SLOVENSKI STANDARD
SIST EN ISO 12215-8:2009

01-julij-2009

Mala plovila - Konstrukcija trupa in zahtevane lastnosti - 8. del: Krmila (ISO 12215-8:2009)

Small craft - Hull construction and scantlings - Part 8: Rudders (ISO 12215-8:2009)

Kleine Wasserfahrzeuge - Rumpfbauweise und Dimensionierung - Teil 8: Ruder (ISO 12215-8:2009)

Petits navires - Construction de coques et échantillonnage - Partie 8: Gouvernails (ISO 12215-8:2009)

Ta slovenski standard je istoveten z: **EN ISO 12215-8:2009**

ICS:

47.020.10	Ladijski trupi in njihovi konstrukcijski elementi	Hulls and their structure elements
47.080	Ļolni	Small craft

SIST EN ISO 12215-8:2009 **en,fr**

EUROPEAN STANDARD

NORME EUROPÉENNE

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EN ISO 12215-8

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ICS 47.020.10; 47.080

English Version

Small craft - Hull construction and scantlings - Part 8: Rudders (ISO 12215-8:2009)

Petits navires - Construction de coques et échantillonnage - Partie 8: Gouvernails (ISO 12215-8:2009)

Kleine Wasserfahrzeuge - Rumpfbauweise und Dimensionierung - Teil 8: Ruder (ISO 12215-8:2009)

This European Standard was approved by CEN on 21 April 2009.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 12215-8:2009) has been prepared by Technical Committee ISO/TC 188 "Small craft" in collaboration with CEN Sub-sector T01 “Shipbuilding and maritime structures”, the secretariat of which is held by CMC.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2009, and conflicting national standards shall be withdrawn at the latest by November 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 12215-8:2009 has been approved by CEN as a EN ISO 12215-8:2009 without any modification.

Annex ZA
(informative)

Relationship between this International Standard and the Essential Requirements of EU Directive 94/25/EC amended by EU Directive 2003/44/EC

This standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 94/25/EC amended by EU Directive 2003/44/EC.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this International Standard and Directive 94/25/EC amended by EU Directive 2003/44/EC

Clause(s)/sub-clause(s) of this International Standard	Essential requirements (ERs) of EU Directive 94/25/EC amended by EU Directive 2003/44/EC	Qualifying remarks/Notes
All clauses	Annex 1 A, Clause 3.1 structure	The standard provides requirements for the structural strength of rudders. Single bearing spade rudders and single hull bearing skeg rudders are not addressed by this standard.

WARNING — Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

INTERNATIONAL STANDARD

ISO 12215-8

First edition
2009-05-15

Small craft — Hull construction and scantlings —

Part 8: Rudders

Petits navires — Construction de coques et échantillonnage —

Partie 8: Gouvernails

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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 12215-8 was prepared by Technical Committee ISO/TC 188, *Small craft*.

ISO 12215 consists of the following parts, under the general title *Small craft — Hull construction and scantlings*:

— *Part 1: Materials: Thermosetting resins, glass-fibre reinforcement, reference laminate*

— *Part 2: Materials: Core materials for sandwich construction, embedded materials*

— *Part 3: Materials: Steel, aluminium alloys, wood, other materials*

— *Part 4: Workshop and manufacturing*

— *Part 5: Design pressures for monohulls, design stresses, scantlings determination*

— *Part 6: Structural arrangements and details*

— *Part 8: Rudders*

Introduction

The reason underlying the preparation of this part of ISO 12215 is that standards and recommended practices for loads on the hull and the dimensioning of small craft differ considerably, thus limiting the general worldwide acceptability of craft. This part of ISO 12215 has been set towards the lower boundary range of common practice.

The objective of this part of ISO 12215 is to achieve an overall structural strength that ensures the watertight and weathertight integrity of the craft.

The working group considers this part of ISO 12215 to have been developed applying present practice and sound engineering principles. The design loads and criteria of this part of ISO 12215 may be used with the scantling determination equations of this part of ISO 12215 or using equivalent engineering methods such as continuous beam theory, matrix-displacement method and classical lamination theory, as indicated within.

Considering future development in technology and craft types, and small craft presently outside the scope of this part of ISO 12215, provided that methods supported by appropriate technology exist, consideration may be given to their use as long as equivalent strength to this part of ISO 12215 is achieved.

The dimensioning according to this part of ISO 12215 is regarded as reflecting current practice, provided the craft is correctly handled in the sense of good seamanship and equipped and operated at a speed appropriate to the prevailing sea state.

Small craft — Hull construction and scantlings —

Part 8: Rudders

1 Scope

This part of ISO 12215 gives requirements on the scantlings of rudders fitted to small craft with a length of hull, L_H, of up to 24 m, measured according to ISO 8666. It applies only to monohulls.

This part of ISO 12215 does not give requirements on rudder characteristics required for proper steering capabilities.

This part of ISO 12215 only considers pressure loads on the rudder due to craft manoeuvring. Loads on the rudder or its skeg, where fitted, induced by grounding or docking, where relevant, are out of scope and need to be considered separately.

NOTE Scantlings derived from this part of ISO 12215 are primarily intended to apply to recreational craft including charter craft.

2 Normative references

The following referenced documents are indispensable for the application 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 8666, *Small craft — Principal data*

ISO 12215-5:2008, *Small craft — Hull construction and scantlings — Part 5: Design pressures for monohulls, design stresses, scantlings determination*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
design categories
sea and wind conditions for which a craft is assessed by this part of ISO 12215 to be suitable, provided the craft is correctly handled in the sense of good seamanship and operated at a speed appropriate to the prevailing sea state

3.1.1
design category A ("ocean")
category of craft considered suitable to operate in seas with significant wave heights above 4 m and wind speeds in excess of Beaufort Force 8, but excluding abnormal conditions such as hurricanes

3.1.2
design category B (“offshore”)
category of craft considered suitable to operate in seas with significant wave heights up to 4 m and winds of Beaufort Force 8 or less

3.1.3
design category C (“inshore”)
category of craft considered suitable to operate in seas with significant wave heights up to 2 m and a typical steady wind force of Beaufort Force 6 or less

3.1.4
design category D (“sheltered waters”)
category of craft considered suitable to operate in waters with significant wave heights up to and including 0,3 m with occasional waves of 0,5 m height, for example from passing vessels, and a typical steady wind force of Beaufort Force 4 or less

3.2
loaded displacement mass
m_{LDC}
mass of the craft, including all appendages, when in the fully loaded ready-for-use condition as defined in ISO 8666

3.3
sailing craft
craft for which the primary means of propulsion is wind power, having $A_S > 0{,}07(m_{LDC})^{2/3}$ where A_S is the total profile area of all sails that may be set at one time when sailing closed hauled, as defined in ISO 8666 and expressed in square metres

NOTE 1 For the headsails, A_S is the area of the fore triangle.

NOTE 2 In the rest of this part of ISO 12215, non-sailing craft are called motor craft.

4 Symbols

For the purposes of this document, unless specifically otherwise defined, the symbols given in Table 1 apply.

NOTE The symbols used in the annexes are not listed in Table 1.

Table 1 — Symbols, coefficients, parameters

Symbol	Unit	Designation/meaning of symbol	(Sub)clause/table concerned
A	m^2	Total area of the moving part of the rudder	6.2.1, 6.2.3
A_0	m^2	Rudder effective area (Types II to IV)	6.2.3
A_1	m^2	Rudder blade area (Types II to IV) or top blade area (Type V)	6.2.3
A_2	m^2	Bottom rudder blade area (Type V)	6.2.3
A_3	m^2	Rudder skeg area [only used to determine type (see Figure 3)]	6.2.3
c	m	Rudder chord length at centre of area level	6.2.1, 6.2.2
c_1	m	Length of the top chord (Type I)	6.2.1
c_2	m	Length of the bottom chord (Type I)	6.2.1
co_1	m	Compensation at top chord (distance from LE to rotation axis) (Type I)	6.2.2
co_2	m	Compensation at bottom chord (distance from LE to stock CL) (Type I)	6.2.2
d	mm	Required solid stock diameter	10.4
d_i	mm	Inner diameter of tubular stock	10.6
d_o	mm	Outer diameter of tubular stock	10.6
F	N	Final side force on rudder	7.1
F_1	N	Side force on rudder in design category sea state	7.2
F_2	N	Side force on rudder during a turn at speed in slight sea	7.3
h_b	m	Height between rudder top and centre of hull bearing	6.2.1
h_c	m	Height between rudder top and centre of area	6.2.1
h_d	m	Height between rudder top and centre of skeg bearing (Type V)	6.2.3
h_e	m	Height between rudder bottom and centre of skeg bearing (Type V)	6.2.3
h_{in}	m	Height between centre of upper bearing and a point inside the hull (Type I)	6.2.1
h_{ou}	m	Height between bottom of spade and a point outside the hull (Type I)	6.2.1
h_r	m	Average height of rudder blade (see Figure 1)	6.2.1
h_s	m	Height of skeg from hull attachment to skeg bearing (Types II to V)	6.2.3
h_u	m	Height between centres of hull (lower) bearing and upper bearing	6.2.1
k_b	1	Rudder bending coefficient	6.2.1
k_{FLAT}	1	Coefficient lowering force for flat or wedge rudder blade shape	7.3
k_{GAP}	1	Coefficient lowering force due to gap hull/rudder top	7.2
k_{LD}	1	Length displacement coefficient	7.2
k_S	1	Coefficient for skeg deflection	8.3.4
k_{SEA}	1	Coefficient considering extra load due to sea in design categories A and B	7.2
k_{SERV}	1	Coefficient considering lower required service in design categories C and D	7.3
k_{SIG}	1	Coefficient lowering design stress for F_2	7.3
k_{USE}	1	Coefficient considering lower usage of craft with damage survey	7.2
k_5	1	Fibre type factor	13.3.1.2
L_S	m	Effective length of the skeg	8.3.4