RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part CS Hull Construction and Equipment of Small Ships

Rules for the Survey and Construction of Steel Ships
Part CS 2021 AMENDMENT NO.2
Guidance for the Survey and Construction of Steel Ships
Part CS 2021 AMENDMENT NO.2

Rule No.61 / Notice No.58 27 December 2021
Resolved by Technical Committee on 28 July 2021

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An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part CS Hull Construction and Equipment of Small Ships

2021 AMENDMENT NO.2

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Rule No.61 27 December 2021
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Rules for the survey and construction of steel ships" has been partly amended as follows:

Part CS HULL CONSTRUCTION AND EQUIPMENT OF SMALL SHIPS

Amendment 2-1

Chapter 18 SUPERSTRUCTURES AND DECKHOUSES

Section 18.4 has been added as follows.

18.4 Additional Requirements for Bulk Carriers, Ore Carriers and Combination Carriers, etc.

Bulk carriers defined in **1.3.1(13)** of **Part B** and self-unloading ships defined in **1.3.1(19)** of **Part B** are to be provided with forecastles in accordance with the following requirements. However, the forecastle deck arrangements of ships for which the application of this requirement is, for some reason, difficult are to be at the direction of the Society.

(1) The forecastle is to be an enclosed superstructure.

(2) The forecastle is to be located on the freeboard deck with its aft bulkhead fitted in way or aft of the forward bulkhead of the foremost hold. (See **Fig. CS18.1**)

(3) The forecastle height H_F above the main deck is to be not less than the value given in the following **(a)** or **(b),** whichever is greater:

(a) $H_C + 0.5$ (m), where H_C is the height of the forward transverse hatch coaming of the foremost cargo hold.

(b) The standard height of superstructure as given in **Table CS18.2**. Intermediate values of L_f are to be obtained by linear interpolation.

(4) With respect to the design loads for the hatch covers and forward transverse hatch coamings of foremost cargo holds, to reduce the load on the forward transverse hatch coaming of the foremost cargo hold and/or the pressure applying abaft on the hatch cover of the foremost cargo hold, the horizontal distance l_F (m) from the hatch coaming to all points of the aft edge of the forecastle deck is to satisfy the following formula:

$$l_F \leq 5\sqrt{H_F - H_C}$$

H_F and H_C: As specified in **(3)**

(5) A breakwater is not to be fitted on the forecastle deck with the purpose of protecting the hatch coaming or hatch covers. If fitted for other purposes, it is to be located such that its aft edge at the centre line is forward of the aft edge of the forecastle deck at the horizontal distance l_w (m) satisfying the following formula:

$$l_w \geq H_B/\tan 20^\circ$$

H_B: Height of the breakwater above the forecastle.

Fig. CS18.1

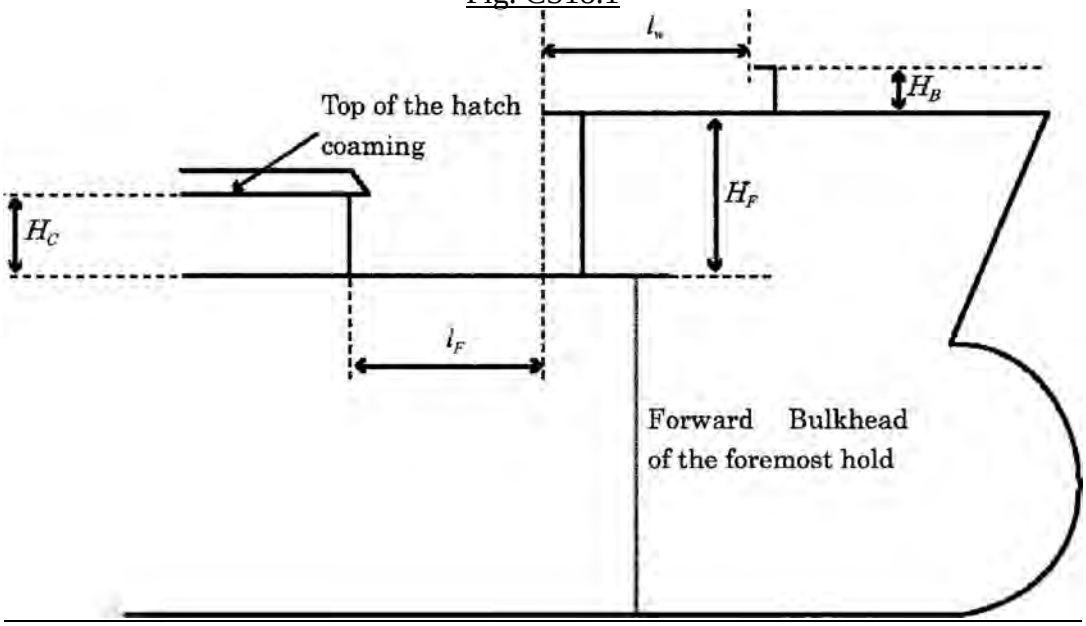


Table CS18.2 Standard Height of Superstructure

Length of ship for freeboard (L_f)	Standard Height of Superstructure (m)
75 m or less	1.80
125 m or more	2.30

Chapter 19 HATCHWAYS, MACHINERY SPACE OPENINGS AND OTHER DECK OPENINGS

19.2 Hatchways

19.2.1 Application*

Sub-paragraph -2 has been amended as follows.

1 The construction and the means for closing of cargo and other hatchways are to comply with the requirements in **19.2**.
2 Notwithstanding the provisions in this paragraph, the construction and means for closing of cargo and other hatchways of bulk carriers defined in **1.3.1(13)**~~,~~ of **Part B** ~~of the Rules~~, self-unloading ships defined in **1.3.1(19)** of **Part B** and ships intended to be registered as "bulk carriers" are to be at the discretion of the Society.
3 When the loading condition or the type of construction differs from that specified in this section, the calculation method used is to be as deemed appropriate by the Society.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 27 December 2021.

Amendment 2-2

Chapter 23 EQUIPMENT

Title of Section 23.1 has been amended as follows.

23.1 Anchors~~,~~ and Chain Cables~~ and Ropes~~

Paragraph 23.1.1 has been amended as follows.

23.1.1 General

1 All ships~~, according to their equipment numbers,~~ are to be provided with anchors~~,~~ and chain cables~~, ropes, etc.~~ which are not less than that given in **Table CS23.1**~~,~~ and **Table CS23.2** or **23.1.5** according to their equipment number. All ships are to be provided with suitable appliances for handling anchors and ropes.

2 Anchors, chain cables, ropes, etc. for ships with having equipment numbers ~~not more than~~ of 50 or ~~more than 1670~~ less (EN≤50) are to be determined by the Society.

3 ~~Two of t~~The anchors given in **Table CS23.1** are to be connected to their cables and be positioned on board ready for use.

4 Anchors~~,~~ and chain cables~~, wire ropes and fibre ropes~~ are to ~~be in~~ compl~~iance~~y with the requirements in **Chapter 2** as well as **3.1** ~~of~~in **Chapter 3~~, Chapter 4~~** and **~~5~~, Part L of the Rules**.

5 The anchoring equipment subject to the requirements specified in this chapter is based on the following conditions of intended use. The Society may, however, require special consideration be given to anchoring equipment intended for use in deep and unsheltered waters.

(1) The anchoring equipment required herewith is intended for temporary mooring of a ship within a harbour or sheltered area when the ship is awaiting berth, tide, etc. The equipment is, therefore, not designed to hold a ship off fully exposed coasts in rough weather or to stop a ship which is moving or drifting.

(2) The anchoring equipment required herewith is designed to hold a ship in good holding ground conditions so as to avoid dragging of the anchor. In poor holding ground conditions, the holding power of the anchors is significantly reduced.

(3) Anchoring equipment is used under the environmental condition that an assumed maximum current speed of 2.5 *m/s*, a maximum wind speed of 25 *m/s* and a minimum scope of chain cable of 6, the scope being the ratio between the paid-out length of the chain and water depth.

(4) It is assumed that under normal circumstances a ship uses only one bow anchor and chain cable at a time.

6 Sheltered waters are generally calm stretches of water (e.g. harbours, estuaries, roadsteads, bays, lagoons) where the wind force does not exceed 6 on the Beaufort scale.

Paragraph 23.1.2 has been amended as follows.

23.1.2 Equipment Numbers*

~~**1** Equipment number is the value obtained from the following formula:~~

~~$W^{\frac{2}{3}} + 2.0hB + 0.1A$~~

~~Where:~~

~~*W*: Full load displacement (*t*)~~

~~*h* and *A*: Values specified in the following **(1)**, **(2)** and **(3)**~~

~~(1) *h* is the value obtained from the following formula :~~

~~$f + h'$~~

~~f : Vertical distance (m), at the midship, from the designed maximum load line to the top of the uppermost continuous deck beam at side~~

~~h': Height (m) from the uppermost continuous deck to the top of uppermost superstructures or deckhouses having a breadth greater than $B/4$.~~

~~In the calculation of h', sheer and trim may be ignored. Where a deckhouse having a breadth greater than $B/4$ is located above a deckhouse with a breadth of $B/4$ or less, the narrow deckhouse may be ignored.~~

~~(2) A is the value obtained from the following formula:~~

~~$f L_2 + \Sigma h'' l$~~

~~f : Value specified in **(1)**~~

~~L_2: Length (m) of ship specified in **2.1.2, Part A** or 0.97 *times* the length of ship on the designed maximum load line, whichever is smaller. The fore end of L_2 is the perpendicular to the designed maximum load draught at the forward side of the stem, and the aft end of L_2 is the perpendicular to the designed maximum load draught at a distance L_2 aft of the fore end of L_2.~~

~~$\Sigma h'' l$: Sum of the products of the height h'' (m) and length l (m) of superstructures, deckhouses or trunks which are located above the uppermost continuous deck within L_2 and also have a breadth greater than $B/4$ and a height greater than 1.5 m~~

~~(3) In the application of **(1)** and **(2)**, screens and bulwarks more than 1.5 m in height are to be regarded as parts of superstructures or deckhouses.~~

1 The equipment number (EN) is the value obtained from the following formula:

$$W^{\frac{2}{3}} + 2.0\left(hB + S_{fun}\right) + 0.1A$$

W: Full load displacement (t)

B: Breadth of ship (m) (See **2.1.4, Part A of the Rules**)

h: Effective height (m) defined as follows: $h = a + \sum h_i$

a: Vertical distance (m), at the midship, from the designed maximum load line to the top of the uppermost continuous deck beam at side

h_i: Height (m) at the centreline of each tier of deckhouses having a breadth greater than $B/4$; for the lowest tier h_1 is to be measured at the centreline from the upper deck or from the notional deck line where there is local discontinuity in the upper deck (See **Fig. CS23.1**)

S_{fun}: Effective front projected area of the funnel (m^2) defined as follows: $S_{fun} = A_{FS} - S_{shield}$

A_{FS}: Front projected area of the funnel (m^2) calculated between the upper deck at the centreline (or the notional deck line where there is local discontinuity in the upper deck) and the effective height h_F. The value for A_{FS} is to be taken as zero if the funnel breadth is $B/4$ or less at all elevations along the funnel's height.

h_F: Effective height of the funnel (m) measured from the upper deck at the centreline (or the notional deck line where there is local discontinuity in the upper deck) and the top of the funnel. The top of the funnel may be taken at the level where the funnel breadth reaches $B/4$.

S_{shield}: Section of front projected area A_{FS} (m^2) which is shielded by all deckhouses having breadth greater than $B/4$. To determine S_{shield}, the deckhouse breadth is assumed B for all deckhouses having breadth greater than $B/4$. (See **Fig. CS23.2**)

A: Side projected area (m^2) of the hull, superstructures, deckhouses and funnels above the designed maximum load line which are within the length of the ship L_2 and also have a breadth greater than $B/4$. The side projected area of the funnel is to be considered in A when A_{FS} is greater than zero. In such cases, the side projected area of the funnel is to be

calculated between the upper deck at the centreline (or the notional deck line where there is local discontinuity in the upper deck) and the effective height h_F.

L_2: Length (*m*) of ship specified in **2.1.2, Part A of the Rules** or 0.97 *times* the length of ship on the designed maximum load line, whichever is smaller. The fore end of L_2 is the perpendicular to the designed maximum load draught at the forward side of the stem, and the aft end of L_2 is the perpendicular to the designed maximum load draught at a distance L_2 aft of the fore end of L_2.

Fig. CS23.1 Effective Height

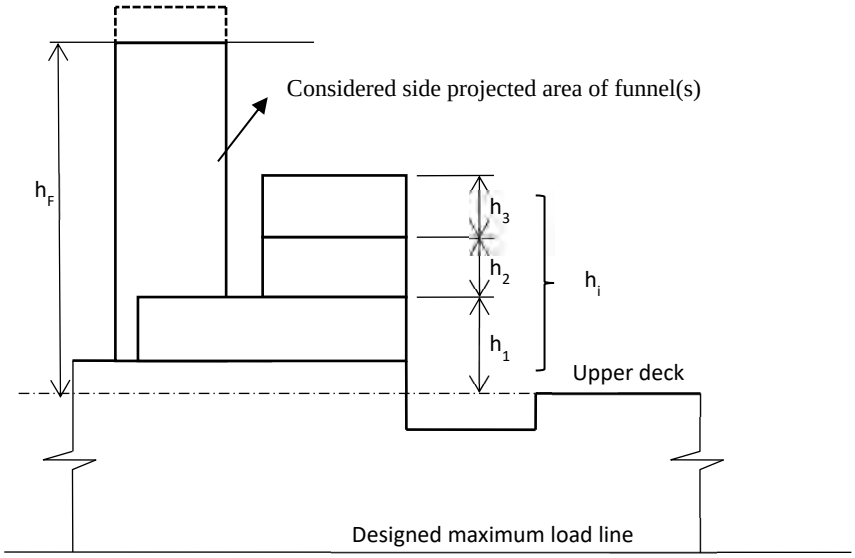
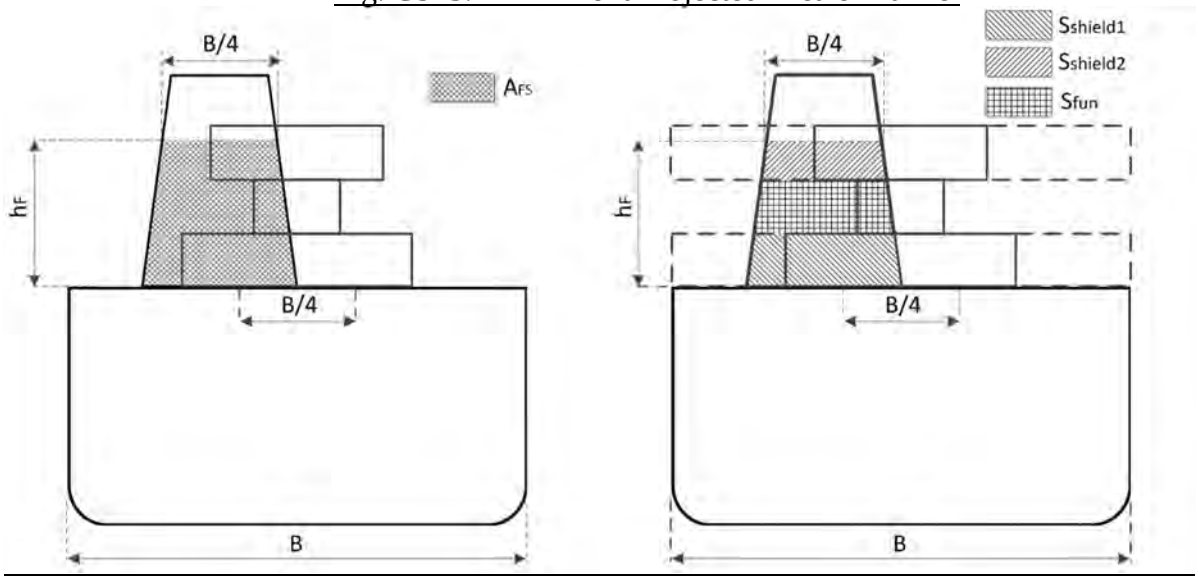
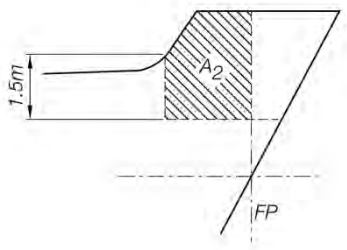


Fig. CS23.2 Front Projected Area of Funnel



2 Screens or bulwarks 1.5 *m* or more in height are to be regarded as parts of deckhouses when determining *h* and *A*. The height of the hatch coamings and that of any deck cargo, such as containers, may be disregarded when determining *h* and *A*. With regard to determining *A*, when a bulwark is more than 1.5 *m* high, the area A_2 in **Fig. CS23.3** is to be included in *A*.

Fig. CS23.3 Effective Area for Screens, Bulwarks, etc.



3 When several funnels are fitted on the ship, the above parameters are to be taken as follows:

h_F: Effective height of the funnel (m) measured from the upper deck at the centreline (or the notional deck line where there is local discontinuity in the upper deck) and the top of the highest funnel. The top of the highest funnel may be taken at the level where the sum of each funnel breadth reaches $B/4$.

A_{FS}: Sum of the front projected area of each funnel (m^2) calculated between the upper deck at the centerline (or the notional deck line where there is local discontinuity in the upper deck) and the effective height h_F. The value for A_{FS} is to be taken as zero if the sum of each funnel breadth is $B/4$ or less at all elevations along the funnel's height.

A: Side projected area (m^2) of the hull, superstructures, deckhouses and funnels above the designed maximum load line which are within the length of the ship L_2. The total side projected area of the funnel is to be considered in the side projected area of the ship (A) when A_{FS} is greater than zero. The shielding effect of funnels in transverse direction may be considered in the total side projected area (i.e. when the side projected areas of two or more funnels fully or partially overlap), the overlapped area needs only to be counted once.

~~**2**~~**4** Notwithstanding ~~-~~**1**, ~~for tugs,~~ the equipment number for tugs is to be obtained from the following formula:

$$W^{\frac{2}{3}} + 2.0(~~f~~aB + \sum ~~h'' b~~ h_i b_i) + 0.1A$$

W, ~~f~~a, h_i and A: As specified in **1** above

~~$\sum h'' b$: Sum of the products of the height h'' (m) and the breadth b(m) of each widest superstructure and deckhouse which have a breadth greater than $B/4$ and are located above the uppermost continuous deck~~

b_i: Breadth (m) of the widest superstructure or deckhouse of each tier having a breadth greater than $B/4$

Paragraph 23.1.5 has been deleted.

~~**23.1.5 Tow Lines and Mooring Lines**~~

~~**1** As for wire ropes and fibre ropes used as tow lines and mooring lines, the breaking test load specified in **Chapter 4** or **5, Part L** is not to be less than the breaking load given in **Table CS23.1** and **Table CS23.2** or **-3** respectively.~~

~~**2** The number of mooring lines for ships whose equipment numbers do not exceed 2,000 is to be in accordance with **Table CS23.2.** However, for ships having the ratio A/EN above 0.9, the following number of ropes should be added to the number required by **Table CS23.2** for mooring lines.~~

~~Where A/EN is above 0.9 up to 1.1: 1~~
~~Where A/EN is above 1.1 up to 1.2: 2~~
~~Where A/EN is above 1.2: 3~~

EN: Equipment number

A: Value specified in **23.1.2-1(2)**

3 The number and strength of mooring lines for ships whose equipment numbers exceed 2,000 are to be in accordance with the followings **(1)** to **(4)**.

(1) Minimum breaking strength (MBL) is not to be less than that obtained from the following formula:

$$MBL = 0.1A_1 + 350 \quad (kN)$$

A_1: Ship side-projected area specified in **-5.**

(2) Head lines, stern lines, breast lines or spring lines in the same service are to be of the same characteristics in terms of strength and elasticity. The strength of spring lines is to be the same as that of the head, stern and breast lines.

(3) The total number of head, stern and breast lines is to be obtained from the following formula and rounded to the nearest whole number:

(a) for oil tankers, chemical tankers, bulk carriers and ore carriers

$$n = 8.3 \times 10^{-4} A_1 + 4$$

(b) for others

$$n = 8.3 \times 10^{-4} A_1 + 6$$

(4) The total number of spring lines is to be taken as not less than:

Two lines when the equipment number < 5,000

Four lines where the equipment number $\geq$ 5,000

4 Notwithstanding the requirement in **-3,** the number of head, stern and breast lines may be increased or decreased in conjunction with an adjustment to the strength of the lines. The adjusted strength, MBL^*, is to be taken as:

$MBL^* = 1.2MBL \cdot n/n^* \leq MBL$ (*kN*) for an increased number of lines

$MBL^* = MBL \cdot n/n^*$ (*kN*) for a reduced number of lines

n^*: The increased or decreased total number of head, stern and breast lines

n: The number of lines for the considered ship type as calculated by the formulae specified in **-3(3)** without rounding.

In the same manner, the strength of head, stern and breast lines may be increased or decreased in conjunction with an adjustment to the number of lines. If the number of head, stern and breast lines is increased in conjunction with an adjustment to the strength of the lines, the number of spring lines is to be likewise increased, but rounded up to the nearest even number.

5 The ship side-projected area A_1 is to be obtained from the same formula specified in **23.1.2-1(2)**. However, following **(1)** to **(4)** are to be considered.

(1) For oil tankers, chemical tankers, bulk carriers and ore carriers, the lightest ballast draft is to be considered for the calculation of the side-projected area A_1. For other ships, the lightest draft of usual loading conditions is to be considered if the ratio of the freeboard in the lightest draft and the full load condition is equal to or above two.

(2) Wind shielding of the pier can be considered for the calculation of the side-projected area A_1 unless the ship is intended to be regularly moored to jetty-type piers. A height of the pier surface of 3 *m* over waterline may be assumed; in other word, the lower part of the side-projected area with a height of 3 *m* above the waterline for the considered loading condition may be disregarded for the calculation of the side-projected area A_1.

(3) Deck cargo is to be included for the determination of side-projected area A_1. Deck cargo may not need to be considered if a usual light draft condition without cargo on deck generates a larger side-projected area A_1 than the full load condition with cargo on deck. The larger of both side-projected areas is to be chosen as side-projected area A_1.

(4) Usual loading conditions mean loading conditions as given by the trim and stability booklet that are to be expected to regularly occur during operation and, in particular, excluding light

~~weight conditions, propeller inspection conditions, etc.~~

~~**6** The mooring lines specified in **-3** and **-4** are based on the following environmental conditions:~~

~~(1) Maximum current speed: 1.0 *m/s*~~

~~(2) Maximum wind speed v_w in *m/s* as followins.~~

~~(a) $v_w = 25.0 - 0.002(A_L - 2000)$ (*m/s*) for passenger ships, ferries, and car carriers with $2{,}000\ m^2 < A_L \leqq 4{,}000\ m^2$~~

~~(b) $v_w = 21.0$ (*m/s*) for passenger ships, ferries, and car carriers with $4{,}000\ m^2 > A_L$~~

~~(c) $v_w = 25.0$ (*m/s*) for other ships~~

~~**7** Among the environmental conditions specified in **-6**, the maximum wind speed v_w may be increased and decreased in conjunction with an adjustment to the strength of the lines as the acceptable wind speed v_w^*. In this case, the acceptable wind speed v_w^* is to be obtained from the following formula:~~

$$v_w^* = v_w \sqrt{\frac{MBL^*}{MBL}}$$

~~*MBL**: The adjusted strength of mooring lines (*kN*)~~

~~However, the maximum wind speed v_w can be decreased where maximum breaking strength, *MBL*, specified in **-3(1)** is more than 1,275 *kN*. The acceptable wind speed v_w^* is to be not less than 21 *m/s*.~~

~~**8** The length of mooring lines for ships whose equipment numbers are less than or equal to 2,000 is to be in accordance with **Table CS23.2**. For ships whose equipment numbers exceed 2,000, the length of mooring lines is to be taken as 200 *m*.~~

~~**9** Application of fibre ropes for tow lines or mooring lines is to be as deemed appropriate by the Society.~~

~~**10** For mooring lines connected with powered winches where the rope is stored on the drum, steel cored wire ropes of suitable flexible construction may be used instead of fibre cored wire ropes subject to the approval by the Society.~~

~~**11** The length of individual mooring lines may be reduced by up to 7% of the lengths given in **-8**, provided that the total length of the stipulated number of mooring lines is not less than that obtained from multiplying the length by the number given in **-2** to **-4**.~~

Paragraph 23.1.6 has been renumbered to Paragraph 23.1.5, and has been amended as follows.

23.1.~~6~~5 Chain Lockers

1 Chain lockers are to be of capacities and depths adequate to provide an easy direct lead of the cables through the chain pipes and a self-stowing of the cables.

2 Chain lockers including spurling pipes are to be watertight up to the weather deck and to be provided with a means for drainage.

3 Chain lockers are to be subdivided by centre~~-~~line screen walls.

4 Where a means of access is provided, it is to be closed by a substantial cover and secured by closely spaced bolts.

5 Where a means of access to spurling pipes or cable lockers is located below the weather deck, the access cover and its securing arrangements are to be to the satisfaction of the Society. Butterfly nuts and/or hinged bolts are prohibited as the securing mechanism for the access cover.

6 Spurling pipes through which anchor cables are led are to be provided with permanently attached closing appliances to minimize water ingress.

7 The inboard ends of the chain cables are to be secured to the structures by fasteners able to withstand a force not less than 15 % ~~and~~ but not more than 30 % of the breaking load of the chain cable.

8 Fasteners are to be provided with a means suitable to permit, in case of emergency, an easy slipping of chain cables to the sea, operable from an accessible position outside the chain locker.

Paragraph 23.1.7 has been renumbered to Paragraph 23.1.6, and has been amended as follows.

23.1.~~7~~6 Supporting Hull Structures of Anchor Windlasses and Chain Stoppers

1 The supporting hull structures of anchor windlasses and chain stoppers are to be sufficient to accommodate operating loads and sea loads

(1) Operating loads are to be taken as not less than the following:
   (a) For chain stoppers, 80 % of the chain cable breaking load
   (b) For windlasses, where no chain stopper is fitted or a chain stopper is attached to the windlass, 80 % of the chain cable breaking load
   (c) For windlasses, where chain stoppers are fitted but not attached to the windlass, 45 % of the chain cable breaking load

(2) Sea loads are to be taken according to **2.1.6, Section 4, Chapter 11, Part 1 of Part CSR-B&T of the Rules**

2 The permissible stresses for supporting hull structures of windlasses and chain stoppers~~, based on gross thicknesses,~~ are not to be greater than the following permissible values:

~~(1) Normal stress: 1.00 R_{eH}~~

~~(2) Shear stress: 0.60 R_{eH}~~

~~R_{eH}: The specified minimum yield stress of the material~~

(1) For strength assessment by means of beam theory or grillage analysis
   (a) Normal stress: 1.00 R_{eH}
   (b) Shear stress: 0.60 R_{eH}

   R_{eH}: The specified minimum yield stress of the material

(2) For strength assessment by means of finite element analysis
   (a) Von Mises stress: 1.00 R_{eH}

(3) The normal stress referred to in **(1)** above is the sum of bending stress and axial stress with the corresponding shearing stress acting perpendicular to the normal stress. No stress concentration factors are to be considered.

3 For strength assessments of supporting hull structures, beam theory or finite element analysis using net scantlings is to be applied as appropriate. Where finite element analysis is used, the provisions of **23.2.3-5** are to be applied. In addition, the total corrosion addition is to be 2.0 *mm*.

Section 23.2 has been amended as follows.

23.2 Towing and Mooring Fittings

23.2.1 General

1 The requirements in **23.2** apply to ships of not less than 500 *gross tonnage*. The requirements in **23.2** apply to shipboard fittings used for towing and mooring operations associated with the normal operation of the ship~~,~~ as well as ~~and~~their supporting hull structures. ~~With respect to this requirement, towing is limited to the following:~~

~~(1) Normal towing: towing operations necessary for manoeuvring in ports and sheltered waters associated with the normal operation of the ship~~

~~(2) Other towing: emergency towing by another ship or a tug.~~

~~**2** Ships are to be adequately provided with shipboard fittings.~~

~~**3** Shipboard fittings are to comply with the requirements of **23.2.2** and **23.2.3** respectively.~~

~~**4** When shipboard fittings are not selected from industry standards deemed appropriate by the~~

~~Society, the corrosion additions specified in **23.2.4** are to be applied to shipboard fittings and their supporting structures such as foundations.~~

~~**5** When the shipboard fitting is not selected from industry standards deemed appropriate by the Society, the wear down allowances specified in **23.2.5** are to be applied to shipboard fittings.~~

~~**6** The scantlings of supporting hull structures are to be built at least with the gross scantlings obtained by adding the corrosion addition specified in **23.2.4** to the net scantlings obtained by applying the criteria specified in this section.~~

~~**7** The scantlings of supporting hull structures are to be in accordance with the relevant chapters or sections in addition to this section.~~

2 Ships are to be adequately provided with shipboard fittings which are selected from industry standards deemed appropriate by the Society. The "shipboard fittings" referred to in **23.2** are bollards, bitts, fairleads, stand rollers, chocks used for normal mooring of the ship and other similar components used for normal or other towing of the ship. Other components such as capstans, winches, etc. are not included. Any welds, bolts or equivalent devices connecting shipboard fittings to their supporting structures are considered to be part of the shipboard fitting if selected in accordance with industry standards deemed appropriate by the Society.

3 The definitions of terms which appear in this section are as follows.

(1) Maximum towing load

"Maximum towing load" is the largest load that can be assumed or intended in normal towing such as static bollard pull.

(2) Safe Towing Load (*TOW*)

"Safe Towing Load" (*TOW*) is the safe load limit of shipboard fittings used for towing purpose. However, it does not represent the actual strength of shipboard fittings and their supporting hull structures.

(3) Safe Working Load (*SWL*)

"Safe Working Load" (*SWL*) is the safe load limit of shipboard fittings used for mooring purpose. However, it does not represent the actual strength of shipboard fittings and their supporting hull structures.

(4) Line Design Break Force (*LDBF*)

"Line Design Break Force" (*LDBF*) is the minimum force that a new, dry, spliced, mooring line will break at. This is the cases for all synthetic cordage materials.

(5) Ship Design Minimum Breaking Load (MBL_{sd})

"Ship Design Minimum Breaking Load" (MBL_{sd}) is the minimum breaking load of new, dry mooring lines or tow line for which shipboard fittings and supporting hull structures are designed in order to meet mooring restraint requirements or the towing requirements of other towing services.

(6) Ships intended to be regularly moored to jetty-type piers

Ships intended to be regularly moored to jetty-type piers are oil tankers, chemical tankers or gas carriers which are assumed to be moored to jetty-type piers.

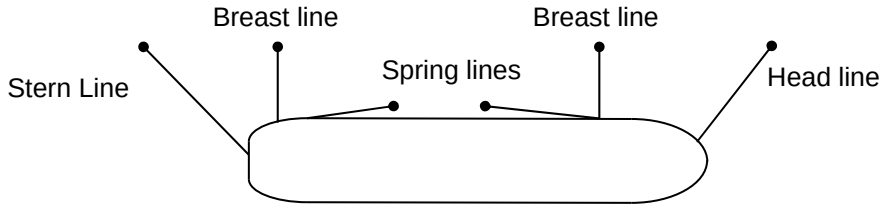
(7) Breast lines, head lines, stern lines and spring lines are defined as follows. (See **Fig. CS23.4**)

(a) Breast line: A mooring line that is deployed perpendicular to the ship, restraining the ship in the off-berth direction.

(b) Spring line: A mooring line that is deployed almost parallel to the ship, restraining the ship in either the fore or aft direction.

(c) Head/Stern line: A mooring line that is oriented between the longitudinal and transverse directions, restraining the ship in the off-berth direction as well as in either the fore or aft direction. The amount of restraint in these directions depends on their relative line angles.

Fig. CS23.4 Sample Arrangement of Mooring Lines



(8) Wind speed for maximum wind speed v_w and acceptable wind speed v_w^*

Wind speed is considered representative of a 30 *second* mean speed from any direction and at a height of 10 *m* above the ground

(9) Current speed for maximum current speed

The current speed is considered representative of the maximum current speed acting on bow or stern ($\pm 10°$) and at a depth of one-half of the mean draft. Furthermore, it is considered that ships are moored to solid piers that provide shielding against cross currents.

(10) Ship nominal capacity condition

The ship nominal capacity condition is defined as the theoretical condition in which the maximum possible amount of deck cargoes (in their respective positions) is included in the ship arrangement. For container ships the nominal capacity condition represents the theoretical condition in which the maximum possible number of containers (in their respective positions) is included in the ship arrangement.

(11) Supporting hull structures

Supporting hull structures are the parts of the ship structure on or in which shipboard fittings are placed and which are directly subjected to the forces acting on shipboard fittings.

(12) Sheltered waters

Sheltered waters are generally calm stretches of water (e.g. harbours, estuaries, roadsteads, bays, lagoons) where the wind force does not exceed 6 on the Beaufort scale.

(13) Towing

For the application of this section, towing means the towing operations specified in the following **(a)** and **(b)** but not including **(c)**.

(a) Normal towing means towing operations necessary for manoeuvring in ports and sheltered waters associated with the normal operation of the ships

(b) Other towing means towing by another ship or a tug (e.g. such as to assist the ship in cases of emergency)

(c) Towing services not covered by this section are as follows.

i) Escort towing: A towing service for laden oil tankers or LNG carriers, particularly as required in specific estuaries. Its main purpose is to control the ship in cases of propulsion or steering system failure.

ii) Canal transit towing: A towing service for ships transiting canals (e.g. the Panama Canal).

23.2.2 Tow Lines

Where ships are provided with tow lines, it is advised that such two lines are to be in accordance with the following **(1)** and **(2)**.

(1) Wire ropes and fibre ropes used as tow lines are to be comply with the requirements in **Chapter 4** and **Chapter 5, Part L of the Rules**, respectively. The specifications of tow lines (e.g. breaking load, length) and the number of tow lines are to be in accordance with **Table CS23.1** according to ship equipment numbers. However, when calculating the equipment number, the effect of deck cargoes at the ship nominal capacity condition is to be considered

with respect to the side-projected area *A*.

(2) Fibre ropes used as tow lines are to be not less than 20 *mm* in diameter in consideration of rope age degradation and wear. Therefore, the line design break force for such ropes is to be in accordance with the following **(a)** or **(b)**:

(a) Polyamide ropes: *LDBF* ≥ 120 % of the minimum breaking load specified in **Table C23.1** according to equipment number.

(b) Other synthetic ropes: *LDBF* ≥ 110 % of the minimum breaking load specified in **Table C23.1** according to equipment number.

23.2.~~2~~3 Towing Fittings

1 Strength

The strength of shipboard fittings used for towing operations at the bow, sides and stern as well as their supporting hull structures are to comply with the requirements of **23.2.3**. For fittings intended to be used for both towing and mooring, the requirements of **23.2.6** are to be applied.

~~1~~2 Arrangement

(1) Towing fittings are to be located on stiffeners, girders, or both ~~which~~that are part~~s~~ of the deck construction so as to facilitate efficient distribution of the towing load. Other arrangements may be accepted (for chocks in bulwarks, etc.) provided the strength is confirmed adequate for the intended service.

(2) When towing fittings cannot be located as specified in **(1)**, appropriate reinforced members are to be provided directly underneath the towing fittings.

~~2~~3 Selection

(1) Towing fittings are to be selected from industry standards deemed appropriate by the Society and are to be at least based on the following loads. However, the increase of the line design break force for synthetic ropes (according to **23.2.2(2))** need not be considered for the loads applied to shipboard fittings and their supporting hull structures.

(a) For normal towing operations, the intended maximum towing load. ~~(e.g., static bollard pull) as indicated on the towing and mooring arrangements plan specified in **23.2.6**~~

(b) For other towing services, the minimum breaking strength of the tow line specified in **Table CS23.1** according to the equipment number ~~determined in **23.1.2**~~.

(c) For fittings intended to be used for both normal and other towing operations, the greater of the loads according to **(a)** and **(b)**.

(2) When towing fittings are not selected from industry standards deemed appropriate by the Society, the strength of the fitting and of its attachment to the ship are to be in accordance with ~~**3**~~**4** and ~~**4**~~**5**. For strength assessments, beam theory or finite element analysis using net scantlings is to be applied as appropriate. At the discretion of the Society, load tests may be accepted as alternatives to strength assessments by calculations.

(3) Towing bitts (double bollards) are to be of sufficient strength to withstand the loads caused by the tow line attached with an eye splice.

~~3~~4 ~~Design Load~~Supporting Hull Structures

(1) Design load for the supporting hull structures are to be as specified in **(~~1~~a)** to **(~~7~~c)** below:

(~~1~~a) For ~~the~~ normal towing operations ~~specified in **23.2.1-1(1)**, the minimum design load is to be~~ 1.25 *times* the intended maximum towing load.

(~~2~~b) For ~~the~~ other towing services ~~specified in **23.2.1-1(2)**, the minimum design load is to be~~ the breaking ~~strength~~ load of the tow line specified in **Table CS23.1** ~~according to the equipment number determined in **23.1.2**~~.

(~~3~~c) For fittings intended to be used for both normal and other towing operations, ~~the minimum design load is to be~~ the greater of the design loads specifi~~d~~s in **(1)** and **(2)**.

(2) The reinforced members beneath shipboard fittings are to be effectively arranged for any variation of direction (horizontally and vertically) of the towing forces acting upon the

shipboard fittings, and the proper alignment of the fittings and their supporting hull structures is to be ensured. (See **Fig. CS23.5** for a sample arrangement.)

(~~5~~3) The acting point ~~where~~ of the towing force ~~acts~~ on towing fittings is to be taken as the attachment point of ~~the~~e tow line or at a change in its direction. For bollards and bitts, the attachment point of the tow line is to be taken as not less than 4/5 of the tube height above the base. (See **Fig. CS23.~~1~~6**)

(4) The design load is to be applied to fittings in all directions that may occur ~~by taking into account~~ in consideration of the arrangements shown in the towing and mooring arrangements plan specified in **23.2.~~6~~9**.

(~~6~~5) Where the tow line ~~takes a turn at~~ is paid-out through a fitting, the design load is to be equal to the resultant force of the design loads acting on the line but need~~s~~ not exceed twice the design load acting on the line. The design load acting on the line is to be the minimum design load specified in **(1)** and **(2)**. (~~s~~See **Fig. CS23.~~2~~7**)

~~(7) Notwithstanding the requirements in **(1)** to **(6)**, when a safe towing load (*TOW*) greater than that determined according to **-5** is requested by the applicant, the design load is to be increased in accordance with the appropriate *TOW*/design load relationship given by **-3** and **-5.**~~

(6) The strength of supporting hull structures is to be evaluated based on net scantling calculation.

Fig. CS23.5 Sample Arrangement of Shipboard Fittings and Supporting Hull Structures

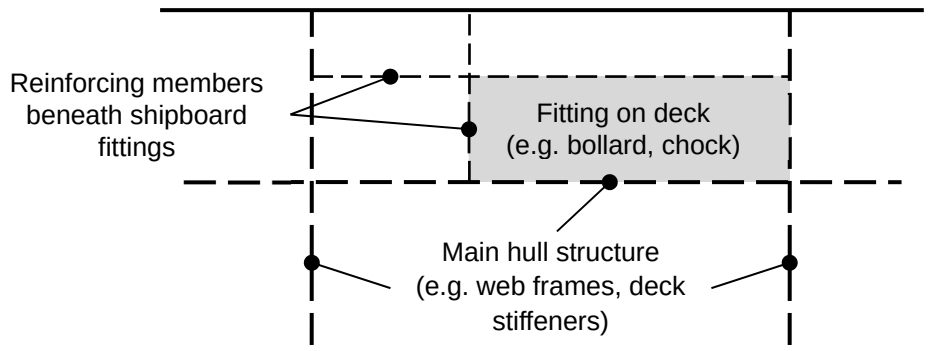


Fig. CS23.~~1~~6 Acting Point of Towing Force

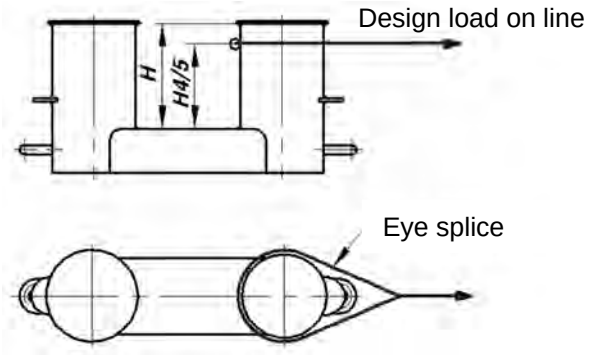
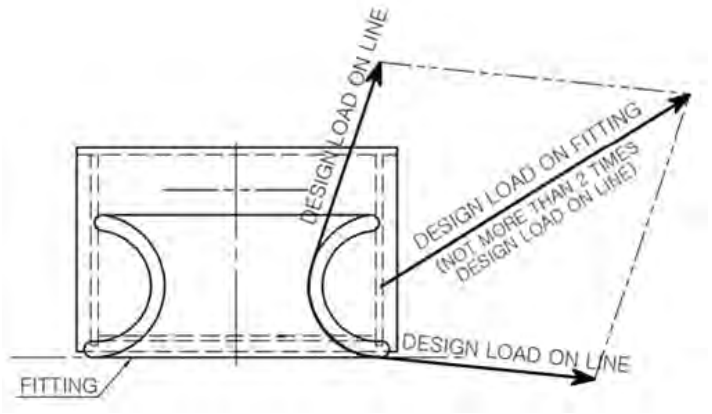


Fig. CS23.~~2~~7 Design Load



~~4~~5 Allowable Stresses

Allowable stresses of supporting hull structures are not to be more than the following:

(1) For strength assessments using beam theory or grillage analysis:

(a) Normal stress: 100 % of the specified minimum yield ~~point~~ stress of the material

(b) Shearing stress: 60 % of the specified minimum yield ~~point~~ stress of the material

(2) For strength assessments using finite element analysis:

(a) ~~Equivalent~~Von Mises stress: 100 % of the specified minimum yield ~~point~~ stress of the material

(3) The normal stress referred to in **(1)** above is the sum of bending stress and axial stress with the corresponding shearing stress acting perpendicular to the normal stress. No stress concentration factors are to be considered.

(4) The followings are recommended to be followed for the strength assessment by means of finite element analysis referred to in **(2)** above.

(a) The geometry is to be idealized as realistically as possible.

(b) The ratio of element length to width is not to exceed 3.

(c) Girders are to be modelled using shell or plane stress elements.

(d) Symmetric girder flanges may be modelled by beam or truss elements.

(e) The element height of girder webs is not to exceed one-third of the web height.

(f) In way of small openings in girder webs the web thickness is to be reduced to a mean thickness over the web height.

(g) Large openings are to be modelled

(h) Stiffeners may be modelled by using shell, plane stress, or beam elements.

(i) Stresses are to be read from the centre of the individual element.

(j) For shell elements the stresses are to be evaluated at the mid-plane of the element.

~~5~~6 Safe Towing Load (*TOW*)

(1) For towing fittings used for the normal towing operations ~~specified in **23.2.1-1(1)**~~, *TOW* is not to exceed 80 % of the minimum design load specified in ~~**3**~~**4(1)(a)**.

(2) For towing fittings used for the other towing operations ~~specified in **23.2.1-1(2)**~~, *TOW* is not to exceed 80 % of the minimum design load specified in ~~**3**~~**4(~~2~~1)(b)**.

(3) For towing fittings used for both normal and other towing operations, *TOW* is to be the greater of ~~the minimum design loads~~*TOW* according to **(1)** and **(2)**.

~~(4) For fittings intended to be used for both towing and mooring, *SWL* according to **23.2.3-5** is to be marked in addition to *TOW*.~~

(~~5~~4) The *TOW* (in *tonnes*) of each fitting is to be marked by weld beads and paint, or the equivalent, on the fitting.

(5) The towing and mooring arrangements plan specified in **23.2.9** is to define the method of use

of tow lines.

23.2.4 Ship Design Minimum Breaking load (MBL_{sd})

1 MBL_{sd} is the design load for the selection of mooring lines, mooring fittings and for the design of supporting hull structures

2 MBL_{sd} is to be at least not less than minimum breaking load (MBL) specified in **23.2.5**. Where the minimum breaking load is adjusted based on the acceptable wind speed, the number of mooring lines, etc., MBL_{sd} is to be not less than the value *MBL** or *MBL***. MBL_{sd} may be determined in accordance with a method deemed appropriate by the Society.

3 Where the MBL_{sd} is determined by the widely recognized industry standards or the owner's standard, MBL_{sd} is to be not less than the minimum breaking load specified in this section.

23.2.5 Mooring Lines

1 General

(1) Ships are to be provided with mooring lines of which *LDBF* is more than MBL_{sd}.

(2) Wire ropes or synthetic ropes used as mooring lines are to comply with the requirements in **Chapter 4** and **Chapter 5, Part L of the Rules,** respectively.

(3) Fibre ropes used for mooring lines are to be not less than 20 *mm* in diameter. For considering rope age degradation and wear, the line design break force for such ropes is to be in accordance with the following **(a)** or **(b)**. However, neither **(a)** nor **(b)** need to be complied with in cases where consideration of rope age degradation and wear is included in the method specified in **23.2.4-3**.

(a) Polyamide ropes: $LDBF \geq 120$ % of MBL_{sd}

(b) Other synthetic ropes: $LDBF \geq 110$ % of MBL_{sd}

(4) For mooring lines connected with powered winches where the rope is stored on the drum, steel cord wire ropes of suitable flexible construction may be used instead of fibre cord wire ropes subject to the approval by the Society.

(5) The length of individual mooring lines may be reduced by up to 7 % of the lengths required in this section, provided that the actual total length of the stipulated number of mooring lines is not less than the required total length required.

2 The minimum breaking load (*MBL*), the number, the length of mooring lines for ships with equipment numbers of 2,000 or less (EN ≤ 2,000) are to be in accordance with the following **(1)** and **(2)**.

(1) The minimum breaking load (*MBL*), the number and the length of mooring lines are to be in accordance with **Table CS23.2** according to the equipment number. However, when calculating the equipment number, the effect of deck cargoes at the ship nominal capacity condition is to be considered with respect to the side-projected area *A*.

(2) For ships having the ratio *A to EN* greater than 0.9 (*A/EN* > 0.9), the following number of ropes are to be added to the number required by **Table CS23.2** for mooring lines.

Where *A/EN* ~~is above~~ is greater than 0.9 ~~up to~~ but is 1.1 or less: 1

Where *A/EN* ~~is above~~ is greater than 1.1 ~~up to~~ but is 1.2 or less: 2

Where *A/EN* ~~is above~~ is greater than 1.2: 3

3 The minimum breaking load and the number of mooring lines for ships with an equipment number greater than 2,000 (EN > 2,000) are to be in accordance with **Chapter 27, Part C of the Rules**.

23.2.~~3~~6 Mooring Fittings

1 Strength

The strength of shipboard fittings used for towing operations at the bow, sides and stern as well as their supporting hull structures are to comply with the requirements of **23.2.6**. For fittings intended to be used for both towing and mooring, the requirements of **23.2.3** are to be applied.

~~1~~2 Arrangement

(1) Mooring fittings, mooring winches and capstans are to be located on stiffeners, girders, or both which are parts of the deck construction so as to facilitate efficient distribution of the mooring loads.

(2) When mooring fittings, mooring winches and capstans cannot be located as specified in **(1),** appropriate reinforced members are to be provided directly underneath ~~them~~the towing fittings.

~~2~~3 Selection

(1) Mooring fittings are to be selected from industry standards deemed appropriate by the Society and are to be at least based on ~~the minimum breaking strength of mooring line according to **23.1.5.**~~*MBL*$_{sd}$

(2) When mooring fittings are not selected from industry standards deemed appropriate by the Society, the strength of the fitting and of its attachment to the ship are to be in accordance with ~~-3~~4 and ~~-4~~5**.** For strength assessments, beam theory or finite element analysis using net scantlings is to be applied as appropriate. At the discretion of the Society, load tests may be accepted as alternatives to strength assessments by calculations.

(3) Mooring bitts (double bollards) are to be chosen for the mooring line attached in a figure~~-of-~~eight fashion if the industry standard distinguishes between different methods to attach the line (i.e. figure~~-of-~~eight or eye splice).

~~3~~4 ~~Design Load~~Supporting Hull Structure

(1) Design load for supporting hull structures ~~of mooring fittings~~ are to be as specified in **(~~1~~a)** to **(~~7~~c)** below:

(~~1~~a) For supporting hull structures of mooring fittings, ~~T~~the minimum design load is to be 1.15 *times* ~~the breaking strength of the mooring line according to **23.1.5.**~~ *MBL*$_{sd}$

(b) For supporting hull structures of mooring winches, 1.25 *times* the intended maximum brake holding load, where the maximum brake holding load is assumed to be not less than 80 % of *MBL*$_{sd}$

(c) For supporting hull structures of capstans, 1.25 *times* the maximum hauling-in force

(2) The design load is to be applied to fittings in all directions that may occur ~~by~~ in consideration of the arrangements shown in the towing and mooring arrangements plan specified in **23.2.~~6~~9**.

(3) The point where the mooring force acts on mooring fittings is to be taken as the attachment point of the mooring line. For bollards and bitts, the attachment point of the mooring line is to be taken as not less than 4/5 of the tube height above the base. (See **Fig. CS23.~~3~~8(a)**) If fins are fitted to the bollard tubes to keep the mooring lines as low as possible, the attachment point of the mooring line may be taken as the location of the fins. (See **Fig. CS23.~~3~~8(b)**)

(4) Where the mooring line ~~takes a turn at~~ is paid-out through a fitting, the design load is to be equal to the resultant force of the design load acting on the line but need not exceed twice the design load acting on the line. The design load acting on the line is to be the minimum design load specified in **(1)**.

~~(5) Notwithstanding the requirements in **(1)** to **(4)**, when a safe working load (*SWL*), greater than that determined according to **-5** is requested by the applicant, the design load is to be increased in accordance with the appropriate *SWL*/design load relationship given by **-3** and **-5.**~~

~~(6) The minimum design load applied to supporting hull structures for mooring winches is to be 1.25 times the intended maximum brake holding load, where the maximum brake holding load is to be assumed not less than 80% of the minimum breaking strength of the mooring line according to **23.1.5.**~~

~~(7) The minimum design load applied to supporting hull structures for capstans is to be 1.25~~

~~times the intended maximum hauling-in force.~~

(5) The reinforced members beneath shipboard fittings are to be effectively arranged for any variation of direction (horizontally and vertically) of the towing forces acting upon the shipboard fittings, and the proper alignment of the fittings and their supporting hull structures is to be ensured. (See **Fig. CS23.5** for a sample arrangement.)

~~**4**~~**5** Allowable Stresses

Allowable stresses of supporting hull structures are ~~not~~ to be ~~more than the following:~~in accordance with **23.2.3-5**.

~~(1) For strength assessments using beam theory or grillage analysis:~~

~~(a) Normal stress: 100% of the specified minimum yield point of the material~~

~~(b) Shearing stress: 60% of the specified minimum yield point of the material~~

~~(2) For strength assessments using finite element analysis:~~

~~(a) Equivalent stress: 100% of the specified minimum yield point of the material~~

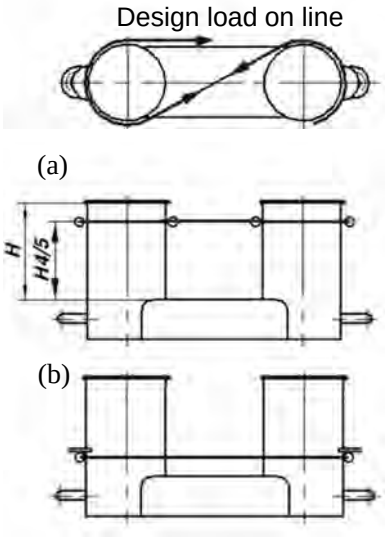
~~**5**~~**6** Safe Working Load (*SWL*)

(1) ~~Unless a greater *SWL* is requested by the applicant according to **3(5)**,~~ *SWL* is not to exceed ~~the minimum breaking strength of the mooring line according to **23.1.5***~~*MBL*sd.

(2) The *SWL* (in *tonnes*) of each fitting, excluding mooring winches and capstan, is to be marked by weld beads and paint, or the equivalent, on the fitting. For fittings intended to be used for both towing and mooring, *TOW* according to **23.2.~~2-5.(5)~~3** is to be marked in addition to *SWL*.

(3) The towing and mooring arrangements plan specified in **23.2.9** is to define the method of use of mooring lines.

Fig. CS23.~~3~~8 Acting Point of Mooring Force



23.2.4~~7~~ Corrosion Additions

Corrosion additions are to be added to the scantlings of the supporting hull structures ~~specified in **23.2.1-6**~~ and shipboard fittings ~~specified in **23.2.1-4**~~ as follows:

(1) Supporting hull structures: ~~According to other rules for the surrounding structures~~total of 2.0 *mm*.

(2) Pedestals and foundations fitted on decks which are not ~~a part of a~~ shipboard fittings ~~according to~~ selected from industry standards deemed appropriate by the Society: total of 2.0 *mm*

(3) Shipboard fittings not selected from industry standards deemed appropriate by the Society: total of 2.0 *mm*

23.2.~~5~~8 Wear Allowances

In addition to the corrosion additions referred to in **23.2.~~4~~7**, the wear allowances for shipboard fittings not selected from industry standards deemed appropriate by the Society are not to be less than 1.0 *mm*, added to surfaces which are intended to regularly contact the line.

23.2.~~6~~9 Towing and Mooring ~~Fitting~~ Arrangement Plan

1 The *SWL* and *TOW* for the intended use for each shipboard fitting is to be noted in the towing and mooring arrangements plan available on board for the Master. If not otherwise chosen, *TOW* is to be the load limit for a tow line attached with an eye splice.

2 Information provided on the plan is to include~~:~~ the followings;

(1) Industry standard and referenced number of each towing and mooring fittings;

(2) For each towing and mooring fitting, the location on the ship, the purpose (mooring, normal towing, other towing etc.), the *SWL* and/or *TOW* ~~and~~as well as the manner of applying towing or mooring line loads including limiting fleet angles.;

(3) An arrangement of mooring lines showing the number of lines.; (See **Fig. CS23.4**)

(4) ~~The minimum breaking load of each mooring line~~The Ship Design Breaking Load MBL_{sd});

(5) The acceptable environmental conditions ~~as given in **23.1.5**, for the minimum breaking strength of mooring lines~~ for ships with equipment numbers greater than 2,000 ~~:~~(EN > 2,000):

(a) Maximum wind speed or acceptable wind speed,

(b) Maximum current speed.

(6) Condition of use for additional mooring equipment not covered by this chapter;

(~~6~~7) Other information or notes related to the design of shipboard fittings or lines.

Table CS23.1 Anchors, Chain Cables and Ropes
(Table is omitted.)

Notes:

1 Length of chain cables may include shackles for connection.

~~2 Values given for anchoring equipment in this table are based on an assumed maximum current speed of 2.5 *m/s*, a maximum wind speed of 25 *m/s* and a minimum scope of chain cable of 6, the scope being the ratio between the paid-out length of the chain and water depth.~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2022.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 2-3

Chapter 4 SUBDIVISIONS

4.1 General

4.1.2 Definitions

Sub-paragraph (16) has been renumbered to Sub-paragraph (18), and Sub-paragraphs (16) and (17) have been added as follows.

(16) "Timber" means all types of wooden material covered by the *Code of Safe Practice for Ships Carrying Timber Deck Cargoes, 2011* (*IMO* resolution *A*.1048(27)), including both round and sawn wood but excluding wood pulp and similar cargo.

(17) "Timber deck cargo" means a cargo of timber carried on an uncovered part of a freeboard or superstructure deck.

(16~~8~~) "Machinery spaces" are spaces between the watertight boundaries of a space containing the main and auxiliary propulsion machinery, including boilers, generators and electric motors primarily intended for propulsion.

4.2 Subdivision Index

4.2.3 Probability of Survival (s_i)

Sub-paragraph -10 has been added as follows.

10 Where the ship carries timber deck cargo, the calculation of the probability of survival (S_i) may be modified as deemed appropriate by the Society.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 July 2022.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part CS Hull Construction and Equipment of Small Ships

2021 AMENDMENT NO.2

Notice No.58 27 December 2021
Resolved by Technical Committee on 28 July 2021

Notice No.58 27 December 2021
AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Guidance for the survey and construction of steel ships" has been partly amended as follows:

Part CS HULL CONSTRUCTION AND EQUIPMENT OF SMALL SHIPS

Amendment 2-1

CS19 HATCHWAYS, MACHINERY SPACE OPENINGS AND OTHER DECK OPENINGS

CS19.2 Hatchways

Paragraph CS19.2.1 has been amended as follows.

CS19.2.1 Application

1 Notwithstanding ship length, the construction and means for closing cargo and other hatchways of bulk carriers defined in **1.3.1(13), Part B of the Rules**, self-unloading ships defined in **1.3.1(19), Part B of the Rules** and ships intended to be registered as "bulk carriers" are to comply with ~~the related~~ relevant requirements in **Part CSR-B&T** or **Part CSR-B of the Rules**.

2 When the requirements for hatchways in **Part CSR-B&T** or **Part CSR-B of the Rules** apply to hatchways of ships ~~which are not subject to the application of **Part CSR-B&T of the Rules**~~ in accordance with **-1** above, the corrosion additions ~~of~~ for hatch coamings, hatch coaming stays and stiffeners may be taken as 1.5 *mm*.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 27 December 2021.

Amendment 2-2

CS23 has been added as follows.

CS23 EQUIPMENT

CS23.1 Anchors and Chain Cables

CS23.1.4 Chain Cables

Wire ropes may be used in place of chain cables on ships less than 40 *m* in length as long as the following **(1)** to **(3)** are satisfied.

(1) The length of the wire rope is to be equal to 1.5 *times* the corresponding length of chain cable specified in **Table CS23.1, Part CS of the Rules** and its strength is to be equal to that of a Grade 1 chain cable as specified in **Table L3.5, Part L of the Rules**.

(2) A short length of chain cable is to be fitted between the wire rope and anchor having a length of 12.5 *m* or the distance between anchor in its stowed position and the winch, whichever is less.

(3) All surfaces coming into contact with the wire rope need to be rounded with a radius of not less than 10 *times* the wire rope diameter (including the stem).

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2022.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.
For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:
(1) such alterations do not affect matters related to classification, or
(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.
The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.