18-390

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part C Hull Construction and Equipment

Rules for the Survey and Construction of Steel Ships
Part C 2018 AMENDMENT NO.2
Guidance for the Survey and Construction of Steel Ships
Part C 2018 AMENDMENT NO.2

Rule No.134 / Notice No.103 25 December 2018
Resolved by Technical Committee on 1 August 2018

ClassNK
NIPPON KAIJI KYOKAI

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 C Hull Construction and Equipment

2018 AMENDMENT NO.2

Rule No.134 25 December 2018

Resolved by Technical Committee on 1 August 2018

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

Rule No.134 25 December 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 C HULL CONSTRUCTION AND EQUIPMENT

Amendment 2-1

Chapter 20 HATCHWAYS, MACHINERY SPACE OPENINGS AND OTHER DECK OPENINGS

20.2 Hatchways

20.2.11 Hatch Cover Supports, Stoppers and Supporting Structures

Table C20.10 has been amended as follows.

Hatch cover supports, stoppers and supporting structures subject to the provisions of **20.2** are to comply with the following **(1)** to **(3)**:
((1) and (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:

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

$p_{n\max} = 3p_n$ 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.

$d = 3.75 - 0.015L_1$

$d_{\min} = 1.0$ in general

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

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 at the summer load waterline.

p_n : As obtained from **Table C20.10**

Table C20.10 Permissible Nominal Surface Pressure p_n

Material	p_n when loaded by	
	Vertical force	Horizontal force
Hull structure steel	25	40
Hardened steel	35	50
~~Plastic materials in steel~~ Lower friction materials	50	-

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

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 25 December 2018.

Amendment 2-2

Chapter 20 HATCHWAYS, MACHINERY SPACE OPENINGS AND OTHER DECK OPENINGS

20.2 Hatchways

Paragraph 20.2.14 has been added as follows.

20.2.14 Steel Hatchway of Ballast Holds*

Special consideration is to be given to steel hatchway covers and similar covers as well as hatch coamings provided on exposed upper decks in way of cargo holds used as deep water ballast tanks for ships in order to ensure they are of sufficient strength to resist loads due to water ballast.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 25 June 2019.

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.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part C Hull Construction and Equipment

2018 AMENDMENT NO.2

Notice No.103 25 December 2018

Resolved by Technical Committee on 1 August 2018

Notice No.103 25 December 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 C HULL CONSTRUCTION AND EQUIPMENT

Amendment 2-1

Annex C1.1.7-5 GUIDANCE FOR THE USE OF FIBER REINFORCED PLASTIC (FRP)

1.3 Requirements for FRP Depending On Service and/or Locations

Paragraph 1.3.1 has been amended as follows.

1.3.1 Requirements for FRP Depending On Service and/or Locations

1 The requirements for fire integrity, fire retardance, flame spread and surface flammability as well as smoke generation required for FRP are, in principle, to be in accordance with those given in **Table 1.3.1**. If a FRP corresponds to the multiple classifications of service in **Table 1.3.1**, it is to satisfy the most stringent requirements.

2 Subdivisions other than those specified in **Table 1.3.1** are to be deemed appropriate by the Society.

3 Where the fire integrity test, the flame spread and surface flammability test have been approved as Approval Tests specified in **Chapter 9, Part 2 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** in accordance with *ASTM F 3059-14*, notwithstanding the requirement in **-1** above, applicable requirements can be in accordance with *ASTM F 3059-14*.

4 Notwithstanding the requirements in **-1** and **-3** above, FRP used for safe access to tanker bows specified in **23.7.2, Part C of the Rules** is to be tested and approved in accordance with the fire integrity test specified in **9.4.2-1(4)**, the flame spread and surface flammability test specified in **9.4.2-3(2)**, the smoke generation test specified in **9.4.2-5(1)** and the toxicity test specified in **9.4.2-5(1), Chapter 9, Part 2 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use by the Society.**

~~3~~**5** FRP may be used for ladders, handrails, steps and small platforms, etc. because they are not considered to be part of the hull and, therefore, required to have the means of access specified in **Chapter 35**, **Part C of the Rules**.

~~4~~**6** In cases where FRP are installed in the hazardous areas specified in **4.3** and **4.7**, **Part H of the Rules**, the risks of FRP taking charge are to be taken into account. In cases where FRP are installed in cargo tanks, fuel oil tanks or the areas deemed necessary by the Society, such FRP are not to have electrostatic properties. Generally, in cases where like gratings of personnel walkways are installed in areas except for those mentioned above, FRP that have electrostatic properties may be used. No electrostatic properties means that the earth resistance of these products at any point is not greater than $1M\Omega$.

Table 1.3.1 has been amended as follows.

Table 1.3.1 Applicable Requirements of FRP

Location	Service	Fire Integrity	Fire Retardance	Flame Spread and Surface Flammability	Smoke Generation	Toxicity
Cargo Pump Rooms	All personnel walkways, catwalk, ladder, platforms or access areas	L1	○	○	-	-
Cargo Holds	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	L1	○	-	-	-
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	-	○	-	-	-
Cargo Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	Note 3)~~-3)~~	○	-	-	-
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	Note 3)~~-3)~~	○	-	-	-
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	Note 4)~~-4)~~	○	-	-	-
Cofferdams, void spaces, double bottoms, pipe tunnels, etc.	All personnel walkways, catwalks, ladders, platforms or access areas	Note 4)~~-4)~~	○	-	-	-
Accommodation, service, and control spaces	All personnel walkways, catwalks, ladders, platforms or access areas	L1	○	○	○	-
Lifeboat embarkation or temporary safe refuse stations in open deck areas	All personnel walkways, catwalks, ladders, platforms or access areas	L2	○	-	-	-
Open Decks or semi-enclosed areas	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue 6)	L3 5)	○	-	-	-
	~~Safe access to bow specified in 23.7.2, Part C of the Rules.~~	~~-5) and 6)~~	~~○~~	~~-7)~~	~~-7)~~	~~-7)~~
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	-	○	-	-	-

Note:

1) SYMBOLS

○: Fire retardance test ~~specified in **9.4.2-2**~~, flame spread and surface flammability test ~~specified in **9.4.2-3**~~, smoke generation test ~~specified in **9.4.2-4**~~, and the toxicity test specified in **9.4.2-~~5~~**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** are to be satisfied.

- : Not applicable

2) ABBREVIATIONS

L1: L1 is the abbreviations ~~of~~for fire retardance Level 1. FRP complying with L1 ~~means it complies with the standard of fire retardance test specified in **9.4.2-1(3)**~~ is the FRP specified in **9.1.2(4)**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

L2: L2 is the abbreviations ~~of~~for fire retardance Level 2. FRP complying with L2 ~~means it complies with the standard of fire retardance test specified in **9.4.2-1(2)**~~ is the FRP specified in **9.1.2(3)**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

L3: L3 is the abbreviations ~~of~~for fire retardance Level 3. FRP complying with L3 ~~means it complies with the standard of fire retardance test specified in **9.4.2-1(1)**~~ is the FRP specified in **9.1.2(2)**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

3) Fire integrity is not required. However if these spaces are normally entered when underway, FRP of L1 integrity is to be required.
4) Fire integrity is not required. However if these spaces are normally entered when underway, FRP of L3 integrity is to be required.
5) Vessels fitted with fixed foam fire-extinguishing systems and fixed dry chemical powder type extinguishing systems on deck require FRP of L1 integrity for foam system operational areas and access routes.
~~6) The standard of the fire integrity test specified in **9.4.2-1(4), Chapter 9, Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** is to be satisfied.~~
~~7) The standards of the surface flammability test specified in **9.4.2-3(2),** the smoke generation test specified in **9.4.2-4(2),** and the toxicity test specified in **9.4.2-5(1), Chapter 9, Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** are to be satisfied.~~
6) Excluding safe access to tanker bows specified in **23.7.2, Part C of the Rules**.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 25 December 2018.
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.
3. Notwithstanding the provision of preceding **2.**, the amendments to the Guidance may apply to ships for which the date of contract for construction is before the effective date upon request.

Amendment 2-2

C20 HATCHWAYS, MACHINERY SPACE OPENINGS AND OTHER DECK OPENINGS

C20.2 Hatchways

Paragraph C20.2.14 has been added as follows.

C20.2.14 Steel Hatchway of Ballast Holds

1 Gross scantlings of steel hatchway covers and similar covers as well as hatch coamings provided on exposed upper decks in way of cargo holds used as deep water ballast tanks for ships are to comply with the following requirements.

(1) The thickness of top plating is not to be less than that obtained from the following formula. However, in the case of double plating type hatch covers, only the plates that actually bear the load need comply.

$1.15S\sqrt{h}+3.0$ (mm)

S : Spacing (m) of stiffeners

h : As obtained by the following formula (kN/m^2)

$9.81\times 0.85(16a/L+0.25b+h')$

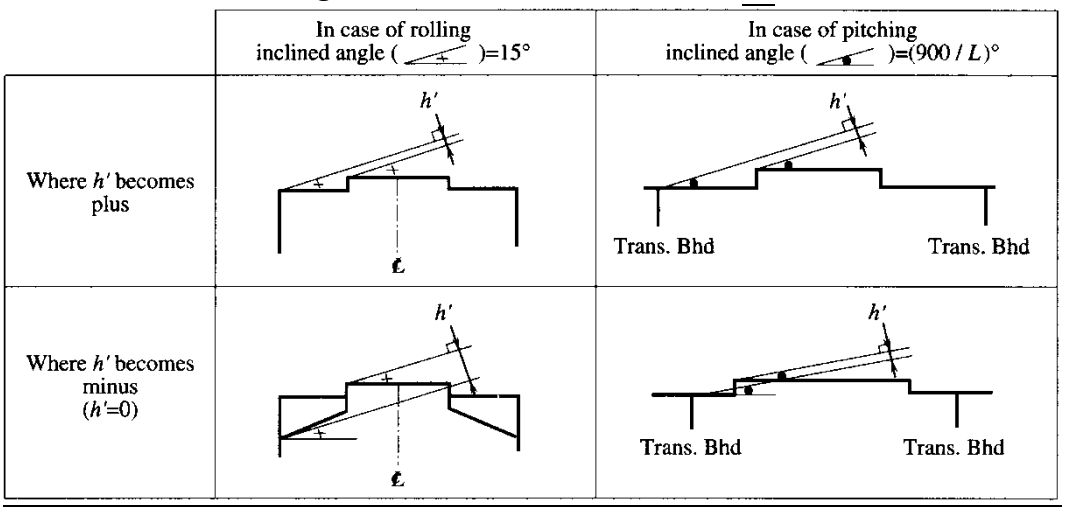
a : Length (m) of hatchways

b : Breadth (m) of hatchways

h' : Vertical distance (m) to the highest point of top plates of tanks from the highest points of hatch covers when ships are inclined at angles of 15° and (900/L)° by rolling and pitching, respectively. In any case, h' is not to be less than zero. (*See* **Fig.C20.2.14-1**)

L : Length (m) of ship

Fig. C20.2.14-1 How to measure h'



(2) The scantlings of stiffeners are to comply with the following formulae.

Section modulus at mid-span:

$C_1 K k_1 S h l^2 (cm^3)$

Moment of inertia at mid-span:

$C_2 k_2 S h l^3 (cm^4)$

Cross sectional area of web plates at the ends of stiffeners:

$C_3 K S h l \ (cm^2)$

S: As specified in **(1)**

l: Unsupported span (m)

C_1, C_2 and C_3: Coefficients given by **Table C20.2.14-1**

K: Coefficient corresponding to the kind of steel
(e.g., 1.0 for mild steel, the values specified in **1.1.7-2(1) of the Rules** for high tensile steel)

k_1 and k_2: Coefficient given by **Table C20.4, Part C of the Rules**

h: As given by the following formulae according to the arranged direction of stiffeners (kN/m^2)

Transverse direction (where hatch covers are opened/closed in the longitudinal direction):

$9.81 \times 0.85(12a/L + 0.125b + h')$ (kN/m^2)

Longitudinal direction (where hatch covers are opened/closed in the transverse direction):

$9.81 \times 0.85(8a/L + 0.188b + h')$ (kN/m^2)

a, b, h' and L: As specified in **(1)**

Table C20.2.14-1 Coefficients C_1, C_2 and C_3

C_1	C_2	C_3
1.07	1.81	0.064

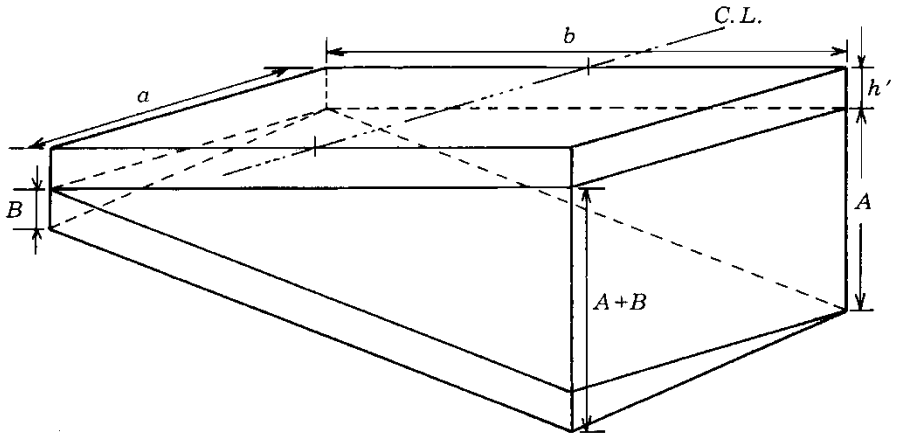
(3) Thicknesses and depths of the webs of girders are not to be less than 7 *mm* and l /25 (where l is the span of girder), respectively. The girders are to be provided with tripping brackets at intervals of about 3 *m*.

(4) Construction and scantlings of hatchway coamings are also to comply with the requirements of **Chapter 14** as well as **Chapter 20, Part C of the Rules**.

2 Where scantlings of structural members of steel hatch covers are determined based upon direct calculations,

(1) The load due to water ballast is to be 0.85 *times* the value specified in **Fig.C20.2.14-2**. However, the corner on which the maximum load acts is to be at an arbitrary place. Where only girders are modelled and the Society deems it appropriate, the values specified in **-1(2)** above may be used.

Fig. C20.2.14-2



Notes:

A : Additional water head due to the rolling motion obtained from $0.25b$

B : Additional water head due to the pitching motion obtained from $16a/L$

h', a, b and L : As specified in **C20.2.14-1(1)**

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 25 June 2019.

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.