INTERNATIONAL STANDARD ISO 4568

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Shipbuilding — Marine windlasses and anchor capstans

Construction navale — Guindeaux et guindeaux-cabestans de navire

First edition — 1978-12-15

UDC 629.12.015 : 621.864 **Ref. No. ISO 4568-1978 (E)**

Descriptors : shipbuilding, winches, equipment specifications, definitions, acceptance inspection.

Price based on 5 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 4568 was developed by Technical Committee ISO/TC 8, *Shipbuilding*, and was circulated to the member bodies in May 1977.

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

Australia	Germany, F.R.	Poland
Austria	India	Romania
Belgium	Italy	Spain
Brazil	Japan	Sweden
Bulgaria	Korea, Dem. P. Rep. of	Turkey
Chile	Korea, Rep. of	United Kingdom
Czechoslovakia	Mexico	U.S.S.R.
Finland	Netherlands	Yugoslavia
France	Norway	

No member body expressed disapproval of the document.

Shipbuilding — Marine windlasses and anchor capstans

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies requirements for the design, construction, safety, performance, and acceptance testing of windlasses and anchor capstans of sea-going ships having electric, hydraulic, steam or external drive (see ISO 3828).

NOTES

1 Where reference is made in the text to "windlass" it should be understood as "windlass and anchor capstan" where applicable.

2 Windlasses and anchor capstans for inland navigation are dealt with in ISO 6219.

2 REFERENCES

ISO 1704, *Shipbuilding — Anchor chains.*

ISO 3730, *Shipbuilding — Mooring winches.*

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

3 DEFINITIONS

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

Terms particularly applicable to this International Standard are defined as follows :

3.1 working load of the windlass : The working load, derived from the cable diameter and the cable grade, measured at the cable lifter (see 5.4, item 1).

3.2 nominal size of windlass : The size expressed in terms of cable diameter in millimetres, cable grade and holding power.

For example 100/3/45 represents a windlass for 100 mm diameter cable of IACS[1)] grade 3 with a holding load of 45 % of the breaking load of the cable (see 5.4, item 3).

3.3 overload pull : The necessary temporary overload capacity of the windlass (see 5.4).

3.4 holding load : The maximum static load on the chain cable which the cable lifter brake should withstand (see 5.4).

3.5 nominal speed : The average speed of recovery of two shots of chain cable when three shots are submerged and freely suspended at commencement of lifting (see 5.3).

3.6 symmetrical double cable-lifter windlass — Type 1 : A windlass in which the two cable lifters are provided with a single integral power source [see figure, a)].

3.7 single cable-lifter windlass — Type 2 : A windlass in which one cable lifter is provided with an integral power source [see figure, b)].

3.8 single cable-lifter unit — Types 3 and 4 : A windlass unit in which one cable lifter is provided with an external power source [see figures, c) and d)]. Reference should also be made to 3.6 in ISO 3828.

3.9 anchor capstan — Type 5 : A machine in which the cable lifter is mounted on a vertical shaft [see figure, e), and 3.2 in ISO 3828 for the complete definition].

3.10 right-hand or left-hand windlasses : Windlasses of types 2 and 3 may be designed as right-hand or left-hand models.

A windlass is termed a right-hand windlass in relation to an observer situated on the side of the motor, power supply or controller when the drive for the cable-lifter or cable-lifter unit is on the right-hand of the cable-lifter.

A left-hand windlass when similarly observed has the drive for the cable-lifter on the left-hand side of the cable lifter.

3.11 breaking load of the chain cable : The minimum breaking load specified by IACS for the diameter and grade of chain cable concerned.

4 DESIGN AND CONTRUCTION

NOTE — Attention is drawn to the existence of national safety regulations in certain countries affecting windlass controls.

4.1 Chain cable

This International Standard is based upon the use of three grades of chain cables (see 5.4 and ISO 1704).

1) International Association of Classification Societies.

4.2 Cable-lifter

4.2.1 The cable-lifter shall have at least five snugs.

4.2.2 The cable-lifter shall be declutchable from the drive. Power operated clutches shall also be delutchable by hand.

4.3 Warping ends

The windlass may be designed with or without warping ends.

For combined windlasses/mooring winches reference should be made to ISO 3730 in addition to this International Standard.

4.4 Strength requirements

The manufacturer of the windlass shall be responsible for determining the strength requirements of the component parts of the windlass so that :

a) If a cable stopper is fitted, the windlass with brakes engaged and cable lifter disengaged will withstand a pull of 45 % of the breaking load of the chain without any permanent deformation of the stressed parts and without brake slip.

b) If a cable stopper is not fitted, the windlass is to comply with the requirements of the Classification Societies.

c) The stresses in the involved parts of the windlass and the windlass frame are below the elastic limit of the material used.

NOTES

1 Attention is to be paid to :

a) stress concentrations in keyways and other stress raisers;

b) dynamic effects due to sudden starting or stopping of the prime mover or chain cable;

c) calculation methods and approximations used when deriving the design stresses.

2 Attention is drawn to the requirements of the Classifications Societies.

4.5 Braking system

4.5.1 *Control brake system*

4.5.1.1 Electric windlass shall be provided with an automatic control brake system which operates when the control handle is in the "off" position or when the power supply is cut off. For other types of drive, a suitable system of braking should be agreed upon between the purchaser and manufacturer.

4.5.1.2 The control brake system shall be capable of sustaining the load given in 5.4, item 4.

4.5.2 *Cable-lifter brake*

Each cable-lifter shall be fitted with a hand-brake, which may be remotely controlled, capable of applying a braking torque sufficient to maintain a load equal to the holding load given in 5.4, item 3.

4.6 Emergency stop

4.6.1 Each remotely controlled windlass shall be fitted with a quick acting local emergency stop mechanism, which, when operated removes power from the windlass and applies the control brake system.

4.6.2 The emergency stop shall be located in a clearly marked and accessible position close to the windlass.

4.7 Protection

Prime movers and gearing shall be protected against excessive torque and shock.

4.8 Speed control

The speed of the rotation of the cable-lifter shall be adjustable between "no load" speed and stop. It shall be possible to make the adjustment whilst the windlass is working.

4.9 Direction of motion of the operating devices

The direction of motion of the operating devices shall be such that the cable is hauled in by clockwise movement at the handwheel or crank handle or alternatively movement of a hand-lever towards the operator.

The direction of operation of all control handles shall be clearly and permanently marked.

Whatever the form of motive power, the operating device shall, when under manual control, be arranged to return to the braking or stop position automatically unless otherwise agreed between the manufacturer and purchaser.

5 PERFORMANCE

NOTE — Attention is drawn to the requirements of the Classification Societies.

5.1 The performance requirements given in 5.4 are based on the use of one cable-lifter at a time.

5.2 The windlasses shall be capable of continuous operation for a period of 30 min while exerting the working load and also be capable of exerting, for a period of at least 2 min at reduced speed, the overload pull stated in 5.4.

5.3 The chain cable nominal speed shall be not less than 0,15 m/s. A standard IACS anchor and a hawse-pipe efficiency of 70 % are assumed.

5.4 The following values shall be used in determining performance data for a windlass :

1) Working load

   a) Grade 1 cable : 37,5 d^2 (N)

   b) Grade 2 cable : 42,5 d^2 (N)

   c) Grade 3 cable : 47,5 d^2 (N)

   } d = Chain cable diameter (mm)

2) Overload pull : 1,5 × working load

3) Holding load

   a) with cable stopper — 0,45 × breaking load of cable

   b) without cable stopper — according to the requirements of the Classification Societies

4) Control brake — not less than 1,3 × working load

6 ACCEPTANCE TESTS

6.1 The following tests shall be carried out on the windlass or windlass unit. Where tests are required in excess of those listed below, they should be agreed between the purchaser and the manufacturer at the time of contract. The location of all tests should be agreed between the purchaser and the manufacturer at the time of contract.

6.1.1 The windlass shall be run without load at a speed not less than nominal speed for 30 min, 15 min in each direction plus 5 min in each direction on each additional gear change as soon as possible after the 30 min test.

While testing, the following should be checked or measured :

a) tightness against oil leakage;

b) temperature of bearings;

c) presence of abnormal noise.

6.1.2 The windlass shall be checked to verify that the working load, nominal speed and overload pull are attainable as specified in 5.2.

While testing, the following should be checked or measured :

a) tightness against oil leakage;

b) temperature of bearings;

c) presence of abnormal noise.

6.1.3 The working and satisfactory operation of the control brake and the cable-lifter brake should be tested to ensure compliance with the requirements of this International Standard (see 5.4).

The holding power of the cable-lifter brake may be verified by test or calculation as agreed between manufacturer and purchaser. The cable-lifter brake is also to be tested with the anchor dropping, controlled and stopped by the brake.

6.1.4 Where remote controls or other special features are fitted their satisfactory operation should be verified.