

Amendments of the Rules for Low-flashpoint Fuel Ships

(External Opinion Inquiry)

Ch. 4, 5, 6, 11 & 16



2020. 09.

Hull Rule Development Team

– Main Amendments –

(1) Effective Date : 1 July 2020(based on contract date for construction)

- The inspection guidelines for liquefied natural gas fuel containment facilities and inspection requirements in Part 1 of the Rules have been moved.
- Reflection of IGF Code amendment (MSC 101/24/Add.1)
 - Revision of areas subject to installation of pressure relief devices.
 - Addition of requirements for fire extinguishing system in fuel preparation room.
 - Expansion of tensile test targets for undermatch welds of fuel containment system.
- Reflection of internal requests for revision of rules

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 1 ~ 3 <omitted></p> <p style="text-align: center;">CHAPTER 4 CLASSIFICATION AND SURVEYS</p> <p style="text-align: center;">Section 1 ~ 2 <omitted></p> <p style="text-align: center;">Section 3 Periodical Surveys</p> <p>301. ~ 302. <omitted></p> <p>303. Special Survey</p> <p style="padding-left: 20px;">1. ~ 7. <omitted></p> <p style="padding-left: 20px;">8. Fuel Storage Tanks</p> <p style="padding-left: 40px;"><u>Fuel storage tanks are to be examined in accordance with an approved survey plan. Liquefied gas fuel storage tanks are to be examined based upon Guidance.</u> ↓ <newly added></p>	<p style="text-align: center;">CHAPTER 1 ~ 3 <same as the present></p> <p style="text-align: center;">CHAPTER 4 CLASSIFICATION AND SURVEYS</p> <p style="text-align: center;">Section 1 ~ 2 <same as the present></p> <p style="text-align: center;">Section 3 Periodical Surveys</p> <p>301. ~ 302. <same as the present></p> <p>303. Special Survey</p> <p style="padding-left: 20px;">1. ~ 7. <same as the present></p> <p style="padding-left: 20px;">8. Fuel Storage Tanks</p> <p style="padding-left: 40px;"><u>Fuel storage tanks are to be examined in accordance with an approved survey plan that includes the following inspection items.</u></p> <p style="padding-left: 40px;">(1) <u>All Fuel tanks are to be examined internally. Vacuum insulated independent fuel storage tanks of type C without access openings need not be examined internally. Where fitted, the vacuum monitoring system should be examined and records should be reviewed.</u></p> <p style="padding-left: 40px;">(2) <u>Special attention is to be given to the fuel tank and insulation in way of chocks, supports and keys. The tank insulation and tank support arrangements should be visually examined. Removal of insulation may be required in order to verify the condition of the tank or the insulation itself if found necessary by the Surveyor. Non-destructive testing may be required if conditions raise doubt to the structural integrity.</u></p>	<p>- Reflection of IACS Rec. 148(rev.1) and transfer from Guidance to Rules.</p>

Present	Amendment	Note
<p>(newly added)</p>	<p>Where the arrangement is such that the insulation cannot be examined, the surrounding structures of wing tanks, double bottom tanks and cofferdams are to be examined for cold spots when the fuel tanks are in the cold condition unless voyage records together with the instrumentation give sufficient evidence of the integrity of the insulation system.</p> <p>(3) Non-destructive testing:</p> <p>(A) Non-destructive testing is to supplement fuel tank inspection with special attention to be given to the integrity of the main structural members, tank shell and highly stressed parts, including welded connections as deemed necessary by the surveyor. However, for type C tanks, this does not mean that non-destructive testing can be dispensed with totally. The following items are, inter alia, considered as highly stressed parts:</p> <ul style="list-style-type: none"> - fuel tanks supports and anti-rolling/anti-pitching devices - web frames or stiffening rings - swash bulkhead boundaries - dome and stump connections to tank shell - foundations for pumps, towers, ladders, etc. - pipe connections <p>(B) For independent tanks type B, the extent of non-destructive testing shall be as given in a programme specially prepared for the fuel tank design.</p> <p>(4) The tightness of all fuel tanks is to be verified by an appropriate procedure. Provided that the effectiveness of the ship's gas detection equipment has been confirmed, it will be acceptable to utilize this equipment for the tightness test of independent tanks below deck.</p> <p>(5) Where findings of (1) to (4) or an examination of the voyage records raises doubts as to the structural integrity of a fuel tank, a hydraulic or hydro-pneumatic test is to be carried out. For independent tank type A and B, the test pressure is to be carried out in accordance with proper pressure based on design of each tank. For independent tanks type C, the test pressure is not to be less than 1.25 times the MARVS.</p> <p>(6) At every other special survey (i.e., 2nd, 4th, 6th, etc.), all independent fuel tanks type C are to be either:</p> <p>(A) Hydraulically or hydro-pneumatically tested to 1.25 times MARVS, followed by nondestructive testing in accordance with (3) (A), or</p>	

Present	Amendment	Note
<p>(newly added)</p>	<p><u>(B) Subjected to a thorough, planned non-destructive testing. This testing is to be carried out in accordance with a programme specially prepared for the tank design. If a special programme does not exist, the following applies:</u></p> <ul style="list-style-type: none"> - <u>fuel tank supports and anti-rolling/anti-pitching devices,</u> - <u>stiffening rings,</u> - <u>Y-connections between tank shell and a longitudinal bulk-head of bilobe tanks,</u> - <u>swash bulkhead boundaries,</u> - <u>dome and sump connections to the tank shell,</u> - <u>foundations for pumps, towers, ladders etc.,</u> - <u>pipe connections.</u> <p><u>At least 10% of the length of the welded connections in each of the above mentioned areas is to be tested. This testing is to be carried out internally and externally as applicable. Insulation is to be removed as necessary for the required non-destructive testing.</u></p> <p><u>(7) As far as practicable all hold spaces and hull insulation (if provided), secondary barriers and tank supporting structures are to be visually examined. The secondary barrier of all tanks is to be checked for their effectiveness by means of a pressure/vacuum test, a visual examination or another acceptable method.</u></p> <p><u>(8) Membrane tanks systems.</u></p> <p><u>(A) For membrane tank systems, inspection and testing are to be carried out in accordance with programmes specially prepared in accordance with an approved method for the actual tank system.</u></p> <p><u>(B) For membrane storage systems a tightness test of the primary and secondary barrier shall be carried out in accordance with the system designers' procedures and acceptance criteria as approved by the classification society. Low differential pressure tests may be used for monitoring the fuel storage system performance, but are not considered an acceptable test for the tightness of the secondary barrier.</u></p> <p><u>(C) For membrane storage systems with glued secondary barriers if the designer's threshold values are exceeded, an investigation is to be carried out and additional testing such as thermographic or acoustic emissions testing should be carried out.</u></p>	

Present	Amendment	Note
<p data-bbox="159 204 327 233"><newly added></p>	<p data-bbox="1068 204 1888 323">(9) <u>The pressure/vacuum relief valves, rupture disc and other pressure relief devices for interbarrier spaces and hold spaces are to be opened, examined, tested and readjusted as necessary, depending on their design.</u></p> <p data-bbox="1068 328 1888 695">(10) <u>The pressure relief valves for the fuel tanks are to be opened for examination, adjusted, function tested, and sealed. If the fuel tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, such non-metallic membranes are to be replaced. Where a proper record of continuous overhaul and retesting of individually identifiable relief valves is maintained, consideration will be given to acceptance on the basis of opening, internal examination, and testing of a representative sampling of valves, including each size and type of liquefied gas or vapor relief valve in use, provided there is logbook evidence that the remaining valves have been overhauled and tested since crediting of the previous Special Survey. ↓</u></p>	

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 5 SHIP DESIGN AND ARRANGEMENT</p> <p style="text-align: center;">Section 1 ~ 2 <omitted></p> <p style="text-align: center;">Section 3 Arrangement of Fuel Tanks</p> <p>301. <omitted></p> <p>302. Location of fuel tanks</p> <p>1. <omitted></p> <p>2. As an alternative to 1 (1) above, the following calculation method may be used to determine the acceptable location of the fuel tanks:</p> <p>(1) <omitted></p> <p>(2) The f_{CN} is calculated by the following formulation:</p> $f_{CN} = f_l \times f_t \times f_v$ <p>where:</p> <p>f_l = <omitted></p> <p>f_t = <omitted></p> <p>f_v = the calculated value by use of the formulations for factor v contained in SOLAS II-1/7-2.6.1.1 and reflects <u>the probability that the damage is not extending vertically above the lowermost boundary of the fuel tank.</u> The formulations to be used are:</p> <p><omitted></p> <p>(3) ~ (8) <omitted></p>	<p style="text-align: center;">CHAPTER 5 SHIP DESIGN AND ARRANGEMENT</p> <p style="text-align: center;">Section 1 ~ 2 <same as the present></p> <p style="text-align: center;">Section 3 Arrangement of Fuel Tanks</p> <p>301. <same as the present></p> <p>302. Location of fuel tanks</p> <p>1. <omitted></p> <p>2. As an alternative to 1 (1) above, the following calculation method may be used to determine the acceptable location of the fuel tanks:</p> <p>(1) <omitted></p> <p>(2) The f_{CN} is calculated by the following formulation:</p> $f_{CN} = f_l \times f_t \times f_v$ <p>where:</p> <p>f_l = <omitted></p> <p>f_t = <omitted></p> <p>f_v = the calculated value by use of the formulations for factor v contained in SOLAS II-1/7-2.6.1.1 and reflects <u>the probability that the damage is extending vertically above the lowermost boundary of the fuel tank.</u> The formulations to be used are:</p> <p><omitted></p> <p>(3) ~ (8) <omitted></p>	<p>- Reflection of IGF 2019 Amendment(Res.MSC458(101))</p>

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 6 FUEL CONTAINMENT SYSTEM</p> <p style="text-align: center;">Section 1 ~ 6 <omitted></p> <p style="text-align: center;">Section 7 Pressure Relief System</p> <p>701. General</p> <p>1. All fuel storage tanks are to be provided with a pressure relief system appropriate to the design of the fuel containment system and the fuel being carried. <u>Fuel storage hold spaces, interbarrier spaces, tank connection spaces and tank cofferdams</u>, which may be subject to pressures beyond their design capabilities, are to also be provided with a suitable pressure relief system. Pressure control systems specified in 901, are to be independent of the pressure relief systems.</p> <p>2. <omitted></p> <p>702. ~ 703. <omitted></p> <p style="text-align: center;">Section 8 ~ 14 <omitted></p> <p style="text-align: center;">CHAPTER 7 ~ 10 <omitted></p>	<p style="text-align: center;">CHAPTER 6 FUEL CONTAINMENT SYSTEM</p> <p style="text-align: center;">Section 1 ~ 6 <same as the present></p> <p style="text-align: center;">Section 7 Pressure Relief System</p> <p>701. General</p> <p>1. All fuel storage tanks are to be provided with a pressure relief system appropriate to the design of the fuel containment system and the fuel being carried. <u>Fuel storage hold spaces, interbarrier spaces and tank connection spaces</u>, which may be subject to pressures beyond their design capabilities, are to also be provided with a suitable pressure relief system. Pressure control systems specified in 901, are to be independent of the pressure relief systems.</p> <p>2. <same as the present></p> <p>702. ~ 703. <same as the present></p> <p style="text-align: center;">Section 8 ~ 14 <same as the present></p> <p style="text-align: center;">CHAPTER 7 ~ 10 <same as the present></p>	<p>- Reflection of draft amendment of IGF Code(MSC 101/24/Add.1 Annex 14)</p>

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 11 FIRE SAFETY</p> <p style="text-align: center;">Section 1 ~ 2 <omitted></p> <p style="text-align: center;">Section 3 Fire Protection</p> <p>301. Fire protection</p> <p>1. ~ 2. <omitted></p> <p>3. The space containing fuel containment system is to be separated from the machinery spaces of category A or other rooms with high fire risks. The separation is to be done by a cofferdam of at least 900 mm with insulation of A-60 class. When determining the insulation of the space containing fuel containment system from other spaces with lower fire risks, the fuel containment system is to be considered as a machinery space of category A, <u>in accordance with SOLAS regulation II-2/9</u>. The boundary between spaces containing fuel containment systems is to be either a cofferdam of at least 900 mm or A-60 class division. For type C tanks, the fuel storage hold space may be considered as a cofferdam.</p> <p>4. ~ 7. <omitted></p> <p style="text-align: center;">Section 4 ~ 7 <omitted></p> <p style="text-align: center;"><newly added></p>	<p style="text-align: center;">CHAPTER 11 FIRE SAFETY</p> <p style="text-align: center;">Section 1 ~ 2 <same as the present></p> <p style="text-align: center;">Section 3 Fire Protection</p> <p>301. Fire protection</p> <p>1. ~ 2. <same as the present></p> <p>3. The space containing fuel containment system is to be separated from the machinery spaces of category A or other rooms with high fire risks. The separation is to be done by a cofferdam of at least 900 mm with insulation of A-60 class. When determining the insulation of the space containing fuel containment system from other spaces with lower fire risks, the fuel containment system is to be considered as a machinery space of category A, <u>in accordance with the requirements of Pt 8. Ch 7 of Rules for the classification of steel ships</u>. The boundary between spaces containing fuel containment systems is to be either a cofferdam of at least 900 mm or A-60 class division. For type C tanks, the fuel storage hold space may be considered as a cofferdam.</p> <p>4. ~ 7. <same as the present></p> <p style="text-align: center;">Section 4 ~ 7 <same as the present></p> <p style="text-align: center;"><u>Section 8 Fuel Preparation Room Fire-extinguishing Systems</u></p> <p><u>801. Fuel preparation room fire-extinguishing systems</u></p> <p><u>Fuel preparation rooms containing pumps, compressors or other potential ignition sources shall be provided with a fixed fire-extinguishing system complying with the provisions of SOLAS II-2/10.4.1.1 and taking into account the necessary concentrations/application rate required for extinguishing gas fires.</u></p>	<p>- Reflection of draft amendment of IGF Code(MSC 101/24/Add.1 Annex 14)</p>

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 12 ~ 15 <omitted></p> <p style="text-align: center;">CHAPTER 16 MANUFACTURE WORKMANSHIP AND TESTING</p> <p style="text-align: center;">Section 1 ~ 2 <omitted></p> <p style="text-align: center;">Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System</p> <p>301. ~ 302. <omitted></p> <p>303. Welding procedure tests for fuel tanks and process pressure vessels</p> <p>1. ~ 4. <omitted></p> <p>5. Each test is to satisfy the following:</p> <p>(1) tensile tests: cross-weld tensile strength is not to be less than the specified minimum tensile strength for the appropriate parent materials. <u>For aluminium alloys, reference is to be made to Ch 6, 412. 1 (1) (C) with regard to the regulations for weld metal strength of under-matched welds (where the weld metal has a lower tensile strength than the parent metal). In every case, the position of fracture is to be recorded for information;</u></p> <p>(2) ~ (3) <omitted></p> <p>6. <omitted></p> <p>304. ~ 306. <omitted></p> <p style="text-align: center;">Section 4 ~ 7 <omitted></p> <p style="text-align: center;">CHAPTER 17 ~ 18 <omitted></p>	<p style="text-align: center;">CHAPTER 12 ~ 15 <same as the present></p> <p style="text-align: center;">CHAPTER 16 MANUFACTURE WORKMANSHIP AND TESTING</p> <p style="text-align: center;">Section 1 ~ 2 <same as the present></p> <p style="text-align: center;">Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System</p> <p>301. ~ 302. <same as the present></p> <p>303. Welding procedure tests for fuel tanks and process pressure vessels</p> <p>1. ~ 4. <same as the present></p> <p>5. Each test is to satisfy the following:</p> <p>(1) tensile tests: cross-weld tensile strength is not to be less than the specified minimum tensile strength for the appropriate parent materials. <u>For material such as aluminium alloys, reference is to be made to Ch 6, 412. 1 (1) (C) with regard to the regulations for weld metal strength of under-matched welds (where the weld metal has a lower tensile strength than the parent metal). In every case, the position of fracture is to be recorded for information;</u></p> <p>(2) ~ (3) <omitted></p> <p>6. <same as the present></p> <p>304. ~ 306. <same as the present></p> <p style="text-align: center;">Section 4 ~ 7 <same as the present></p> <p style="text-align: center;">CHAPTER 17 ~ 18 <same as the present></p>	<p>- Reflection of draft amendment of IGF Code(MSC 101/24/Add.1 Annex 14)</p>

RULES FOR CLASSIFICATION(STEEL SHIPS)

(Guidance for the Classification of Ships Using Low-flashpoint Fuels)

- External Opinion Inquiry -

2020.09.



Hull Rule Development Team

- Main Amendments -

(1) Enter into force on 1 July 2021 (the contract date for ship construction)

● To reflect Request for Establishment/Revision of Classification Technical Rules

- To insert UT standard

Present	Amendment	Reason
<p align="center">Chapter 1 ~ Chapter 15 <Omitted></p> <p align="center">Chapter 16 Manufacture, Workmanship and Testing</p> <p align="center">Section 1 ~ Section 2 <Omitted></p> <p align="center">Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System</p> <p>301. ~ 305. <Omitted></p> <p>306. Non-destructive testing [See Rules]</p> <p>1. In applying 306. 1 of this Rules, the following requirements (1) through (4) are to apply as the testing procedures.</p> <p>(1) <Omitted></p> <p>(2) For ultrasonic tests, the requirements in KS D 0250 apply correspondingly.</p> <p>(3) ~(4) <Omitted></p> <p><Below Omitted></p>	<p align="center">Chapter 1 ~ Chapter 15 <Same as the present Guidance></p> <p align="center">Chapter 16 Manufacture, Workmanship and Testing</p> <p align="center">Section 1 ~ Section 2 <Same as the present Guidance></p> <p align="center">Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System</p> <p>301. ~ 305. <Same as the present Guidance></p> <p>306. Non-destructive testing [See Rules]</p> <p>1. In applying 306. 1 of this Rules, the following requirements (1) through (4) are to apply as the testing procedures.</p> <p>(1) <same as the present Guidance></p> <p>(2) For ultrasonic tests, the requirements <u>in KS B 0896 for cargo tanks and process pressure vessels and</u> in KS D 0250 <u>for piping</u> apply correspondingly.</p> <p>(3) ~(4) <same as the present Guidance></p> <p><Below same as the present Guidance></p>	<p>Reflection of Request for Revision of Classification Technical Rules</p>

RULES FOR CLASSIFICATION OF SHIPS USING LOW-FLASHPOINT FUELS

(Development Review : For external opinion inquiry)

2020. 9.



Machinery Rule Development Team

- Main Amendments -

(1) Effective date : 1 July 2021 (Date of which contracts for construction are signed)

- The application for ships less than 500 tons gross tonnage using LNG as fuel and having a restricted to domestic service has been added.
- The application for ships using methyl/ethyl alcohol as fuel has been added
- The notations for ships using methyl/ethyl alcohol as fuel has been added.
- The requirements of Periodical Surveys have been amended.

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p style="text-align: center;">Section 1 General</p> <p>101. Application</p> <p>1. This Rules applies to ships using low-flashpoint fuels. However, does not apply to the ships specified in the following.</p> <p>(1) Ships carrying liquefied gases in bulk using their cargoes as fuel and complying with the requirements of Pt 7, Ch 5 of Rules for the classification of steel ships</p> <p>(2) Ships carrying liquefied gases in bulk using other low-flashpoint gaseous fuels provided that the fuel storage and distribution systems design and arrangements for such gaseous fuels comply with the requirements of Pt 7, Ch 5 of Rules for the classification of steel ships .</p> <p>(3) <newly added></p> <p>2. <u>Notwithstanding the requirement specified in 1, for the ships specified in the following (1) or (2), some requirements of this Rules may be modified, as appropriate.</u></p> <p>(1) ships to which SOLAS II-1 does not apply; or</p> <p>(2) <u>ships which are subjected to Korean Ship Safety Act and Notification having a restricted to domestic service.</u></p> <p>3. Ch 5 to Ch 15 of this Rules applies to ships using natural gas as fuel, either in its liquefied or gaseous state.</p> <p>4. <newly added></p> <p>4. In addition to the requirements in this Rules, they meet other related requirements in Rules for the classification of steel ships.</p>	<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p style="text-align: center;">Section 1 General</p> <p>101. Application</p> <p>1. This Rules applies to ships using low-flashpoint fuels. However, does not apply to the ships specified in the following.</p> <p>(1) Ships carrying liquefied gases in bulk using their cargoes as fuel and complying with the requirements of Pt 7, Ch 5 of Rules for the classification of steel ships</p> <p>(2) Ships carrying liquefied gases in bulk using other low-flashpoint gaseous fuels provided that the fuel storage and distribution systems design and arrangements for such gaseous fuels comply with the requirements of Pt 7, Ch 5 of Rules for the classification of steel ships.</p> <p>(3) <u>Notwithstanding the requirement specified in (1) and (2), some requirements of this rules may be applied if specified in Pt 7, Ch 5 of Rules for the classification of steel ships. (2021)</u></p> <p>2. Notwithstanding the requirement specified in 1, For the ships specified in the following (1) or (2), some requirements of this Rules may be modified, as appropriate; (2021)</p> <p>(1) ships to which SOLAS II-1 does not apply; or</p> <p>(2) <u>ships less than 500 tons gross tonnage using LNG as fuel and having a restricted to domestic service. In this case, Annex X may applied in lieu of the relevant requirements.</u></p> <p>3. Ch 5 to Ch 15 of this Rules applies to ships using natural gas as fuel, either in its liquefied or gaseous state.</p> <p>4. Annex Y applies to ships using methyl/ethyl alcohol as fuel. (2021)</p> <p>5. In addition to the requirements in this Rules, they meet other related requirements in Rules for the classification of steel ships.</p>	<p>(amendment)</p> <p>– Some of this Rules is quoted in Pt 7, Ch 5 of Rules for the classification of steel ships.</p> <p>–Newly added the requirements for small LNG fueled ships</p> <p>–Newly added the requirements for methyl/ethyl alcohol fueled ships</p>

Present	Amendment	Note
<p>CHAPTER 4 CLASSIFICATION AND SURVEYS</p> <p>Section 1 <omitted></p> <p>Section 2 Classification</p> <p>201. Class notations</p> <p>Ships satisfying the requirements of this Rules may be given a notation "LFFS" as additional special feature notations and details are as follows. <i>(2020)</i></p> <ol style="list-style-type: none"> 1. LFFS(DF-LNG): Dual fuel engines using LNG as fuel are installed 2. LFFS(SF-LNG): Single fuel engines using LNG as fuel are installed 3. ~ 7. <newly added> 	<p>CHAPTER 4 CLASSIFICATION AND SURVEYS</p> <p>Section 1 <omitted></p> <p>Section 2 Classification</p> <p>201. Class notations</p> <p>Ships satisfying the requirements of this Rules may be given a notation "LFFS" as additional special feature notations and details are as follows. <i>(2021)</i></p> <ol style="list-style-type: none"> 1. LFFS(DF-LNG): Dual fuel engines using LNG as fuel are installed 2. LFFS(SF-LNG): Single fuel engines using LNG as fuel are installed 3. <u>LFFS(DF-Methyl): Dual fuel engines using methyl alcohol as fuel are installed</u> 4. <u>LFFS(SF-Methyl): Single fuel engines using methyl alcohol as fuel are installed</u> 5. <u>LFFS(DF-Ethyl): Dual fuel engines using ethyl alcohol as fuel are installed</u> 6. <u>LFFS(SF-Ethyl): Single fuel engines using ethyl alcohol as fuel are installed</u> 7. <u>Ships applying Annex X may be given a notation "LFFS*"</u>. 	<p>(amendment)</p> <p>– New notations have been added.</p>

Present	Amendment	Note
<p style="text-align: center;">Section 3 Periodical Surveys</p> <p>301. Annal Survey The following is to be carried out during the survey of the Fuel Storage, Fuel Bunkering System and Fuel Supply System.</p> <p>1. ~ 2. <omitted></p> <p>3. Control, Monitoring and Safety Systems (1) ~ (2) <omitted> (3) Operational test, as far as practicable, of the shutdown of ESD protected machinery spaces.</p> <p>4. Fuel Handling Piping, Machinery and Equipment <u>Piping, hoses, emergency shut-down valves, remote operating valves, relief valves, machinery and equipment for fuel storage, fuel bunkering, and fuel supply such as venting, compressing, refrigerating, liquefying, heating, cooling or otherwise handling the fuel is to be examined, as far as practicable. Means for inerting is to be examined. Stopping of pumps and compressors upon emergency shut-down of the system is to be confirmed as far as practicable.</u></p> <p>5. ~ 7. <omitted></p>	<p style="text-align: center;">Section 3 Periodical Surveys</p> <p>301. Annal Survey The following is to be carried out during the survey of the Fuel Storage, Fuel Bunkering System and Fuel Supply System.</p> <p>1. ~ 2. <same as the present></p> <p>3. Control, Monitoring and Safety Systems (1) ~ (2) <omitted> (3) Operational test, as far as practicable, of the shutdown of ESD protected machinery spaces. <u>As a minimum, the operational test is include the following. (2021)</u> <u>(A) Gas detectors and fire detectors</u> <u>(B) Function of ventilation system</u> <u>(C) Safety functions in connection with the ventilation systems in machinery space</u> <u>(D) Function of ventilation system</u></p> <p>4. Fuel Handling Piping, Machinery and Equipment (2021) (1) Fuel handling piping <u>(A) Piping, hoses, double wall piping or duct are to be external examined without dismantling of insulation as far as practicable. Removal of insulation for examination may be required if deemed necessary by the attending Surveyor.</u> <u>(B) Emergency shut-down valves and remote operating valves are to be external examined and function-tested.</u> <u>(C) Relief valves of fuel piping are to be external examined.</u> <u>(D) Disconnection of all electrical equipment or installations not of a certified safe type</u> (2) Machinery and Equipment <u>(A) Machinery and equipment for fuel storage, fuel bunkering, and fuel supply such as venting, compressing, refrigerating, liquefying, heating, cooling or otherwise handling the fuel is to be examined, as far as practicable.</u> <u>(B) Means for inerting is to be examined.</u> <u>(C) Stopping of pumps and compressors upon emergency shut-down of the system is to be confirmed as far as practicable.</u></p> <p>5. ~ 7. <same as the present></p>	<p>(amendment)</p> <p>– The survey items have been amended and specified details.</p>

Present	Amendment	Note
<p>8. Electrical Bonding Electrical bonding arrangements in hazardous areas, including bonding straps where fitted, are to be examined.</p> <p>9. ~ 11. <omitted> 12. <newly added></p> <p>302. Intermediate Survey At the Intermediate Survey, in addition to all the requirements for Annual Survey, the following items are to be surveyed.</p> <p>1. Safety Systems Gas detectors, temperature sensors, pressure sensors, level indicators, and other equipment providing input to the fuel safety system are to be randomly tested to confirm satisfactory operating condition. Proper response of the fuel safety system upon fault conditions is to be verified.</p> <p style="text-align: center;">CHAPTER 13 VENTILATION Section 1 ~ Section 3 Section 4 Tank Connection Space</p> <p>401. Tank connection space 1. <omitted> 2. <u>Approved</u> automatic fail-safe fire dampers are to be fitted in the ventilation trunk for the tank connection space.</p>	<p>8. Electrical Bonding <u>(1) Electrical bonding arrangements in hazardous areas, including bonding straps where fitted, are to be examined.</u> <u>(2) Electrical bonding for gas piping is to be examined where applicable. (2021)</u></p> <p>9. ~ 11. <same as the present></p> <p>12. Water spray systems (2021) <u>Water spray systems are to be surveyed.</u></p> <p>302. Intermediate Survey At the Intermediate Survey, in addition to all the requirements for Annual Survey, the following items are to be surveyed.</p> <p>1. Safety Systems <u>(1) Gas detectors, temperature sensors, pressure sensors, level indicators, and other equipment providing input to the fuel safety system are to be randomly tested to confirm satisfactory operating condition.</u> <u>(2) Proper response of the fuel safety system upon fault conditions is to be verified.</u> <u>(3) Alarms and shutdown function for gas compressor and engine are to be verified. (2021)</u></p> <p style="text-align: center;">CHAPTER 13 VENTILATION Section 1 ~ Section 3 Section 4 Tank Connection Space</p> <p>401. Tank connection space 1. <omitted> 2. <u>Type approved</u> automatic fail-safe fire dampers are to be fitted in the ventilation trunk for the tank connection space. <u>(2021)</u></p>	<p>(amendment)</p> <p>- The survey items have been amended and specified details.</p>

GUIDANCES RELATING TO THE RULES FOR CLASSIFICATION OF SHIPS USING LOW-FLASHPOINT FUELS

(external opinion inquiry)



2021.02.

Machinery Rule Development Team

- Main Amendments -

(1) Effective date : 1 July 2021 (Ships for which contracts for construction are signed)

- Has been added the definition of access openings of vacuum insulated independent fuel storage tanks
- Has been added requirements for approval of nozzles for water spray systems
- Reflection of MET4600-320-2020
 - Improvement of excessive requirements for inspection items
- Reflection of MET4600-6-2021
 - Improvement of excessive requirements of material for equipment

Present	Amendment	Note
<p>Annex 1 Requirements for Equipment Used for Low-flashpoint Fuel Supply Systems</p> <p>Section 2 Centrifugal Gas Compressors</p> <p>201. ~ 202. <omitted></p> <p>203. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts</u> and power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships.</p> <p>2. ~ 4. <omitted></p> <p>204. <omitted></p> <p>205. Strength</p> <p>1. <omitted></p> <p>2. Strength of impeller shaft is to be in accordance with Pt 5, Ch 3, 303. of Rules for the Classification of Steel Ships.</p> <p>206. ~ 207. <omitted></p> <p>208. Tests and inspections</p> <p>1. <omitted></p> <p><u>2. The assembled compressor (including end seals) is to be tested for gas leakage with helium or nitrogen at the design pressure. However, for compressors handling gases with molar mass equal to or less than 12, helium is to be used for the test.</u></p> <p><u>3. After assembly, a operation test including performance test is to be performed and overspeed test is to be performed at not less than 115% of maximum continuous speed.</u></p>	<p>Annex 1 Requirements for Equipment Used for Low-flashpoint Fuel Supply Systems</p> <p>Section 2 Centrifugal Gas Compressors</p> <p>201. ~ 202. <same as the present></p> <p>203. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts</u> and power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships. <u>The materials used for essential parts are to be manufactured by the manufacturer approved by the Society and complied with Korean Industrial Standards or equivalent, unless the Society specially considers necessary. (2021)</u></p> <p>2. ~ 4. <same as the present></p> <p>204. <same as the present></p> <p>205. Strength</p> <p>1. <same as the present></p> <p>2. Strength of impeller shaft is to be in accordance with Pt 5, Ch 6, 101. 5 (2) of Rules for the Classification of Steel Ships. <i>(2021)</i></p> <p>206. ~ 207. <same as the present></p> <p>208. Tests and inspections <i>(2021)</i></p> <p>1. <omitted></p> <p>2. The assembled compressor (including end seals) is to be tested for gas leakage with helium or nitrogen at the design pressure. However, for compressors handling gases with molar mass equal to or less than 12, helium is to be used for the test.</p> <p><u>2. After assembly and before installation on board, capacity tests of gas compressors are to be carried out at design condition and function tests for safety devices and alarm devices are to be carried out.</u></p>	<p>(amendment)</p> <p>–Improvement of excessive requirements of material for equipment</p> <p>–Improvement of excessive requirements for inspection items</p>

Present	Amendment	Note
<p style="text-align: center;">Section 3 Reciprocating Gas Compressors</p> <p>301. ~ 302. <omitted></p> <p>303. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts and</u> power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships.</p> <p>2. ~ 4. <omitted></p> <p>304. ~ 308. <omitted></p> <p>309. Tests and inspections</p> <p>1. Parts subject to internal pressure are to be subjected to hydraulic test at the pressure of 1.5 times the design pressure.</p> <p><u>2. Cylinders are to be leak-tested with helium or nitrogen at the design pressure without liners, but with cylinder covers, valve covers, etc. to ensure no leakage at connection parts. However, for compressors handling gases with molar mass equal to or less than 12, helium is to be used for the test.</u></p> <p><u>3. After assembly, a operation test including performance test is to be performed before installation on board.</u></p>	<p style="text-align: center;">Section 3 Reciprocating Gas Compressors</p> <p>301. ~ 302. <same as the present></p> <p>303. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for pressure-bearing parts and power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships. <u>The materials used for essential parts are to be manufactured by the manufacturer approved by the Society and complied with Korean Industrial Standards or equivalent, unless the Society specially considers necessary. (2021)</u></p> <p>2. ~ 4. <same as the present></p> <p>304. ~ 308. <same as the present></p> <p>309. Tests and inspections (2021)</p> <p>1. Parts subject to internal pressure are to be subjected to hydraulic test at the pressure of 1.5 times the design pressure.</p> <p>2. Cylinders are to be leak-tested with helium or nitrogen at the design pressure without liners, but with cylinder covers, valve covers, etc. to ensure no leakage at connection parts. However, for compressors handling gases with molar mass equal to or less than 12, helium is to be used for the test.</p> <p><u>2. After assembly and before installation on board, capacity tests of gas compressors are to be carried out at design condition and function tests for safety devices and alarm devices are to be carried out.</u></p>	<p>(amendment)</p> <p>-Has been amended for requirements of material for equipment</p> <p>-Improvement of excessive requirements for inspection items</p>

Present	Amendment	Note
<p style="text-align: center;">Section 4 Screw Gas Compressors</p> <p>401. ~ 402. <omitted></p> <p>403. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts and</u> power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships.</p> <p>2. ~ 4. <omitted></p> <p>404. ~ 407. <omitted></p> <p>408. Tests and inspections</p> <p>1. Parts subject to internal pressure are to be subjected to hydraulic test at the pressure of 1.5 times the design pressure.</p> <p>2. <u>The assembled compressor (including end seals) is to be tested for gas leakage with helium or nitrogen at the design pressure. However, for compressors handling gases with molar mass equal to or less than 12, helium is to be used for the test.</u></p> <p>3. <u>After assembly, a operation test including performance test is to be performed.</u></p>	<p style="text-align: center;">Section 4 Screw Gas Compressors</p> <p>401. ~ 402. <same as the present></p> <p>403. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for pressure-bearing parts and power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships. <u>The materials used for essential parts are to be manufactured by the manufacturer approved by the Society and complied with Korean Industrial Standards or equivalent, unless the Society specially considers necessary. (2021)</u></p> <p>2. ~ 4. <same as the present></p> <p>404. ~ 407. <same as the present></p> <p>408. Tests and inspections (2021)</p> <p>1. Parts subject to internal pressure are to be subjected to hydraulic test at the pressure of 1.5 times the design pressure.</p> <p>2. The assembled compressor (including end seals) is to be tested for gas leakage with helium or nitrogen at the design pressure. However, for compressors handling gases with molar mass equal to or less than 12, helium is to be used for the test.</p> <p>2. <u>After assembly and before installation on board, capacity tests of gas compressors are to be carried out at design condition and function tests for safety devices and alarm devices are to be carried out.</u></p>	<p>(amendment) -Has been amended for requirements of material for equipment</p> <p>-Improvement of excessive requirements for inspection items</p>

Present	Amendment	Note
<p style="text-align: center;">Section 5 Centrifugal Pumps</p> <p>501. ~ 502. <omitted></p> <p>503. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts and</u> power transmission shafts of prime mover having output of 100 kW and above are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships.</p> <p>2. ~ 4. <omitted></p>	<p style="text-align: center;">Section 5 Centrifugal Pumps</p> <p>501. ~ 502. <same as the present></p> <p>503. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts and</u> power transmission shafts of prime mover having output of 100 kW and above are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships. <u>The materials used for essential parts are to be manufactured by the manufacturer approved by the Society and complied with Korean Industrial Standards or equivalent, unless the Society specially considers necessary. (2021)</u></p> <p>2. ~ 4. <same as the present></p>	<p>(amendment) -Has been amended for requirements of material for equipment</p>
<p style="text-align: center;">Section 6 Reciprocating Pumps</p> <p>601. ~ 602. <omitted></p> <p>603. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts and</u> power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships.</p> <p>2. ~ 4. <omitted></p>	<p style="text-align: center;">Section 6 Reciprocating Pumps</p> <p>601. ~ 602. <omitted></p> <p>603. Material</p> <p>1. Materials used for main structural parts are to be suitable for their respective working conditions, such as service temperatures, pressures, etc. In addition, materials to be used for <u>pressure-bearing parts and</u> power transmission shafts of prime mover having output of 100 kW are to be in accordance with relevant requirements in Pt 2, Ch 1 of Rules for the Classification of Steel Ships. <u>The materials used for essential parts are to be manufactured by the manufacturer approved by the Society and complied with Korean Industrial Standards or equivalent, unless the Society specially considers necessary. (2021)</u></p> <p>2. ~ 4. <same as the present></p>	<p>-Has been amended for requirements of material for equipment</p>

RULES FOR CLASSIFICATION(STEEL SHIPS)
(Guidance for the Classification of Ships Using Low-flashpoint Fuels)

- External Opinion Inquiry -

2020.09.



Hull Rule Development Team

- Main Amendments -

(1) Enter into force on 1 July 2021 (the contract date for ship construction)

● To reflect Request for Establishment/Revision of Classification Technical Rules

- To insert UT standard

Present	Amendment	Reason
<p align="center">Chapter 1 ~ Chapter 15 <Omitted></p> <p align="center">Chapter 16 Manufacture, Workmanship and Testing</p> <p align="center">Section 1 ~ Section 2 <Omitted></p> <p align="center">Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System</p> <p>301. ~ 305. <Omitted></p> <p>306. Non-destructive testing [See Rules]</p> <p>1. In applying 306. 1 of this Rules, the following requirements (1) through (4) are to apply as the testing procedures.</p> <p>(1) <Omitted></p> <p>(2) For ultrasonic tests, the requirements in KS D 0250 apply correspondingly.</p> <p>(3) ~ (4) <Omitted></p> <p><Below Omitted></p>	<p align="center">Chapter 1 ~ Chapter 15 <Same as the present Guidance></p> <p align="center">Chapter 16 Manufacture, Workmanship and Testing</p> <p align="center">Section 1 ~ Section 2 <Same as the present Guidance></p> <p align="center">Section 3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System</p> <p>301. ~ 305. <Same as the present Guidance></p> <p>306. Non-destructive testing [See Rules]</p> <p>1. In applying 306. 1 of this Rules, the following requirements (1) through (4) are to apply as the testing procedures.</p> <p>(1) <same as the present Guidance></p> <p>(2) For ultrasonic tests, the requirements <u>in KS B 0896 for cargo tanks and process pressure vessels and in KS D 0250 for piping</u> apply correspondingly.</p> <p>(3) ~ (4) <same as the present Guidance></p> <p><Below same as the present Guidance></p>	<p>Reflection of Request for Revision of Classification Technical Rules</p>

RULES FOR CLASSIFICATION(STEEL SHIPS)
(Guidance for the Classification of Ships Using Low-flashpoint Fuels)

- External Opinion Inquiry -

2021.02.



Hull Rule Development Team

- Main Amendments -

(1) Enter into force on 1 July 2021 (the contract date for ship construction)

● To reflect Request for Establishment/Revision of Classification Technical Rules

- To describe the application of High Manganese Austenitic Steel

Present	Amendment	Reason
<p style="text-align: center;">Annex 4 High manganese austenitic steel for Cryogenic Service(2020)</p> <p style="text-align: center;">Section 1 General</p> <p>101. <Omitted></p> <p>102. Application</p> <p style="padding-left: 20px;">1. <Omitted></p> <p style="padding-left: 20px;">2. <New></p> <p>103. <Below Omitted></p>	<p style="text-align: center;">Annex 4 High manganese austenitic steel for Cryogenic Service(2020)</p> <p style="text-align: center;">Section 1 General</p> <p>101. <Same as the present Guidance></p> <p>102. Application</p> <p style="padding-left: 20px;">1. <Same as the present Guidance></p> <p style="padding-left: 20px;">2. <u>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 administration.</u></p> <p>103. <Below same as the present Guidance></p>	<p>Reflection of Request for Revision of Classification Technical Rules</p>