

ISO 12215-7:2020 (E)

Small craft — Hull construction and scantlings — Part 7: Determination of loads for multihulls and of their local scantlings using ISO 12215-5

Contents

| | |
|-------|--|
| | Foreword |
| | Introduction |
| 1 | Scope |
| 2 | Normative references |
| 3 | Terms and definitions |
| 4 | Symbols |
| 5 | Application of this document |
| 5.1 | Materials |
| 5.2 | Limitations |
| 5.3 | Overall procedure for the application of this document |
| 6 | Main dimensions, data and areas |
| 6.1 | Dimensions and data |
| 6.1.1 | General |
| 6.1.2 | Bottom deadrise of the hulls β_x and chine beam BC_x of planing multihulls |
| 6.1.3 | Wet deck bottom |
| 6.1.4 | Crossbeams |
| 6.2 | Areas |
| 7 | Dimensions and pressure for panels and stiffeners under local loads |
| 7.1 | General |
| 7.2 | Example of application on multihulls |
| 7.2.1 | Sections |
| 7.2.2 | Details on panel assessment and dimensions |
| 7.2.3 | The constant averaged pressure method |
| 7.2.4 | Other assessment and dimensioning methods |
| 7.2.5 | Panels acting as "natural" stiffeners |
| 7.3 | Other topics on panel or stiffener dimensions |
| 8 | Local pressure-adjusting factors |
| 9 | Local design pressures |
| 9.1 | General |
| 9.2 | Limits of areas |
| 9.3 | Tables defining the local design pressures for multihulls |
| 9.4 | Design pressure for trimaran floats $PTRF_x$ |
| 9.4.1 | Pressure reduction factors |
| 9.4.2 | Pressure |
| 9.5 | Design pressure on watertight bulkheads and integral tanks |
| 10 | Further treatment of structural elements subject to local loads |
| 11 | Assessment of multihulls rudders, appendages and their wells |
| 12 | Multihull global loads |
| 12.1 | General |
| 12.2 | Typical structural arrangements |

- 12.3 Global load assessment
 - 12.3.1 General
 - 12.3.2 The simplified method
 - 12.3.2.1 Global loads for the simplified method
 - 12.3.3 The enhanced method
 - 12.4 Design stresses under global loads
 - 12.5 Global load case GLC1: Diagonal load in quartering sea
 - 12.6 Global load case GLC 2: Rig loads
 - 12.7 Combination of diagonal load GLC 1 and rig load GLC 2 for sailing multihulls
 - 12.8 Global load case GLC 3: Asymmetric broaching loads in sailing multihulls
 - 12.9 Global load case GLC 4: Longitudinal broaching/pitchpoling
 - 12.9.1 General
 - 12.9.2 Full method of analysis of the buoyancy load when the craft pitchpoles
 - 12.10 Global load case GLC 5: Longitudinal force on one hull
 - 12.10.1 General
 - 12.10.2 Longitudinal force
 - 12.11 Global load case GLC 6: Bending of crossbeams connecting hulls for motor catamarans.
- 13 Structural arrangement for supporting global loads
 - 14 Multihulls used as commercial craft and workboats
 - 15 Information to be included in the owner's manual
 - 15.1 General
 - 15.2 Respect of maximum loaded displacement
 - 15.3 Operational guidance
 - 15.4 Information to take care of sandwich plating
 - 15.5 Information required by Annex J of ISO 12215-5:2019 - for commercial craft and workboat
- Annex A (informative) Application sheet of ISO 12215-7**
- Annex B (informative) "Established practice" recommendations for global loads assessment using FEM methods and reporting**
- B.1 Examples of "Established practices"
 - B.2 Guidelines for reporting the structural analysis with FEM method
- Annex C (informative) "Established practice" details**
- C.1 Details for the connection of crossbeams with the hulls
 - C.2 Design stresses
 - C.3 Analysis of beams
 - C.3.1 General
 - C.3.2 Method of analysis
 - C.3.3 Dimensions, sections, neutral axis
 - C.3.4 Shear buckling analysis
 - C.3.4.1 Single skin shear buckling
 - C.3.4.2 Sandwich shear buckling
 - C.3.5 Compression buckling and skins stability
 - C.3.6 Eventual cut-out in the web
 - C.3.6.1 Shear stress
 - C.3.6.2 Secondary bending moment
- Annex D (informative) Technical background and example of torsional moment analysis with differential deflection of crossbeams**
- D.1 General
 - D.2 Theory
 - D.3 Worked example
 - D.3.1 General
 - D.3.2 Full method
 - D.3.3 Special case of two cross-beams only (suitable for small sports sailing catamarans)
 - D.3.4 General case of more than 2 cross-beams
 - D.3.5 Special case of a continuous cross-structure as found in some motor catamarans
 - D.3.6 Recommended application of this annex