
**Marine structures — Mobile offshore
units — Mooring positioning
windlasses and winches**

Structures maritimes — Unités mobiles au large — Treuils d'ancrage

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 9089:2019](https://standards.iteh.ai/catalog/standards/sist/c5d800ff-0cb6-445f-80e9-cb20aa1cd969/iso-9089-2019)

<https://standards.iteh.ai/catalog/standards/sist/c5d800ff-0cb6-445f-80e9-cb20aa1cd969/iso-9089-2019>



iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 9089:2019

<https://standards.iteh.ai/catalog/standards/sist/c5d800ff-0cb6-445f-80e9-cb20aa1cd969/iso-9089-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification of mooring positioning windlasses and winches	3
5 Functional and operational requirements	3
5.1 General.....	3
5.2 No-load.....	3
5.3 Nominal load.....	3
5.4 Nominal speed.....	3
5.5 Stalling load.....	3
5.6 Static braking.....	4
5.7 Automatic braking.....	4
5.8 Emergency release.....	4
5.9 Anchor deployment (anchor dropping) speed limitation.....	5
5.10 Anchor line length, speed and tension measurement.....	5
5.11 Chain or wire rope stoppers.....	5
5.12 Ratchet mechanisms.....	5
5.13 Operating system.....	5
6 Design and construction	6
6.1 General.....	6
6.2 Mooring anchor lines.....	6
6.3 Cable-lifters.....	6
6.4 Drums.....	7
6.5 Friction winch drums.....	7
6.6 Warping ends.....	7
6.7 Anchor line guides.....	7
6.8 Gears.....	8
6.9 Drive equipment.....	9
6.10 Strength requirements.....	9
7 Test methods	9
7.1 General.....	9
7.2 Test conditions.....	10
7.3 No-load test.....	10
7.4 Nominal load test.....	10
7.5 Nominal speed test.....	10
7.6 Stalling load.....	10
7.7 Static braking load.....	10
7.8 Automatic braking.....	10
7.9 Anchor deployment (anchor dropping) speed limitation.....	10
7.10 Length, speed and tension calibration.....	11
7.11 Chain or wire rope stoppers.....	11
7.12 Ratchet mechanisms.....	11
7.13 Operating systems.....	11
8 Designation	11
8.1 Nominal sizes.....	11
8.2 Labelling.....	11
8.2.1 Model designation.....	11
8.2.2 Example.....	12
9 Marking	12
10 Documentation	12

10.1	Workshop certificate.....	12
10.2	Instructions for use and maintenance.....	12

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 9089:2019

<https://standards.iteh.ai/catalog/standards/sist/c5d800ff-0cb6-445f-80e9-cb20aa1cd969/iso-9089-2019>

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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee 8, *Ships and marine technology*, Subcommittee 4, *Outfitting and deck machinery*.

This second edition cancels and replaces the first edition (ISO 9089:1985), which has been technically revised.

The main changes compared to the previous edition are as follows:

- Added no-load, nominal load, nominal speed, stalling/slipping load, anchor deployment (anchor dropping) speed limitation, anchor line length, speed and tension measurement, cable/wire rope stopper, ratchet mechanisms, etc. to the functional and operational requirements.
- Refined all sub-items in design and construction, and quantified the requirements of all indicators and formula.
- Provided an overview of various tests, and specified test types, methods and requirements.
- Provided check items, sequence, qualification criteria for type inspection of mooring positioning windlass and winches.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 9089:2019

<https://standards.iteh.ai/catalog/standards/sist/c5d800ff-0cb6-445f-80e9-cb20aa1cd969/iso-9089-2019>

Marine structures — Mobile offshore units — Mooring positioning windlasses and winches

1 Scope

This document specifies a classification, technical requirements and test methods, as well as designation, marking and documentation requirements for mooring positioning windlasses and winches of mobile offshore floating units, including drill-ships, semi-submersible drilling rigs, production platforms and offshore accommodation platforms.

It can be used as a reference for ship-shifting positioning winches of pipelaying, crane and pile-driving vessels.

This document is applicable to the design, manufacturing and acceptance testing of mooring positioning windlasses and winches.

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 1704, *Ships and marine technology — Stud-link anchor chains*

ISO 1968, *Fibre ropes and cordage — Vocabulary*

ISO 3108, *Steel wire ropes — Test method — Determination of measured breaking force*

ISO 3730, *Shipbuilding and marine structures — Mooring winches*

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

ISO 6336, *Calculation of load capacity of spur and helical gears*

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

ISO 7825:2017, *Shipbuilding — Deck machinery — General requirements*

ISO 9083, *Calculation of load capacity of spur and helical gears — Application to marine gears*

ISO 17893, *Steel wire ropes — Vocabulary, designation and classification*

ISO 18692, *Fibre ropes for offshore stationkeeping — Polyester*

IEC 60092, *Electrical installations in ships*

IEC 61892, *Mobile and fixed offshore units — Electrical installations*

API Spec 2F, *Specification for mooring chain*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3828 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 <https://www.iso.org/obp>

3.1 mooring positioning windlass and winch

windlass and winch and associated electric control system used for mooring positioning of mobile offshore floating units, including windlass and winch bodies (chain wheels/drums, drives, braking systems, anchor deployment (anchor dropping) speed limiters, etc.), chain or wire rope stoppers, anchor line guides and electric control system

3.2 Right-hand (left hand) windlasses or winches

3.2.1 right-hand windlass or winch

windlass or winch where, in relation to an observer situated on the side of the prime mover, power supply or controller, the drive for the cable-lifter or drum is on the right of the cable-lifter or drum

Note 1 to entry: See [Figure 1](#).

3.2.2 left-hand windlass or winch

windlass or winch where, in relation to an observer situated on the side of the prime mover, power supply or controller, the drive for the cable-lifter or drum is on the left of the cable-lifter or drum

Note 1 to entry: See [Figure 2](#).

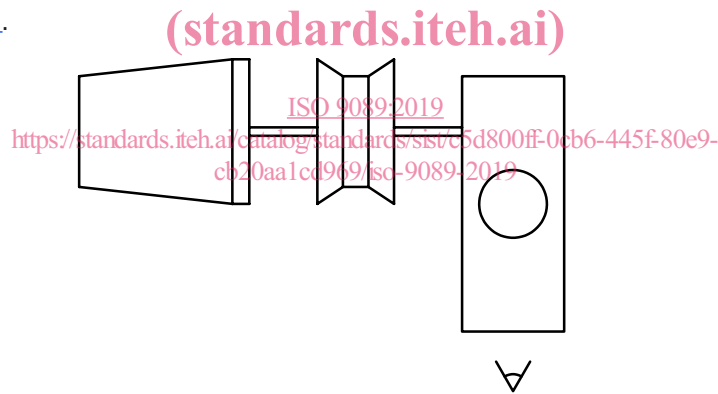


Figure 1 — Right-hand windlass or winch

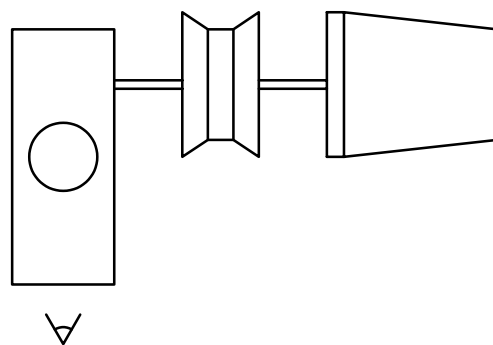


Figure 2 — Left-hand windlass or winch

3.3

nominal load

maximum chain or rope tension that the windlass or winch is able to maintain continuously when hauling at nominal speed, measured either at the cable-lifter exit, or at the rope exit of the first layer in the case of a drum

4 Classification of mooring positioning windlasses and winches

Mooring positioning windlasses and winches are divided into the following types according to functions and structural types.

- Type A — positioning windlass (positioning windlass with mooring chains).
- Type B — positioning winch (positioning winch with steel wire ropes).
- Type C — friction positioning windlass and winch (positioning winches with friction drum).
- Type D — positioning windlass and winch of combined mooring chains and steel wire ropes (positioning windlass and winch capable of hauling in both mooring chains and steel wire ropes).
- Type E — hoisting positioning windlass driven by the cylinder.

5 Functional and operational requirements

5.1 General

Windlass and winches shall meet the general requirements for mooring winches in ISO 3730.

5.2 No-load

The windlass and winch operating under no-load at nominal speed shall be free from abnormal vibration or noise; the hydraulic system shall act flexibly and reliably without oil seepage or leakage.

5.3 Nominal load

The nominal load of the windlass and winch shall meet the following requirements.

- a) The nominal load of the windlass and winch is recommended to be not less than one third of the minimum breaking load of the chain or wire rope. The nominal load of the anchor gear connected by a combination of the chain and wire rope shall be not less than one third of the breaking load of either design anchor or rope, whichever is the lesser.
- b) The windlass and winch operating under nominal load shall be free from abnormal vibration or noise; the hydraulic system shall act flexibly and reliably without oil seepage or leakage; the cable-lifter shall engage the chains well without chain jumping.
- c) The windlass and winch shall stop immediately during the emergency stop.

5.4 Nominal speed

The nominal speed shall be agreed upon between the manufacturer and the purchaser. If windlasses and winches are required to be used for temporary mooring of windlass on sea trial, the nominal hoisting speed shall be not less than 9 m/min.

5.5 Stalling load

The windlass and winch shall be equipped with a torque limiter; the stalling load shall be not less than 40 % of the minimum breaking load of mooring chains or wire ropes, the windlass and winch

shall have the capacity of maintaining the stalling load before the braking system acts, without speed requirements. The cable-lifter or drum shall not slip under 40 % of the breaking load of the anchor line and shall slip under 45 % of the breaking load of the anchor line. For winches, the stalling load shall be designed to refer to the maximum allowable number of layers of ropes configured.

5.6 Static braking

Each cable-lifter (drum) shall be fitted with two separate static braking systems, the static brake load of each system shall be sufficient to withstand at least 0,5 times the breaking load of the anchor line. For the winch, the brake capacity shall be designed to refer to the maximum allowable number of layers of ropes configured.

For each braking system under a braking condition, there shall be no slip of cable-lifter or drum or permanent deformation of the cable-lifter/drum, shaft, braking system and foundation bracket.

The operation of the power operating system of the braking system shall not be affected by a failure of the primary power source. The emergency release system of the braking system shall be provided with an emergency power source.

Ratchet and pawl mechanisms are not considered as static brakes.

5.7 Automatic braking

5.7.1 The motor-driven windlass and winch shall be provided with an automatic braking system. For the hydraulic motor-driven windlass and winch, the setup of an automatic braking system shall be agreed upon between the manufacturer and the purchaser.

5.7.2 An automatic braking system shall meet the following requirements.

- a) The static braking force of the prime mover braking system shall be capable of holding the torque induced by the line pull force at 0,5 times the breaking load of the anchor line.
- b) The braking system shall be capable of automatic braking instantly when the control handle is in the stop position or when the power supply fails.
- c) Braking shall be reliable, without the cable-lifter or drum slip and without any permanent deformation of the cable-lifter/drum, shaft, braking system and foundation bracket. If the hydraulically-driven windlass and winch without automatic braking system achieves the function only with a balanced valve, the anchor line slippage shall be not more than 1 m/min under the load.

5.8 Emergency release

5.8.1 The windlass/winch shall be able to carry out an emergency release of the anchor line within 10s when the platform is under mooring conditions.

5.8.2 The operation of an emergency release shall meet the following requirements.

- a) It shall be possible to limit the speed of the released anchor line and to apply and release one of the brakes, at least once, during the emergency release.
- b) The emergency release operating device shall be installed next to the windlass and winch, or chain or wire rope stopper, as well as within the safety zone of the central console (if equipped with a central console). After the emergency release, the braking system shall be capable of restoring its normal functions instantly. At all control places, the operation of the same controller shall realize the emergency release. The winch prime mover shall not re-operate automatically after an emergency release. The control handles and buttons for emergency release shall be provided with protections to avoid misoperation.

5.8.3 If the platform is fitted with a riser disconnecting system, when the riser is still connected to the platform, the anchor line shall not be released; the protection is provided to prevent misoperation resulting in an emergency release, but after the safety protection is removed manually, the riser at a connected state may still achieve the function of emergency release.

5.8.4 Electrical equipment for emergency release mechanism, if located in the hazardous zone, shall be certified safe type. The cooling water system where required shall be provided to effectively prevent any sparks due to emergency release of the anchor line. The system shall be kept pressurized and arranged for auto starting of the pump to ensure immediate availability of cooling water supply.

5.9 Anchor deployment (anchor dropping) speed limitation

Each windlass and winch shall be equipped with a set of anchor deployment (anchor dropping) dynamic brakes and have the sufficient capacity of anchor deployment (anchor dropping) speed limitation, to control the dynamic load due to anchor deployment, continuously pay out anchor lines, and result in no damage or overheat during anchor deployment (anchor dropping). The speed of the anchor deployment should not exceed 2,5 m/s.

5.10 Anchor line length, speed and tension measurement

5.10.1 The windlass and winch shall be equipped with means to measure the length and speed of each anchor line.

5.10.2 The windlass and winch shall be fitted with two sets of tension measuring devices which have been subjected to calibration. The minimum measurement accuracy of the anchor line tension measuring device shall not exceed 5 % of the entire range. Unless otherwise specified, the range of the tension measuring device shall satisfy 10 %-70 % of the breaking load of the anchor line.

<https://standards.iteh.ai/catalog/standards/sist/c5d800ff-0cb6-445f-80e9-cb20aa1cd969/iso-9089-2019>

5.11 Chain or wire rope stoppers

The windlass and winch may be fitted with chain or wire rope stoppers, as necessary.

- a) The chain or wire rope stopper shall be capable of withstanding the static load equal to the breaking load of the chain or wire rope.
- b) After the operation of an emergency release, the chain or wire rope stopper shall be capable of emergency release.
- c) The chain or wire rope stopper shall stop the anchor line at all times without chain or wire rope slip, and without any permanent deformation of the chain or wire rope stoppers and brackets.

5.12 Ratchet mechanisms

The cable-lifter or drum may be fitted with a ratchet mechanism, as necessary, which shall meet the following requirements.

- a) The ratchet mechanism is used for the maintenance of windlasses and winches, and for the prevention of the cable-lifter or drum rotation.
- b) The strength of the engaged ratchet shall be not less than the stalling load of the windlass and winch.

5.13 Operating system

The operating system shall meet the following requirements.

- a) The local and central consoles shall be reliably controlled, and one of them shall be visible; the local console shall be fitted with communication equipment.