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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Shipbuilding — Cargo winches

Construction navale — Treuils de charge

Reference number
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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3078 was prepared by Technical Committee ISO/TC 8, *Shipbuilding and marine structures.*

This second edition cancels and replaces the first edition (ISO 3078: 1974), of which it constitutes a minor revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Shipbuilding — Cargo winches

1 Scope and field of application

This International Standard specifies the characteristics of cargo winches on cargo derricks, especially winches with electric or hydraulic drive.

2 References

ISO 2408, *Steel wire ropes for general purposes — Characteristics.*

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

ISO 6482, *Shipbuilding — Deck machinery — Warping end profiles.*

ISO 7825, *Shipbuilding — Deck machinery — General requirements.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 3828 and the following definitions apply.

3.1 cargo winch: Winch used for hoisting and lowering cargo. (Definition repeated from ISO 3828.)

3.2 nominal size: Size which corresponds to the nominal load, i.e. the maximum working load at the hook, in tonnes, which the winch is rated to lift in direct operations (with a single sheave at the derrick-head and a single sheave at the foot — see figure 1).

Winches are graded according to their nominal size as given in the table (see clause 5).

If the winch has reduction gear with several gear ratios, each step shall correspond to a nominal load in the table.

NOTES

1 The nominal sizes are derived from the preferred number series.

2 The definition of the nominal size given above is not applicable to heavy derricks.

3.3 nominal speed of hoisting: Speed at which the winch is capable of lifting the nominal load.

The minimum nominal speeds of hoisting are given in the table (see clause 5).

3.4 drum load: Maximum rope tension, in kilonewtons, measured at the drum exit when the winch is hauling in at the nominal speed with the rope wound on the drum in a single layer. (Definition repeated from ISO 3828.)

NOTE — The drum load is approximately 11 times the nominal load measured in tonnes. The factor of 11 takes account of the loss through friction due to the sheaves and of the ratio between force in kilonewtons and mass in tonnes.

3.5 Right-hand and left-hand cargo winches

3.5.1 right-hand winch: Winch where the reduction gear or the drive for the drum is on the right-hand side of the drum in relation to an observer situated on the side of the motor, power supply or controller (in the case of a symmetrical winch). (See figure 2.)

3.5.2 left-hand winch: Winch where the reduction gear or the drive for the drum is on the left-hand side of the drum in relation to an observer situated on the side of the motor, power supply or controller (in the case of a symmetrical winch).

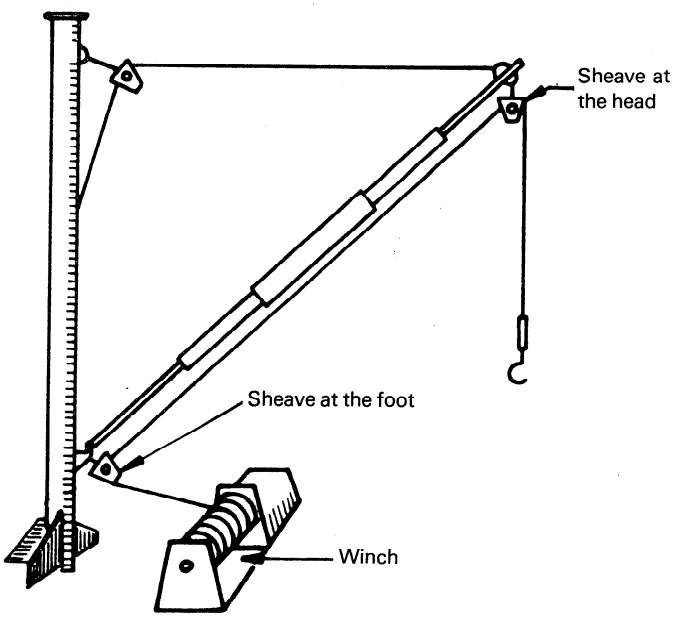

Figure 1 — Example of use of a winch

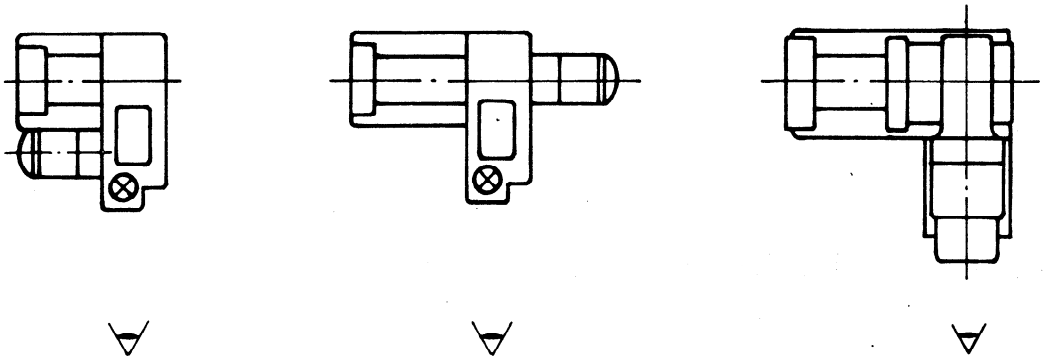

Figure 2 — Examples of right-hand winches

4 Design and operation

Winches shall meet the general requirements for deck equipment in ISO 7825 and the specific requirements given in 4.1 to 4.6.

4.1 Stress calculation

The stress calculation of the mechanical parts is based on:

a) the drum load on the winch: in this case the allowable calculated stresses based on simple elastic theory of any part of the winch shall not be greater than 0,4 times the 0,2 % proof stress of the material;

b) the maximum torque of the motor corresponding to the most severe working conditions: in this case the allowable stresses shall be within 0,9 times the 0,2 % proof stress of the material.

4.2 Direction of motion of operating devices

The direction of motion of the operating devices shall be such that the load is raised by clockwise movement at a hand-wheel or crank-handle, or alternatively movement of a hand-lever towards the operator.

Whatever the form of motive power, the operating device shall be arranged to return to the braking position automatically when the operator releases the control.

NOTE — Reference should be made to the ILO Code of practice on *Safety and health in dock work.*

4.3 Acceleration and deceleration

In direct manoeuvre at drum load, the acceleration and deceleration shall have a mean value of not more than 3 m/s^2.

4.4 Braking

4.4.1 Electric winches shall be provided with an automatic braking system which operates when bringing the operating device to zero, or to the braking position, and also when there is no power on the winch.

4.4.2 The braking system shall be capable of effectively arresting and holding a load at least 1,5 times the nominal load.

Means shall also be provided for lowering the load in the event of power failure.

4.4.3 Winches with a declutchable drum shall be provided with a locking device, or a brake on the drum capable of preventing rotation of the drum.

When a brake is required to hold the load, this shall be specified by the purchaser.

4.4.4 The braking system shall be such as not to induce an excessive shock load.

4.5 Drum design

For all operating conditions, the distance between the top layer of the wire rope on the drum and the outer edge of the drum flanges shall be at least 2,5 times the diameter of the wire rope.

NOTE — This requirement only concerns drums not fitted with special wire rope guards to prevent over-spilling of the wire rope.

The diameter of the drum shall be not less than 18 times the diameter of the wire rope, which for design purposes only shall conform to ISO 2408, Group 3, Class 6 × 37, IWR. Other grades and constructions may be used in service.

4.6 Warping ends

A winch may be specified with or without warping ends; their profile shall be in accordance with ISO 6482.

When warping ends are specified, the purchaser shall state whether the drum is to be declutchable or not.

If only one warping end is specified, its position (right or left) shall also be stated in the order.