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**Shipbuilding and marine structures —  
Deck machinery — Vocabulary and  
symbols**

*Construction navale et structures maritimes — Auxiliaires de pont —  
Vocabulaire et symboles*

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

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 3828 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

This third edition cancels and replaces the second edition (ISO 3828:1984), which has been technically revised.






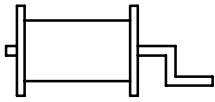
# Shipbuilding and marine structures — Deck machinery — Vocabulary and symbols

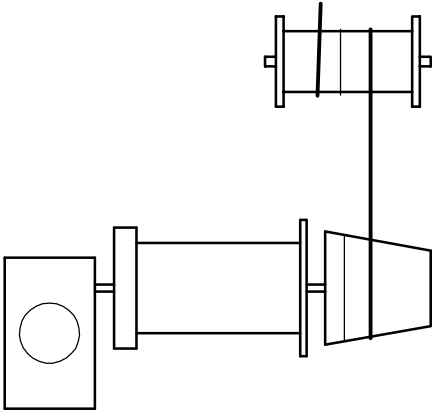
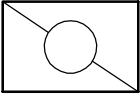
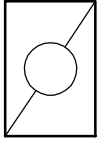
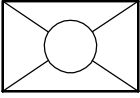
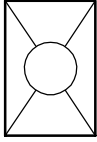
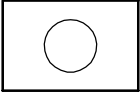
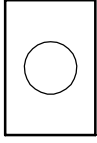
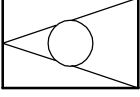
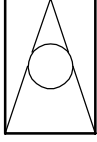
## 1 Scope

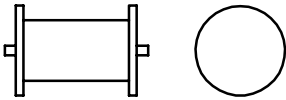
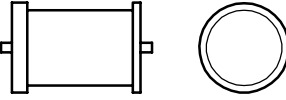
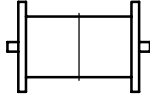
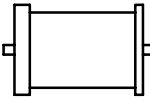
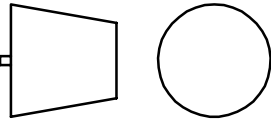
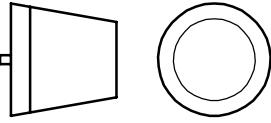
This International Standard establishes the vocabulary for the various terms in use relative to ship's deck machinery. It defines, in English, general terms used in connection with this subject, and includes specific terms associated with anchoring and mooring, cargo handling, towing, ancillary deck equipment and special deck machinery of working and oceanographic research ships.

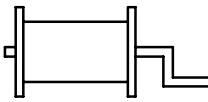
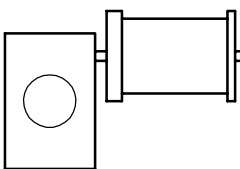
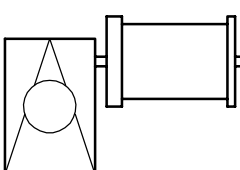
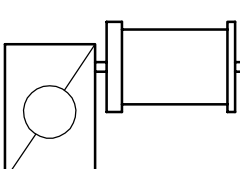
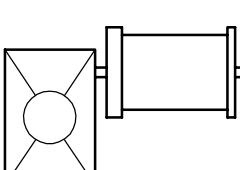
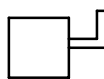
In the preparation of this vocabulary, care has been taken to standardize only suitable terms and definitions and not to perpetuate unsuitable terms because of their use in the past. The illustration given against the respective terms are purely diagrammatic and have been developed to provide for any series of combination of symbols, to represent the respective type of deck machinery.

## 2 General terms relating to deck machinery

Definition	Symbol
<p><b>2.1</b> <b>prime mover</b> electric or hydraulic motor, steam engine or similar drive, acting directly on the deck machinery</p> <p>NOTE In a diesel electric drive, the electric motor is the prime mover.</p>	<p>Power source</p> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">Electric</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">Hydraulic</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">Pneumatic</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">Steam</div> </div> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;">Internal combustion</div> </div> <p>X: number of discrete speeds (1.2.3, etc.) or V: infinitely variable speed</p>
<p><b>2.2</b> <b>unpowered</b> without any means of powering, except for hand power</p>	

<p><b>2.3</b> <b>externally powered</b> activated by means other than a directly connected prime mover</p>	
<p><b>2.4</b> <b>lightly powered</b> prime mover which is suitable only for operating the deck machinery in a light loaded condition  EXAMPLE Reeling in of an untensioned rope, or topping an unloaded derrick.</p>	<p style="text-align: center;">Non-portable</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">Portable</p> <div style="display: flex; justify-content: space-around;">   </div>
<p><b>2.5</b> <b>fully powered</b> prime mover which is suitable for operating the deck machinery at its full designed load</p>	<div style="display: flex; justify-content: space-around;">   </div>
<p><b>2.6</b> <b>non-automatic</b> controlled solely by hand</p>	
<p><b>2.7</b> <b>remote control</b> controlled from a position not integral with the machine  NOTE This may be achieved by a radio-electric, electric, hydraulic, pneumatic or other link.</p>	
<p><b>2.8</b> <b>automatic</b> controlled without direct human intervention</p>	<div style="display: flex; justify-content: space-around;">   </div>

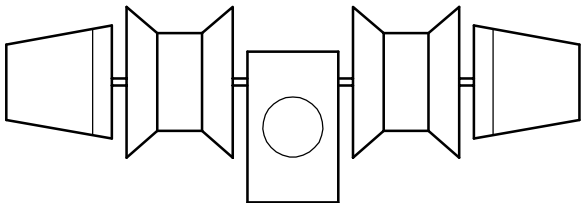
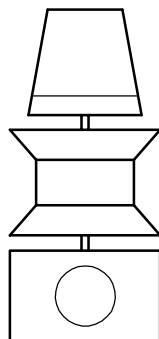
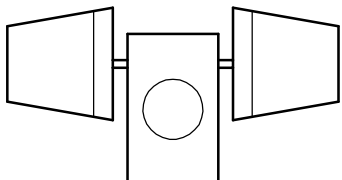
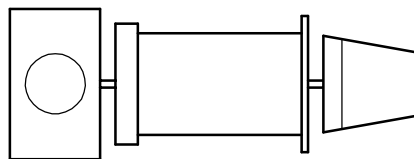
<p><b>2.9</b> <b>drum</b> a cylinder normally flanged at both ends</p> <p>NOTE When used, the rope is fixed and stored on it.</p>	<p style="text-align: center;">Unpowered</p>  <p style="text-align: center;">Powered</p>  <p style="text-align: right;">End view</p>
<p><b>2.10</b> <b>split drum</b> drum normally split by a flange somewhere along its length</p> <p>NOTE The flange may or may not have a slot.</p>	 <p style="text-align: right;">Unpowered</p>  <p style="text-align: right;">Powered</p>
<p><b>2.11</b> <b>warping end</b> part similar to a drum but longitudinally concave shaped and fixed to the shaft end for hauling but not storing a rope</p>	<p style="text-align: center;">Unpowered</p>  <p style="text-align: center;">Powered</p> 
<p><b>2.12</b> <b>fleet angle</b> included angle between a rope and the vertical plane of the drum or warping end axial line, through the point at which the rope leaves the drum or warping end</p>	

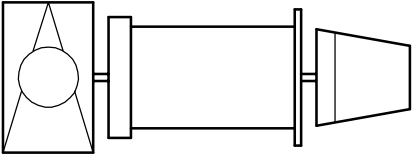
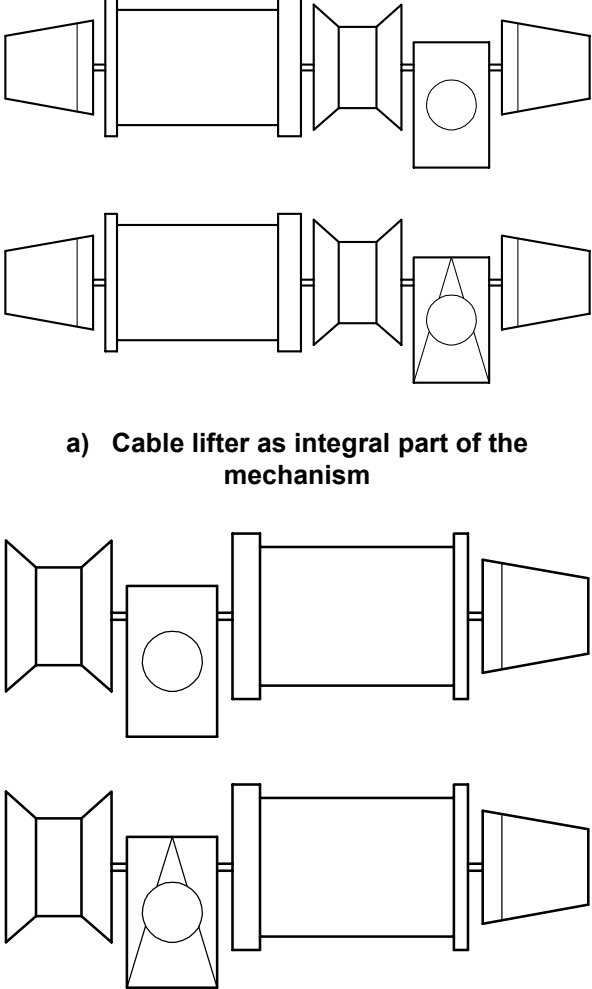
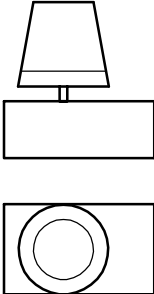
<p><b>2.13</b> <b>winch</b> powered or unpowered machine, having one or more horizontally mounted drums and/or one or two warping end(s), on which a rope may be wound under load</p>	 <p>Unpowered</p>  <p>Fully powered</p>  <p>Fully powered</p>  <p>Lightly powered non-portable</p>  <p>Lightly powered portable</p>
<p><b>2.14</b> <b>controller</b> unit fitted with control levers, buttons, etc., as appropriate</p>	
<p><b>2.15</b> <b>nominal size</b> essential characteristic parameters of a machine's mechanical performance or an indication of its standing against some important technical index</p>	
<p><b>2.16</b> <b>drum load</b> maximum pull (kN) measured at the drum exit when the winch is hoisting or hauling in at the nominal speed with a rope wound on the drum in a single layer</p>	
<p><b>2.17</b> <b>holding load</b> maximum pull (kN) that can be maintained by a braking/locking system on a cable lifter or drum with a rope wound on it in a single layer</p>	
<p><b>2.18</b> <b>stalling load</b> maximum pull (kN) measured at the drum end when the drum ceases to rotate in the direction of applied driving torque, the prime mover being set for maximum torque and the rope being wound on the drum in a single layer</p>	

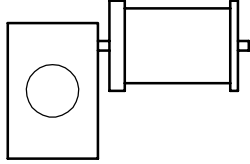
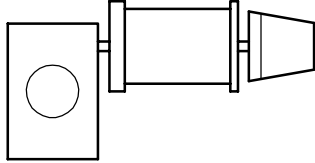


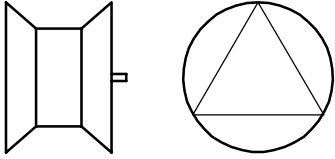
<p><b>2.19</b> <b>prototype test</b> test applied to the first machine of a new design</p>	
<p><b>2.20</b> <b>individual test</b> test applied to each machine produced by a manufacturer</p>	
<p><b>2.21</b> <b>type test</b> a test applied to one of a batch of machines of identical design from one manufacturer</p>	

### 3 Terms relating to anchoring and mooring

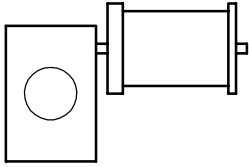
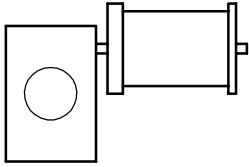
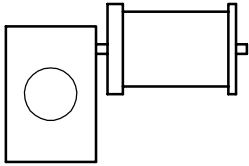
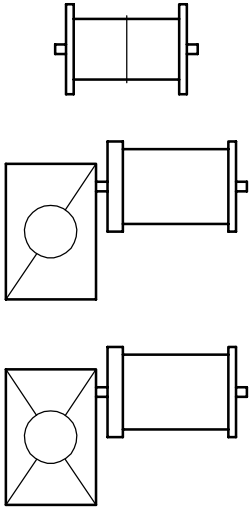
Definition	Symbol
<p><b>3.1</b> <b>windlass</b> machine designed to drop and hoist the anchor</p> <p>NOTE A windlass has one or more cable lifters mounted on a horizontal shaft, each being fitted with a brake. The cable lifters are capable of being declutched from the prime mover. One or two warping ends may also be fitted.</p>	
<p><b>3.2</b> <b>anchor capstan</b> power-driven cable lifter mounted on a vertical shaft</p> <p>NOTE The vertical shaft may be extended beyond the cable lifter to carry a warping end. The cable lifter is capable of being declutched from the prime mover, and in operation and use is similar to the windlass.</p>	
<p><b>3.3</b> <b>warping winch</b> winch used solely for warping, on which a rope may be wound under power but not stored</p>	
<p><b>3.4</b> <b>mooring winch</b> winch with the ability to hold and haul a tensioned mooring rope and having a capacity for rope storage, controlled solely by hand</p>	

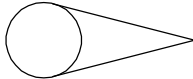
<p><b>3.5</b>  <b>automatic mooring winch</b>  a mooring winch with the additional ability to haul, veer or render a mooring rope within selected limits without direct human intervention</p>	
<p><b>3.6</b>  <b>combined windlass/mooring winch</b>  machine with a common prime mover which will provide independently the functions of either a windlass or a mooring winch (automatic or non-automatic)</p>	 <p>a) Cable lifter as integral part of the mechanism</p> <p>b) Cable lifter attached to the winch</p>
<p><b>3.7</b>  <b>capstan</b>  machine having a vertically mounted warping end on which a rope may be wound under power, but not stored</p>	

<p><b>3.8</b> <b>anchor winch</b> winch with the ability to drop, veer and heave an anchor that is connected by a rope, or a rope combined with a chain, and to hold and store rope</p> <p>NOTE The shaft may be extended beyond the drum to carry a warping end.</p>	<p>Without warping end</p>  <p>With warping end</p> 
<p><b>3.9</b> <b>nominal recovery speed</b> average speed of recovery of two shots of chain cable when three shots are submerged and freely suspended at commencement lifting (m/s)</p>	
<p><b>3.10</b> <b>nominal mooring speed</b> maximum speed (m/s) maintained by a winch when it is bearing the drum load with a rope wound on the drum in a single layer</p>	
<p><b>3.11</b> <b>light line speed</b> maximum speed (m/s) that a winch can maintain with a rope wound on the drum in a single layer and with negligible load on the rope</p> <p>NOTE Light line speed is normally not more than 10 % of the drum load.</p>	
<p><b>3.12</b> <b>creep speed</b> minimum uniform speed (m/s) measured on the first layer that the winch can maintain under drum load</p>	
<p><b>3.13</b> <b>recovery load</b> maximum rope pull (kN), measured as the drum commences to rotate in the direction of haul, the prime mover being set for maximum torque under automatic control and the rope being wound on the drum in a single layer</p>	
<p><b>3.14</b> <b>rendering load</b> maximum pull (kN) measured at drum exit as the drum commences to rotate in the opposite direction to the applied driving torque, the prime mover being set for maximum torque under automatic control and the rope being wound on the drum in a single layer</p>	

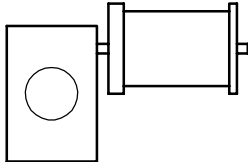
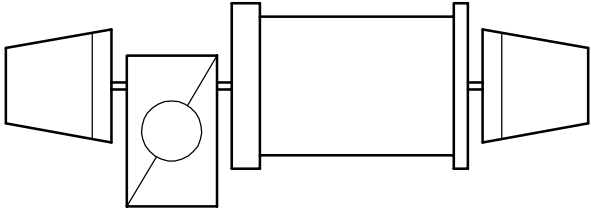
<p><b>3.15</b> <b>cable lifter</b> deeply grooved drum shaped to engage the links of a chain cable</p>	
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**4 Terms relating to cargo handling**

Definition	Symbol
<p><b>4.1</b> <b>derrick crane</b> crane with a derrick boom capable of slewing and luffing</p> <p>NOTE The derrick boom heel pivots by means of a goose-neck mounted at the lower part of the mast and the derrick boom head is connected to the mast top by a steel wire topping lift. The mast itself is fixed to the deck and is maintained upright.</p>	
<p><b>4.2</b> <b>cargo winch</b> winch used for hoisting and lowering cargo</p>	
<p><b>4.3</b> <b>slewing winch</b> winch having a rope storage capacity and used for slewing and retaining a boom</p>	
<p><b>4.4</b> <b>span winch</b> winch having a rope storage capacity and used for topping, lowering and supporting a boom whether under load or unloaded</p>	
<p><b>4.5</b> <b>topping winch</b> winch, frequently unpowered, having rope storage capacity and used for topping and lowering a derrick boom while the boom is unloaded and for supporting it while it is supporting a load</p>	

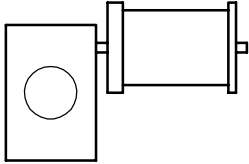
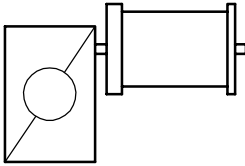
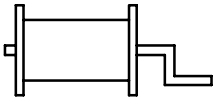
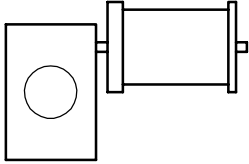
<p><b>4.6</b> <b>jib crane</b> crane with a jib which may be rotated by turning gear and adjusted in the vertical plane</p>	
<p><b>4.7</b> <b>cantilever crane</b> crane with a cantilever which is incapable of luffing</p> <p>NOTE The cargo hook is fixed at the outer end of the cantilever, or suspended from a carriage which can move along the cantilever.</p>	
<p><b>4.8</b> <b>fold-boom crane</b> crane with a boom consisting of several sections, being capable of moving the weight positions though folding the boom</p>	
<p><b>4.9</b> <b>telescopic-boom crane</b> crane with a boom capable of luffing, whose structure consists of several coaxial sections, each section capable of extending in the axial direction and thus changing the boom length</p> <p>NOTE A crane may have a telescopic boom combined with an articulated boom.</p>	
<p><b>4.10</b> <b>safe working load</b> total allowable lifting capacity of a cargo handling system, being the sum of the weight of the cargo and sub-hook (or fittings) under design working conditions</p> <p>NOTE For a crane with a variable luffing capability, the safe working load is also related to the luffing capacity. Safe working loads are also related to the radius of operation of a crane.</p>	

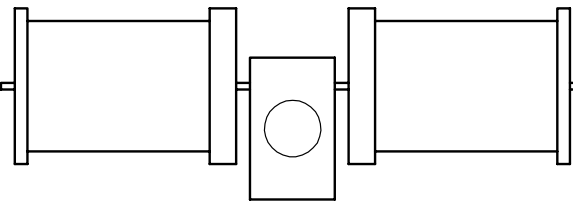
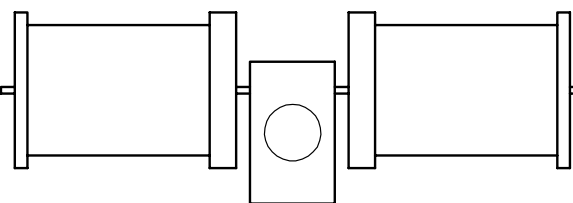
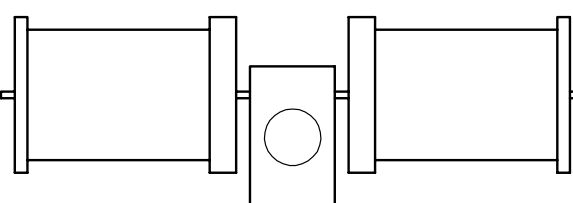
## 5 Terms relating to towing

Definition	Symbol
<p><b>5.1</b> <b>towing winch</b> winch with one or more rope storage drums for veering out, hauling in or making-fast tow ropes</p>	
<p><b>5.2</b> <b>towing bridle winch</b> winch having a rope storage drum, with or without warping end, for handling the rope bridle</p>	

<p><b>5.3</b> <b>maximum bollard pull</b> maximum static pull (kN) produced in a vessels harbour trail, measured against a bollard</p>	
<p><b>5.4</b> <b>emergency towing gear</b> gear that, under emergency conditions, may be connected to a tug or other vessel so as to enable the ship to which it is fitted to be pulled away from its berth or mooring</p> <p>NOTE As a minimum, the gear consists of a reel, towing hawser, signal cable, buoy, wire storage box, signal lamp, etc.</p>	

**6 Terms relating to ancillary deck equipment**

Definition	Symbol
<p><b>6.1</b> <b>accommodation ladder winch</b> winch designed specifically for lowering, retaining and hoisting an accommodation ladder, and having a rope storage drum</p>	
<p><b>6.2</b> <b>rope storage reel</b> lightly powered or unpowered drum intended solely for rope storage</p>	 <p style="text-align: right;">Lightly powered</p>  <p style="text-align: right;">Unpowered</p>
<p><b>6.3</b> <b>fibre rope handling gear</b> power-operated device with one or two drums to ensure that the working part of the fibre rope is wound in no more than one layer</p> <p>NOTE Fibre rope handling gear can be used in conjunction with a rope storage reel.</p>	
<p><b>6.4</b> <b>hatch cover winch</b> winch designed specifically for opening or closing hatch covers</p>	

<p><b>6.5</b>  <b>rescue-boat winch</b>          winch designed for hoisting and lowering the rescue-boat or life/rescue-boat</p>	
<p><b>6.6</b>  <b>lifeboat winch</b>          winch designed for hoisting and lowering the lifeboat</p>	
<p><b>6.7</b>  <b>launching appliances for a davit launched lifeboat</b>          device for hoisting and lowering the davit-launched lifeboat</p>	
<p><b>6.8</b>  <b>work-boat winch</b>          winch designed for hoisting and lowering the work-boat</p>	
<p><b>6.9</b>  <b>on-shore electric cable reel</b>          reel designed for recovery/rendering and storing the on-shore electric cable</p>	
<p><b>6.10</b>  <b>torque hinge</b>          powered hinge</p>	

**7 Terms relating to special deck machinery of working ship and oceanographic research ships**

Definition	Symbol
<p><b>7.1</b>  <b>ship-shifting winch</b>          winch designed for longitudinal and transverse moving or positioning of a working ship</p>	
<p><b>7.2</b>  <b>trawl winch</b>          winch having one or more drums operating independently or simultaneously, to hold, haul or veer the trawl ropes</p> <p>NOTE It may be fitted with monitoring equipment, safety devices and spooling gear to protect ropes, net and gear. Auxiliary drums and warping ends may be fitted.</p>	

<p><b>7.3</b> <b>nets-lifter</b> machine powered device for hauling nets from the water onto a ship, shore or ice surface by means of the friction between the reel and the netting</p>	
<p><b>7.4</b> <b>cable-laying machine</b> machinery device designed for use clipping, receiving and rendering electric cables during underwater cable laying operations</p>	
<p><b>7.5</b> <b>dredging shovel</b> special mechanical device designed for use on a dredger for digging, loosening soil, mashing and sucking mud or rock underwater</p>	
<p><b>7.6</b> <b>sweep winch</b> winch designed for use on a survey ship for recovering, rendering and towing the apparatus and hawser used for sweeping seabed sediments</p>	
<p><b>7.7</b> <b>hydrographic winch</b> winch designed for veering and recovering the survey apparatus used to take hydrographic measurements</p>	
<p><b>7.8</b> <b>geological winch</b> winch designed for recovering or rendering the apparatus used to perform under-sea geological sampling</p>	
<p><b>7.9</b> <b>deep sea-bed trawl winch</b> winch designed for rendering and recovery of the apparatus used to perform benthonic organism trawl surveys or deep sea-bed material sampling</p>	
<p><b>7.10</b> <b>umbilical winch</b> winch designed for receiving and rendering a pipe-bundle</p> <p>NOTE The pipe-bundle (also called umbilical stalk) binds together different supply pipes and cables such as air, fresh water, electrical power and communications, through which the underwater working unit is supported from the operating base on the surface or under water.</p>	



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