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 2018 AMENDMENT NO.1
Guidance for the Survey and Construction of Steel Ships
Part CS 2018 AMENDMENT NO.1

Rule No.100 / Notice No.52 29 June 2018
Resolved by Technical Committee on 31 January 2018

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

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Part CS Hull Construction and Equipment of Small Ships

2018 AMENDMENT NO.1

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Rule No.100 29 June 2018
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 1-1

Chapter 1 GENERAL

1.3 Materials, Scantlings, Welding and End Connections

1.3.1 Materials

Sub-paragraph -2(1) has been amended as follows.

2 Where high tensile steels specified in **Chapter 3, Part K**, are used, the construction and scantlings of ships are to comply with **(1)** to **(3)**:

(1) The section modulus of the transverse sections of the hull is not to be less than the value obtained by multiplying the following coefficient to the value specified in **Chapter 15**. Moreover, the extent of high tensile steel use is to be in accordance with the discretion of the Society.
0.78: where high tensile steels *KA32, KD32, KE32* and *KF32* are used
0.72: where high tensile steels *KA36, KD36, KE36* and *KF36* are used
0.68: where high tensile steels *KA40, KD40, KE40* and *KF40* are used (However, 0.66 may be taken where a fatigue assessment of the structure is performed to verify compliance with the requirements of the Society.)

(2) With the exception of the requirements in **(1)**, details such as the thickness of decks and shell plating, the section modulus of stiffeners, and other scantlings are to be at the discretion of the Society.

(3) With the exception of the requirements in **(1)**, the construction and scantlings where high tensile steels are used are to be at the discretion of Society.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 1 July 2018.

Amendment 1-2

Chapter 23 EQUIPMENT

23.1 Anchors, 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, chain cables, ropes, etc. which are not less than that given in **Table CS23.1**, and **Table CS23.2** or **23.1.5**. All ships are to be provided with suitable appliances for handling anchors and ropes.
(-2 to -4 are omitted.)

Paragraph 23.1.5 has been amended as follows.

23.1.5 Tow Lines and Mooring Lines

1 As for wire ropes and ~~hemp~~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 **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, ~~I~~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.~~1~~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:

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

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 $\geqq$ 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) $v_w = 25.0 - 0.002(A_1 - 2000)$ (*m/s*) for passenger ships, ferries, and car carriers with 2,000 $m^2 < A_1 \leqq$ 4,000 m^2

(b) $v_w = 21.0$ (*m/s*) for passenger ships, ferries, and car carriers with 4,000 $m^2 > A_1$

(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*.

~~3~~**9** Application of ~~synthetic~~ fibre ropes for tow lines or mooring lines is to be as deemed appropriate by the Society.

~~4~~**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.

~~5~~**11** The length of individual mooring lines may be reduced by up to 7% of the lengths given in ~~**Table CS23.1**~~ **-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 ~~**Table CS23.1**~~ **-2** to **-4**.

Paragraph 23.1.6 has been amended as follows.

23.1.6 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.

~~1~~**2** Chain lockers including spurling pipes are to be watertight up to the weather deck and to be provided with a means for drainage.

~~2~~**3** Chain lockers are to be subdivided by centre line screen walls.

~~3~~**4** Where a means of access is provided, it is to be closed by a substantial cover and secured by closely spaced bolts.

~~4~~**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.

~~5~~**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 not more than 30% 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 amended as follows.

23.1.7 ~~Miscellaneous~~Supporting Hull Structures of Anchor Windlasses and Chain Stoppers

1 ~~All ships are to be provided with suitable appliances for handling anchors.~~ 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**

2 ~~The inboard end of the chain cable is to be secured to the hull through a strong eye plate by means of a shackle or by other equivalent means.~~ 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

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 ~~normal~~ towing ~~(hereinafter referred to as 'towing fittings')~~ and ~~normal~~ mooring ~~(hereinafter referred to as 'mooring fittings')~~ operations associated with the normal operation of the ship, and their supporting hull structures ~~(hereinafter referred to as 'supporting 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 ~~towing and mooring~~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.

~~**3**~~**6** The scantlings of supporting hull structures are to be built at least with the gross scantlings obtained by adding the corrosion additions specified in ~~**23.2.2-5** and **23.2.3-5**~~**23.2.4** to the net scantlings obtained by applying the criteria specified in this section.

~~**4**~~**7** The scantlings of supporting hull structures are to be in accordance with the relevant chapters or sections in addition to this section.

23.2.2 Towing Fittings

1 Arrangement ~~of Towing Fittings~~

(1) Towing fittings are to be located on ~~longitudinals, beams or~~ stiffeners, girders, or both which are parts of the deck construction so as to facilitate efficient distribution of the towing load.

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

2 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.

(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** and **-4**. 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 eye splice.

~~2~~3 Design Load

Design load for ~~towing fittings and their~~ the supporting hull structures ~~(hereinafter referred to as "design load on fittings" (see **Fig.CS23.1**) in this paragraph)~~ are to be as specified in **(1)** to **(~~6~~7)** below:

(1) For the normal towing operations specified in **23.2.1-1(1)** ~~(e.g. harbour/manouvring)~~, the minimum design load ~~on the line (see **Fig.CS23.1**)~~ is to be 1.25 times the intended maximum towing load.

(2) For the other ~~types of~~ towing services ~~(e.g. escort)~~ specified in **23.2.1-1(2)**, the minimum design load ~~on the line (see **Fig.CS23.1**)~~ is to be the breaking strength of the tow~~ing~~ line specified in **Table CS23.1** according to the equipment number determined in **23.1.2**.

(3) 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 specified in **(1)** and **(2)**.

(~~3~~4) The design load ~~on fittings~~ is ~~to take into account all acting loads~~ to be applied to fittings in all directions that may occur by taking into account the arrangements shown in the towing and mooring arrangements plan specified in **23.2.6**.

(~~4~~5) The point where the towing force acts on towing fittings is to be taken as the attachment point of the tow~~ing~~ line. For bollards and bitts, the attachment point of the tow line is to be taken not less than 4/5 of the tube height above the base (see **Fig.CS23.1**).

(~~5~~6) Where the tow line takes a turn at a fitting, ~~T~~the design load ~~on fittings~~ is to be equal to ~~take into account~~ the resultant force of ~~total~~ the design loads acting on the line, but needs not exceed twice the design load on the line. ~~specified in **(1)** and **(2)** (see **Fig.C27.1**)~~ The design load acting on the line is to be the minimum design load specified in **(1)** and **(2)** (see **Fig.CS23.2**)~~, but need not exceed twice the design load on the line~~.

(~~6~~7) ~~If the design load on fitting specified in **(2)** to **(5)** is less than the intended towing load stipulated in the construction specifications for the towing fittings and their supporting structures used for towing operations specified in **(2)**, the design load on fittings is to be not less than the intended towing load.~~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**.

~~**3 Selection of Towing Fittings**~~

~~Towing fittings are generally to be specified according to standards approved by the Society.~~

4 Allowable Stresses ~~of Supporting Structures~~

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

(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

~~(1) Normal stress : 100% of the specified yield point for the material used~~

~~(2) Shearing stress : 60% of the specified yield point for the material used~~

~~**5 Corrosion Addition of Supporting Structures**~~

~~For the corrosion addition of supporting structures, the value will be considered by the Society, but is not to be less than 2*mm*.~~

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

(1) For towing fittings ~~and their supporting structures~~ used for the normal towing operations specified in ~~**2(1)**~~**23.2.1-1(1)**, ~~the *SWL*~~*TOW* is not to exceed 80% of the minimum design load ~~on fittings~~ specified in ~~**2**~~**3(1)~~**, (3), (4) and (5)**.

(2) For towing fittings ~~and their supporting structures~~ used for the other towing operations specified in ~~**2(2)**~~**23.2.1-1(2)**, ~~the *SWL*~~*TOW* is not to exceed the minimum design load ~~on fittings~~ specified in ~~**2**~~**3(2)** ~~**to (6)**~~.

(3) For towing fittings ~~and their supporting structures~~ used for both normal and other towing operations ~~specified in both **2(1)** and **2(2)**~~, ~~the *SWL*~~*TOW* is ~~**not**~~ to ~~**exceed**~~ be the greater of the minimum design loads.

(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*.

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

Fig. CS23.1 Acting point of the towing force

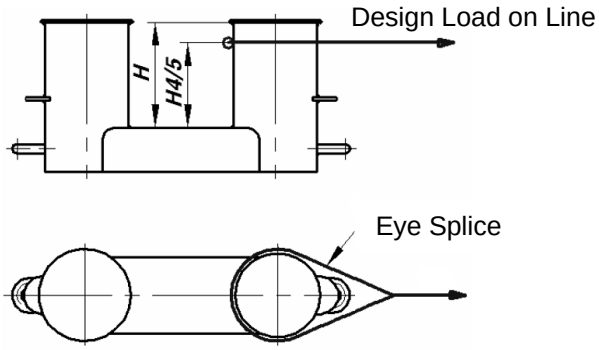
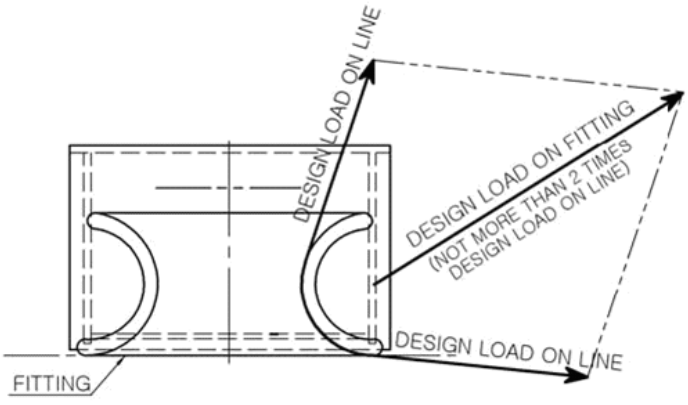


Fig. CS23.~~1~~2 Design Load



23.2.3 Mooring Fittings

1 Arrangement ~~of Mooring Fittings~~

(1) Mooring fittings, winches and capstans are to be located on ~~longitudinals, beams or~~ 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, winches and capstans can not be located as specified in **(1)**, ~~the mooring fittings~~ appropriate reinforced members are to be ~~arranged on reinforced members~~ provided directly underneath them.

2 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**.

(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** and **-4**. 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 figure-of-eight fashion if the industry standard distinguishes between different methods to attach the line, i.e. figure-of-eight or eye splice.

~~2~~**3** Design Load

Design load for ~~mooring fittings and their~~ supporting hull structures of mooring fittings ~~(hereinafter referred to as "design load on fittings" (see **Fig.CS23.1**) in this paragraph)~~ are to be as specified in **(1)** to **(7)** below:

(1) The minimum design load ~~on the line (see **Fig.CS23.1**)~~ is to be 1.~~2~~15 times the breaking strength of the mooring line ~~specified in **Table CS23.1**~~ according to ~~the equipment number determined in~~ **23.1.~~2~~5**.

(2) The design load ~~on fittings~~ is to ~~take into account all acting loads.~~be applied to fittings in all directions that may occur by taking into account the arrangements shown in the towing and mooring arrangements plan specified in **23.2.6**.

(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 not less than 4/5 of the tube height above the base (See **Fig.CS23.3(a)**). If fins are fitted to the bollard tubes to keep the mooring line as low as possible, the attachment point of the mooring line may be taken as the location of the fins. (See **Fig.CS23.3(b)**)

(4) Where the mooring line takes a turn at a fitting, ~~T~~the design load ~~on fittings~~ is to ~~take into account the total~~ be equal to the resultant force of the design load acting on the line ~~specified in **(1)** (see **Fig.CS23.1**)~~, but need not exceed twice the design load on the line. The design load acting on the line is to be the minimum design load specified in **(1)**.

(5) ~~If the design load on fittings specified in **(1)** to **(4)** is less than 1.25 times the intended mooring load stipulated in the construction specifications for the mooring fittings and their supporting structures used for mooring operations specified in **(1)**, the design load on the fittings is to be at least 1.25 times the intended mooring load.~~ 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 tha 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.

~~**3 Selection of Mooring Fittings**~~

~~Mooring fittings are generally to be specified according to standards approved by the Society.~~

4 Allowable Stresses ~~of Supporting Structures~~

Allowable stresses of supporting hull structure are not to be more than ~~below~~the following:

~~(1) Normal stress : 100% of the specified yield point for the material used~~

~~(2) Shearing stress : 60% of the specified yield point for the material used~~

(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 Corrosion Addition of Supporting Structures**~~

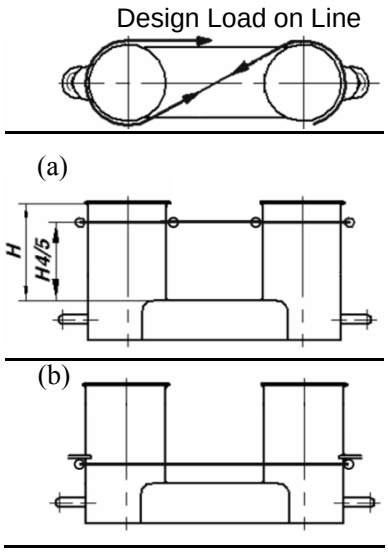
~~For the corrosion addition of supporting structures, the value will be considered by the Society, but is not to be less than 2*mm*.~~

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

(1) Unless a greater *SWL* is requested by the applicant according to -**3(5)**, ~~The~~ *SWL* is not to exceed ~~80% of the design load on fittings specified in **-2(1) to (5)** or the design load specified in **-2(6)** or **(7)**~~the minimum breaking strength of the mooring line according to **23.1.5**.

(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** is to be marked in addition to *SWL*.

Fig. CS23.3 Acting Point of Mooring Force



23.2.4 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

(2) Pedestals and foundations on deck which are not a part of a fitting according to an industry standard deemed appropriate by the Society: 2.0 *mm*

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

23.2.5 Wear Allowances

In addition to the corrosion additions referred to in **23.2.4**, 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.

23.2.4~~6~~6 Towing and Mooring Fitting Arrangement Plan

~~Ships are to have a Towing and Mooring Fitting Arrangement Plan which includes the notes below:~~

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 eye-splice.

2 Information provided on the plan is to include:

(1) ~~Approved~~ Industry standard and referenced ~~No.~~ number of each towing and mooring fittings

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

(3) An arrangement of mooring lines showing the number of lines

(4) The minimum breaking load of each mooring line

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

(a) Maximum wind speed or acceptable wind speed

(b) Maximum current speed

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

Table CS23.1 Anchors, Chain Cables and Ropes

Equipment Letter	Equipment number		Anchor		Chain cable for anchor (Stud anchor for chain)				Tow line		~~Mooring line~~		
			number	Mass per anchor (stock-less anchor)	Total length	Diameter Grade 1	Grade 2	Grade 3	Length	Breaking load	~~number~~	~~Length of each line~~	~~Breaking load~~
	Over	Up to		*kg*	*m*	*mm*	*mm*	*mm*	*m*	*kN*		~~*m*~~	~~*kN*~~
A1	50	70	2	180	220	14	12.5		180	98	~~3~~	~~80~~	~~34~~
A2	70	90	2	240	220	16	14		180	98	~~3~~	~~100~~	~~37~~
A3	90	110	2	300	247.5	17.5	16		180	98	~~3~~	~~110~~	~~39~~
A4	110	130	2	360	247.5	19	17.5		180	98	~~3~~	~~110~~	~~44~~
A5	130	150	2	420	275	20.5	17.5		180	98	~~3~~	~~120~~	~~49~~
B1	150	175	2	480	275	22	19		180	98	~~3~~	~~120~~	~~54~~
B2	175	205	2	570	302.5	24	20.5		180	112	~~3~~	~~120~~	~~59~~
B3	205	240	2	660	302.5	26	22	20.5	180	129	~~4~~	~~120~~	~~64~~
B4	240	280	2	780	330	28	24	22	180	150	~~4~~	~~120~~	~~69~~
B5	280	320	2	900	357.5	30	26	24	180	174	~~4~~	~~140~~	~~74~~
C1	320	360	2	1020	357.5	32	28	24	180	207	~~4~~	~~140~~	~~78~~
C2	360	400	2	1140	385	34	30	26	180	224	~~4~~	~~140~~	~~88~~
C3	400	450	2	1290	385	36	32	28	180	250	~~4~~	~~140~~	~~98~~
C4	450	500	2	1440	412.5	38	34	30	180	277	~~4~~	~~140~~	~~108~~
C5	500	550	2	1590	412.5	40	34	30	190	306	~~4~~	~~160~~	~~123~~
D1	550	600	2	1740	440	42	36	32	190	338	~~4~~	~~160~~	~~132~~
D2	600	660	2	1920	440	44	38	34	190	371~~1~~0	~~4~~	~~160~~	~~147~~
D3	660	720	2	2100	440	46	40	36	190	406	~~4~~	~~160~~	~~157~~
D4	720	780	2	2280	467.5	48	42	36	190	441	~~4~~	~~170~~	~~172~~
D5	780	840	2	2460	467.5	50	44	38	190	4~~80~~79	~~4~~	~~170~~	~~186~~
E1	840	910	2	2640	467.5	52	46	40	190	518	~~4~~	~~170~~	~~201~~
E2	910	980	2	2850	495	54	48	42	190	559	~~4~~	~~170~~	~~216~~
E3	980	1060	2	3060	495	56	50	44	200	603	~~4~~	~~180~~	~~230~~
E4	1060	1140	2	3300	495	58	50	46	200	647	~~4~~	~~180~~	~~250~~
E5	1140	1220	2	3540	522.5	60	52	46	200	691	~~4~~	~~180~~	~~270~~
F1	1220	1300	2	3780	522.5	62	54	48	200	738	~~4~~	~~180~~	~~284~~
F2	1300	1390	2	4050	522.5	64	56	50	200	786	~~4~~	~~180~~	~~309~~
F3	1390	1480	2	4320	550	66	58	50	200	836	~~4~~	~~180~~	~~324~~
F4	1480	1570	2	4590	550	68	60	52	220	888	~~5~~	~~190~~	~~324~~
F5	1570	1670	2	4890	550	70	62	54	220	941	~~5~~	~~190~~	~~333~~
G1	1670	1790	2	5250	577.5	73	64	56	220	1024			
G2	1790	1930	2	5610	577.5	76	66	58	220	1109			
G3	1930	2080	2	6000	577.5	78	68	60	220	1168			
G4	2080	2230	2	6450	605	81	70	62	240	1259			
G5	2230	2380	2	6900	605	84	73	64	240	1356			
H1	2380	2530	2	7350	605	87	76	66	240	1453			
H2	2530	2700	2	7800	632.5	90	78	68	260	1471			
H3	2700	2870	2	8300	632.5	92	81	70	260	1471			
H4	2870	3040	2	8700	632.5	95	84	73	260	1471			
H5	3040	3210	2	9300	660	97	84	76	280	1471			
J1	3210	3400	2	9900	660	100	87	78	280	1471			
J2	3400	3600	2	10500	660	102	90	78	280	1471			
J3	3600	3800	2	11100	687.5	105	92	81	300	1471			
J4	3800	4000	2	11700	687.5	107	95	84	300	1471			

*J*5	4000	4200	2	12300	687.5	111	97	87	300	≒	1471		
*K*1	4200	4400	2	12900	715	114	100	87	300	≒	1471		
*K*2	4400	4600	2	13500	715	117	102	90	300	≒	1471		
*K*3	4600	4800	2	14100	715	120	105	92	300	≒	1471		
*K*4	4800	5000	2	14700	742.5	122	107	95	300	≒	1471		
*K*5	5000	5200	2	15400	742.5	124	111	97	300	≒	1471		
*L*1	5200	5500	2	16100	742.5	127	111	97	300	≒	1471		
*L*2	5500	5800	2	16900	742.5	130	114	100	300	≒	1471		
*L*3	5800	6100	2	17800	742.5	132	117	102	300	≒	1471		
*L*4	6100	6500	2	18800	742.5		120	107	300		1471		
*L*5	6500	6900	2	20000	770		124	111	300		1471		
*M*1	6900	7400	2	21500	770		127	114	300		1471		
*M*2	7400	7900	2	23000	770		132	117	300		1471		
*M*3	7900	8400	2	24500	770		137	122	300		1471		
*M*4	8400	8900	2	26000	770		142	127	300		1471		
*M*5	8900	9400	2	27500	770		147	132	300		1471		
*N*1	9400	10000	2	29000	770		152	132	300		1471		
*N*2	10000	10700	2	31000	770			137	300		1471		
*N*3	10700	11500	2	33000	770			142	300		1471		
*N*4	11500	12400	2	35500	770			147	300		1471		
*N*5	12400	13400	2	38500	770			152	300		1471		
*O*1	13400	14600	2	42000	770			157	300		1471		
*O*2	14600	16000	2	46000	770			162	300		1471		

Notes:

~~1 Where steel wire ropes are used, the following wire ropes corresponding to the marks shown in the Table are to be provided: ●(6×12), ○(6×24), and ◎(6×37).~~

~~2~~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.

Table CS23.2 Mooring Lines for Ships with Equipment Number ≦ 2,000

Equipment Letter	Equipment number		Mooring line		
			Number	Length of each line	Breaking load
	Over	Up to		*m*	*kN*
*A*1	50	70	3	80	37
*A*2	70	90	3	100	40
*A*3	90	110	3	110	42
*A*4	110	130	3	110	48
*A*5	130	150	3	120	53
*B*1	150	175	3	120	59
*B*2	175	205	3	120	64
*B*3	205	240	4	120	69
*B*4	240	280	4	120	75
*B*5	280	320	4	140	80
*C*1	320	360	4	140	85
*C*2	360	400	4	140	96
*C*3	400	450	4	140	107
*C*4	450	500	4	140	117
*C*5	500	550	4	160	134
*D*1	550	600	4	160	143
*D*2	600	660	4	160	160
*D*3	660	720	4	160	171
*D*4	720	780	4	170	187
*D*5	780	840	4	170	202
*E*1	840	910	4	170	218
*E*2	910	980	4	170	235
*E*3	980	1060	4	180	250
*E*4	1060	1140	4	180	272
*E*5	1140	1220	4	180	293
*F*1	1220	1300	4	180	309
*F*2	1300	1390	4	180	336
*F*3	1390	1480	4	180	352
*F*4	1480	1570	5	190	352
*F*5	1570	1670	5	190	362
*G*1	1670	1790	5	190	384
*G*2	1790	1930	5	190	411
*G*3	1930	2000	5	190	437

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2018.

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

2018 AMENDMENT NO.1

Notice No.52 29 June 2018
Resolved by Technical Committee on 31 January 2018

Notice No.52 29 June 2018
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

Appendix 1 APPLICATION OF PART C OF THE GUIDANCE

Table CS has been amended as follows.

Table CS Correspondence Table of Guidance between Part CS and Part C

Part CS	Part C	Part CS	Part C	Part CS	Part C
1.1.3	**C1.1.3**[See Note 1]	13.3	**C13.3**	21.1.3	**C23.1.3**[See Note 22]
1.3.1	**C1.1.7** **C1.1.11** and **C1.1.12**	14.1.3	**C14.1.3**	21.2.1	**C23.2.1**[See Note 23]
		14.2.3	**C14.2.3**	21.2.2	**C23.2.2**[See Note 24]
		15.1.1	**C15.1.1**	21.2.3	**C23.2.3**
2.1.1	**C2.1.1**	15.2.1	**C15.2.1**	21.3	**C23.3**
2.2.2	**C2.2.2**	15.2.3	**C15.2.3**	21.4	**C23.4**[See Note 25]
2.2.3	**C2.2.3**	16.3.3	**C16.3.3**	21.5.1	**C23.5.1**[See Note 26]
2.2.4	**C2.2.4**	16.4.4	**C16.4.4**	21.5.3	**C23.5.3**[See Note 27]
3	**C3**	16.5.3	**C16.6.1**	21.5.7	**C23.5.7**[See Note 28]
4	**C4**[See Note 2]	16.6.1	**C16.7.1**	21.6.5	**C23.6.5**[See Note 29]
5	**C5**	16.6.2	**C16.7.2**	21.6.7	**C23.6.7**[See Note 30]
6.1.1	**C6.1.1-1** to **-3** [See Note 3]	17.1.1-1	**C10.2.1**[See Note 10]	21.6.8	**C23.6.8**
		17.2.1	**C17.1.1**	21.7.1	**C23.7.1**[See Note 31]
6.1.3	**C6.1.3** [See Note 4]	17.2.2	**C17.1.2**	21.7.2	**C23.7.2**
6.6.2-1	**C6.4.3-2**	17.2.4	**C17.1.4**[See Note 11]	21.8.1	**C23.8.1**[See Note 32]
6.7.1	**C6.5.1-1** and **-4**	17.2.5	**C17.1.5**	22.2.1	**C24.2.1**
6.9	**C6.8**	17.3.2	**C17.2.2**	22.4.1	**C25.2.1**[See Note 33]
7.5.2	**C7.6.2**[See Note 5]	17.3.4	**C17.2.4**	22.4.2	**C25.2.2**
7.5.3	**C7.6.3**[See Note 6]	17.3.5	**C17.2.5**	22.4.3	**C25.2.3** [See Note 34]
8.3	**C7.5.3**	17.4.1	**C17.3.1**	23~~23.1.2~~	**C27~~C27.1.2~~** ~~[See Note 35]~~
9.1.2	**C9.1.2**[See Note 7]	17.4.5	**C17.3.5**	~~23.1.5~~	~~**C27.1.5** and **C27.1.6**~~ ~~[See Note 35]~~
9.1.3	**C9.1.3**	18	**C18**	~~23.1.6~~	~~**C27.1.7**~~
10.1.2	**C10.1.2**	19.1.2	**C20.1.2**[See Note 12]	~~23.2~~	~~**C27.2**~~
10.2.3	**C10.3.3**[See Note 8]	19.2.4	**C20.2.4**[See Note 13]	24.1.1	**C29.1.1**[See Note ~~36~~35] [See Note ~~37~~36]
10.3.2	**C10.4.2**	19.2.5	**C20.2.5**[See Note 14]		
10.7.1	**C10.9.1**	19.2.6	**C20.2.6**[See Note 15]		
11.1.2	**C11.1.2**	19.2.10	**C20.2.10**[See Note 16]	24.1.2	**C29.1.2**[See Note ~~38~~37]
11.2.1	**C11.2.1**	19.2.12	**C20.2.12**[See Note 17]	24.3.2	**C29.4.2**
12.1.3	**C12.1.3**	19.2.13	**C20.2.13**[See Note 18]	24.9.4	**C29.7.4**[See Note ~~39~~38]
12.1.4	**C12.1.4**	19.3.5	**C20.3.5**[See Note 19]	24.11.5	**C29.12.4**
12.2.1	**C12.2.1**[See Note 9]	19.4.2	**C20.4.2**	25.1.2	**C34.1.2**[See Note ~~40~~39]
13.1.1	**C13.1.1**	20.2.2	**C21.2.2**	26	**C35**
13.1.4	**C13.1.4**	21.1.1	**C23.1.1**[See Note 20]		
13.2.3	**C13.2.3**	21.1.2	**C23.1.2**[See Note 21]		

Notes:

(1. to 34. are omitted.)

~~35. The title of Guidance **C27.1.6** is to be read as "Tow Lines".~~

3~~6~~5. In Guidance **C29.1.1-1(1)**, **Chapter 29, Part C** of the Rules is to be read as **Chapter 24, Part CS** of the Rules.

3~~7~~6. In Guidance **C29.1.1-3(1)(b)i)**, **29.4**, **29.5** and **29.6, Part C** of the Rules are to be read as **24.3**, **24.4** and **24.7, Part CS** of the Rules.

3~~8~~7. In Guidance **C29.1.2-4(1)**, **29.1.2-2, Part C** of the Rules is to be read as **24.1.2-2, Part CS** of the Rules.

3~~9~~8. In Guidance **C29.7.4**, **29.7.4, Part C** of the Rules is to be read as **24.9.4, Part CS** of the Rules.

~~40~~39. In Guidance **C34.1.2**, **34.1.2-1, Part C** of the Rules is to be read as **25.1.2-1, Part CS** of the Rules.

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