

**Väikelaevad. Kerekonstruktsioon ja prussid. Osa 5:
Arvutuslik surve monokerele, arvutuslikud pinged,
prussidega seotud arvutused**

Small craft - Hull construction and scantlings - Part 5:
Design pressures for monohulls, design stresses,
scantlings determination

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 12215-5:2008 sisaldab Euroopa standardi EN ISO 12215-5:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 20.06.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

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This Estonian standard EVS-EN ISO 12215-5:2008 consists of the English text of the European standard EN ISO 12215-5:2008.

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English Version

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

Petits navires - Construction de la coque et échantillonnage
- Partie 5: Pressions de conception pour monocoques, contraintes de conception, détermination de l'échantillonnage (ISO 12215-5:2008)

Kleine Wasserfahrzeuge - Rumpfbauweise und Dimensionierung - Teil 5: Entwurfsdrücke für Einrumpffahrzeuge, Entwurfsspannungen, Ermittlung der Dimensionierung (ISO 12215-5:2008)

This European Standard was approved by CEN on 28 December 2007.

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Foreword

This document (EN ISO 12215-5:2008) has been prepared by Technical Committee ISO/TC 188 "Small craft" in collaboration with Technical Committee CEN/SS 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of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

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, 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 12215-5:2008 has been approved by CEN as a EN ISO 12215-5:2008 without any modification.

Annex ZA (informative)

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

This International Standard has been prepared under a mandate given to CEN by the European Commission to provide one means of conforming to Essential Requirements of the New Approach Directive 94/25/EC as amended by 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 as amended by Directive 2003/44/EC

Clause(s)/sub-clause(s) of this International Standard	Essential requirements (ERs) of EU Directive 94/25/EC as amended by Directive 2003/44/EC	Qualifying remarks/Notes
All clauses	Annex I, Part A, Clause 3.1, Structure	The standard provides requirements for scantling determination for monohull craft constructed from fibre reinforced plastics, aluminium or steel alloys, glued wood (laminated) or similar suitable materials.

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

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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 from one to another, thus limiting the general worldwide acceptability of boat scantlings. This part of ISO 12215 has been set towards the lower boundary of the range of current 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. It is intended to be a tool to assess the scantlings of a craft against lower bound practice and it is not intended to be a structural design procedure.

The scantling requirements are based principally on providing adequate local strength. Serviceability issues such as deflection under normal operating loads, global strength and its connected shell and deck stability are not addressed. The criteria contained within may need to be supplemented by additional considerations deemed necessary by the designer of the structure.

The mechanical property data supplied as default values make no explicit allowance for deterioration in service nor provide any guarantee that these values can be obtained for any particular craft. The responsibility for the decision to use this part of ISO 12215 as part of the design procedure rests solely with the designer and/or manufacturer.

The design pressures given in this part of ISO 12215 are only used with the given equations.

Considering future development in technology and boat types and small craft currently outside the scope of this part of ISO 12215, provided methods supported by appropriate technology exist, consideration may be given to their use provided equivalent support for 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 operated at a speed appropriate to the prevailing sea state.

Important notice:

- 1) ISO/TC 188/WG 18 believes that this part of ISO 12215 is the best that can be achieved at the time of publication. It has therefore decided to publish this document as an ISO Standard. It is anticipated that wider usage may reveal a number of issues that require modification. It is for this reason that WG 18 has asked for a revision of the document at the same time as its publication. This revision agreement will enable the group to amend this part of ISO 12215 quickly should this prove necessary.
- 2) In furtherance of this, this part of ISO 12215 needs to be applied with a critical mind, and users are invited to report to the TC secretariat, or national standardization body, any items that are considered to require correction, together with supporting evidence, be that theoretical or based on satisfactory, long-term service experience with actual boats operating in the appropriate design category sea states.

Small craft — Hull construction and scantlings —

Part 5:

Design pressures for monohulls, design stresses, scantlings determination

1 Scope

This part of ISO 12215 applies to the determination of design pressures and stresses, and to the determination of the scantlings, including internal structural members of monohull small craft constructed from fibre-reinforced plastics, aluminium or steel alloys, glued wood or other suitable boat building material, with a length of hull, L_H , in accordance with ISO 8666, between 2,5 m and 24 m. It only applies to boats in the intact condition.

It only applies to craft with a maximum speed ≤ 50 knots in m_{LDC} conditions.

The assessment shall generally include all parts of the craft that are assumed watertight or weathertight when assessing stability, freeboard and buoyancy in accordance with ISO 12217 and are essential to the safety of the craft and of persons on board.

For the complete scantlings of the craft, this part of ISO 12215 is used in conjunction with Part 6, for details, Part 7 for multihulls, Part 8 for rudders and Part 9 for appendages and rig attachment.

The scantling determination of windows, portlights, deadlights, hatches and doors, is in accordance with ISO 12216. The structure supporting these elements is in accordance with this part of ISO 12215.

NOTE 1 Scantlings derived from this part of ISO 12215 are primarily intended to apply to recreational craft including recreational charter vessels and may not be suitable for performance racing craft.

NOTE 2 This part of ISO 12215 is based on the assumption that scantlings are governed solely by local loads.

NOTE 3 The scantling requirements of this part of ISO 12215 are considered to correspond to the minimum strength requirements of motor and sailing craft which are operated in a safe and responsible manner, having due cognisance of the prevailing conditions.

Pressures and stresses are normally expressed in pascals, kilopascals or megapascals. For the purposes of a better understanding for the users of this part of ISO 12215, the pressures are expressed in kilonewtons per square metre ($1 \text{ kN/m}^2 = 1 \text{ kPa}$) and stresses or elastic moduli are expressed in newtons per square millimetre ($1 \text{ N/mm}^2 = 1 \text{ MPa}$).

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 178, *Plastics — Determination of flexural properties*

ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles*

ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 844, *Rigid cellular plastics — Determination of compression properties*

ISO 845, *Cellular plastics and rubbers — Determination of apparent density*

ISO 1922, *Rigid cellular plastics — Determination of shear strength*

ISO 8666:2002, *Small craft — Principal data*

ISO 12215-3, *Small craft — Hull construction and scantlings — Part 3: Materials: Steel, aluminium alloys, wood, other materials*

ISO 12215-6, *Small craft — Hull construction and scantlings — Part 6: Structural arrangements and details*

ISO 12215-7, *Small craft — Hull construction and scantlings — Part 7: Scantling determination of multihulls*

ISO 12215-9, *Small craft — Hull construction and scantlings — Part 9: Sailing boats — Appendages and rig attachment*

ISO 12216, *Small craft — Windows, portlights, hatches, deadlights and doors — Strength and watertightness requirements*

ISO 12217 (all parts), *Small craft — Stability and buoyancy assessment and categorization*

ASTM C393, *Standard Test Method for Flexural Properties of Sandwich Constructions*

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 boat 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 boats 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, e.g. hurricanes

NOTE For the application of this part of ISO 12215, the calculation wave height is 7 m.

3.1.2

design category B (“offshore”)

category of boats 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 boats 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