ISO 12216:2020 (E)

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

Contents

Foreword

1 Scope

2 Normative references

3 Terms and definitions

- 3.1 General definitions of openings and their coverings
- 3.2 Devices covering an opening
- 3.3 Plate of an appliance
- 3.4 Specific appliances
- 3.5 Areas definition
- 3.6 Plate end-connections
- 3.7 Types of glass
- 3.8 Watertightness
- 3.9 Other general definitions

4 General requirements

- 4.1 Requirements of other International Standards
- 4.2 Strength of appliances
- 4.3 Watertightness of appliances
- 4.3.1 Minimum degree of watertightness
- 4.3.2 Additional requirements for appliances related to watertightness
- 4.3.2.1 Sliding appliances
- 4.3.2.2 Deck hatches of trimaran outrigger hulls
- 4.3.2.3 Non-permanently attached hatches

5 Plate materials

- 5.1 General
- 5.2 Acrylic sheet materials
- 5.3 Glass
- 5.3.1 Restrictions of usage
- 5.3.1.1 Monolithic glass
- 5.3.1.2 Laminated glass

6 Specific requirements of appliances

- 6.1 Plate end connection and location
- 6.1.1 Simply supported plates
- 6.1.1.1 Plates in area I
- 6.1.1.2 Flexibly connected plates
- 6.1.2 Semi-fixed plates
- 6.1.2.1 Plates made of material other than glass
- 6.1.2.2 Plates made of glass
- 6.2 Fastening requirements
- 6.2.1 Fastening of plates and frames
- 6.2.2 Fastening of semi-fixed plates
- 6.2.3 Fastening of glued plates
- 6.2.4 Stiffeners and attachments
- 6.3 Special requirements
- 6.3.1 Appliances fitted in area I
- 6.3.1.1 Requirements for all appliances
- 6.3.1.1.1 Maximum small side dimension for glazing in the hull.
- 6.3.1.1.2 Protection

6.3.1.2 Use of glass
6.3.1.3 Opening appliances
6.3.1.3.1 Height above waterline
6.3.1.3.2 Opening side
6.3.2 Appliances fitted in area IIa
6.3.2.1 Use of glass
6.3.2.2 Tests on hinged deck hatches
6.3.2.2.1 Unintentional stepping test
6.3.2.2.2 Rope jamming test
6.3.2.2.3 Hatch and hinge strength test
6.3.3 Flush deck companionway opening sill heights
6.3.3.1 Flush deck companionway deck hatch up to 45°
6.3.3.2 Flush deck companionway deck hatch above 45°
6.3.4 Sliding appliances
6.3.4.1 Rabbet depth
6.3.4.2 Stops
6.3.5 Washboards
6.3.6 Securing system
6.3.7 Deadlights
6.3.8 Multihull escape hatches
6.3.8.1 Minimum dimensions
6.3.8.2 Material
6.3.8.3 Opening
6.3.9 Prefabricated appliances
6.3.10 Appliance systems (composite appliances)

7 Strength assessment

7.1 Assessment methods for appliances strength
7.2 Monolithic plates — Direct calculation methods
7.2.1 Monolithic semi-fixed plates — Direct calculation method
7.2.2 Selection of monolithic plate thickness
7.2.3 Plate aspect-ratio coefficients, kr and kf
7.2.4 Design pressure
7.2.5 Pressure reduction factor
7.2.6 Curvature coefficient
7.2.7 Flexural strength and modulus of elasticity
7.2.8 Safety factor and minimum plate thickness
7.2.9 Monolithic simply supported on 2 sides — Direct calculation
7.2.10 Monolithic simply supported on 3 sides — Direct calculation
7.3 Laminated glass — Direct calculation
7.4 Advanced calculation method
7.5 Pressure test assessment method

Annex A (informative) Location areas of appliances above WLREF

Annex B (informative) Types of plate edge connection

Annex C (normative) Unsupported plate dimensions

Annex D (normative) Test methods

D.1 General
D.2 Pressure and watertightness tests
D.2.1 Pressure test for watertight appliances (watertightness degree 2)
D.2.2 Watertightness tests
D.2.2.1 Determination of degrees of watertightness and weathertightness
D.2.2.2 Test for "spraytight" level
D.3 Test or calculation for mechanical links
D.4 Gluing tests
D.4.1 General
D.4.2 Inside pressure test
D.4.2.1 Sample
D.4.2.2 Test procedure
D.4.2.3 Test result
D.4.3 Separation test

D.4.3.1 Sample
D.4.3.2 Test procedure
D.4.3.3 Test result

Annex E (normative) High-impact-resistance glass

Annex F (informative) Precalculated tables

F.1 Mechanical properties of typical materials
F.2 Use of pre-calculated tables

Page count: 69