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Mindre skibe – Skrogkonstruktion – Dimensioner – Del 5: Dimensionerende tryk for enkeltskrog, dimensionerende spændinger, bestemmelse af materialedimensioner

Small craft – Hull construction and scantlings – Part 5: Design pressures for monohulls, design stresses, scantlings determination (ISO 12215-5:2008, including Amd 1:2014)

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EUROPÄISCHE NORM

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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,
including Amd 1:2014)**

Petits navires - Construction de coques et
échantillonnage - Partie 5: Pressions de
conception pour monocoques, contraintes de
conception, détermination de l'échantillonnage
(ISO 12215-5:2008, y compris Amd 1:2014)

Kleine Wasserfahrzeuge - Rumpfbauweise und
Dimensionierung - Teil 5: Entwurfsdrücke für
Einrumpffahrzeuge, Entwurfsspannungen,
Ermittlung der Dimensionierung
(ISO 12215-5:2008, einschließlich Amd 1:2014)

This European Standard was approved by CEN on 16 April 2018.

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Contents

Page

European foreword	3
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of Directive 2013/53/EU aimed to be covered.....	4

This is a preview of "DS/EN ISO 12215-5:20...". Click here to purchase the full version from the ANSI store.

European foreword

The text of ISO 12215-5:2008, including Amd 1:2014 has been prepared by Technical Committee ISO/TC 188 "Small craft" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 12215-5:2018.

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of an identical text or by endorsement, at the latest by March 2019, and conflicting national standards shall be withdrawn at the latest by March 2019.

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

This document supersedes EN ISO 12215-5:2008.

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 EU Directive 2013/53/EU.

For relationship with EU Directive 2013/53/EU, 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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 12215-5:2008, including Amd 1:2014 has been approved by CEN as EN ISO 12215-5:2018 without any modification.

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Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of Directive 2013/53/EU aimed to be covered

This European standard has been prepared under a Commission's standardization request M/542 C(2015) 8736 final to provide one voluntary means of conforming to Essential Requirements of Directive 2013/53/EU.

Once this standard is cited in the Official Journal of the European Union under that Directive, 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 European Standard and Annex I of Directive 2013/53/EU

Essential Requirements of Directive 2013/53/EU	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Annex I, Part A, 2.5 – Owner's manual	12	

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Table ZA.1 (continued)

Essential Requirements of Directive 2013/53/EU	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Annex I, Part A, 3.1 - Structure	All clauses	<p>The purpose of this part of this standard is to achieve overall structural strength that ensures the watertight and weathertight integrity of the watercraft.</p> <p>The standard provides requirements for scantling determination for monohull craft with a maximum speed ≤ 50 knots in m_{LDC} conditions constructed from fibre reinforced plastics, aluminium or steel alloys, glued wood (laminated) or similar suitable materials.</p> <p>It should be further noted that:</p> <ul style="list-style-type: none"> — For the complete scantlings of the watercraft, this part of ISO 12215 shall be used in conjunction with Part 6, for details, Part 7 for multihulls, Part 8 for rudders, Part 9 for appendages and Part 10 for rig loads and rig attachments; — The scantling determination of windows, portlights, deadlights, hatches and doors, shall be in accordance with ISO 12216, the structure supporting these elements being in accordance with this part of ISO 12215. <p>Annex A (see note to Annex A) provides a link to a software application using Microsoft excel to support this part and the determination of scantlings for watercraft in design categories A-C up to $L_H=12$ m and in design category D up to $L_H=24$ m that are constructed of GRP, steel and aluminium.</p>

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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First edition
2008-04-15

Small craft — Hull construction and scantlings —

Part 5:

Design pressures for monohulls, design stresses, scantlings determination

Petits navires — Construction de la coque et échantillonnage —

*Partie 5: Pressions de conception pour monocoques, contraintes de
conception, détermination de l'échantillonnage*



Reference number
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Contents

Page

Foreword.....	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	2
4 Symbols	4
5 General.....	6
6 Dimensions, data and areas	7
6.1 Dimensions and data.....	7
6.2 Areas	7
7 Pressure adjusting factors	9
7.1 General.....	9
7.2 Design category factor k_{DC}	9
7.3 Dynamic load factor n_{CG}	9
7.4 Longitudinal pressure distribution factor k_L	10
7.5 Area pressure reduction factor k_{AR}	11
7.6 Hull side pressure reduction factor k_Z	12
7.7 Superstructure and deckhouse pressure reduction factor k_{SUP}	13
7.8 Light and stable sailing craft pressure correcting factor for slamming k_{SLS}	13
8 Design pressures	14
8.1 Motor craft design pressure	14
8.2 Sailing craft design pressure	16
8.3 Watertight bulkheads and integral tank boundaries design pressure.....	16
8.4 Design pressures for structural components where k_{AR} would be $\leq 0,25$	18
9 Dimensions of panels and stiffeners	19
9.1 Dimensions of plating panels.....	19
9.2 Dimensions of stiffeners	23
10 Plating — Scantling equations	25
10.1 Thickness adjustment factors for plating	25
10.2 FRP single-skin plating	28
10.3 Metal plating — Aluminium alloy and steel.....	29
10.4 Laminated wood or plywood single-skin plating	30
10.5 FRP sandwich plating.....	31
10.6 Single-skin plating minimum thickness	35
11 Stiffening members requirements	36
11.1 General.....	36
11.2 Properties adjustment factors for stiffeners.....	37
11.3 Design stresses for stiffeners	37
11.4 Requirements for stiffeners made with similar materials.....	38
11.5 Requirements for stiffeners made with dissimilar materials	39
11.6 Effective plating	40
11.7 Overall dimensions of stiffeners	41
11.8 Structural bulkheads	43
11.9 Structural support for sailing craft ballast keel.....	44

This is a preview of "DS/EN ISO 12215-5:20...". [Click here to purchase the full version from the ANSI store.](#)

12	Owner's manual	44
12.1	General	44
12.2	Normal mode of operation	44
12.3	Possibility of outer skin damage	44
Annex A (normative)	Simplified method for scantling determination	45
Annex B (normative)	Drop test for boats of < 6 m	49
Annex C (normative)	FRP laminates properties and calculations	52
Annex D (normative)	Sandwich mechanical core properties and sandwich calculation	63
Annex E (normative)	Wood laminate properties and wood calculations	69
Annex F (normative)	Mechanical properties of metals	78
Annex G (normative)	Geometric properties of stiffeners	80
Annex H (normative)	Laminate stack analysis	97
Bibliography	108

This is a preview of "DS/EN ISO 12215-5:20...". Click here to purchase the full version from the ANSI store.

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 12215-5 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 7: Scantling determination of multihulls*
- *Part 8: Rudders*
- *Part 9: Sailing boats — Appendages and rig attachment*

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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.

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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*

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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*