Amendments of Guidance relating to the Rules for the Classification of Steel Ships

Pt.1 Classification and Surveys

Annex 1-1 Class Notations

(External Opinion Inquiry)

2024. 01.

Hull Rule Development Team

- Main Amendments -

(1) Effective Date : 1 July 2024(construction contract date)

◉ Reflecting the request for Introduction of new classification notations related to the IP CODE (STS6000-8-2024)
- Establishment of new classification notations applicable to ships complying with the IP Code

<table>
<tr><th>Present</th><th>Amendment</th><th>Note</th></tr>
<tr>
<td>(Remarks) (35) : The following Additional Special Feature Notations are to be appended to ships complying with the relevant requirements. The Additional Special Feature Notations are to be located under Service Restriction Notations of Hull after Special Feature Notations regardless whether they are hull items or machinery items. (2023)
<table>
<tr><th>Additional Special Feature Notations</th><th>Relevant Requirements</th></tr>
<tr><td>〈omitted〉</td><td>〈omitted〉</td></tr>
<tr><td>SPS</td><td>to ships comply with the Code of Safety for Special Purpose Ships(SPS Code).</td></tr>
<tr><td>〈newly added〉</td><td>〈newly added〉</td></tr>
<tr><td>Grab</td><td>to ships where cargo holds are protected from loading/discharge equipment in accordance with the requirements specified in Pt 7, Annex 7-7, 2 of the Guidance.</td></tr>
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<tr><td><u>IP</u></td><td><u>to ships comply with the Code of Safety for Ships Carrying Industrial Personnel(IP Code).</u></td></tr>
<tr><td>Grab</td><td>to ships where cargo holds are protected from loading/discharge equipment in accordance with the requirements specified in Pt 7, Annex 7-7, 2 of the Guidance.</td></tr>
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Amendments of the Guidance relating to the Rules

(External Development Review-External Opinion Inquiry)

Part 4 Hull Equipment

2024.01.

Hull Rule Development Team

Main Amendments

(1) Background of Amendment

1) Rudder carrier and bearing materials have been amended to reflect the current state of the industry.

2) The phrases related to jumping stopper spacing have been amended to clarify that these are standard values for reference only.

(2) Effective date : ships contracted for construction on or after 1 July 2024

Present	Amendment	Note
# CHAPTER 1 RUDDERS ## Section 1 ~ Section 9 〈omitted〉 ## Section 10 Rudder Accessories **1001. Rudder carriers 【See Rule】** **1. Materials of rudder carriers and intermediate bearings** Rudder carriers and intermediate bearings are to be of steel. They are not to be of cast iron. **2. ~ 6. 〈omitted〉** **1002. Jumping stoppers 【See Rule】** The clearance between the jumping stopper and the rudder carrier is to be 2 mm as a standard.	# CHAPTER 1 RUDDERS ## Section 1 ~ Section 9 〈same as present〉 ## Section 10 Rudder Accessories **1001. Rudder carriers 【See Rule】** **1. Materials of rudder carriers and intermediate bearings** When metallic materials are applied to rudder carrier and intermediate bearings, they are not to be of cast iron. **2. ~ 6. 〈omitted〉** **1002. Jumping stoppers 【See Rule】** The clearance between the jumping stopper and the rudder carrier is considered to be 2 mm as a standard and the recommended values given by manufacturer may be accepted.	- Rudder carrier and bearing materials have been amended to reflect the current state of the industry. - Amended to clarify that it is a standard value, and modified to accept the value given by the manufacturer.

Amendments of the Guidance

(External Opinion Inquiry)

Pt. 7 Ships of Special Service

Ch.5 Ships Carrying Liquefied Gas in Bulk

2024. 01

Hull Rule Development Team

Background and main contents of the amendments

1. Background of amendments: (effective date : the date of contract for construction on of after 1 July 2024)

(1) Reflects request for technical rules received by the Machinery Rule Development Team(GCH4800-51- 2023):
: non-distructive test for independent tank type C
- Reflecting requirements of Annex 2-7 of Pt 2, guidelines of Ch 5 605 Pt 7 non-destructive inspection methods and acceptance criteria for independent tank type C have been revised.

(2) To reflect Request for Establishment/Revision of Classification Technical Rules
- To reflect the revision item of MSC.1/Circ.1599/Rev.3

2. Main Contents: Refer to the amendments

Present	Amendment	Note
〈Guidance〉 - Pt 7 **Ch.5 Ships Carrying Liquefied Gas in Bulk** **Section 6 Materials of Construction and Quality Control** 603., 604. 〈omission〉 **605. Welding of metallic materials and non-destructive testing 【See Rule】** **1. ~ 4. 〈omission〉** **5. Non-destructive testing** (1) For the purpose of the requirements in **605. 6** (2) of the Rules, the following requirements are to be complied with. (A) 〈omission〉 (B) The following requirements (a) through (d) are to apply as the testing procedures and acceptance criteria for the non-destructive tests referred to in the requirements in **605. 6** (5) of the Rules : (a) For radiographic tests, the test may be in accordance with the requirements in KS B 0845, ISO 2437, ISO 2504 and ISO/R1027 where the acceptance criteria are to be KS Grade 2 or higher. In the case of KS Grade 3, acceptance is left to the discretion of the Society in consideration of the importancy of the structural members and nature of defects, etc.	**〈Guidance〉 - Pt 7** **Ch.5 Ships Carrying Liquefied Gas in Bulk** **Section 6 Materials of Construction and Quality Control** 603., 604. 〈same as current〉 **605. Welding of metallic materials and non-destructive testing 【See Rule】** **1. ~ 4.** 〈same as current〉 **5. Non-destructive testing** (1) 〈same as current〉 (A) 〈same as current〉 (B) Non-destructive tests refered to in the requirements in **605. 6** (5) of the Rules are to be in accordance with **Pt 2. Annex 2-7** of the Rules. *(2024)* (a) For radiographic tests, the quality level and acceptance levels are provided in **table 7.5.7-1** below. When If the requirements in **table 7.5.7-1** are not met, the acceptance is left to the discretion of the Society in consideration of the importancy of the structural members and nature of defects, etc. **Table 7.5.7-1 The acceptance levels and required quality levels for Radiographic Testing** Quality Levels (ISO 5817:2014 applies)(1) / Testing Techniques/ levels (ISO 17636-1:2022 applies)(1) / Acceptance levels (ISO 10675-1:2021 applies)(1) B / B(class) / 1 Note: (1) Or any recognized standard agreed with the Society and demonstrated to be acceptable	

<table>
<tr><th>Present</th><th>Amendment</th><th>Note</th></tr>
<tr>
<td>(b) For ultrasonic tests, the requirements in KS B 0896 for cargo tanks and process pressure vessels and in KS D 0250 for piping apply correspondingly. (2021)

(c) For magnetic particle test, the requirements in KS D 0213 apply correspondingly.</td>
<td>(b) For ultrasonic tests, the quality level and acceptance levels are provided in table 7.5.7-2 below.

Table 7.5.7-2 The acceptance levels and required quality levels for Ultrasonic Testing
<table>
<tr><th>Quality Levels
(ISO 5817:2014 applies)(1)</th><th>Testing Techniques/Levels
(ISO 17640:2018 applies)(1)</th><th>Acceptance Levels
(ISO 11666:2018 applies)(1)</th></tr>
<tr><td>B</td><td>at least B</td><td>2</td></tr>
<tr><td colspan="3">Note:
(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable</td></tr>
</table>
(c) For magnetic particle tests, the quality level and acceptance levels are provided in table 7.5.7-3 below.

Table 7.5.7-3 The acceptance levels and required quality levels for Magnetic Partcile Testing
<table>
<tr><th>Quality Levels
(ISO 5817:2014 applies)(1)</th><th>Acceptance Levels
(ISO 11666:2018 applies)(1)</th></tr>
<tr><td>B</td><td>2X</td></tr>
<tr><td colspan="2">Note:
(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable</td></tr>
</table>
</td>
<td></td>
</tr>
</table>

<table>
<tr><th>Present</th><th>Amendment</th><th>Note</th></tr>
<tr>
<td>(d) For dye penetrant tests, the requirements in KS B 0816 apply correspondingly.

(C) 〈omission〉

(2), (3) 〈omission〉

606. 〈Omission〉</td>
<td>(c) For dye penetrant tests, the quality level and acceptance levels are provided in table 7.5.7-4 below.

Table 7.5.7-4 The acceptance levels and required quality levels for Dye Panetrant Testing
<table><tr><td>Quality Levels
(ISO 5817:2014 applies)(1)</td><td>Acceptance Levels
(ISO 11666:2018 applies)(1)</td></tr><tr><td>B</td><td>2X</td></tr><tr><td colspan="2">Note:
(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable</td></tr></table>
(C) 〈same as current〉

(2), (3) 〈same as current〉

606. 〈same as current〉</td>
<td></td>
</tr>
</table>

Present	Amendment	Note
Annex 7A-1 ~ Annex 7A-3 〈Omitted〉 **Annex 7A-4 High manganese austenitic steel for Cryogenic Service** **Section 1 General** 101. Scope 1. 〈Omitted〉 102. Application 1. This Annex provides the designer and manufacturer with practical information on the design and construction of cargo tanks using high manganese austenitic steel for cryogenic service to comply with the Design Conditions defined in Pt7, Chapter 5, 418. 2. High manganese austenitic steel for cryogenic service is used for only domestic voyage. When high manganese austenitic steel for cryogenic service is used for international voyage, it is to be approved by the relevant adminstration. 3. High manganese austenitic steel is applicable to cargo tanks such as Butane(all isomers), Butane-propane mixture, Carbon dioxide(High Purity and reclaimed quality), Ethane, Ethylene, Methane(LNG), Pentane(all isomers) or Propane. 4. 〈New〉 〈Below omitted〉	**Annex 7A-1 ~ Annex 7A-3 〈Same as the present Guidance〉** **Annex 7A-4 High manganese austenitic steel for Cryogenic Service** **Section 1 General** 101. Scope 1. 〈Same as the present Guidance〉 102. Application 1. This Annex provides the designer and manufacturer with practical information on the design and construction of cargo tanks using high manganese austenitic steel for cryogenic service to comply with the Design Conditions defined in Pt7, Chapter 5, 418. 2. High manganese austenitic steel for cryogenic service is used for only domestic voyage. When high manganese austenitic steel for cryogenic service is used for international voyage, it is to be approved by the relevant adminstration. 3. High manganese austenitic steel is applicable to cargo tanks such as Ammonia(anhydrous), Butane(all isomers), Butane-propane mixture, Carbon dioxide(High Purity and reclaimed quality), Ethane, Ethylene, Methane(LNG), Pentane(all isomers) or Propane. 4. The post-weld stress relief heat treatment referenced in Rules Part 7 Chapter 5, 1712.2.(2) is waived for ammonia cargo tanks. 〈Below Same as the present Guidance〉	CCC 9 consensus (MSC.1/Circ.1599/Rev.3 draft) includes Ammonia, anhydrous and waives the post-weld stress relief heat treatment.

Amendments of the Guidance

(External Review)

Pt. 7 Ships of Special Service

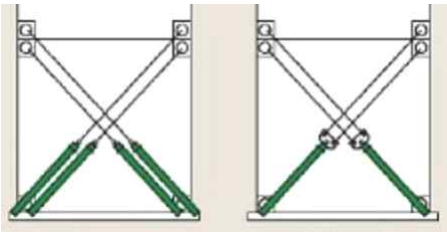
2024. 01

Hull Rule Development Team

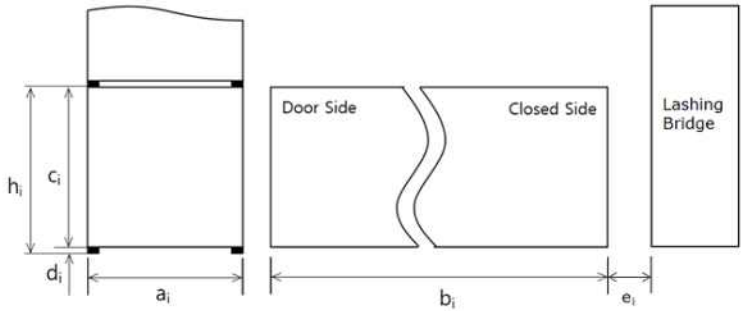
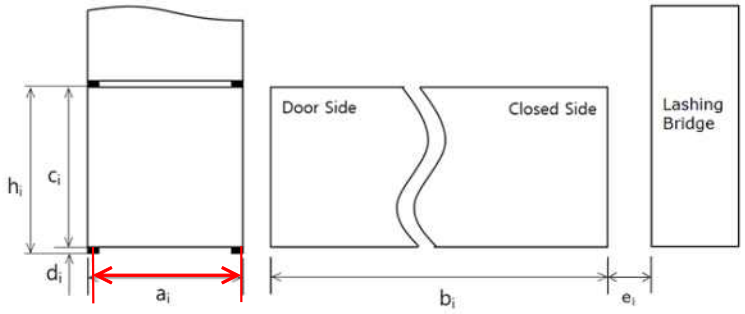
Background and main contents of the amendments

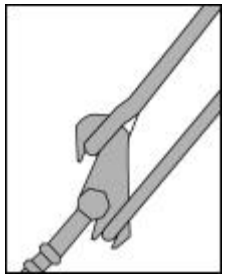
1. Background of amendments: (effective date 2024. 07. 01 the date of which application for survey is submitted)

1) Change the distance (a_i) between the centers of corner castings applied in container force calculations, to the distance between the center of one corner casting and the end of the container on the other side. (2.438 mm → 2.349 mm) : Fig. 5
2) Delete Appendix 3 Sample Calculation based on equations
3) Modifications of Notes of Table 11
4) Edited phrases related to para-lashing
   - In the case of a para-lashing arrangement ~~where two lashing rods and two turnbuckles are attached to adjacent corner castings,~~ total cross-section area is set to the sum of each rod section area. In the case of para-lashing arrangement in which one turnbuckle and two lashing rods are used in combination, shown on (Fig 8), the same section area is used.



2. Main Contents: Refer to the amendments

Present	Amendment	Note
〈Guidance〉 – Pt 7 **Annex 7-2 Guidance for the Container Securing Arrangements** **8. Determination and application of forces** (1) Symbols and definitions *(2019)* (A) Definitions and symbols of terms are as follows. ~ a_i : distance between center of container corner casting (m), (see **Fig 5**) ~ C_c : height ratio of container weight, generally, 0.45 ~  **Fig 5**	**〈Guidance〉 – Pt 7** **Annex 7-2 Guidance for the Container Securing Arrangements** **8. Determination and application of forces** (1) Symbols and definitions *(2019)* (A) Definitions and symbols of terms are as follows. ~ a_i : distance between the center of one corner casting and the end of the container on the other side.(m), (see **Fig 5**) ~ C_c : height ratio of container weight, generally, 0.45 ~  **Fig 5**	– fig 5, Appendix3

Present	Amendment	Note
(2), (3) 〈omission〉 (4) Arrangements incorporating lashings (A), (B) 〈omission〉 (C) In the case of a para-lashing arrangement where two lashing rods and two turnbuckles are attached to adjacent corner castings, total cross-section area is set to the sum of each rod section area. In the case of para-lashing arrangement in which one turnbuckle and two lashing rods are used in combination, shown on (**Fig 8**), the same section area is used. *(2021)* (D), (I) 〈omission〉 (5), (6) 〈omission〉	(2), (3) 〈omission〉 (4) Arrangements incorporating lashings (A), (B) 〈omission〉 (C) In the case of a para-lashing arrangement, total cross-section area is set to the sum of each rod section area. In the case of para-lashing arrangement in which one turnbuckle and two lashing rods are used in combination, shown on (**Fig 8**), the same section area is used. *(2024)* (D), (I) 〈omission〉 (5), (6) 〈omission〉	 **Fig 8**

Present

Table 11 Allowable Load on ISO containers *(2018)*

	Allowable Load	
	20 ft (kN)	40 ft (kN)
Vertical forces at each top corner post, compression (See **Fig 12** (c))	848	848
Vertical force at each bottom corner casting of the lowest container in a stack, compression (See **Fig 12** (c))	848 + (1.8R)/4 see Note 3 & 4	848 + (1.8R)/4 see Note 3 & 4

(Notes)

1., 2 〈omission〉

3. The vertical compression force on the lower corner casting on the closed end of the lowest container may exceed 848 + (1,8R)/4 kN, provided the following conditions are complied with:
   (a) The vertical compression force acting on the lowest container from the container above does not exceed 848 kN
   (b) The horizontal racking force acting on the lowest container from the container above does not exceed 150 kN.
   (c) The vertical compressive force acting on the lower corner casting is not exceed the safe working load on the approved certificate for pedestal socket and bottom twistlocks(midlocks). *(2018)*
4. When the container is approved by ISO 1496-1 including amendments up to 2014, 942 kN may be used instead of 848 kN.

Amendment

Table 11 Allowable Load on ISO containers *(2018)*

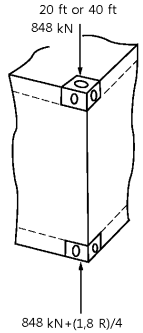
	Allowable Load	
	20 ft (kN)	40 ft (kN)
Vertical forces at each top corner post, compression (See **Fig 12** (c))	848 see Note 4	848 see Note 4
Vertical force at each bottom corner casting of the lowest container in a stack, compression (See **Fig 12** (c))	848 + (1.8R)/4 see Note 3 & 4	848 + (1.8R)/4 see Note 3 & 4

(Notes)

1., 2 〈omission〉

3. The vertical compression force on the lower corner casting on the closed end of the lowest container may exceed 848 + (1,8R)/4 kN, provided the following conditions are complied with:
   (a) The vertical compression force acting on the lowest container from the container above does not exceed 848 kN
   (b) The horizontal racking force acting on the lowest container from the container above does not exceed 150 kN.
   (c) The vertical compressive force acting on the lower corner casting is not exceed the safe working load on the approved certificate for pedestal socket and bottom twistlocks(midlocks). *(2018)*
4. When the container is approved by ISO 1496-1 (including amendments up to 2014) or higher, 942 kN may be used instead of 848 kN.

Note



Present	Amendment	Note
Appendix 3 Sample Calculation based on equations **3.1** For unlashed condition as shown in left part of **Fig A3.1**, the sample stack has 7 tiers with 2.438m of breadth(a_i) and 2.510m of total height(h_i) for each container. For simple calculation, following assumptions for each container are applied in this example. 〈omission〉 – **Table A3.1 Racking force calculation for unlashed condition** (table below) **3.3** If i-th container is 5, the moment is as below and detail result for other containers is showed in **Table A3.2**. $\sum_{j=5}^{n}\left(F_j\sum_{k=5}^{j}h_k\right)$ $= F_5(h_5) + F_6(h_5+h_6) + F_7(h_5+h_6+h_7)$ $= 3.(2.51) + 3.(2.51+2.51) + 1.(2.51 + 2.51. + 2.51)$ $= 7.53 + 15.060 + 7.53$ $= 30.120\,(\mathrm{kN-m})$	~~**Appendix 3 Sample Calculation based on equations**~~ 〈delete〉	- delete Appendix3

No. of tier	W_i	a_y	a_z	a_i	h_i	H_i	P_i	F_i	$Ru_i = \sum_{k=1}^{i} F_i$
7	6.0	1.0	-2.0	2.438	2.510	3.0	-3.0	1.0	1.0
6	6.0	1.0	-2.0	2.438	2.510	3.0	-3.0	3.0	4.0
5	6.0	1.0	-2.0	2.438	2.510	3.0	-3.0	3.0	7.0
4	6.0	1.0	-2.0	2.438	2.510	3.0	-3.0	3.0	10.0
3	6.0	1.0	-2.0	2.438	2.510	3.0	-3.0	3.0	13.0
2	6.0	1.0	-2.0	2.438	2.510	3.0	-3.0	3.0	16.0
1	6.0	1.0	-2.0	2.438	2.510	3.0	-3.0	3.0	19.0

Present	Amendment	Note
Table A3.2 Moments due to racking forces for unlashed condition	〈delete〉	

No. of tier	$F_j\sum_{k=1}^{j}h_k$	$F_j\sum_{k=2}^{j}h_k$	$F_j\sum_{k=3}^{j}h_k$	$F_j\sum_{k=4}^{j}h_k$	$F_j\sum_{k=5}^{j}h_k$	$F_j\sum_{k=6}^{j}h_k$	$F_j\sum_{k=7}^{j}h_k$
7	17.570	15.060	12.550	10.040	7.530	5.020	2.510
6	45.180	37.650	30.120	22.590	15.060	7.530	
5	37.650	30.120	22.590	15.060	7.530		
4	30.120	22.590	15.060	7.530			
3	22.590	15.060	7.530				
2	15.060	7.530					
1	7.530						
$\sum_{j=i}^{n}\left(F_j\right.$	175.700	128.010	87.850	55.220	30.120	12.550	2.510

3.4 According to **8.**(3), compression and lifting force are shown as below when i-th container is 5.

$$Cu_5 = \sum_{j=5}^{n} P_j - \frac{1}{a_5}\sum_{j=5}^{n}\left(F_j\sum_{k=5}^{j}h_k\right)$$

$$= (P_5 + P_6 + P_7) - \frac{1}{a_5}(30.120)$$

$$= (-3.0 - 3.0 - 3.0) - \frac{1}{2.438}(30.120) = -9.0 - 12.354 = -21.354\,(\mathrm{kN})$$

$$Lu_5 = \sum_{j=5}^{n} P_j + \frac{1}{a_5}\sum_{j=5}^{n}\left(F_j\sum_{k=5}^{j}h_k\right)$$

$$= (P_5 + P_6 + P_7) + \frac{1}{a_5}(30.120) = -9.0 + 12.354 = 3.354\,(\mathrm{kN})$$

Present	Amendment	Note
Table A3.3 Compression and lifting forces for unlashed condition | No. of tier	$\sum_{j=i}^{n}\left(F_j\sum_{k=i}^{j}h_k\right)$	$\frac{1}{a_i}\sum_{j=i}^{n}\left(F_j\sum_{k=i}^{j}h$	$\sum_{k=i}^{n}P_k$	Cu_i	Lu_i | |---|---|---|---|---|---| | 7 | 2.510 | 1.030 | -3.000 | -4.030 | -1.970 | | 6 | 12.550 | 5.148 | -6.000 | -11.148 | -0.852 | | 5 | 30.120 | 12.354 | -9.000 | -21.354 | 3.354 | | 4 | 53.220 | 22.650 | -12.000 | -34.650 | 10.650 | | 3 | 87.850 | 36.034 | -15.000 | -51.034 | 21.034 | | 2 | 128.010 | 52.506 | -18.000 | -70.506 | 34.506 | | 1 | 175.770 | 72.067 | -21.000 | -93.067 | 51.067 |	〈delete〉	
Table A3.4 Properties of lashing rods |	No. of tier	E_i	ℓ_i	θ_i(rad)	A_i	$K_i=\frac{E_iA_i\cos^2\theta}{\ell_i}$ | |---|---|---|---|---|---|---| | Long lashing | 4 | 175.0 | 5.581 | 1.119 | 1 | 5.98 | | Short lashing | 3 | 140.0 | 3.499 | 0.800 | 1 | 19.42 | According to equations in **Fig 9**, if i is 3 and $i+1$ is 4, the horizontal and vertical support forces due to lashing rod are follows.		

Present	Amendment	Note
According to equations in **Fig 9**, if i is 3 and $i+1$ is 4, the horizontal and vertical support forces due to lashing rod are follows. $$T_3\cos\theta_3 = \frac{K_3K_4\left[\left(\sum_{k=1}^{3} Ru_k\right) - 3Ru_4\right] + K_3K_c\sum_{k=1}^{3} Ru_k}{3K_3(K_4+K_c) + K_c[(3+1)K_4+K_c]}$$ $$= \frac{19.42\times5.98\times[(13+16+19)-3\times10.0]+19.42\times3.7\times(13+16+19)}{3\times19.42(5.98+3.7)+3.7(4\times5.98+3.7)}$$ $$= 8.314\,(\mathrm{kN})$$ $$T_4\cos\theta_4 = \frac{K_4\left(K_c\sum_{k=1}^{4} Ru_k\right) + 3K_3K_4Ru_4}{3K_3(K_4+K_c) + K_c[(3+1)K_4+K_c]}$$ $$= \frac{5.98[3.7(10+13+16+19)+3\times19.42\times5.98\times10}{3\times19.42(5.98+3.7)+3.7(4\times5.98+3.7)}$$ $$= 7.158\,(\mathrm{kN})$$ $$T_3\sin\theta_3 = (T_3\cos\theta_3)\tan(\theta_3) = 8.314\times\tan(\theta_3) = 8.599\,(\mathrm{kN})$$ $$T_4\sin\theta_4 = (T_4\cos\theta_4)\tan(\theta_4) = 7.518\times\tan(\theta_3) = 14.739\,(\mathrm{kN})$$ **3.6** Racking force of each container for double lashed condition in accordance with **8.**(5) is showed in **Table A3.5**	〈delete〉	

Present	Amendment	Note
Table A3.5 Racking force calculation for lashed condition No. of Tier | $T_i\cos\theta_i$ | $T_i\sin\theta_i$ | $Ft_i = F_i - T_i\cos\theta_i$ | $Pt_i = P_i - T_i\sin\theta_i$ | Rt_i 7 | | | 1.000 | -3.000 | 1.000 6 | | | 3.000 | -3.000 | 4.000 5 | | | 3.000 | -3.000 | 7.000 4 | 7.158 | 14.739 | -4.158 | -17.739 | 2.842 3 | 8.314 | 8.559 | -5.314 | -11.559 | -2.472 2 | | | 3.000 | -3.000 | 0.528 1 | | | 3.000 | -3.000 | 3.528 **3.7** Moments due to racking forces for double lashed condition are obtained according to similar approach described in **A3.3.** The results are shown in **Table A3.6**. **Table A3.6 Moments due to racking forces for lashed condition** No. of Tier | $Ft_j\sum_{k=1}^{j}h_k$ | $Ft_j\sum_{k=2}^{j}h_k$ | $Ft_j\sum_{k=3}^{j}h_k$ | $Ft_j\sum_{k=4}^{j}h_k$ | $Ft_j\sum_{k=5}^{j}h_k$ | $Ft_j\sum_{k=6}^{j}h_k$ | $Ft_j\sum_{k=7}^{j}h_k$ 7 | 17.570 | 15.060 | 12.550 | 10.040 | 7.530 | 5.020 | 2.510 6 | 45.180 | 37.650 | 30.120 | 22.590 | 15.060 | 7.530 | 5 | 37.650 | 30.120 | 22.590 | 15.060 | 7.530 | | 4 | -41.748 | -31.311 | -20.874 | -10.437 | | | 3 | -40.013 | -26.676 | -13.338 | | | | 2 | 15.060 | 7.530 | | | | | 1 | 7.530 | | | | | | $\sum_{j=i}^{n}\left(Ft_j\sum_{k}\right.$ | 41.228 | 32.373 | 31.048 | 37.253 | 30.120 | 12.550 | 2.510	〈delete〉	

Present	Amendment	Note
3.8 According to **8.**(5), compression and lifting force for internal double lashed condition are shown as below when i-th container is 3. $$Ct_3 = \sum_{j=3}^{n} Pt_j - \frac{1}{a_3}\sum_{j=3}^{n}\left(Ft_j \sum_{k=3}^{j} h_k\right)$$ $$= (-3-3-3-17.739-11.559) - \frac{1}{2.438}31.048 = -51.034\,(\mathrm{kN})$$ $$Lt_3 = \sum_{j=3}^{n} P_j + \frac{1}{a_3}\sum_{j=3}^{n}\left(Ft_j \sum_{k=3}^{j} h_k\right)$$ $$= (-3-3-3-3-3) + \frac{1}{2.438}31.048 = -2.265\,(\mathrm{kN})$$ Rest of results are shown in **Table A3.7**. ⚓ **Table A3.7 Compression and lifting forces for internal lashed condition** No. of tier | $\sum_{j=i}^{n}\left(F_j\sum_{k=i}^{j}h_k\right)$ | $\frac{1}{a_i}\sum_{j=i}^{n}\left(F_j\sum_{k=i}^{j}h_k\right)$ | $\sum_{k=i}^{n}Pt_k$ | $\sum_{k=i}^{n}P_k$ | Ct_i | Lt_i 7 | 2.510 | 1.030 | -3.000 | -3.000 | -4.030 | -1.970 6 | 12.550 | 5.148 | -6.000 | -6.000 | -11.148 | -0.852 5 | 30.120 | 12.354 | -9.000 | -9.000 | -21.354 | 3.354 4 | 37.253 | 15.280 | -16.739 | -12.000 | -42.019 | 3.280 3 | 31.048 | 12.735 | -38.299 | -15.000 | -51.034 | -2.265 2 | 32.373 | 13.279 | -41.299 | -18.000 | -54.577 | -4.721 1 | 41.228 | 16.911 | -44.299 | -21.000 | -61.209 | -4.089	〈delete〉	

Guidance for Approval of Manufacturing Process and Type Approval, etc.

(External Review)

2024. 01

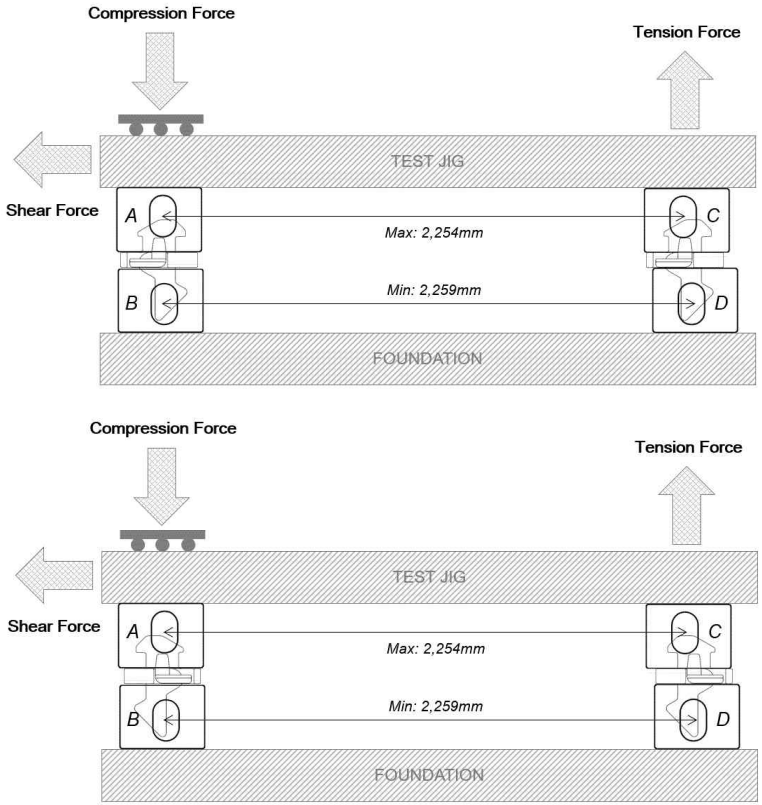
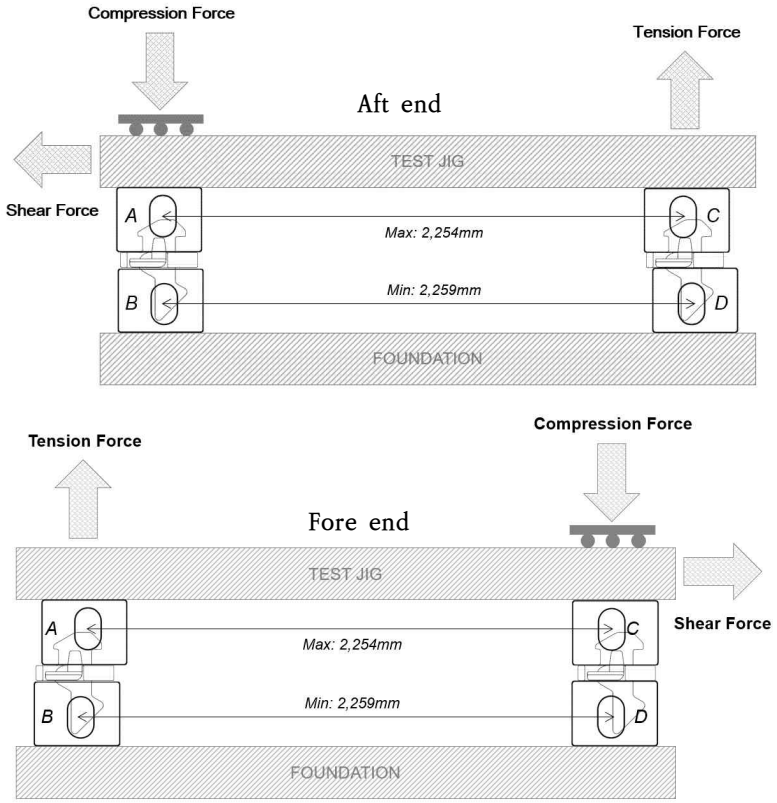
Hull Rule Development Team

Background and main contents of the amendments

1. Background of amendments:

(1) Figure 3.25.2 has been modified.

2. Main Contents: Refer to the amendments

Present	Amendment	Note
〈Guidance〉 – Guidance for Approval of Manufacturing ~ **Ch.4 Type Approval** **Section 25 Securing Devices** 2505. Test requirements of additional special feature notation HHT(High Holding Twistlock) *(2021)*  Fig. 3.25.2 Configuration of HHS test equipment (fully automatic twistlock) *(2021)*	〈Guidance〉 – Guidance for Approval of Manufacturing ~ **Ch.4 Type Approval** **Section 25 Securing Devices** 2505. Test requirements of additional special feature notation HHT(High Holding Twistlock) *(2021)*  Fig. 3.25.2 Configuration of HHS test equipment (fully automatic twistlock) *(2024)*	

Amendments of Guidance relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels

(External Opinion Inquiry)

2024. 01.

Hull Rule Development Team

- Main Amendments -

(1) Effective Date : 1 July 2024(construction contract date)

◉ Reflecting the agreement of CCC 9 (*criteria for the protrusion of suction wells of fuel tank)

- New requirements for the arrangement of suction wells of fuel tanks in Ch 5, 302.

◉ Reflecting MSC.1/Circ.1667 (UI regarding fuel preparation rooms not located on an open deck)

- New design requirements for fuel preparation rooms not located on an open deck in Ch 5, 801., 5.

◉ Reflecting the Machinery Rule Development Team received Revision request (GCH4800-51-2023, Revision of Non-Destructive Testing Requirements for Independent Tank Type C)

- Revision of non-destructive testing methods and criteria for independent tank Type C in Ch 16, 306. (Align Part 2, Appendix 2-7 of the Rules for the Classification of Steel Ships)

◉ Reflecting the results of internal review (revision of fuel tank types to do cold spot inspection)

- Revision of the requirements for fuel tank to carry out cold spot inspection in Ch 16, 501 - Excluding internally insulated tanks and independent tank Type C.

Present	Amendment	Note
CHAPTER 5 SHIP DESIGN AND ARRANGEMENT	CHAPTER 5 SHIP DESIGN AND ARRANGEMENT	
〈newly added〉	Section 3 Arrangement of Fuel Tanks 302. Location of fuel tanks 1. In applying **302.** of this Rules, for vessels with suction wells installed in fuel tanks, the bottom of the suction well may protrude into the vertical extent of the minimum distance specified in **302. 1** (5), provided that such wells are as small as practicable and the protrusion below the inner bottom plating does not exceed 25 % of the depth of the double bottom or 350 mm, whichever is less.	- Reflect the consensus CCC.9(draft amendment of IGF Code)
Section 4 ~ 7 〈omitted〉	Section 4 ~ 7 〈omitted〉	

Present	Amendment	Note
Section 8 Fuel Preparation Room	**Section 8 Fuel Preparation Room**	
801. Fuel preparation room 【See Rules】	**801. Fuel preparation room** 【See Rules】	
1. Fuel preparation rooms, regardless of location, is to be arranged to safely contain cryogenic leakages.	**1.** Fuel preparation rooms, regardless of location, is to be arranged to safely contain cryogenic leakages.	
2. The material of the boundaries of the fuel preparation room is to have a design temperature corresponding with the lowest temperature it can be subjected to in a probable maximum leakage scenario unless the boundaries of the space, i.e. bulkheads and decks, are provided with suitable thermal protection.	**2.** The material of the boundaries of the fuel preparation room is to have a design temperature corresponding with the lowest temperature it can be subjected to in a probable maximum leakage scenario unless the boundaries of the space, i.e. bulkheads and decks, are provided with suitable thermal protection.	
3. The fuel preparation room is to be arranged to prevent surrounding hull structure from being exposed to unacceptable cooling, in case of leakage of cryogenic liquids.	**3.** The fuel preparation room is to be arranged to prevent surrounding hull structure from being exposed to unacceptable cooling, in case of leakage of cryogenic liquids.	- Reflect the amendment of IGF Code(RESOLUTION MSC.458(101))
4. The fuel preparation room is to be designed to withstand the maximum pressure build up during such a leakage. Alternatively, pressure relief venting to a safe location (mast) can be provided. ⚓	**4.** The fuel preparation room is to be designed to withstand the maximum pressure build up during such a leakage. Alternatively, pressure relief venting to a safe location (mast) can be provided.	
〈newly added〉	**5.** certain tank connection space requirements to the design of a fuel preparation room not located on an open deck in compliance with **801.** of this Rules is as follows. (1) Access Arrangements and Associated Hazardous Areas (A) The bolted hatch requirement in **1101. 3** of this Rules and the associated Zone 2 hazardous area requirement in **Ch 12, 503. 2** of Rules do not apply to a fuel preparation room located below deck unless that space can also be defined as a tank connection space using the definition in **Ch 1, 102. 15** (3) of this Rules. (B) A fuel preparation room opening into another enclosed space on the ship which is a non-hazardous space is required to be fitted with an airlock according to **1101. 2** of this Rules. (C) A fuel preparation room with direct access onto an open deck, or to a semi-enclosed space on deck, does not require an airlock. In the absence of an airlock, the area outside the door will be classified as a hazardous area according to **Ch 12, 502. 4** and **503. 1** of this Rules. (2) Bilge Well Requirements (A) The bilge well requirements in **Ch 15, 301. 2** of this Rules only apply to a fuel preparation room located below deck if that fuel preparation room handles fuel in its liquid phase. ⚓	

Present	Amendment	Note
CHAPTER 16 MANUFACTURE, WORKMANSHIP AND TESTING **Section 1 ~ 2 〈omitted〉** **Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System** 301. ~ 305. 〈omitted〉 306. Non-destructive testing 【See Rules】 1. In applying **306. 1** of this Rules, The following requirements (1) through (4) are to apply as the testing procedures. (1) For radiographic tests, the test may be in accordance with the requirements in KS B 0845, ISO 2437, ISO 2504 and ISO/R1027 where the acceptance criteria are to be KS Grade 2 or higher. In the case of KS Grade 3, acceptance is left to the discretion of the Society in consideration of the importancy of the structural members and nature of defects, etc. 〈newly added〉	**CHAPTER 16 MANUFACTURE, WORKMANSHIP AND TESTING** **Section 1 ~ 2 〈omitted〉** **Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System** 301. ~ 305. 〈omitted〉 306. Non-destructive testing 【See Rules】 1. In applying **306. 4** of this Rules, non-distructive testing procedures are to comply with the requirements in the **Annex 2-7** of **Pt 2** of the **Rules for the Classification of Steel Ships.** (1) For radiographic testing, the acceptance levels and required quality levels are provided in **Table 16.1** below. In case of the criteria in **Table 16.1** are not satisfied, acceptance is left to the discretion of Society in consideration of the importancy of the structural members and nature of defects, etc. Table 16.1 Radiographic Testing Quality Levels (ISO 5817:2014 applies)(1) / Testing Techniques/ levels (ISO 17636-1:2022 applies)(1) / Acceptance levels (ISO 10675-1:2021 applies)(1) B / B(class) / 1 Note: (1) Or any recognized standard agreed with the Society and demonstrated to be acceptable	-Align NDT requirement with Pt 2 Annex 2-7 of the Rules.

<table>
<tr><th>Present</th><th>Amendment</th><th>Note</th></tr>
<tr><td>(2) For ultrasonic tests, the requirements in KS B 0896 for cargo tanks and process pressure vessels and in KS D 0250 for piping apply correspondingly.</td><td>(2) For ultrasonic testing, the acceptance levels and required quality levels are provided in Table 16.2 below.

Table 16.2 Ultrasonic Testing<table><tr><td>Quality Levels
(ISO 5817:2014 applies)(1)</td><td>Testing Techniques/Levels
(ISO 17640:2018 applies)(1)</td><td>Acceptance Levels
(ISO 11666:2018 applies)(1)</td></tr><tr><td>B</td><td>at least B</td><td>2</td></tr><tr><td colspan="3">Note:
(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable</td></tr></table></td><td></td></tr>
<tr><td>(3) For magnetic particle test, the requirements in KS D 0213 apply correspondingly.</td><td>(3) For magnetic particle testing, the acceptance levels and required quality levels are provided in Table 16.3 below.

Table 16.3 Magnetic Partcile Testing<table><tr><td>Quality Levels
(ISO 5817:2014 applies)(1)</td><td>Acceptance Levels
(ISO 11666:2018 applies)(1)</td></tr><tr><td>B</td><td>2X</td></tr><tr><td colspan="2">Note:
(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable</td></tr></table></td><td></td></tr>
<tr><td>(4) For dye penetrant testing, the requirements in KS B 0816 apply correspondingly.</td><td>(4) For dye penetrant tests, the acceptance levels and required quality levels are provided in Table 16.4 below.

Table 16.4 Dye Panetrant Testing<table><tr><td>Quality Levels
(ISO 5817:2014 applies)(1)</td><td>Acceptance Levels
(ISO 11666:2018 applies)(1)</td></tr><tr><td>B</td><td>2X</td></tr><tr><td colspan="2">Note:
(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable</td></tr></table></td><td></td></tr>
</table>

Present	Amendment	Note
Section 4 Other Regulations for Construction in Metallic Materials *(2019)*	**Section 4 Other Regulations for Construction in Metallic Materials *(2019)***	
〈omitted〉	〈omitted〉	
Section 5 Testing *(2019)*	**Section 5 Testing *(2019)***	
501. Testing and Inspections during Construction	501. Testing and Inspections during Construction	
1. ~ 3. 〈omitted〉	1. ~ 3. 〈omitted〉	
4. Cold spot inspection 【See Rules】	4. Cold spot inspection 【See Rules】	
(1) The cold spot inspection of fuel tanks specified in **501. 7** of the Rules is to be carried out during the fuel full loading test to capacity specified in **3** (1) for the membrane tank, ~~internal insulation tank,~~ and when necessary, independent tank.	(1) The cold spot inspection of fuel tanks specified in **501. 7** of the Rules is to be carried out during the fuel full loading test to capacity specified in **3** (1) for the membrane tank, and when necessary, independent tank.	
502. ~505 〈omitted〉	502. ~505 〈omitted〉	
Section 7 Testing Regulations	**Section 7 Testing Regulations**	
〈omitted〉	〈omitted〉	

Amendments of the Guidance for Floating Structures

(External Development Review-External Opinion Inquiry)

2024.01.

Hull Rule Development Team

Main Amendments

(1) Background of Amendment

1) Deleted of Grade 1/2 for fibre rope and amended to apply the breaking test loads for fibre ropes as an industry standard according to Rules Part 4. (ch.8 sec.6)

(2) Effective date : ships contracted for construction on or after 1 July 2024

Present	Amendment	Note
CHAPTER 4 MOORING AND ANCHORING, ETC.	**CHAPTER 4 MOORING AND ANCHORING, ETC.**	
Section 1 Standard for Ship's Facilities	**Section 1 Standard for Ship's Facilities**	
101. Assessment of total resistances 〈omitted〉	**101. Assessment of total resistances** 〈same as present〉	
102. Standard and provisions for anchor, etc.	**102. Standard and provisions for anchor, etc.**	
1. The floating structures are to be provided with anchors, anchor chains, etc. of which strength are not less than total resistance according to **101.** In this case, safety factor, tensile force acting on the anchor chain and mass of anchor are as follows: (1) ~ (4) 〈omitted〉 (5) The specification, etc. of the wire rope and fibre rope are to be given in **Table 4.1.3** to **Table 4.1.6.** 〈omitted〉	**1.** The floating structures are to be provided with anchors, anchor chains, etc. of which strength are not less than total resistance according to **101.** In this case, safety factor, tensile force acting on the anchor chain and mass of anchor are as follows: (1) ~ (4) 〈same as present〉 (5) The specification, etc. of the wire rope and fibre rope are to be given in **Table 4.1.3** to Table 4.1.5. 〈same as present〉	
Table 4.1.5 Kind of fibre ropes	**Table 4.1.5 Kind of fibre ropes**	

Kind of fibre rope			Filament (material)
Hemp rope			Manila hemp
Synthetic fibre rope	Vinylon rope	Grade 1 Grade 2	Vinylon
	Polyethylene rope	Grade 1 Grade 2	Polyethylene
	Polyester rope		Polyester
	Polypropylene rope	Grade 1 Grade 2	Polypropylene
	Polyamide rope		Polyamide

Kind of fibre rope		Filament (material)
Hemp rope		Manila hemp
Synthetic fibre rope	Vinylon rope	Vinylon
	Polyethylene rope	Polyethylene
	Polyester rope	Polyester
	Polypropylene rope	Polypropylene
	Polyamide rope	Polyamide

(NOTES)
1. Fibre ropes not includedin this Table may be in accordance with the relevant industry standard. Industry standard means international standard(ISO etc.) or standards issued by national association(KS, DIN, JMSA etc.) which are recognized in the country where the ship is built.
2. The requirements of breaking tests load for fibre ropes are to comply with **Pt 4, Ch 8, 607.** of the Rules.

Deleted of Grade 1/2 for fibre rope and amended to apply the breaking test loads for fibre ropes as an industry standard according to Rules Part 4. (ch.8 sec.6)

Present	Amendment	Note

Table 4.1.6 Breaking test load for fibre ropes (unit : kN)

Diameter of rope (mm)	Hemp rope[1]	Synthetic fibre rope							Polyamide[1]
		Vinylon[1]		Polyethylene[2]		Polyester[1]	Polypropylene[2]		
		Grade 1	Grade 2	Grade 1	Grade 2		Grade 1	Grade 2	
10	7.06	9.32	15.7	9.71	12.7	15.6	10.8	12.7	18.1
12	9.90	13.4	21.8	13.9	17.7	22.0	15.7	17.7	27.5
14	13.1	17.9	28.4	18.6	23.5	29.2	20.6	23.5	36.6
16	16.9	22.9	36.3	23.8	29.4	37.5	26.5	29.4	46.9
18	21.0	28.6	45.1	29.7	37.3	46.7	32.4	37.3	58.3
〈omitted〉									

(NOTES)
[1] Breaking load at room temperature in dried condition
[2] Breaking load at room temperature after having been immersed in warm water at 35 ± 2 °C for more than 30 minutes

~~**Table 4.1.6 Breaking test load for fibre ropes (unit : kN) 〈deleted〉**~~

~~Diameter of rope (mm)~~	~~Hemp rope[1]~~	~~Synthetic fibre rope~~							~~Polyamide[1]~~
		~~Vinylon[1]~~		~~Polyethylene[2]~~		~~Polyester[1]~~	~~Polypropylene[2]~~		
		~~Grade 1~~	~~Grade 2~~	~~Grade 1~~	~~Grade 2~~		~~Grade 1~~	~~Grade 2~~	
~~10~~	~~7.06~~	~~9.32~~	~~15.7~~	~~9.71~~	~~12.7~~	~~15.6~~	~~10.8~~	~~12.7~~	~~18.1~~
~~12~~	~~9.90~~	~~13.4~~	~~21.8~~	~~13.9~~	~~17.7~~	~~22.0~~	~~15.7~~	~~17.7~~	~~27.5~~
~~14~~	~~13.1~~	~~17.9~~	~~28.4~~	~~18.6~~	~~23.5~~	~~29.2~~	~~20.6~~	~~23.5~~	~~36.6~~
~~16~~	~~16.9~~	~~22.9~~	~~36.3~~	~~23.8~~	~~29.4~~	~~37.5~~	~~26.5~~	~~29.4~~	~~46.9~~
~~18~~	~~21.0~~	~~28.6~~	~~45.1~~	~~29.7~~	~~37.3~~	~~46.7~~	~~32.4~~	~~37.3~~	~~58.3~~
~~〈omitted〉~~									

~~(NOTES)~~
~~[1] Breaking load at room temperature in dried condition~~
~~[2] Breaking load at room temperature after having been immersed in warm water at 35 ± 2 °C for more than 30 minutes~~

deleted due to decision to follow industry standards