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**Shipbuilding — Deck machinery —  
Warping end profiles**

*Construction navale — Auxiliaires de pont — Profils de poupée*

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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.

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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This second edition cancels and replaces the first edition (ISO 6482:1980), which has been technically revised.

This edition revises the type, nominal dimensions, relation between nominal dimensions and rope sizes of warping ends, cancels the part related to hole and rope hooks, and adds some requirements on manufacturing quality.

# Shipbuilding — Deck machinery — Warping end profiles

## 1 Scope

This document specifies the types, nominal sizes, dimensions, markings and selection rules of warping end profiles.

The warping end specified in this document is applicable to windlasses, mooring winches, capstans and other deck machinery with steel wire rope, and ropes of natural and man-made fibre.

## 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 8062-3, *Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts — Part 3: General dimensional and geometrical tolerances and machining allowances for castings*

## 3 Terms and definitions

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

## 4 Types, nominal sizes and dimensions

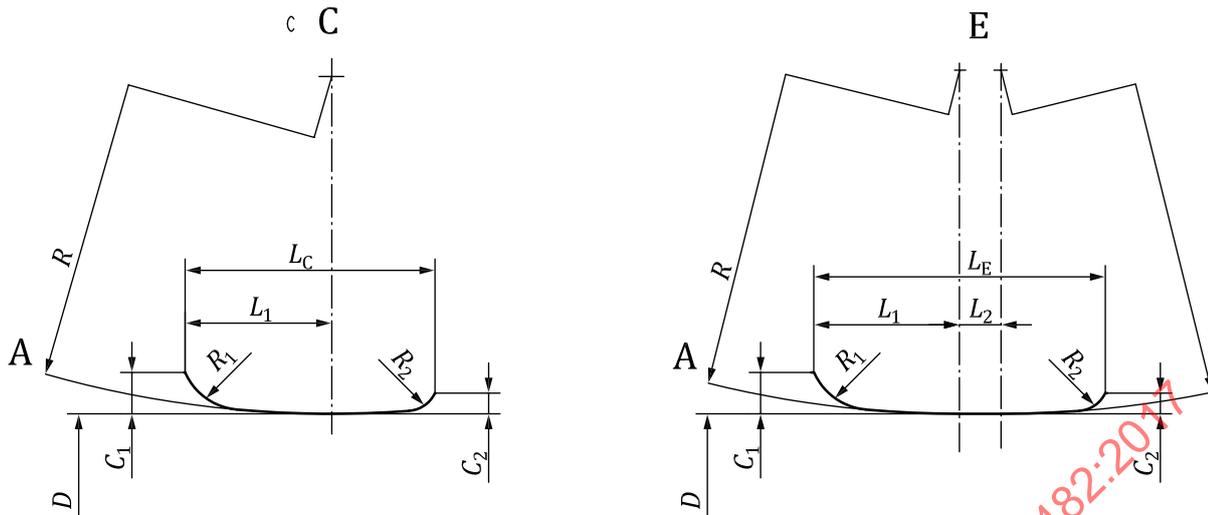
### 4.1 Types

The document specifies two types of warping end profiles, as shown in [Figure 1](#), namely:

- a) Type C – Common;
- b) Type E – Elongated.

### 4.2 Nominal sizes and dimensions

The nominal sizes and physical dimensions of the warping end are given in [Figure 1](#) and [Table 1](#).



**Key**

- C Profile type C
- E Profile type E
- A Winch side

**Figure 1 — Profile types**

**Table 1 — Nominal sizes and physical dimensions**

Dimensions in millimetres

Nominal size <i>D</i>	Length of warping end		<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>R</i>	<i>R</i> <sub>1</sub>	<i>R</i> <sub>2</sub>	<i>C</i> <sub>1</sub>	<i>C</i> <sub>2</sub>
	Type C ( <i>L</i> <sub>C</sub> )	Type E ( <i>L</i> <sub>E</sub> )							
180	180	225	112	45	500	50	25	50	28
200	200	250	125	50	560	56	28	56	32
225	225	280	140	56	630	63	32	63	36
250	250	315	160	63	710	71	36	71	40
280	280	360	180	71	800	80	40	80	45
315	315	400	200	80	900	90	45	90	50
360	360	450	225	90	1 000	100	50	100	56
400	400	500	250	100	1 120	112	56	112	63
450	450	560	280	112	1 250	125	63	125	71
500	500	630	315	125	1 400	140	71	140	80
560	560	700	360	140	1 600	160	80	160	90
630	630	800	400	160	1 800	180	90	180	100
710	710	900	450	178	2 000	200	100	200	112
800	800		500		2 250	225	112	225	125
900	900		560		2 550	255	128	255	144
1 000	1 000		630		2 850	285	143	285	160

NOTE For the warping end which has special requirements for length, dimensions *L*<sub>C</sub>, *L*<sub>E</sub> and *L*<sub>2</sub> may be determined by design engineers or in the contract.

## 5 Relation between warping end dimensions and rope sizes

### 5.1 Proportional relation between warping end lengths and selected rope sizes

The proportional relation between warping end lengths  $L_C$ ,  $L_E$  and selected rope diameter  $d$  must be met as follows:

- steel wire rope:  $L \geq 10d$
- natural fibre rope and man-made fibre rope:  $L \geq 7,5d$

### 5.2 Proportional relation between warping end diameters and selected rope sizes

The proportional relation between warping end diameter  $D$  and selected rope diameter  $d$  must be met as follows:

- steel wire rope:  $D \geq 16d$
- natural fibre rope and man-made fibre rope:  $D \geq 6d$

## 6 Calculation of warping end shaft torque and bending moment

### 6.1 Calculated position of maximum torque

The maximum shaft torque shall be calculated with dimension  $C_r$  given by the following formula when calculating the shaft torque of the warping end (see [Figure 2](#)).

$$C_r = 0,75d \quad (1)$$

### 6.2 Calculated position of bending moment at maximum torque

The maximum bending moment shall be calculated with dimension  $L_r$  given by the following formula when calculating the bending moment at the maximum shaft torque of the warping end:

$$L_r = 1,17d \quad (2)$$

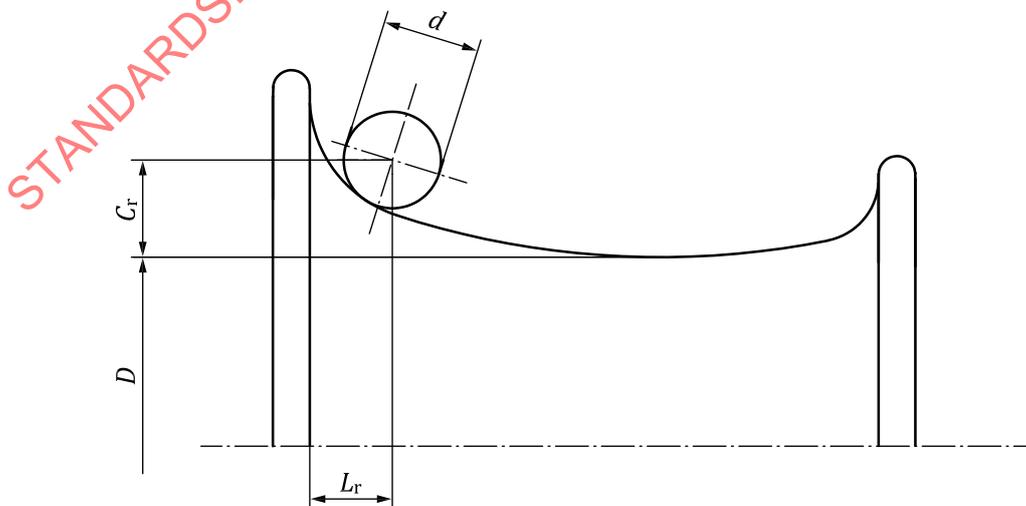


Figure 2 — Calculating chart of output shaft torque and bending moment of warping end

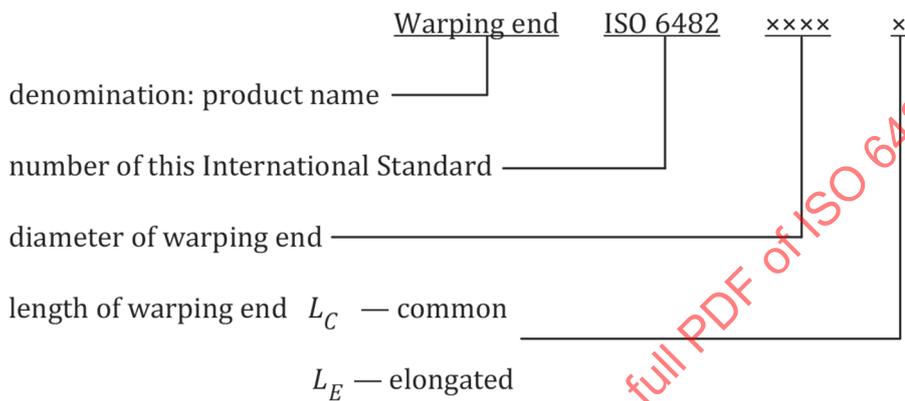
## 7 Dimensional tolerances and surface roughness

7.1 Linear casting dimensional tolerances shall comply with ISO 8062-3 DCTG 11.

7.2 The surface roughness of the warping end shall be determined by design according to the characteristics of ropes and materials of the warping end, or defined in the contract.

## 8 Designation

The warping end profile conforming to this document shall be designated in the following order:



EXAMPLE For the designation of a warping end according to ISO 6482, with elongated length and nominal size  $D = 630$  mm:

Warping end ISO 6482-0630- $L_E$

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