TASNEEF
هيئة الإمـــــارات للتصـــنـيـف
EMIRATES CLASSIFICATION SOCIETY

Amendments to the "Rules for the Classification of Workboats"

Effective from 1/1/2025

List of the amendments:

Part/Chapter/Section/Paragraph amended	Reason
Pt A, Ch 1, Sec 1, [2.1.1] Pt B, Ch 1, Sec 2, [3](new) Pt B, Ch 1, Sec 4, [1.1.2], [2.1.1], Tab 2(new) Pt B, Ch 4, Sec 1, [3.4](new)	to introduce the new additional service features "Aquaculture" and "Small Tug" and new requirements for: • towing equipment of Small Tugs and the strength of the relevant hull foundations • equipment number and anchors of vessels having a restricted navigation notation • stability of Small Tugs (Prop 249)

SECTION 1 FIELD OF APPLICATION OF THE RULES, SERVICE NOTATION AND GENERAL

1 Field of application of the Rules

1.1

1.1.1 *(1/5/2023)*

These Rules apply for the purpose of classification of vessels with steel, reinforced plastic, aluminium alloy or high density polyethylene (HDPE) hull - including catamarans and rigid inflatable boats (RIBs) - in commercial use, other than those in use for recreational, sport and pleasure, having a load line length between 4 m and 24 m, with a maximum speed of 45 knots and carrying no more than 12 passengers.

The application of these Rules to vessels with reinforced plastic hull or aluminium alloy hull having different load line length or speed may be considered by the Society on a case-by-case basis, depending on their specific operation and construction characteristics.

These rules deal with HDPE ships having slender hull shapes, having a length not greater than 24 m and having an operating profile extended up to "moderate environment"; HDPE ships having different features will be specially considered on a case by case basis.

Where necessary, in the various parts of these Rules, specific conditions relevant to the field of application of the requirements are given.

The requirements for assignment of special service notations will be established by Tasneef case by case on the basis of the requirements of Part E of the Rules for the Classification of Ships.

For the purpose of the assignment of special class notations, the requirements of Part F of the Rules for the Classification of Ships are to be complied with, as far as practicable, at Tasneef's discretion, in relation to the navigation and service notations, vessel size and hull material.

2 Service Notation

2.1

2.1.1 *(1/1/2025)*

The vessels complying with the classification requirements of these Rules are assigned with the service notation **WORKBOAT**, that may be completed by the following additional service features:

- **Aquaculture**: when the workboat is designed to reach the sea fish breeding site, provide assistance to the breeding facilities, catch the fish living group and take it back to the onshore aquaculture center.
- **Crew Transfer Vessel - CTV**: when the workboat is designed to transport technician and other personnel out to sites.
- **Dive Support Vessel - DSV**: when the workboat is designed to support the offshore diving operation.
- **MULTICAT**: when the workboat is designed as multi-purpose workboat for offshore works and transport. Normally a multicat is equipped with one or more winches and cranes as well as a spacious flat deck.
- **Patrol and Guard Vessel**: when the workboat is designed to patrol a coastal area or site for security, observation and defense.
- **Pilot boats**: when the workboat is designed to transport maritime pilots from harbors to ships that need piloting, or vice versa.
- **Seismic and Geotechnical Survey Vessel - SGSV**: when the workboat is designed for the purpose of research, seismic survey and mapping at seas.
- **Small Tug**: when the workboat has a navigation notation not broader than NAV 60, a design category not higher than "C" and is provided with towing devices for towage activities featured by a towing pull not greater than 49,05 KN.
- **Taxi**: when the workboat is designed to transport paying passengers on rivers, canals, or sea coastal area.
- **Windfarm Service Vessel - WSV**: when the workboat is designed to transport technician and other personnel to offshore wind farm and to support operations of wind farm maintenance and survey.

3 Navigation and design category

3.1 Navigation Notations

3.1.1 *(1/7/2021)*

Every classed workboat is to be assigned one navigation notation.

3.1.2 *(1/7/2021)*

The navigation notation **unrestricted navigation** is assigned to a ship intended to operate in any area and any period of the year.

3.1.3 *(1/7/2021)*

The navigation notation "**NAV 150**" is assigned to ships intended to operate only within 150 nautical miles from a safe haven.

SECTION 2 HULL OUTFITTING

1 Propeller shaft brackets

1.1 General

1.1.1 For certain vessels, the propeller shafting is extended to the propeller bearings clear of the main hull.

Propeller shafting is either enclosed in bossing or independent of the main hull and supported by shaft brackets.

1.2 Shaft brackets

1.2.1 The scantlings of bracket arms are to be calculated as indicated below.

Bracket arms are to be attached to deep floors or girders of increased thickness, and the shell plating is to be increased in thickness and suitably stiffened, at the discretion of Tasneef. The thickness of the palm connecting the arms to the hull, if any, is to be not less than $0,2 \, \mathbf{d}_S$, where:

$\mathbf{d}_S$: Rule diameter, in mm, of the propeller shaft, calculated with the actual mechanical characteristics.

The arm is to be connected to the hull by means of through bolts, fitted with nut and lock nut, in way of the internal hull structures suitably stiffened at the discretion of Tasneef. The arms of V-shaft brackets are to be perpendicular, as far as practicable.

The bearing length of the shaft bracket boss, in mm, is to be not less than $3 \cdot \mathbf{d}_S$.

The thickness, in mm, of the shaft bracket boss after boring operation is to be not less than:

$$\mathbf{t_b} = 0,2 \cdot \mathbf{d}_s \cdot (\mathbf{K}_1 + 0,25)$$

where:

$\mathbf{K}_1$: $\mathbf{R}_{ms}/\mathbf{R}_{mb}$,

$\mathbf{R}_{ms}$: minimum tensile strength, in N/mm^2, of the propeller shaft,

$\mathbf{R}_{mb}$: minimum tensile strength, in N/mm^2, of the shaft bracket boss, with appropriate metallurgical temper.

Each arm of V-shaft brackets is to have a cross-sectional area, in mm^2, of not less than:

$$\mathbf{S} = 87,5 \cdot 10^{-3} \cdot \mathbf{d}_{so}^2 \cdot \left(\frac{1600 + \mathbf{R}_{ma}}{\mathbf{R}_{ma}}\right)$$

where:

$\mathbf{d}_{SO}$: Rule diameter, in mm, of the propeller shaft, for carbon steel material,

$\mathbf{R}_{ma}$: minimum tensile strength, in N/mm^2, of arms, with appropriate metallurgical temper.

Single-arm shaft brackets are to have a section modulus at vessel plating level, in cm^3, of not less than:

$$\mathbf{W} = \frac{30}{\mathbf{R}_{ma}} \cdot 10^{-3} \cdot \mathbf{l} \cdot \mathbf{d}_{so}^2 \cdot (\mathbf{n} \cdot \mathbf{d}_{so})^{0,5}$$

where:

$\mathbf{l}$: length of the arm, in m, measured from the shell plating to the centreline of the shaft boss,

$\mathbf{n}$: shaft revolutions per minute.

Moreover, the cross-sectional area of the arm at the boss is not to be less than 60% of the cross-sectional area at shell plating.

1.3 Plated bossing

1.3.1 Where the propeller shafting is enclosed within a plated bossing, the aft end of the bossing is to be adequately supported.

The scantlings of end supports are to be individually considered. Supports are to be designed to transmit loads to the main structure.

End supports are to be connected to at least two deep floors of increased thickness, or connected to each other within the vessel.

Stiffening of the boss plating is to be individually considered. At the aft end, transverse diaphragms are to be fitted at every frame and connected to floors of increased scantlings. At the fore end, web frames spaced not more than four frames apart are to be fitted.

2 Waterjets

2.1

2.1.1 The supporting structures of waterjets are to be able to withstand the loads thereby generated in the following conditions:

- maximum ahead thrust;
- maximum thrust at maximum lateral inclination;
- maximum reversed thrust (going astern).

Information on the above loads is to be given by the waterjet Manufacturer, supported by documents.

The shell thickness in way of nozzles, as well as the shell thickness of the tunnel, is to be individually considered. In general, such thicknesses are to be not less than 1,5 times the thickness of the adjacent bottom plating.

3 Towing Equipment

3.1 General

3.1.1 Application *(1/1/2025)*

The requirements reported in [3.2] to [3.3] apply to the towing equipment of Small Tugs and to the strength of the relevant hull foundations.

3.2 Equipment

3.2.1 Hooks and Winches *(1/1/2025)*

In general, towing hooks and winches are to be arranged in way of the ship's centerline, in such a position as to minimize heeling moments in normal working conditions.

The strength of the towing hooks and winches is to be verified in compliance with Pt E, Ch 14, Sec 2 [3.8.5] or [3.8.7] of the Rules, as applicable. Alternatively, marine certified towing hooks and winches are to be used.

3.2.2 Additional Equipment *(1/1/2025)*

Small Tugs are to be fitted with the additional equipment specified in Tab 1.

Table 1 *(1/1/2025)*

Arrangement or equipment	Navigation Notation		
	Nav 60	Nav 30	Nav 3
Fender	Requested	Not Requested	Not Requested
Towing hook or winch	Requested	Requested	Requested
Towing Staple **(1)**	Requested	Requested	Not Requested
No. of towlines of suitable diameter **(2)**	1	1	0
Length, in m, of towlines of suitable diameter **(2)**	100	60	0
Line throwing appliances	Not Requested	Not Requested	Not Requested
Crew accommodation spaces	Not Requested	Not Requested	Not Requested

(1) The Society may not require the tow bar depending on the characteristics of the ship under consideration and where any obstructions on the deck area aft do not interfere with the towline during towing operations.

(2) The suitability of the towline diameter is left to the judgement of the interested parties.

3.3 Hull Foundations

3.3.1 Strength of Steel Hull Foundations *(1/1/2025)*

The scantlings of the structures supporting the towing devices are to be such that, under a calculation load equal to 1,5·TP, the following conditions are fulfilled for all types of verifications (analytic or f.e.):

a) General: $\sigma_{VM} \leq R_y / \gamma_R \cdot \gamma_m$ where γ_R=1,02, γ_m=1,02

b) Compressed parts: $|\sigma| \leq \sigma_C / \gamma_R \cdot \gamma_m$ where γ_R=1,05, γ_m=1,05 and σ_C is the critical buckling stress to be obtained from Pt B, Ch 8, Sec 3 or from Pt B, Ch 8, Sec 4 or from Pt B, Ch 8, Sec 5 of the Rules, as the case may be.

3.3.2 Strength of Aluminium Hull Foundations *(1/1/2025)*

The scantlings of the structures supporting the towing devices are to be such that, under a calculation load equal to 1,5·TP, the following conditions are fulfilled for all types of verifications (analytic or f.e.):

a) General: $\sigma_{VM} \leq 75 / K$ where K is the material factor defined in Ch 3, Sec 1, [1.6.1]

b) Compressed parts: $|\sigma| \leq \sigma_C$ where σ_C is the critical buckling stress to defined in Ch 3, Sec 2, [2.5.3] or in Ch 3, Sec 2, [2.5.4], as the case may be.

3.3.3 Strength of GRP Hull Foundations *(1/1/2025)*

The scantlings of the structures supporting the towing devices are to be such that, under a calculation load equal

to 1,5*TP, the following conditions are fulfilled for all types of verifications (analytic or f.e.):

a) Single skin laminate, tensioned: $\sigma \leq R_m / 1,9$ where Rm is the ultimate tensile strength defined in Ch 2, Sec 1, Tab 3

b) Single skin laminate, compressed: $\sigma \leq R_{mc} / 1,9$ where R_{mc} is the ultimate tensile strength defined in Ch 2, Sec 1, Tab 3

c) Single skin laminate, sheared: $\tau \leq R_{mt} / 1,9$ where R_{mt} is the ultimate shear strength defined in Ch 2, Sec 1, Tab 3

d) Sandwich laminate, tensioned skin: $\sigma \leq R_m / 1,9$ where R_m is the ultimate tensile strength defined in Ch 2, Sec 1, Tab 3

e) Sandwich laminate, compressed skin: $\sigma \leq R_{mc} / 1,9$ or $0,32 * (E_c * E_{cc} * G_c)^{1/2}$ (whichever is the less) where R_{mc} is the ultimate compressive strength defined in Ch 2, Sec 1, Tab 3, E_c is the compressive modulus of inner skin defined in Ch 2, Sec 1, Tab 3, E_{cc} is the elastic modulus of the core (in MPa) and G_c is the elastic modulus of the core (in MPa).

3.3.4 Strength of HDPE Hull Foundations *(1/1/2025)*

The scantlings of the structures supporting the towing devices are to be such that, under a calculation load equal to 1,5*TP, the following conditions are fulfilled for all types of verifications (analytic or f.e.):

a) General: $\sigma_{VM} \leq R_{eh} / 1,33$ where R_{eh} is the tensile stress at yield (MPa) of the HDPE defined by the manufacturer or given in Ch 5, Sec 2, Tab 1 (subject to the subsequent confirmation by mechanical tests).

SECTION 4 EQUIPMENT

1 Equipment Number

1.1

1.1.1

The equipment of the vessel is to be as stipulated in Tab 1 based on the Equipment Number EN given in the requirements of Part B, Ch 10, Sec 4 of the Rules. Alternatively, Tasneef, taking into account the specific service and operational area for which the vessel is classed, may accept arrangements other than those above, following a request with grounds from the Interested Parties.

1.1.2 *(1/1/2025)*

In case the vessel is normally moored at quay and is thus only exceptionally anchored, the second anchor and attached chain end length (or guy pendant) may be stored ashore and not necessarily onboard.

Moreover, for vessels having a restricted navigation notation (NAV 150 or lower), the required number of anchors may be reduced to 1. The mass of the anchor may be reduced according to the scheme in Tab 2.

2 Anchors

2.1

2.1.1 *(1/1/2025)*

The mass per anchor given in Tab 1 applies to normal type anchors and may be reduced to 75% of that shown when high holding power anchors are used. Moreover, for vessels having a restricted navigation notation (NAV 60 or lower), the mass per anchor given in Tab 1 may be also reduced, for EN ≤ 110, according to the scheme in Tab 2:

Anchors are generally to be arranged in hawse pipes or, in any event, so that the chain cables can be easily and rapidly paid out. The chafing lips, and in any case the zone at the shell and deck, are to have radius adequate to the diameter of the chain cable; in general, this is to be not less than 8 times the diameter of the chain cable.

3 Chain cables and ropes

3.1

3.1.1 The chain cable diameters shown in Tab 1 refer to chain cables made of mild steel, grade Q1. The total length of chain cable for the anchor may be provided using a length of at least 10 m, having the required diameter, connected at one end to the anchor and at the other to a wire or natural fibre rope having the required chain cable length and breaking load at least equal to that of the chain cable.

If synthetic fibre ropes are used to replace both the chain cable and the mooring and/or warping lines, the breaking load is to be calculated as stated in Part B, Ch 10, Sec 4 of the Rules.

4 Windlass

4.1

4.1.1 The windlass is to be suitable for the size of chain cable and is generally to be power driven.

Table 1

Equipment number EN	Number of anchors	Mass of each anchor (kg)	Chain Cable			Lines		
			Diameter (mm)		Total length (m)	Breaking load (kN)		Length (m)
			studless	with stud		warping	mooring	
30	2	28	9,5	-	110	31	18	60
40	2	48	11	-	110	46	21	65
50	2	58	11	-	165	60	24	70
60	2	78	12,5	-	165	71	26	75
70	2	99	14	-	165	80	28	80
80	2	117	14	12,5	190	88	30	85
90	2	133	16	12,5	190	94	33	88
100	2	149	17,5	14	190	99	35	92
110	2	156	17,5	14	220	104	37	97
120	2	167	19	16	220	108	38	102
130	2	177	19	16	220	112	39	104
140	2	187	19	16	220	114	40	107
150	2	195	20,5	17,5	220	116	41	110
160	2	205	20,5	17,5	220	118	42	113

Note 1: When the calculated EN is intermediate between two values given in the Table, the masses of the anchors and the breaking loads of the lines may be obtained by linear interpolation; the other elements are to be assumed based on the higher EN.

Note 2: Natural or synthetic fibre ropes with diameter under 20 mm are not permitted.

Note 3: The breaking loads of the lines refer to steel wires or natural fibre ropes. For synthetic fibre ropes, the breaking load is to be determined in accordance with Part B, Chapter 10, Sec 4 of the Rules.

Table 2 *(1/1/2025)*

Navigation Notation	Required Anchor Mass
NAV 60 (EN ≤ 110)	Mass of Tab 1 / 1,15
NAV 30 or NAV 3 (EN ≤ 110)	Mass of Tab 1 / 1,25

SECTION 1 GENERAL REQUIREMENTS

1 Documentation to be submitted and general requirements

1.1 Documentation to be submitted

1.1.1

The following documentation shall be submitted for approval:

- stability manual
- inclining test report (when required)
- weathertight integrity plan
- freeboard calculation

The following documentation is assumed for information:

- general arrangement
- body/lines plan

In general the requirements of Part B, Chapter 3 of the Rules apply with the relaxations/alternatives reported in this section.

For vessel required to be arranged with buoyancy elements, the capability in flooded condition shall be documented and verified by full scale test. Enclosed superstructure, deckhouses and trunks may be included as buoyancy elements provided they have approved strength and watertight closing appliances.

Buoyancy elements may consist of foam, prefabricated or formed in position (in-situ), or tanks and double hull filled with air or buoyancy elements. Buoyancy elements must be fixed or permanently fitted and protected against mechanical damage and degradation from the environment; drainage shall be arranged for enclosed spaces used for buoyancy element. Such spaces shall normally not be used for storage or other scopes.

For vessel with fenders along the sides of the hull the fenders may be included when calculating the stability of the vessel subject to agreement with the Society. This applies to fenders that are secured or bonded to the hull such that they will not be dislodged when submerged. Fenders shall be solid or may be of foam filled construction in which case the foam shall be bonded to the hull such that it will not be dislodged when submerged.

Marks for maximum draught are to be arranged only at bow and stern.

For vessel with length L less than 6 m, and vessels arranged with buoyancy, the ordinary inclining test may be replaced by a full scale stability test.

Permanent heel or trim which may generate danger for accumulation of water on deck is not accepted.

Ballast is generally acceptable provided that it is documented and installed as prescribed by Tasneef Rules and good practice.

1.2 General Requirements

1.2.1

No damage stability calculation is required. Anyway Flag Administration may requires for damage stability calculation or similar cases.

1.2.2

For intact stability in general the requirements of Part B, Chapter 3 of the Rules apply with the relaxations/alternatives reported in this section.

1.2.3

In case of vessels where buoyancy elements are required, it is to be verified with a practical full scale test the stability with the buoyant element flooded,

If of adequate strength and watertight means of closure enclosed superstructure, trunks, deckhouses or similar structures may be considered elements of buoyancy.

Buoyancy elements may consist of foam, prefabricated or not or may be tanks, void spaces or double hull filled with air or buoyancy elements.

Buoyancy elements must be strongly fixed or permanently fitted and protected against damages and degradation from the environment.

Systems to drain enclosed spaces used for buoyancy element have to be provided and nothing is to be stored in such spaces.

1.2.4

Fenders located on the sides may be considered elements of buoyancy if agreed with Tasneef.

Such fenders are to be solid, filled with foam and fixed to the hull so that they remain in place when the vessel is flooded.

1.2.5

For vessel with $L < 6$ m and vessels arranged with buoyancy, the ordinary inclining test may be replaced by a full scale stability test.

1.2.6

Permanent heel or trim which may generate danger for accumulation of water on deck is not accepted.

1.2.7

Ballast is generally acceptable provided that it is documented and installed as prescribed by Tasneef Rules and good practice.

1.2.8

Marks for maximum draught are to be arranged only at bow and stern.

2 Freeboard

2.1 Decked vessel

2.1.1

For decked vessel the minimum freeboard is to be at least 0.2m. The platform height at stem normally is to be nowhere less than 0.12 L above deepest waterline. Such height may be reduced up to the level of freeboard deck at 0.25 L from the stem and afterwards.

Tasneef may evaluate reduction at stem.

2.2 Open vessel

2.2.1

The mean freeboard, F, in mm, is to be not less than:

$$\mathbf{F} = \frac{4,5\Delta}{1000\mathbf{LB}}$$

or F_{min} = 500 mm

If what above is not satisfied in the vessel buoyancy elements have to be installed.

2.2.2

For vessel arranged with buoyancy elements, the mean freeboard, F, is to be not less than:

F = 200 B mm

or

F_{min} = 200 mm

2.2.3

On vessels the freeboard aft is to be not less than:

F_{aft} = 0.8 F

3 Stability Requirements

3.1 Decked vessel

3.1.1

In general the requirements of Part B, Chapter 3 of the Rules apply. As alternative what follows may be applied:

The following conditions are to be considered:

a) Lightship with minimum equipment and cargo. Combined loads are not to exceed 10% of maximum load capacity.

b) Loaded with maximum equipment and cargo in holds and on deck. Combined loads are not to be less than 90% of maximum load capacity in the mode of departure and arrival.

c) Deck load with maximum equipment and cargo on deck and empty holds in the mode of departure and arrival.

d) Other relevant conditions , where necessary.

3.1.2

Crowding of persons at one side: In maximum load condition the vessel shall not capsize or be flooded if all persons moves to the sameside, the angle of heel shall not exceed 10°, caused by a heeling weight of at least:

P = 82.5 n (kg)

where n = total number of persons.

with the weight located 1 m above deck along the gunwale.

3.1.3

For the calculation of the heeling moment due to operation of lifting gear and similar appliances it is to be considered a dynamic factor of 1.4. The angle of heel is to be less than 10° for maximum moment in the most unfavourable condition.

In the condition stated in [3.1.1] the followings criteria have to be satisfied:

- The righting arm at 30° heel shall be minimum 0.20 metres
- The maximum value of the GZ-curve shall occur at an angle not smaller than 25°
- The GZ curve shall normally be positive up to 50° of heel.

3.2 Open vessel

3.2.1

One of the following criteria may be applied:

a) An inclining test is to be carried out to define the metacentric height GM in lightship condition. GM is to be more than 0.50 m, or

b) The inclining test may be omitted if it for the load condition can be demonstrated that the period of roll in seconds (from one side and back to the same side) is less or equal to the vessel beam in meters, or

c) The GZ curves satisfy the requirements for Decked vessel up to an angel of heel of at least 30°, and

d) Crowding of persons at one side as described for decked vessel.

3.3 Open vessel with buoyancy

3.3.1 Stability in intact condition

In lightweight condition the vessel is not to be flooded, or the angle of heel does not exceed 10°, for a heeling weight of:

P = 22 × n (kg) (n = number of persons),

or

P_{min} = 44 (kg).

with the weight placed at the gunwale at the maximum beam of the vessel, and not less than $B_{max}/2$ from the centreline.

The requirements in case of the crowding of person at one side is to be satisfied with the weight be located on the floor as near to the gunwale as possible, but minimum $B_{max}/4$ from centreline and with longitudinal position corresponding to the arrangement of the accommodation. Weights representing equipment shall be located at their locations.

3.3.2 Buoyancy in flooded condition

In maximum load condition including any outboard engine the flooded vessel is to float reasonably horizontally and not sink when loaded with additional weight:

P = 27.5 × n (kg) (n = total number of persons),

but not less than:

P = 55 + 55 (L - 2.5) (kg),

or

P_{min} = 82.5 (kg).

Weights shall be located at their locations on board.

3.3.3 Stability in flooded condition

In maximum load condition including any outboard engine the flooded vessel is to have a positive stability up to at least 50° of heel when loaded with an additional weight located anywhere along the gunwale:

P_K = 11 + 5.5 × n (kg) (n = total number of persons),

or

P_{Kmin} = 27.5 (kg).

3.4 Stability of Small Tugs

3.4.1 *(1/1/2025)*

Units having the additional service feature "Small Tug" are to have an initial metacentric height GM, in m, corrected according to Pt B, Ch 3, Sec 2, [4.7] of the Rules, which - in the most severe condition - is not to be less than the value obtained from the following formula:

$$GM = \frac{66 \cdot T \cdot h \cdot B}{f \cdot \Delta}$$

where:

B: ship's maximum breadth, in m

f: ship's freeboard, in mm, to be assumed not greater than 650 mm

T: Maximum towing pull, in kN. To be assumed, whenever unknown, equal to:

- T = 0,179 P for propellers not fitted with nozzles
- T = 0,228 P for propellers fitted with nozzles.

h: vertical distance, in m, between the towing hook, or equivalent fitting, and half draught at midship corresponding to Δ

Δ: loading condition displacement, in tons.

4 Freeing ports and recesses

4.1 Freeing ports

4.1.1

Freeing ports on decked vessel have to be provided along the deck, with lower edge preferably flush with deck level in any case of not more than 150mm from the deck.

On vessel with bulwark, forecastle, deckhouse or open structures forming wells or recesses, the total freeing port area on each side of the deck is to be minimum A = 0.02 V m^2 where the volume is the net volume up to the top the bulwark.

Means to block the flaps or reducing the effective area are not allowed.

If the freeing port has a height of more than 330mm horizontal interruption have to be fitted, the maximum distance from the flush deck and the horizontal interruption is to be not more than 230mm.

4.2 Drainage

4.2.1

On open vessel drainage of deck have to be provided on each side of the vessel to the bilge or directly overboard with a non-return valve.

The area of drainage shall be minimum A = 0.01 V m^2, where V is the volume as defined in [4.1.1].

5 Weathertight integrity

5.1

5.1.1

Watertight closing appliances have to provided on paced below the freeboard deck or contributing to the reserve of buoyancy.

Closing appliances are to have the same strength of the surrounding structure.

Other openings giving access to the interior have to be provided with weathertight means of closure.

Weather tight appliances is to be tested with a water jet test.

Hatches which may be opened at sea have to be hinged or attached and being capable of being secured in open position.

Hatch coamings are to be at least 380 mm. For hatches located at least 380 mm above freeboard deck the coaming height may be reduced to 150mm.

Flush hatches on the deck may be accepted if watertight and normally closed when at sea.Flush hatches located at the top of the superstructure or the deckhouse can be opened during the operation at sea and need to be only weathertight.

The hatches that are required to be weathertight has to be subject to a water jet test, and those that have to be watertight to hydrostatic test.

5.1.2

Doors have to be operable from either side of the bulkhead without keys or other tools if they are in the way of escape.

The sill height of door openings to spaces below freeboard deck is to be at least 380 mm. For doors located at least 380 mm above freeboard deck, a reduced height of sill may be accepted, but normally not less than minimum 150 mm.

5.1.3

Arrangement for removable washboard replacing a sill may be accepted based on special consideration.

Port and ramps have to be watertight, the arrangement for safety of operation, stop arrangement and any indicators etc. are to be submitted for approval and the lower edge of openings shall not be less than 200 mm above deepest waterline.

5.1.4

Ventilation openings have to be arranged so that they have minimum height 600 mm above freeboard deck and have not be immersed at heel angle smaller than 50°.