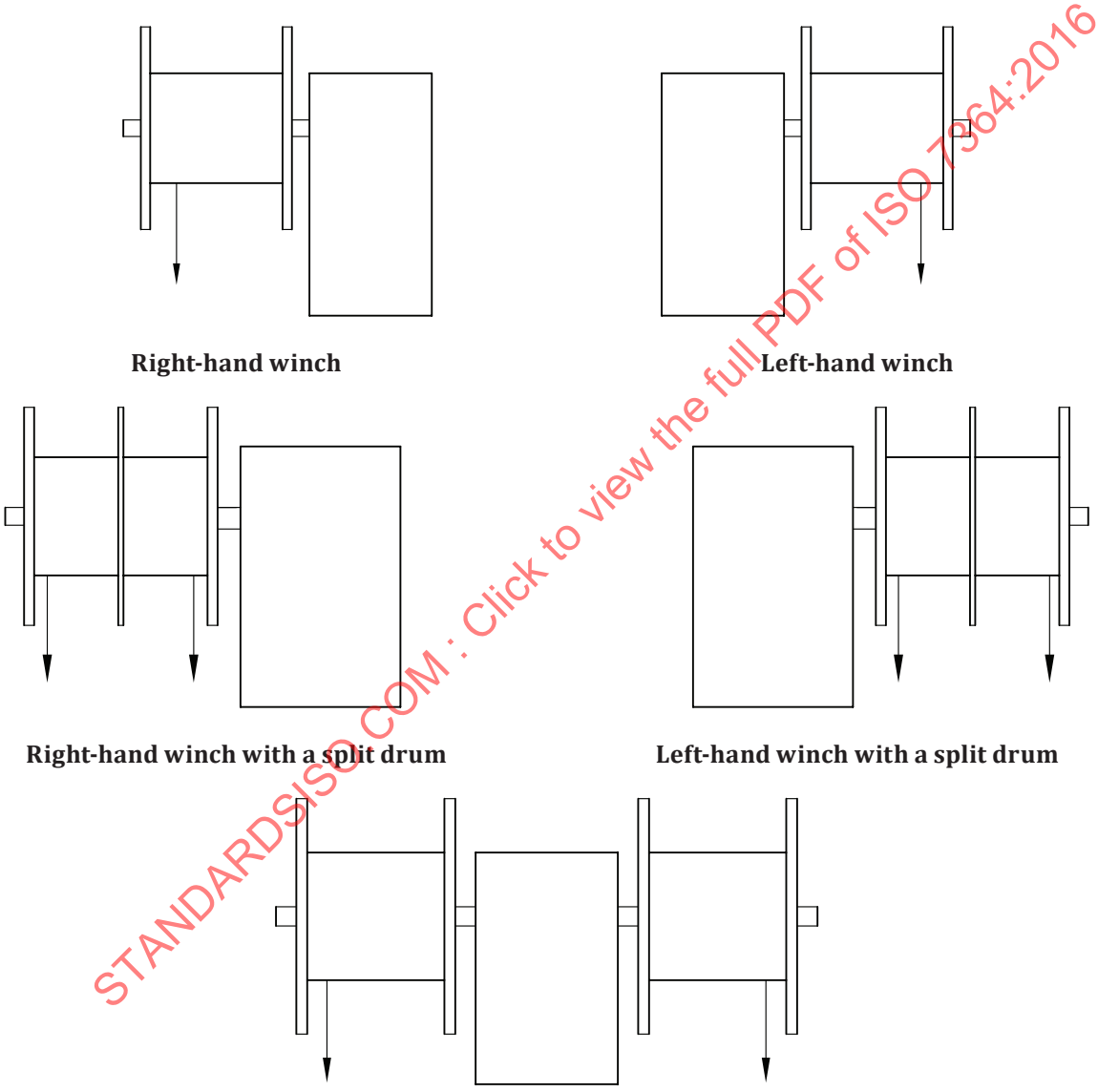

Figure 1 — Examples of accommodation ladder winches

4 Design and operation

4.1 The winches shall be equipped with one or two drums. The drum shall be a split drum where two ropes are to be wound on it.

4.2 The drum length shall be such that the rope in effective working length can be wound on fully, in not more than three layers, while the rope can be wound on fully, in not more than five layers.

4.3 The drum diameter shall be not less than 14 times the rope diameter given in Table 1.

4.4 The flange height shall be such that it will project at least 1,5 times the rope diameter beyond the outermost layer of the rope.

4.5 Double drum winches intended for double flight accommodation ladders shall be fitted with a suitable device to allow independent holding, hoisting or lowering of each flight.

4.6 The winch shall be provided with a device capable of holding the drum at 1,5 holding load. For powered winches, such device shall automatically operate when the drive is being shut off or if the power fails. Manual lowering and hoisting of the accommodation ladder shall be possible. A self-braking worm gearbox (or equivalent) may be considered a holding device if agreed between the purchaser and the manufacturer.

4.7 For design purposes, the drum shall be based on the use of 6 × 37 galvanized steel wire rope with fibre core of 1 770 N/mm^2 tensile grade, as specified in ISO 2408. Wire rope diameters are listed in Table 1. This requirement does not preclude the use of other types of rope in service.

In every case, the safety factor of the rope shall be not less than five in relation to the holding load as specified in ISO 5488:2015, 6.1.3.

NOTE Attention is drawn to the possibility of national authorities requiring a safety factor of more than five.

4.8 The winch shall be designed to ensure that all bearing surfaces and corresponding sliding and rotating component parts of the winch are lubricated during operation.

4.9 Stresses in component parts of the winch being acted upon with the drum load and holding load shall not exceed 0,4 times the proof stress of the material.

4.10 The winch shall be fitted with a local emergency stop.

4.11 Powered winches shall also be also provided with manual drive.

4.12 Winches shall be provided with safety precautions to protect the operator against the possibility of being struck by a revolving crank handle.

4.13 Electrical equipment of winches shall be installed in accordance with IEC 60092-401.

4.14 Winches shall not be made of asbestos-containing material.

5 Characteristics

5.1 The characteristics of the winch shall be as listed in Table 1.

5.2 For powered winches, the nominal speed of hoisting the accommodation ladder shall be not less than 0,05 m/s.

5.3 It shall be possible to continuously overload the drive of the winch by 1,5 times the drum load for 2 min when the accommodation ladder is being hoisted, without causing failure.

5.4 When the accommodation ladder is being hoisted or lowered, the emergency stop of the winch shall be carried out. And the winch shall stop instantly and reliably.

Table 1 — Performance data

Nominal size	Drum load[a] kN	Holding load[a] kN	Winch load test procedure		Steel wire rope diameter actually selected[d] mm	
			Minimum rope strength[a] (5× holding load) KN	Steel wire rope diameter[b,c] mm	Single drum	Split drum or double drum
5	5	15	75	12	11	—
6	6,3	18	90	13	11	—
8	8	25	125	16	13	—
10	10	30	150	18	13	13
12	12,5	37,5	188	20	13	13
16	16	48	240	22	14(15)	14(15)
20	20	60	300	24	16(15)	16(15)
25	25	75	375	26	—	16
30	30	90	450	28	—	16

NOTE Choose the actual steel wire rope diameter of winches according to the following case that the breaking load of steel wire rope shall be not less than five times the actual holding load of accommodation ladder winches.

[a] For winches working with two ropes, the listed values are the sum of the forces on each rope.

[b] In column 4, based on a holding load safety factor of five, all values shall be selected in winch load test.

[c] The rope diameter given in column 4 is used only for static load test of winches with one rope according to 6.4.

[d] The rope diameter in brackets means that these values are included in national standard specifications.

6 Acceptance tests (individual)

6.1 General

The winch shall be tested as a complete unit, i.e. prime mover, drum, gearing and controls. The results of tests shall be recorded in the certificate.

6.2 Test without load (factory test)

The winch shall be run without load for 10 min continuously, 5 min in each direction. The temperature of bearings shall be checked.

6.3 Drum load test (factory test)

6.3.1 The winch shall be run under drum load through two lowering and hoisting cycles include haul-in operation, the length of the rope paid out being not less than one-third of the drum capacity. The results shall conform to the requirements of 5.2.

6.3.2 Continuously overload the drive of the winch by 1,5 times the drum load for 2 min. The results shall conform to the requirements of 5.3.

6.3.3 When the accommodation ladder is being hoisted or lowered, the emergency stop of the winch shall be carried out once. The results shall conform to the requirements of 5.4. The following shall be checked:

a) oil-tightness;

b) input current or working pressure or hydraulic flow;

c) nominal speed;

d) presence of abnormal noise;

e) correct operation of the control brake.

6.4 Static test under 1,5 holding load

A load equivalent to the 1,5 holding load shall be applied, with the rope wound in a single layer on the drum. The holding device shall prevent rotation of the drum when subjected to this load.

6.5 On board test and inspections

The winch shall be tested as a part of the complete accommodation ladder unit. The minimum extent of the test shall be as follows:

a) twice hoisting the accommodation ladder up to its full height and lowering it (tested as in 6.3);

b) holding a static load for the complete accommodation ladder unit loaded as specified in ISO 5488:2015, 6.1.3.

7 Designation

Accommodation ladder winches conforming to this International Standard shall be designated as follows:

a) safety operation specification or points for attention and direction indication of the rope or ropes at the drum exit;

b) name of product;

c) name and label of manufacturer;

d) load limit, including drum load, holding load, drum capacity, hoisting speed, etc.;

e) specification or type of product, including the following:

   1) type of drive (E - electric, P – pneumatic, H - hydraulic, U - unpowered);

   2) nominal size (according to Table 1);

   3) type of winch:

      — R – right-hand;

      — L – left-hand;

      — D – single drum;

      — DD – split drum;

      — 2DS – symmetrical double drum;