International Standard 6555

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Shipbuilding — Topping winches

Construction navale — Treuils d'apiquage

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Foreword

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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.

International Standard ISO 6555 was developed by Technical Committee ISO/TC 8, *Shipbuilding*, and was circulated to the member bodies in November 1979.

It has been approved by the member bodies of the following countries :

Australia	Germany, F. R.	Netherlands
Austria	India	Norway
Belgium	Ireland	Poland
Bulgaria	Italy	Romania
China	Japan	Spain
Czechoslovakia	Korea, Dem. P. Rep. of	United Kingdom
France	Korea, Rep. of	USSR

No member body expressed disapproval of the document.

Shipbuilding — Topping winches

1 Scope and field of application

This International Standard specifies requirements and characteristics of lightly-powered and externally-powered topping winches as used in derrick cargo handling gear. The lightly-powered topping winches include the winches provided with an electric or hydraulic drive.

2 References

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

ISO 3828, *Shipbuilding — Deck machinery — Vocabulary.*

3 Definitions

Definitions are to be as in ISO 3828, except as follows :

3.1 nominal size : The winches, as covered in this International Standard, are designated by their nominal sizes.

The nominal size is derived from the drum load and the holding load.

3.2 drum load : The drum load is the maximum load in a topping rope measured at the drum exit while hauling in the rope at a nominal speed, the first layer of the rope being wound onto the drum.

3.3 messenger rope : In the context of cargo handling and the scope of this International Standard, the messenger rope is a rope used for transferring torque from a powered winch to an externally-powered winch.

3.4 Handing of winches

3.4.1 Lightly-powered topping winch (see figure 1)

The lightly-powered topping winch is termed a right-hand winch in relation to an observer situated on the side of the motor or power supply when the reduction gear or the drive for the drum is on the right-hand side of the drum.

The lightly-powered topping winch is termed a left-hand winch in relation to an observer situated on the side of the motor or power supply when the reduction gear or the drive for the drum is on the left-hand side of the drum.

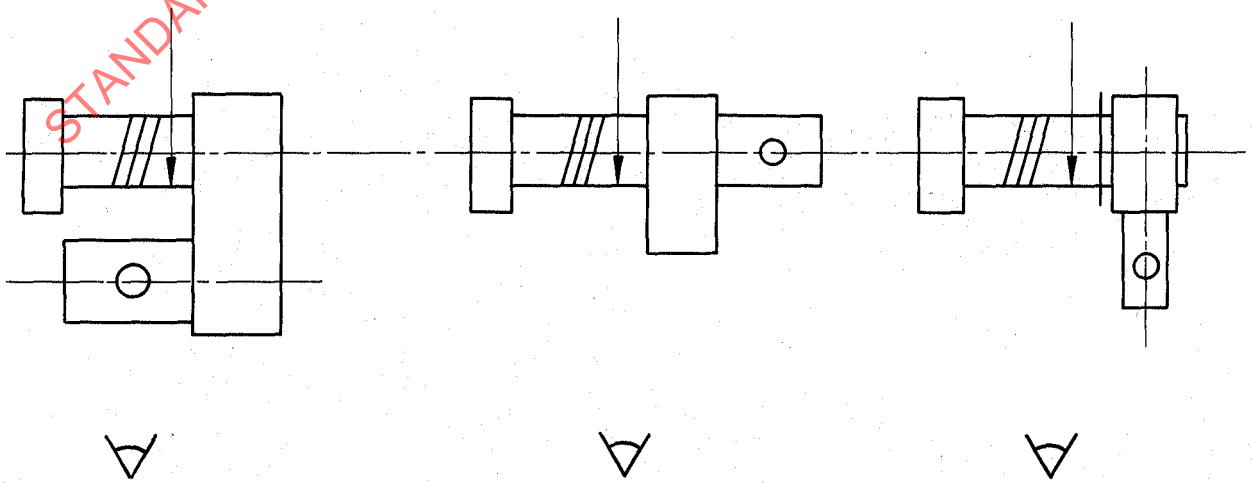

Figure 1 — Examples of right-hand, lightly-powered topping winches

3.4.2 Externally-powered topping winch (see figure 2)

The externally-powered topping winch is termed a right-hand winch in relation to an observer situated on the side of hauling in the messenger and the topping ropes when the topping rope is hauled in on the right part and the messenger rope is hauled in on the left part of the drum.

The externally-powered topping winch is termed a left-hand winch in relation to an observer situated on the side of hauling in the messenger and the topping ropes when the topping rope is hauled in on the left part and the messenger rope is hauled in on the right part of the drum.

4 Design and operation

NOTE — Attention is drawn to the existence of national safety regulations in certain countries affecting the rope end attachment.

4.1 Drum

4.1.1 The drum length shall be such that the topping rope can be fully accommodated in not more than three layers; the complete length of the rope being evenly reeled.

4.1.2 The drum diameter shall not be less than 16 times the topping rope diameter.

4.1.3 The flange height shall be such that with the rope evenly wound it will project at least 2,5 topping-rope diameters beyond the outermost layer of the rope.

4.1.4 The externally-powered topping winch may be provided with a split drum to separate the messenger rope from the topping rope.

4.2 Drum-locking devices

The drum may be provided with a locking device. The locking device shall be capable of resisting at least 1,5 times the holding load.

The locking device shall be interlocked with a control of the winch so that the lowering of the derrick is impossible until the locking device has been disengaged.

If agreed with the appropriate national authority or classification society, a self-locking wormgear may be considered as a drum-locking device.

4.3 Control brake system

The lightly-powered topping winch shall be provided with a system of braking, automatically applied to the prime mover when the control handle is in the "off" position, or when the power supply is cut off.

The control brake system shall be capable of effectively arresting and holding a load at the drum corresponding to at least 1,5 times the drum load; if the brake is to be used as a locking device, it shall hold at least 1,5 times the holding load.

4.4 Direction of motion of the operating devices

The direction of motion of the operating devices of a lightly-powered topping winch shall be such that the derrick is hoisted by a clockwise movement at a hand-wheel or crank handle or alternatively movement of a hand lever towards the operator. The derrick shall be lowered with motion of the operating devices in the opposite direction.

4.5 Speed control

If agreed between the purchaser and the manufacturer, a lightly-powered topping winch may be provided with speed control of the drum.

4.6 Topping winch design

The design of the topping winch shall be based on the use of 6 × 37 galvanized steel wire rope with fibre core in accordance with ISO 2408.

The nominal breaking strength of the wire shall be at least 1 570 N/mm^2.

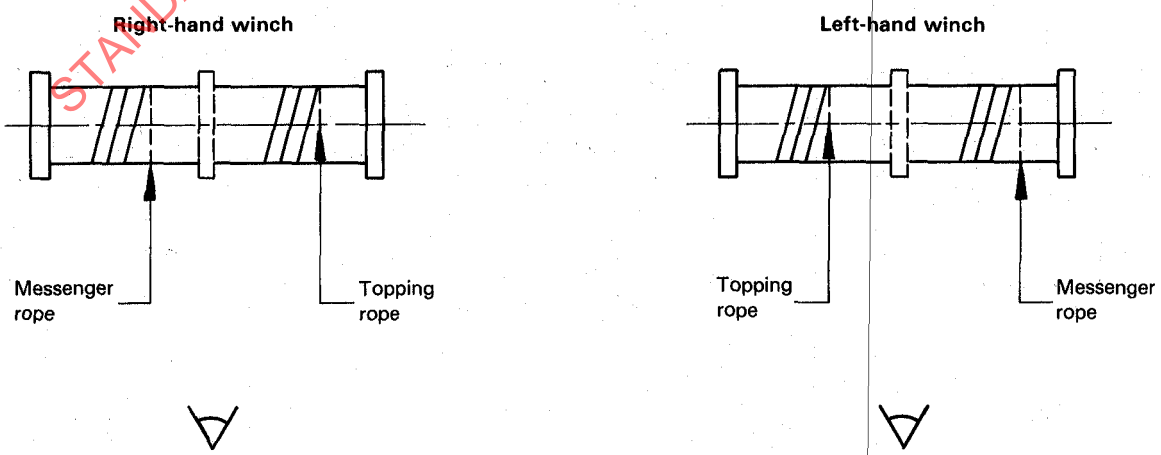

Figure 2 — Examples of handing of externally-powered topping winches

4.7 Emergency stop

The topping winch shall be fitted with a local emergency stop which cuts off the power supply or stops the operation of the drive of the winch.

4.8 Material stresses

The stresses in component parts of the winch being acted upon by forces derived from the drum load or by forces derived from the holding load, shall not exceed 0,4 times the 0,2 % proof stress of the material.

The stresses in component parts of the winch at maximum torque of the prime mover or being acted upon by at least 1,5 times the holding load, shall not exceed 0,9 times the 0,2 % proof stress of the material.

5 Characteristics

5.1 The topping winch shall be capable of continuous operation for a period of 5 min while exerting the drum load.

5.2 Hauling overload

It shall be possible to overload the topping winch by 1,25 times the drum load.

5.3 Nominal speed at drum load shall be not less than 0,15 m/s.

5.4 Further characteristics shall be as indicated in the following table.

Table — Performance data for topping winches

Nominal size	Drum load kN	Holding load kN	Design rope diameter mm	Rope strength minimum kN
10 32	10	32	18	160
10 63	10	63	26	315
16 80	16	80	28	400
25 80	25	80	32	500
40 80	40	80	32	500
20 125	20	125	36	625

6 Acceptance tests

6.1 The topping winch shall be tested as a complete unit (i.e. prime mover, drum, gearing and controls) at the manufacturer's works and on board the ship.

The externally-powered winches shall be tested with the use of an external drive.

6.2 Factory type-test

The factory type-test comprises :

6.2.1 Operation under no-load

The winch shall be run for 10 min continuously, 5 min in each direction. While testing, the following shall be verified :

a) tightness against oil leakage,

b) temperature of bearings,

c) power input,

d) satisfactory operation of control brake system (for lightly-powered winches),

e) presence of abnormal noise.

6.2.2 Operation under drum load

The winch shall hoist the test load (corresponding to the nominal drum load) to a height of 10 m and immediately lower the load. This test shall be performed twice. While testing, the following shall be verified :

a) tightness against oil leakage,

b) temperature of bearings,

c) power input,

d) nominal speed,

e) satisfactory operation of drum-locking device, if fitted,

f) satisfactory operation of control brake system.

6.2.3 Operation under holding load

The drum shall be held stationary and a load of at least 1,5 times the holding load shall be applied to a rope secured to and wound on the drum in a single layer. The load shall be held for a period of 2 min. While testing, the state of the drum-locking device and the component parts being acted upon by the load shall be checked.

6.2.4 Operation under at least 1,5 times the drum load

The winch with the control brake system engaged shall hold a load corresponding to at least 1,5 times the drum load for a period of 2 min. While testing, the drum shall not rotate.

6.3 Individual tests at the manufacturer's works

Operation under no-load according to 6.2.1 and 6.2.2 e) shall be effected.

6.4 On-board test

The winch shall be tested in a set of cargo-handling gear. The extent of the test shall be suited to the test of the cargo handling gear, provided that the following shall be tested.

6.4.1 The complete hoisting and lowering of an unloaded derrick twice.

6.4.2 Holding overload of the winch when the cargo-handling gear is being tested at 1,25 times the safe working load. While testing, the following shall be verified :

a) tightness against oil leakage,

b) satisfactory operation of the drum-locking device, if fitted,

c) satisfactory operation of the control brake system.

7 Designation

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

— topping winch;

— the number of this International Standard;

— type of drive :

E = electric
H = hydraulic
EP = externally-powered;

— nominal size (according to table);

— handing of winch :

R = right hand
L = left hand;

— split drum :

X = when the topping winch is provided with a split drum.

Example of designation of a topping winch according to ISO 6555, hydraulically powered (H), of nominal size 10 63, right handed (R), without split drum :

Topping winch ISO 6555 H 10 63 R