

RULES 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 2020 AMENDMENT NO.1

Rule No.47 30 June 2020
Resolved by Technical Committee on 22 January 2020

ClassNK
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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” has been partly amended as follows:

Part CS HULL CONSTRUCTION AND EQUIPMENT OF SMALL SHIPS

Chapter 15 LONGITUDINAL STRENGTH

15.1 General

15.2.1 Bending Strength at the Midship Part

Sub-paragraph -1 has been amended as follows.

1 The section modulus of the transverse sections of the hull at the midship part is not to be less than the value of Z_σ obtained from the following formula. However, application of the requirement may be dispensed with to ships not exceeding 60 metres in length at the discretion of the Society.

$$Z_\sigma = 5.72(M_S + M_w) \text{ (cm}^3\text{)}$$

Where:

M_S : Maximum longitudinal bending moments in still water ($kN\cdot m$) for sagging and hogging, respectively, which are calculated at the transverse section under consideration along the length of the hull for all conceivable loading conditions by a method of calculation deemed appropriate by the Society.

M_w : Wave induced longitudinal bending moment ($kN\cdot m$) at the transverse section under consideration along the length of the hull, which is obtained from the following formulae, corresponding to either the sagging or the hogging moment of M_S :

$$0.11C_1C_2L_1^2B(C'_b + 0.7) \text{ (kN}\cdot\text{m) for sagging moment of } M_S$$

$$0.19C_1C_2L_1^2BC'_b \text{ (kN}\cdot\text{m) for hogging moment of } M_S$$

C_1 : As given by the following formula: $0.03 L_1 + 5$

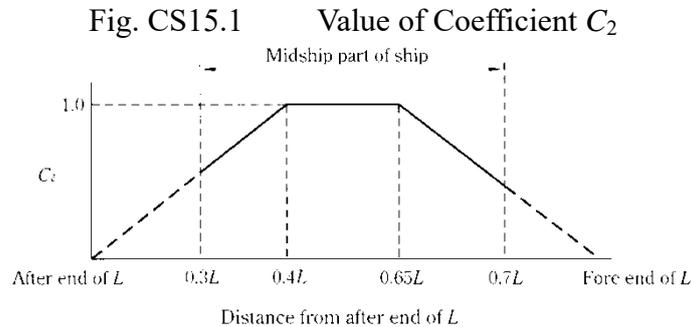
L_1 : ~~Length (m) of ship specified in 2.1.2, Part A of the Rules or 0.97 times the length of ship on the designed maximum load line, whichever is smaller~~ Distance (m) measured on the waterline at the scantling draught d_S from the forward side of the stem to the centre of the rudder stock. L_1 is to be not less than 96% and need not exceed 97% of the extreme length on the waterline at the scantling draught d_S . In ships without rudder stocks (e.g. ships fitted with azimuth thrusters), the Rule length L_1 is to be taken equal to 97% of the extreme length on the waterline at the scantling draught d_S .

d_S : Scantling draught (m) at which the strength requirements for the scantlings of the ship are met and represents the full load condition; it is to be not less than that corresponding to the assigned freeboard.

C'_b : Volume of displacement corresponding to ~~the designed maximum load line~~ the scantling draught d_S divided by ~~L_1B~~ $L_1B_Sd_S$
However, the value is to be taken as 0.6, where it is less than 0.6.

B_S : Breadth (m) measured amidships at the scantling draught d_S .

C_2 : Coefficient specified along the length at positions where the transverse section of the hull is under consideration, as given in **Fig. CS15.1**



Chapter 19 HATCHWAYS, MACHINERY SPACE OPENINGS AND OTHER DECK OPENINGS

19.2 Hatchways

19.2.4 Design Load for Steel Hatch Covers, Portable Beams and Hatchway Coamings

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

The design loads for steel hatchway covers, steel pontoon covers, steel weathertight covers, portable beams and hatchway coamings applying the requirements in **19.2** are specified in following **(1)** to **(5)**:

((1) is omitted.)

(2) Design horizontal wave load P_H (kN/m^2) is not to be less than that obtained from the following formulae. However, P_H is not to be taken less than the minimum values given in **Table CS19.3**. P_H need not be included in the direct strength calculation of the hatch cover, except where structures supporting stoppers are assessed.

$$P_H = ac(bc_1 - y)$$

a : As given by the following:

$$20 + \frac{L'}{12} \quad \text{for unprotected front coamings and hatch cover skirt plates}$$

$$10 + \frac{L'}{12} \quad \text{for unprotected front coamings and hatch cover skirt plates, where the distance from the actual freeboard deck to the summer load line exceeds the minimum non-corrected tabular freeboard according to the ILCC by at least one superstructure standard height}$$

$$5 + \frac{L'}{15} \quad \text{for side and protected front coamings and hatch cover skirt plates}$$

$$7 + \frac{L'}{100} - 8 \frac{x}{L_1} \quad \text{for aft ends of coamings and aft hatch cover skirt plates abaft amidships}$$

$$5 + \frac{L'}{100} - 4 \frac{x}{L_1} \quad \text{for aft ends of coamings and aft hatch cover skirt plates forward of amidships}$$

L' : Length of ship L_1 (m)

L_1 : ~~Length of ship specified in 2.1.2, Part A (m). However, L_1 need not to be greater than 97% of the total length on the summer load waterline.~~ Distance (m) measured on the waterline at the scantling draught d_s from the forward side of the stem to the centre of the rudder stock. L_1 is to be not less than 96% and need not exceed 97% of the extreme length on the waterline at the scantling draught d_s . In ships without rudder stocks (e.g. ships fitted with azimuth thrusters), the Rule length L_1 is to be taken equal to 97% of the extreme length on the waterline at the scantling draught d_s .

d_s : Scantling draught (m) at which the strength requirements for the scantlings of the ship are met and represents the full load condition; it is to be not less than that corresponding to the assigned freeboard.

C_1 : As given by the following formula:

$$C_1 = 10.75 - \left(\frac{300 - L_1}{100} \right)^{1.5}$$

c_L : Coefficient to be taken as 1.0

b : As given by the following formulae:

$$1.0 + \left(\frac{0.45 - \frac{x}{L_1}}{C_{b1} + 0.2} \right)^2 \quad \text{for } \frac{x}{L_1} < 0.45$$

$$1.0 + 1.5 \left(\frac{\frac{x}{L_1} - 0.45}{C_{b1} + 0.2} \right)^2 \quad \text{for } \frac{x}{L_1} \geq 0.45$$

x : Distance (m) from the hatchway coamings or hatch cover skirt plates to after perpendicular, or distance from mid-point of the side hatchway coaming or hatch cover skirt plates to after perpendicular. However, where the length of the side hatchway coaming or hatch cover skirt plates exceeds $0.15 L_1$, the side hatchway coaming or hatch cover skirt plates are to be equally subdivided into spans not exceeding $0.15 L_1$ and the distance from the mid-point of the subdivisions to the after perpendicular is to be taken.

C_{b1} : Block coefficient. However, where C_b is 0.6 or under, C_{b1} is to be taken as 0.6 and where C_b is 0.8 and over, C_{b1} is to be taken as 0.8. When determining scantlings of the aft ends of coamings and aft hatch cover skirt plates forward of amidships, C_{b1} does not need to be taken as less than 0.8.

c : As given by the following formula. However, where $\frac{b'}{B'}$ is less than 0.25, $\frac{b'}{B'}$ is to be taken as 0.25.

$$0.3 + 0.7 \frac{b'}{B'}$$

b' : Breadth (m) of hatchway coamings at the position under consideration

B' : Breadth (m) of ship on the exposed weather deck at the position under consideration

y : Vertical distance (m) from the designed maximum load line to the mid-point of the span of stiffeners when determining the scantlings of stiffeners and to the mid-point of the plating when determining the thickness of plating

Table CS19.3 Minimum Value of P_H (kN/m^2)

Unprotected front coamings and hatch cover skirt plates	others
$25 + \frac{L_1}{10}$	$12.5 + \frac{L_1}{20}$

((3) to (5) are omitted.)

19.2.11 Hatch Cover Supports, Stoppers and Supporting Structures

Sub-paragraph (3) has been amended as follows.

Hatch cover supports, stoppers and supporting structures subject to the provisions of 19.2 are to comply with the following (1) to (3):

((1) to (2) are omitted.)

(3) The details of hatch cover supporting structures are to be in accordance with the following (a) to (g):

(a) The nominal surface pressure (N/mm^2) of a hatch cover supports is not to be greater than that obtained from the following formula:

$$p_{n \max} = dp_n \quad \text{in general}$$

$$p_{n \max} = 3p_n \quad \text{for metallic supporting surface not subjected to relative displacements}$$

d : As given by the following formula. Where d exceeds 3, d is to be taken as 3.

$$d = 3.75 - 0.015L_1$$

$$d_{\min} = 1.0 \quad \text{in general}$$

$$d_{\min} = 2.0 \quad \text{for partial loading conditions}$$

L_1 : ~~Length of ship specified in 2.1.2, Part A (m). However, L_1 need not be greater than 97% of the total length at the summer load waterline.~~ Distance (m) measured on the waterline at the scantling draught d_S from the forward side of the stem to the centre of the rudder stock. L_1 is to be not less than 96% and need not exceed 97% of the extreme length on the waterline at the scantling draught d_S . In ships without rudder stocks (e.g. ships fitted with azimuth thrusters), the Rule length L_1 is to be taken equal to 97% of the extreme length on the waterline at the scantling draught d_S .

d_S : Scantling draught (m) at which the strength requirements for the scantlings of the ship are met and represents the full load condition; it is to be not less than that corresponding to the assigned freeboard.

p_n : As obtained from **Table CS19.10**

Table CS19.10 Permissible nominal surface pressure p_n

Material	p_n when loaded by	
	Vertical force	Horizontal force (on stoppers)
Hull structure steel	25	40
Hardened steel	35	50
Lower friction materials	50	-

((b) to (g) are omitted.)

Chapter 21 BULWARKS, GUARDRAILS, FREEING ARRANGEMENTS, CARGO PORTS AND OTHER SIMILAR OPENINGS, SIDE SCUTTLES, RECTANGULAR WINDOWS, VENTILATORS AND GANGWAYS

21.6 Ventilators

21.6.8 Additional Requirement for Ventilators Fitted on Exposed Fore Deck

Sub-paragraph -1 has been amended as follows.

1 For ships of 80 m or more in length L_1 , the ventilators located on the exposed deck forward of $0.25 L_1$ are to be of sufficient strength to resist green sea force if the height of the exposed deck in way of those ventilators is less than $0.1 L_1$ or $22 m$ above the designed maximum load line, whichever is smaller. The length L_1 is ~~specified in 15.2.1-1, Part C,~~ the distance (m) measured on the waterline at the scantling draught d_S from the forward side of the stem to the centre of the rudder stock. L_1 is to be not less than 96% and need not exceed 97% of the extreme length on the waterline at the scantling draught d_S . In ships without rudder stocks (e.g. ships fitted with azimuth thrusters), the Rule length L_1 is to be taken equal to 97% of the extreme length on the waterline at the scantling draught d_S . d_S is the scantling draught (m) at which the strength requirements for the scantlings of the ship are met and represents the full load condition; it is to be not less than that corresponding to the assigned freeboard.

Chapter 23 EQUIPMENT

23.1 Anchors, Chain Cables and Ropes

23.1.2 Equipment Numbers*

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

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) is omitted.)

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

$$f \frac{L_2}{L_1} + \Sigma h''l$$

f : Value specified in (1)

~~L_1 : Length (m) of ship specified in 15.2.1-1~~

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_1~~ L_2 and also have a breadth greater than $B/4$ and a height greater than 1.5 m

((3) is omitted.)

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 July 2020.
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.