

# Amendments of the Rules

(External Development Review-External Opinion Inquiry)

## Part 4 Hull Equipment



2024.02.

Hull Rule Development Team

# Main Amendments

## (1) Background of Amendment

- 1) Breaking test for Nylon ropes has been amended to reflect IACS Rec.10 2.1(Rev.5) and MSC.1/Circ.1619 5.2.8.1.
- 2) Breaking test for polyethylene rope and polypropylene rope has been amended to reflect industrial standards(ISO 1969/KS K ISO 1346).

## (2) Effective date (circular will be issued)

- 1) for which the building contract is placed on or after 1 January 2024; or
- 2) in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2024; or
- 3) the delivery of which is on or after 1 January 2027.

Present	Amendment	Note
<p style="text-align: center;"><b>CHAPTER 8 EQUIPMENT NUMBER AND EQUIPMENT</b></p> <p style="text-align: center;"><b>Section 1 ~ Section 5 &lt;omitted&gt;</b> <b>Section 6 Fibre Ropes</b></p> <p>601. ~ 606. &lt;omitted&gt;</p> <p><b>607. Breaking tests [See Guidance] (2023)</b></p> <p>Breaking tests for fibre ropes are to be carried out in accordance with the following requirements. However, relevant industry standards may be followed if the breaking test required by industry standard is different from these requirements. 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.</p> <p>(1) One specimen is to be taken from each coil of the fibre ropes. Where fibre ropes are continuously manufactured by the same machine with the yarns of the same type and divided into several coils, one specimen may be taken from one coil of the ropes selected by the Surveyor at random.</p> <p>(2) The length of the specimen is not to be less than 30 times the diameter of the hemp rope, but need not exceed one <i>metre</i>.</p> <p>(3) <u>Specimens for polyethylene and polypropylene ropes are to be subjected to breaking tests in as wet condition immediately after having been immersed in warm water at 35±2 °C for more than 30 minutes. For other fibre ropes than the above ropes, specimens are to be subjected to breaking tests in as dry condition at room temperature.</u></p> <p>(4) The load at the time of breaking is not to be less than given in industry standard. And breaking test loads of different from industry standards are to be specially considered by the Society.</p> <p>&lt;omitted below&gt;</p>	<p style="text-align: center;"><b>CHAPTER 8 EQUIPMENT NUMBER AND EQUIPMENT</b></p> <p style="text-align: center;"><b>Section 1 ~ Section 5 &lt;same as the present&gt;</b> <b>Section 6 Fibre Ropes</b></p> <p>601. ~ 606. &lt;omitted&gt;</p> <p><b>607. Breaking tests [See Guidance] (2023)</b></p> <p>Breaking tests for fibre ropes are to be carried out in accordance with the following requirements. However, relevant industry standards may be followed if the breaking test required by industry standard is different from these requirements. 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.</p> <p>(1) One specimen is to be taken from each coil of the fibre ropes. Where fibre ropes are continuously manufactured by the same machine with the yarns of the same type and divided into several coils, one specimen may be taken from one coil of the ropes selected by the Surveyor at random.</p> <p>(2) The length of the specimen is not to be less than 30 times the diameter of the hemp rope, but need not exceed one <i>metre</i>.</p> <p>(3) <u>Nylon(polyamide) ropes are to be subjected to breaking tests in as wet condition. For other fibre ropes than the above ropes, to be subjected to breaking tests in as dry condition at room temperature.</u></p> <p>(4) The load at the time of breaking is not to be less than given in industry standard. And breaking test loads of different from industry standards are to be specially considered by the Society.</p> <p>&lt;same as the present below&gt;</p>	<p>- Breaking test for Nylon ropes has been amended to reflect IACS Rec.10 2.1(Rev.5) and MSC.1/Circ.1619 5.2.8.1</p> <p>- Breaking test for polyethylene rope and polypropylene rope has been amended to reflect industrial standards(ISO 1969/KS K ISO 1346).</p> <p>- Amend wording inconsistencies</p>

# Amendments of the Rules

(External Review 2)

## Pt. 7 Ships of Special Service

### Ch. 5 Ships Carrying Liquefied Gases in Bulk



2024. 02

Hull Rule Development Team

# Background and main contents of the amendments

## 1. Background of amendments: IACS UI GC13 (R.3 Aug. 2023)

(1) Guideline Pt7 Ch5 420. 6 Examination before and after the first loaded voyage (Only if the LNG, LPG Vessels) have been revised.

- Rule IGC code(Res. MSc 370(93)) 4.20.3.5 : “The overall performance of the cargo containment system shall be verified for compliance with the design parameters during the first full loading and discharging of the cargo, in accordance with the survey procedure and requirements in 104. and the requirements of the Society.”

-> It is specified that the scope of application will be expanded from LNG and LPG carriers to all gas carriers. Revised to clarify the scope of verification that inspectors must perform during the first full load loading and unloading of cargo containment systems.

(2) 2nd revision (additional deliberation on the amendment : Feb. 5. 2024)

- 420.6.1.(b) : Deletion of the condition of ‘omitting attendance of the surveyor for full load test of series ships’
- ‘Table 7.5.6 Survey items for full load test’ was deleted

## 2. Main Contents: Refer to the amendments

Present	Amendment	Note
<p style="text-align: center;"><b>Present</b></p> <p style="text-align: center;"><b>&lt;Guidance&gt; – Pt 7</b></p> <p style="text-align: center;"><b>Ch. 5 Ships Carrying Liquefied Gases in Bulk</b></p> <p style="text-align: center;"><b>Sec.1 ~ Sec.3 &lt;omit&gt;</b></p> <p style="text-align: center;"><b>Section 4 Cargo Containment</b></p> <p>402. ~ 419. &lt;omit&gt;</p> <p>420. Construction processes [See Rule]</p> <p>1. ~ 3. &lt;omit&gt;</p> <p>4. <u>Gas-trial and cargo full loading test (related to 513. 2 (5) of the Rules)</u></p> <p>6. <u>Examination before and after the first loaded voyage (Only if the LNG, LPG Vessels)</u></p> <p>In accordance with the requirements in <b>420. 3 (5) &amp; (7)</b> of the Rules, it is preferred that Cargo Loading Tests are finished at the shipyard, but either or both of these may be postponed until after entering in- to a voyage and the survey requirements are as follows</p> <p>(1) First Loading (Considered to be full loading) :</p> <p>(A) Priority to be given to latter stages of loading (approximately last 6 hours).</p> <p>(B) Review cargo logs and alarm reports.</p> <p>(C) Witness satisfactory operation of the following:</p> <ul style="list-style-type: none"> <li>- Gas detection system.</li> <li>- Cargo control and monitoring systems such as level gaug- ing equipment, temperature sensors, pressure gauges, cargo pumps and compressors, proper control of cargo heat exchangers, if operating, etc.</li> <li>- Nitrogen generating plant or inert gas generator, if operating.</li> </ul>	<p style="text-align: center;"><b>Amendment</b></p> <p style="text-align: center;"><b>&lt;Guidance&gt; – Pt 7</b></p> <p style="text-align: center;"><b>Ch. 5 Ships Carrying Liquefied Gases in Bulk</b></p> <p style="text-align: center;"><b>Sec.1 ~ Sec.3 &lt;same as current&gt;</b></p> <p style="text-align: center;"><b>Section 4 Cargo Containment</b></p> <p>402. ~ 419. &lt;same as current&gt;</p> <p>420. Construction processes [See Rule]</p> <p>1. ~ 3. &lt;same as current&gt;</p> <p>4. <u>Verification before and after the first loaded voyage (2024)</u></p> <p>In accordance with the requirements in <b>420. 3 (5) to (7), 513. 2 (5) and 1303. 5</b> of the Rules, surveyor attendance is required at the first cargo loading and first cargo unloading. Surveyor attendance during new building gas trials can be considered to comply with the below applicable verifications and examinations survey requirements, with the exceptions of the survey requirements marked (**).1</p> <p>(1) <u>Verifications and examinations at first full cargo loading, as appli- cable to cargo containment system</u></p> <p><u>Note: When attending at first full cargo loading, priority shall be given to latter stages of loading;</u></p> <ul style="list-style-type: none"> <li>- <u>verify the satisfactory functionality of the emergency shutdown system during testing;</u></li> <li>- <u>satisfactory operation of gas detection system;</u></li> <li>- <u>satisfactory operation of cargo tank pressure monitoring system;</u></li> <li>- <u>satisfactory operation of inter barrier space(s) and insulation space(s) pressure monitoring system, as applicable;</u></li> </ul>	<p>- 420.4 → 420.6, 420.6 → 420.4 (reflect GC13 R3)</p> <p>- LNG/LPG vessels → all liquefied gas vessels</p> <p>- last 6 hours → latter stage of loading</p>

Present	Amendment	Note
<ul style="list-style-type: none"> <li>- Nitrogen pressure control system for insulation, inter-barrier, and annular spaces, as applicable.</li> <li>- <u>Cofferdam heating system, if in operation.</u></li> <li>- Reliquefaction plant, if fitted.</li> <li>- Equipment fitted for the burning of cargo vapors such as boilers, engines, gas combustion units, etc., if operating.</li> </ul> <p>(D) Examination of on-deck cargo piping systems including expansion and supporting arrangements.</p> <p>(E) <u>Witness topping off process for cargo tanks including high level alarms activated during normal loading.</u></p> <p>(F) Advise master to carry out cold spot examination of the hull and external insulation during transit voyage to unloading port.</p> <p>(2) <u>First Unloading :</u></p> <p>(A) <u>Priority to be given to the commencement of unloading (approximately first 4 - 6 hours).</u></p> <p>(B) <u>Witness emergency shutdown system testing prior to commencement of unloading.</u></p> <p>(C) <u>Review cargo logs and alarm reports.</u></p> <p>(D) <u>Witness satisfactory operation of the following:</u></p> <ul style="list-style-type: none"> <li>- <u>Gas detection system.</u></li> <li>- <u>Cargo control and monitoring systems such as level gauging equipment, temperature sensors, pressure gauges, cargo pumps and compressors, proper control of cargo heat exchangers, if operating, etc.</u></li> <li>- <u>Nitrogen generating plant or inert gas generator, if operating.</u></li> <li>- <u>Nitrogen pressure control system for insulation, inter-barrier, and annular spaces, as applicable.</u></li> <li>- <u>On membrane vessels, verify that the readings of the cofferdam and inner hull temperature sensors are not below the allowable temperature for the selected grade of steel. Review previous readings.</u></li> <li>- <u>Cofferdam heating system, if in operation.</u></li> <li>- <u>Reliquefaction plant and review of records from previous voyage.</u></li> <li>- <u>Equipment fitted for the burning of cargo vapors such as boilers, engines, gas combustion units, etc., if operating.</u></li> </ul>	<ul style="list-style-type: none"> <li>- <u>satisfactory operation of cargo tank temperature monitoring system;</u></li> <li>- <u>satisfactory operation of cargo tank level indicating system;</u></li> <li>- <u>satisfactory operation of inter barrier space(s) and inner hull temperature monitoring system, as applicable;</u></li> <li>- <u>inert gas generator, if operating;</u></li> <li>- <u>nitrogen generating plant, if operating;</u></li> <li>- <u>nitrogen pressure control system for insulation, interbarrier, and annular spaces, as applicable;</u></li> <li>- <u>reliquefaction plant, if fitted;</u></li> <li>- <u>equipment fitted for the burning of cargo vapours such as boilers, engines, gas combustion units, etc., if operating;</u></li> <li>- <u>examination of on-deck cargo piping systems including expansion and supporting arrangements;</u></li> <li>- <u>verification and examination of all piping systems, including valves, fittings and associated equipment for handling cargo or vapours<sup>2</sup></u></li> <li>- <u>advise Master to carry out cold spot examination of the hull and external insulation during transit voyage to unloading port and record in ship's logbook;</u></li> <li>- <u>advise Master to test high-level alarm(s) with liquid cargo during voyage and record in ship's logbook, when loading condition permits.</u></li> <li>- <u>satisfactory operation of cargo compressors;</u></li> </ul> <p>(2) <u>Verifications and examinations at first full cargo unloading, as applicable</u>  <u>Note: When attending at first full cargo unloading, priority shall be given to the commencement of unloading.</u></p> <ul style="list-style-type: none"> <li>- <u>examination of on-deck cargo piping systems including expansion and supporting arrangements;</u></li> <li>- <u>review logbook entry of emergency shutdown system testing prior to commencement of unloading;</u></li> <li>- <u>(**) review cargo logs and alarm reports for cargo tank pressure, temperature, and level indicating systems;</u></li> <li>- <u>satisfactory operation of cargo compressors;</u></li> <li>- <u>satisfactory operation of cargo pumps;</u></li> <li>- <u>inert gas generator, if operating;</u></li> <li>- <u>nitrogen generating plant, if operating;</u></li> </ul>	<p>- UI GC 13 R3</p>

Present	Amendment	Note
<p>(E) Examination of on-deck cargo piping systems including expansion and supporting arrangements.</p> <p>(F) Obtain written statement from the Master that the cold spot examination was carried out during the transit voyage found satisfactory. Where possible, the surveyor should examine selected spaces.</p>	<ul style="list-style-type: none"> <li>- nitrogen pressure control system for insulation, interbarrier, and annular spaces, as applicable;</li> <li>- <u>(**) review of records for satisfactory operation of the reliquefaction plant, if fitted;</u></li> <li>- <u>review of records for equipment fitted for the burning of cargo vapours such as boilers, engines, gas combustion units, etc.;</u></li> <li>- <u>(**) on ships fitted with membrane tanks, review records of the cofferdam and inner hull temperature sensors to verify the readings are not below the allowable temperature for the selected grade of steel;</u></li> <li>- <u>(**) cofferdam heating system, if in operation;</u></li> <li>- <u>(**) review logbook entries for cold spot examination; and</u></li> <li>- <u>(**) review logbook entry for testing of high-level alarm(s) with liquid cargo. If cargo conditions did not permit testing, surveyor to require testing at the first occasion where cargo conditions allow for testing. Master to be advised to record testing in ship's logbook which is to be verified no later than the first annual survey.</u></li> </ul> <p>(3) <u>Documentation to be requested to the Master</u>  <u>To demonstrate satisfactory functionality of the verifications, ship's Master shall be required to arrange and provide to the surveyor print outs or screen shots showing:</u></p> <ul style="list-style-type: none"> <li>- <u>trends of cargo tanks pressure and temperature;</u></li> <li>- <u>trends of pressure and temperature distribution of inter-barrier space(s) and insulation space(s), and temperature distribution of inner hull, as applicable;</u></li> <li>- <u>trends record of performance of cofferdam heating system, when fitted;</u></li> <li>- <u>trends record of consumption of nitrogen gas, and whether any abnormality has been observed;</u></li> <li>- <u>list of any gas alarms, if occurred;</u></li> <li>- <u>Cargo Tanks Containment System Cold Spot Inspection Statement;</u> <u>and</u></li> <li>- <u>activation of Cargo Tanks High-Level Alarm and Overfill Protection tests.</u></li> </ul> <p><u>Note 1: The symbol (**) indicates survey requirements only feasible to be carried out at the time of first full cargo loading/unloading.</u>  <u>Note 2: Refer to <b>Table 7.5.5</b> Test Items at the Gas Trial.</u></p>	

Present	Amendment	Note
<p><b>5. Cold spot inspection</b></p> <p>(1) The cold spot inspection of cargo tanks specified in <b>420. 3</b> (7) of the Rules is to be carried out during the cargo full loading test to capacity specified in <b>420. 4</b>—(1) for the membrane tank, semi-membrane tank, internal insulation tank, and when necessary, independent tank.</p> <p>(2) &lt;omit&gt;</p> <p><b>4. Gas-trial and cargo full loading test (related to 513. 2 (5) of the Rules)</b></p> <p>(1) <u>In accordance with the requirements in <b>420. 3</b> (5) and <b>513. 2</b> (5) of the Rules the following tests (A) and (B) are to be conducted in the attendance of the Surveyor to verify the performance of the cargo containment installations and cargo handling equipment</u></p> <p>∴</p> <p>(A) Gas-trial</p> <p>On items given in <b>Table 7.5.5</b> of the Guidance, tests are to be conducted to verify the performance of the cargo containment system cargo handling equipment and instrumentation using a suitable quantity of the cargo after the completion of all the construction work. However, for cargo tanks which do not require either cool-down operations or the cargo pressure / temperature control specified in <b>Section 7 701. 1 of the Rules</b>, the omission of this gas trials may be accepted if substitution is made by the operating test with the substituting medium at manufacturing plants or shipyards to verify the requirements given in <b>Table 7.5.5</b> of the Guidance except for the case where the tank is of the first cargo tank manufactured by the manufacturer of cargo tanks.</p>	<p><b>5. Cold spot inspection</b></p> <p>(1) The cold spot inspection of cargo tanks specified in <b>420. 3</b> (7) of the Rules is to be carried out during the cargo full loading test to capacity specified in <b>420. 4</b> for the membrane tank, semi-membrane tank, internal insulation tank, and when necessary, independent tank.</p> <p>(2) &lt;same as current&gt;</p> <p><b>6. Additional information on the gas-trial and cargo full loading test (2024)</b></p> <p>(1) <u>Test:</u></p> <p>(A) Gas-trial</p> <p>The tests are to be conducted to verify the performance of the cargo containment system cargo handling equipment and instrumentation using a suitable quantity of the cargo after the completion of all the construction work. <u>Refer to <b>Table 7.5.5</b> for test items.</u> However, for cargo tanks which do not require either cool-down operations or the cargo pressure / temperature control specified in <b>Section 7 701. 1 of the Rules</b>, the omission of this gas trials may be accepted if substitution is made by the operating test with the substituting medium at manufacturing plants or shipyards to verify the requirements given in <b>Table 7.5.5</b> of the Guidance except for the case where the tank is of the first cargo tank manufactured by the manufacturer of cargo tanks.</p>	<p>- 420.4 → 420.6,</p>

Present	Amendment	Note
<p>(B) Cargo full loading test  <del>On items given in Table 7.5.6 of the Guidance, tests are to be conducted after completion of all the construction work to verify that the cargo containment installations, cargo handling equipment and instrumentation satisfy the design conditions under the fully loaded condition of cargo. However, for this test, the attendance of the Surveyor may be omitted for ships whose cargo containment and cargo transfer installations can be regarded as of the same specification of those which have previously been built and tested at the same shipyard.</del></p> <p>(2) ~ (5) &lt;omit&gt;</p> <p>421. ~ 428. &lt;omit&gt;</p> <p><b>Sec.5 ~ Sec.19 &lt;omit&gt;</b></p>	<p>(B) Cargo full loading test  The tests are to be conducted after completion of all the construction work to verify that the cargo containment installations, cargo handling equipment and instrumentation satisfy the design conditions under the fully loaded condition of cargo.</p> <p>(2) ~ (5) &lt;same as current&gt;</p> <p>421. ~ 428. &lt;same as current&gt;</p> <p><b>Sec.5 ~ Sec.19 &lt;same as current&gt;</b></p>	<p>- delete table 7.5.6 : include in the contents of 420.4</p>

**Table 7.5.5 Test Items at the Gas Trial**

Test item	◎ : Attendance of the Surveyor ○ : Submission of the record	Inspection equipment	Survey item
1. Drying test	○	· Inert gas generator	· Dew point · Change of dryness in cargo tanks and hold spaces
2. Inerting test	○	· Inert gas generator	· Operation of the inert gas generator · Measuring of atmosphere in cargo tanks
3. Inert gas purge test using cargo vapour	○	· Cargo vapourizer · Compressor	· Change of O <sub>2</sub> /temperature of cargo vapour in cargo tanks · Quantity of cargo vapour (or liquid) supply · Capacity of the vapourizer · Capacity of the compressor
4. Cool-down test	◎/○	· Spray pump · Compressor · Cargo piping · Temperature indicators for cargo tank · Spray piping	· Temperature curve of cargo tanks <sup>1)</sup> · Inspection of hold spaces/condition of insulation of tanks <sup>1)</sup> (after cool-down) · Cooling condition of spray piping · Cooling condition of cargo piping · Capacity of spray pump · Cargo consumption · Capacity of compressor (property of return gas) · Temperature/pressure in cargo tank · Shrinkage of cargo tank <sup>2)</sup>
5. Loading test of cargo liquid	◎/○	· Compressor · Cargo piping related for loading · level gauge/temperature indicator	· Temperature/pressure level in cargo tanks · Temperature/pressure in hold spaces · Temperature/pressure of cargo liquid/gas at manifolds · Service condition of cargo piping
6. Operation test of cargo pump	◎/○	· All cargo pumps	· Discharge pressure/current of cargo pumps · Liquid level/pressure in cargo tanks · Stripping
7. Operation test of pressure/temperature control system	◎/○	· Depend on the type of controls	· Depend on the type of controls

Notes :

- 1) The Society may approve omission in consideration of the quality control status and manufacturing records of the insulation materials.
- 2) To be verified only in the case of independent tanks.

**Table 7.5.6 Survey Items of Full Load Test (refer to 420. 4)**

	Survey items
1. At loading operation	<ul style="list-style-type: none"> <li>- Continuous loading rate</li> <li>- Actual operation of level, temperature, pressure indicator, etc.</li> <li>- Actual operation of alarm system<sup>1)</sup></li> <li>- Actual operation of overflow control system<sup>1)</sup></li> </ul>
2. Condition of cargo tanks and other cargo containment systems after full loading	<ul style="list-style-type: none"> <li>- Cargo tanks and supports</li> <li>- Hull adjacent to cargo tanks (cold spot)</li> <li>- Insulation capacity of cargo tanks and supports</li> <li>- Atmosphere in hold spaces</li> </ul>
3. During voyage	<ul style="list-style-type: none"> <li>- Insulation capacity of cargo tanks and supports</li> <li>- Cold spot on the construction adjacent to cargo tanks</li> <li>- Capacity of pressure/temperature indicator</li> </ul>
4. At discharging operation	<ul style="list-style-type: none"> <li>- Discharging rate</li> <li>- Other operation of discharging</li> <li>- Submitting/survey of related records without attendance for <b>3</b> above.</li> </ul>
<p>Note :-</p> <p>1) In case where implementation is difficult, the verification of operation may be made by suitable other method.</p>	

# Amendments of the Rules

(External Development Review-External Opinion Inquiry)

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



2024.02.

Hull Rule Development Team

# Main Amendments

## (1) Background of Amendment

- 1) The acceptance criteria for approval of manufacturing process for synthetic fibre ropes has been amended to comply with Part 4, Chapter 8 of the Rules.
  - The breaking load of vinylon and nylon ropes is recognized as 80~90% of the standard value in accordance with current Guidance, but the industrial standards contains the same provisions in the Guidance, resulting in a double deduction, so revision is necessary.  
(Nylon rope requires breaking load in wet condition in accordance with IACS Rec.10(Rev.5) and MSC.1/Circ.1619)

## (2) Effective date (circular will be issued)

- 1) for which the building contract is placed on or after 1 January 2024; or
- 2) in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2024; or
- 3) the delivery of which is on or after 1 January 2027.

Present	Amendment	Note
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## CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS

### Section 1 ~ Section 11 <omitted> Section 12 Synthetic Fibre Ropes

1201. ~ 1202. <omitted>

#### 1203. Approval tests

**Table 2.12.1 Approval Test Items and Acceptance Criteria for synthetic fibre ropes**

Test item	Test method	Acceptance criteria													
Construction & Diameter	Construction and diameter of synthetic fibre ropes are to be measured in accordance with <b>Pt 4, Ch 8, Sec 6</b> of the Rule.	To comply with the <b>Pt 4, Ch 8, Sec 6</b> of the Rule.													
Tensile tests in wet and dry conditions	<p>(1) Tensile tests on three each test specimens are to, in principle, be carried out for each of the test conditions given in <b>Table below</b> and breaking strength and elongation are to be measured. For rope having diameter higher than 60mm, one additional tensile test specimen is to be taken from the rope of maximum diameter.</p> <p>(2) The gauge length of the test specimen is to be 30 times or more of the rope diameter, however it needs not to exceed 1 meter.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Kind of rope Diameter of test rope</th> <th style="text-align: center;">Vinylon rope polyester rope nylon rope</th> <th style="text-align: center;">Polyethylene rope polypropylene rope</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">12 ~ 24 mm</td> <td style="text-align: center;">Wet condition<sup>(1)</sup></td> <td style="text-align: center;">Wet condition<sup>(3)</sup></td> </tr> <tr> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> </tr> <tr> <td rowspan="2" style="text-align: center;">40 ~ 60 mm</td> <td style="text-align: center;">Wet condition<sup>(1)</sup></td> <td style="text-align: center;">Wet condition<sup>(3)</sup></td> </tr> <tr> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> </tr> </tbody> </table> <p>NOTES:            (1) The test specimen is to be soaked in water at normal temperature for a period of 30 <i>minutes</i> or more, then taken out and subjected to tensile test at room temperature.            (2) The test specimen in dry condition is to be subjected to tensile test at room temperature.            (3) The test specimen is to be soaked in warm water at temperature of 35 ± 2°C for a period of 30 <i>minutes</i> or more, then taken out and immediately subjected to tensile test at room temperature.</p>	Kind of rope Diameter of test rope	Vinylon rope polyester rope nylon rope	Polyethylene rope polypropylene rope	12 ~ 24 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>	40 ~ 60 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>	<p>(1) <u>Except on cases with vinylon and nylon in wet condition</u>, respective breaking loads are to satisfy the requirements specified in <b>Pt 4, Ch 8, Sec 6</b>, of the Rules.</p> <p>(2) <u>The breaking loads of vinylon and nylon in wet conditions are to be 80% or more and 90% or more respectively of the values specified in above (1)</u></p> <p>(3) Values with respect to elongation are to be for reference only.</p>
Kind of rope Diameter of test rope	Vinylon rope polyester rope nylon rope	Polyethylene rope polypropylene rope													
12 ~ 24 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>													
	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>													
40 ~ 60 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>													
	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>													

<see next page>

Present

Amendment

Note

## CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS

Section 1 ~ Section 11 <same as the present>  
Section 12 Synthetic Fibre Ropes

1201. ~ 1202. <same as the present>

1203. Approval tests

**Table 2.12.1 Approval Test Items and Acceptance Criteria for synthetic fibre ropes**

Test item	Test method	Acceptance criteria													
Construction & Diameter	Construction and diameter of synthetic fibre ropes are to be measured in accordance with <b>Pt 4, Ch 8, Sec 6</b> of the Rule.	To comply with the <b>Pt 4, Ch 8, Sec 6</b> of the Rule.													
Tensile tests in wet and dry conditions	<p>(1) Tensile tests on three each test specimens are to, in principle, be carried out for each of the test conditions given in <b>Table below</b> and breaking strength and elongation are to be measured. For rope having diameter higher than 60mm, one additional tensile test specimen is to be taken from the rope of maximum diameter.</p> <p>(2) The gauge length of the test specimen is to be 30 times or more of the rope diameter, however it needs not to exceed 1 meter.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 15%;">Kind of rope</th> <th style="width: 35%;">Vinylon rope polyester rope nylon rope</th> <th style="width: 50%;">Polyethylene rope polypropylene rope</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">Diameter of test rope  12 ~ 24 mm</td> <td style="text-align: center;">Wet condition<sup>(1)</sup></td> <td style="text-align: center;">Wet condition<sup>(3)</sup></td> </tr> <tr> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> </tr> <tr> <td rowspan="2" style="text-align: center;">40 ~ 60 mm</td> <td style="text-align: center;">Wet condition<sup>(1)</sup></td> <td style="text-align: center;">Wet condition<sup>(3)</sup></td> </tr> <tr> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> <td style="text-align: center;">Dry condition<sup>(2)</sup></td> </tr> </tbody> </table> <p>NOTES:                      (1) The test specimen is to be soaked in water at normal temperature for a period of 30 <i>minutes</i> or more, then taken out and subjected to tensile test at room temperature.                      (2) The test specimen in dry condition is to be subjected to tensile test at room temperature.                      (3) The test specimen is to be soaked in warm water at temperature of 35 ± 2°C for a period of 30 <i>minutes</i> or more, then taken out and immediately subjected to tensile test at room temperature.</p>	Kind of rope	Vinylon rope polyester rope nylon rope	Polyethylene rope polypropylene rope	Diameter of test rope  12 ~ 24 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>	40 ~ 60 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>	<p>(1) <u>Respective breaking loads are to satisfy the requirements specified in Pt 4, Ch 8, Sec 6, of the Rules.</u></p> <p>(2) Values with respect to elongation are to be for reference only.</p>
Kind of rope	Vinylon rope polyester rope nylon rope	Polyethylene rope polypropylene rope													
Diameter of test rope  12 ~ 24 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>													
	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>													
40 ~ 60 mm	Wet condition <sup>(1)</sup>	Wet condition <sup>(3)</sup>													
	Dry condition <sup>(2)</sup>	Dry condition <sup>(2)</sup>													

- The industrial standards contains the same provisions in the Guidance, resulting in a double deduction, so revision is necessary.

# Amendments of the Rules

(For external opinion inquiry)

Guidance on Strength Assessment of Container ships  
Considering the Whipping Effect



2024. 2.

Hull Rule Development Team

## – Major revisions –

### 1. Modification of loading conditions for whipping evaluation (container ship)

- Present: “ ... the hogging longitudinal bending moment is close to design bending moment in the full load condition.”
- Reason for modification: It is difficult to select the loading condition that simultaneously satisfy the full load condition and the maximum hogging bending moment condition.
- Amendment: Unification of relatively important maximum still water hogging bending moment condition.

Present	Amendment	Note
<p style="text-align: center;"><b>CHAPTER 1 GENERAL &lt;omitted&gt;</b></p> <p style="text-align: center;"><b>CHAPTER 2 Selection of design wave and dominant sea state</b></p> <p style="text-align: center;"><b>Section 1 General</b></p> <p>101. General &lt;omitted&gt;</p> <p>102. Loading condition</p> <ol style="list-style-type: none"> <li>1. For container ships, the loading condition shall be selected <u>where the hogging longitudinal bending moment is close to design bending moment in the full load condition.</u></li> <li>2. For other ships, the loading conditions shall be selected whose longitudinal bending moments in the still water give the maximum sagging and maximum hogging bending moment considering the ballast and full load condition with high operation ratio.</li> </ol> <p>103. Linear load analysis &lt;omitted&gt;</p> <p style="text-align: center;"><b>Section 2 ~ Section 3 &lt;omitted&gt;</b></p> <p style="text-align: center;"><b>CHAPTER 3 Hydro-elastic simulation &lt;omitted&gt;</b></p> <p style="text-align: center;"><b>CHAPTER 4 Evaluation of hull girder strength considering the whipping effect &lt;omitted&gt; ↓</b></p>	<p style="text-align: center;"><b>CHAPTER 1 GENERAL &lt;same as the current Rules&gt;</b></p> <p style="text-align: center;"><b>CHAPTER 2 Selection of design wave and dominant sea state</b></p> <p style="text-align: center;"><b>Section 1 General</b></p> <p>101. General &lt;same as the current Rules&gt;</p> <p>102. Loading condition</p> <ol style="list-style-type: none"> <li>1. For container ships, the loading condition shall be selected <u>whose longitudinal bending moments in the still water give the maximum hogging bending moment</u></li> <li>2. For other ships, the loading conditions shall be selected whose longitudinal bending moments in the still water give the maximum sagging and maximum hogging bending moment considering the ballast and full load condition with high operation ratio.</li> </ol> <p>103. Linear load analysis &lt;same as the current Rules&gt;</p> <p style="text-align: center;"><b>Section 2 ~ Section 3 &lt;same as the current Rules&gt;</b></p> <p style="text-align: center;"><b>CHAPTER 3 Hydro-elastic simulation &lt;same as the current Rules&gt;</b></p> <p style="text-align: center;"><b>CHAPTER 4 Evaluation of hull girder strength considering the whipping effect &lt;same as the current Rules&gt; ↓</b></p>	<p>* It is difficult to select the loading condition that simultaneously satisfy the full load condition and the maximum hogging bending moment condition.</p> <p>Unification of relatively important maximum still water hogging bending moment condition.</p>