

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

Dec. 2019



KR

Effective date : 1 Jan. 2020

(1) The date of application for certification of material & welding or the contract date for ship construction

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

Present	Amendment
<p style="text-align: center;">CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS</p> <p style="text-align: center;">Section 1 General<Omitted></p> <p style="text-align: center;">Section 2-1 Rolled Steels</p> <p>201. ~ 202. <Omitted></p> <p>203. Approval tests</p> <p style="padding-left: 20px;">1. ~ 5. <Omitted></p> <p>Table 2.2.1 Approval Test Items for Rolled Steels <Omitted></p> <p>Table 2.2.2 Test Items and Selection of Test Specimens <Omitted></p> <p>204. ~ 205. <Omitted></p>	<p style="text-align: center;">CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS</p> <p style="text-align: center;">Section 1 General<Sames as the present guidance></p> <p style="text-align: center;">Section 2-1 Rolled Steels</p> <p>201. ~ 202. <Sames as the present guidance></p> <p>203. Approval tests</p> <p style="padding-left: 20px;">1. ~ 5. <Sames as the present guidance></p> <p>Table 2.2.1 Approval Test Items for Rolled Steels</p> <p>Table 2.2.2 Test Items and Selection of Test Specimens</p> <p>204. ~ 205. <Sames as the present guidance></p>

Table 2.2.1 Approval Test Items for Rolled Steels (2017) (2018) (2020)

Kinds	grade	Base metal test														Brittle fracture test				Weldability test					Other test			
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	
Rolled steel for hull	<i>A, B</i>	○	○	○		○		○																				
	<i>D</i>	○	○	○		○		○																				
	<i>E</i>	○	○	○		○		○								○		○	○	○	○							
	<i>AH32, AH36, AH40, DH32, DH36, DH40</i>	○	○	○		○		○										○	○	○	○							
	<i>EH32, EH36, EH40, FH32, FH36, FH40</i>	○	○	○		○		○								○	○ ⁽⁷⁾	○	○	○	○							
YP47 steel plates (Sec. 2-4)	<i>EHA7-H</i>	○	○	○		○		○							○ ⁽⁸⁾	○	○	○	○	○	○							
High strength steels for welded structures (Sec. 2-6)	<i>AH43~FH97, FH43~FH70</i>	○	○	○		○		○	○						○	○		○	○	○	○	○						
Rolled steels for low temp. service	<i>RL235A~RL9N490</i>	○	○	○		○		○	○						○	○		○	○	○	○							
Rolled steel for boilers	<i>RSP42~RSP49A</i>	○	○	○		○		○	○										○					○	○			
Rolled steels for pressure vessels	<i>RPV24~RPV50</i>	○	○	○		○		○	○						○				○									
Round bars for chain	<i>RSBC31~RSBC70</i>	○	○	○		○		○	○										○									
Round bars for offshore chains and accessories(6)	<i>RSBCR3, RSBCR3S, RSBCR4, RSBCR4S, RSBCR5</i>	-																										
Rolled steels bar for boilers	<i>RSB42~RSB46</i>	○	○	○		○		○	○																			
Rolled and forged steel carbon bars	<i>RSFB400~RSFB760</i>	○	○	○		○		○	○																			
Rolled and forged steel low alloy steel bars	<i>RSFB600A~RSFB1100A</i>	○	○	○		○		○	○																			
Rolled stainless steels	<i>RSTS304~RSTS347, RSTS31803, RSTS32750</i>	○	○	○		○		○	○																	○		
Stainless clad steel plates	Base metal	<i>A-E</i>																										
	Clad metal	○	○	○		○		○	○																	○	○	
High manganese austenitic steel plates ⁽⁹⁾	<i>HMN40</i>	○	○	○		○		○	○						○	○	○		○	○	○	○			○	○		

Notes

- (1) Where thermo-mechanical controlled processing(TMCP) is performed, tensile test after stress relieving is required in addition to those tests given in table.
- (2) For steel materials with consideration against through thickness properties as specified in **Pt 2, Ch 1.** of the Rules, the tensile test of through thickness direction, microscopic examination for non-metallic inclusions, ultrasonic test are required in addition to those tests given in table.
- (3) For steels other than steel plates, the strain ageing Charpy impact test, NRL drop weight test and CTOD test are not required, unless otherwise specified. However, where cast piece from the continuous casting method is used, the macro-structure of the cast piece and sulphur print test may be required.
- (4) The CTOD test, high temperature tension test and creep test as specified in the Table are performed for the purpose of evaluating low temperature toughness and high temperature characteristics, and these tests may be omitted in case appropriate records prepared by the manufacturer are available or in case the Society deems the test unnecessary.

Table 2.2.1 Approval Test Items for Rolled Steels (continued)

Notes
(5) Additional tests such as large scale brittle fracture tests (Double Tension test, ESSO test, Deep Notch test, etc.) or other tests may be required when deemed necessary by the Society.
(6) The approval test items of round bar for offshore chains and accessories are to be in accordance with Sec. 10-3 .
(7) Brittle crack arrest steel is to be carried out standard ESSO test in accordance with Pt 2, Ch 1, Sec. 2 of the Guidance.
(8) Instead of CTOD test, deep notch test may be carried out.
(9) <u>Base metal test is to include corrosion test(general corrosion test, intergranular corrosion test and stress corrosion cracking test). Weldability test is to include micro structure, bend test and corrosion test(general corrosion test, intergranular corrosion test and stress corrosion cracking test).</u>
(10) Kind of test
(a) Chemical analysis (b) Sulphur print (c) Micro structure (d) Macro structure (e) Ferrite grain size
(f) Hardness test (g) Tensile test (h) Bend test (i) Shearing strength test (j) Charpy impact test
(k) Strain charpy impact test (l) Hydrogen embrittlement test (m) <u>Fatigue test</u>
(n) CTOD test (o) NRL drop weight test (p) Esso test (q) <u>Weldment tensile test</u>
(r) <u>Weldment impact test</u> (s) Max. hardness test (t) Macro structure (u) Hydrogen crack test
(v) <u>Fatigue test</u> (w)High temp. tensile test (x)Creep test (y) Corrosion test (z) Ultrasonic test

Table 2.2.2 Test Items and Selection of Test Specimens (2018) (2019) (2020)

Approval test items		Position of the Sample ⁽⁰⁾	Direction of the test specimens	Approval Testing method	acceptance criteria
Base metal test	Chemical analysis	T(Top)	-	KS D 0228 or equivalent method. Ladle analysis and production analysis(from the tensile test specimens) are to be performed for C, Si, Mn, P, S and other elements as deemed necessary.	The chemical composition by ladle analysis is to comply with the requirements in Pt2, Ch1, Sec3 of the Rules. Excess difference in the chemical compositions between melt analysis and product analysis is not to be accepted.
	Sulphur print	T	T (Transverse)	KS D 0226 or equivalent method. Length is to be greater than 600 mm (cross section in the case of cast piece)	Segregation, etc, deemed to have negative effect are not to be present
	Microscopic exam. for non-metallic inclusion	T	T	ISO 4969 or equivalent method.	Acceptance criteria is the reference.
	Macro structure	T	T	KS D 0204 or equivalent method.	
	Micro structure	T	-	Microscopic photographs (approx. 100x) of base metal, joining part and cladding metal are to be taken	
	Ferrite grain size	T	-	KS D 0205 or equivalent method. Magnification of microscopic photographs are to be as a rule 100x. ⁽²⁾	
	Hardness test	T	-	In accordance with Pt 2 of the Rules. Hardness distribution in the thickness direction is to be measured in the case of stainless clad steel.	To meet the requirements in Pt 2, Ch 1, Sec 3 of the Rules, to be as appropriate by the Society.
	Tensile test	T	T ⁽³⁾	In accordance with Pt 2 of the Rules. ⁽⁴⁾⁽⁵⁾	To meet the requirements in Pt 2, Ch 1, Sec 3 of the Rules.
		B (Bottom)	T ⁽³⁾		
	Tensile test of through thickness direction	T	thickness direction	In accordance with Pt 2 of the Rules	To meet the requirements in Pt 2, Ch 1, Sec 3 of the Rules
		B			
	Tensile test (stress relieved) ⁽⁶⁾	T	T ⁽³⁾	Tensile test after stress relieving at 600°C (2 min/mm with minimum 1 hour holding)	Acceptance criteria is the reference.
		B	T ⁽³⁾		
	Bend test	B	T	In accordance with Pt 2 of the Rules. However, in case of not being prescribed in the Pt 2 , bend test is to be in accordance with recognized national or international standard which the Society considers appropriate.	Defects etc, deemed to have negative effect are not to be present
	Shearing strength test	T	-	In accordance with Pt 2 of the Rules	To meet the requirements in Pt 2, Ch 1, Sec 3 of the Rules
		B			
	V-notch Charpy impact test	T	P (Parallel)	Using R4 test specimen, the transition temperature curve of the absorbed energy and fracture surface ratio is to be determined by testing three pieces at each temperature. ⁽⁸⁾⁽⁹⁾ (also the lateral expansion to be reported.) Furthermore, the test temperature is to include the temperature as specified in Pt 2 of the Rules, and its interval is to be 10~20°C ⁽¹⁰⁾ V-notch Charpy impact test specimens for stainless clad steels are to be taken from the base material.	To meet the requirements in Pt 2 of the Rules. Others are the reference.
T ⁽⁷⁾					
Strain ageing V-notch charpy impact test	T	P	Same as V-notch Charpy impact test. However The test specimens which have been maintained for one hour at 250°C after strain of 5 % have been applied is, as a rule, to be used. ⁽⁸⁾⁽⁹⁾⁽¹¹⁾	Acceptance criteria is the reference.	
Hydrogen embrittlement test	T	P	In accordance with Pt 2, Ch 1, Sec 3 of the Rules	To meet the requirements in Pt 2, Ch 1, Sec 3 of the Rules	
	B	P			
Fatigue test	T	-	Fatigue tests is to be carried out for butt welded joints and is in accordance with Pt7, Chapter 5, 418.2.(4).(B).	S-N curve should be equal to or above D curve in IIW.	

Table 2.2.2 Test Items and Selection of Test Specimens (continued) (2018) (2019)

Approval test items		Position of the Sample	Direction of the test specimens	Approval Testing method	acceptance criteria
Brittle fracture test	CTOD test	T	P	BS 7448 or equivalent. To be consulted with the Society the dimension of test specimen, test condition, etc, when newly performing tests at the time of approval.	Acceptance criteria is the reference.
	NRL drop weight test	T	P ⁽⁷⁾	ASTM E 208 or equivalent method. The NDTT(Non- Ductility transition temperature) is to be determined and photographs of the tested specimens are to be taken and enclosed with the test report.	Acceptance criteria is the reference. However, in case of rolled steels for hull structural, no fracture to be occurred at the impact test temperature specified in Pt 2, Ch 1, 301. of the Rules.
Weldability test	Weldment tensile test	T	T(to the welding direction)	in accordance with the test method described in below 203. 3	in accordance with the test method described in below 203. 3
	Weldment impact test	T			
	Maximum hardness test	T	-		
	Macro structure	T	-		
	Fatigue test	T	<u>T(to the welding direction)</u>	Fatigue tests is to be carried out for butt welded joints and is in accordance with Pt7, Chapter 5, 418.2.(4).(B).	<u>S-N curve should be equal to or above D curve in IIW.</u>
High temp. characteristics tests	High temp. tensile test	T	P	KS D0026 (High temp. tensile test), KS B 0814 (Creep test) or equivalent.. To be consulted with the Society on the dimension of test specimen, test condition etc, when newly performing tests at the time of Approval.	Acceptance criteria is the reference.
	Creep test	T	P		
Corrosion resistance test	Corrosion test	T	-	ISO 3651-2, ISO 3651-1, KS D 0222 or equivalent method. For duplex stainless steel(<i>RSTS31803, RSTS32750</i>), corrosion test shall be carry out in accordance with ASTM G48 Method A or equivalent method. The test temperature shall be 20°C (±2) for <i>RSTS31803</i> , 50°C(±2) for <i>RSTS32750</i> and the exposure time shall be minimum 24h.	Acceptance criteria is the reference. For duplex stainless steel (<i>RSTS31803, RSTS32750</i>), no pitting is required at 20 X magnification. The weight loss is to be less than 4.0 g/m ² .
				<u>For high manganese austenitic steel, general corrosion test shall be carried out in accordance with ASTM NACE/ASTM G31-12a or equivalent method. Intergranular corrosion test shall follow ASTM A262 or equivalent method and stress corrosion cracking test shall be lined with ASTM G36 and ASTM G123 or equivalent method.</u>	Acceptance criteria is the reference.
Non-destructive test	Ultrasonic test	All surface	-	KS D 0234 (Clad Steels), KS D 0233 (Steels with through thickness property), KS D 0248 (Bars for chains) or equivalent method.	Clad Steels to be met the requirements of class 1 of KS D 0234 . Others to be free from any defects deemed to have negative effect.

Effective date : 1 Jan. 2020

(2) Date of construction

- IACS UI GC 24 (Rev.1, Feb 2019)
 - exception of Fire Test for Emergency Shutdown Valves

Present

CHAPTER 3 TYPE APPROVAL

Section 15 Machinery and Equipment for Ships

1503. Type tests

1. <same as the present>

2. Details of Tests

<same as the present>

Table 3.15.1 Type test item of machinery and equipment of ship (continued) (2018)

Kinds	Type test item
Cargo pipings, pumps and cargo hoses of ships carrying liquefied gases in bulk	<p>Type tests specified in Pt 7, Ch 5, 503. and 507. are to be carried out in accordance with following requirements. Type tests of other systems and equipment which the Society deems necessary are to be considered by the Society in each case.</p> <p>(A) Valve : <omitted></p> <p>(a) <omitted></p> <p>(b) <omitted></p> <p>(c) <omitted></p> <p>(d) For emergency shutdown valves, with materials having melting temperatures lower than 925 °C, the type testing shall include a fire test to a standard acceptable to the Society. In applying this requirement, emergency shutdown valves, with materials having melting temperatures lower than 925 °C does not include emergency shutdown valves which use materials having melting temperatures lower than 925 °C in components such as rubber handle covers where failure would not cause deterioration of shell or seat tightness intrinsically.</p>

<hereafter, omitted>

Amendment

CHAPTER 3 TYPE APPROVAL

Section 15 Machinery and Equipment for Ships

1503. Type tests

1. <same as current Guidance>

2. Details of Tests

<same as current Guidance>

Table 3.15.1 Type test item of machinery and equipment of ship (continued) (2018)

Kinds	Type test item
Cargo pipings, pumps and cargo hoses of ships carrying liquefied gases in bulk	<p>Type tests specified in Pt 7, Ch 5, 503. and 507. are to be carried out in accordance with following requirements. Type tests of other systems and equipment which the Society deems necessary are to be considered by the Society in each case.</p> <p>(A) Valve : <same as current Guidance></p> <p>(a) <same as current Guidance></p> <p>(b) <same as current Guidance></p> <p>(c) <same as current Guidance></p> <p>(d) For emergency shutdown valves, with materials having melting temperatures lower than 925 °C, the type testing shall include a fire test to a standard acceptable to the Society. In applying this requirement, Emergency shutdown valves, with materials having melting temperatures lower than 925°C does not include an emergency shutdown valves in which components made of use materials having melting temperatures lower than 925°C do not contribute to the shell or seat tightness intrinsically of the valve. (2020)</p>

<hereafter, same as current Guidance>

Effective date

(3) Equipment for which the date of application for type approval certification is dated on or after 1 January 2020 or equipment intended to be installed on ships contracted for construction on or after 1 January 2022.

● Reflected IACS UR E10(Rev.7 Oct 2018)

- The requirements (Table 3.23.1) for type test of automatic and remote control systems have been amended.

Present	Amendment
<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p>Section 1 - 22 <same as the present Rules></p> <p>Section 23 Automatic and Remote Control Systems</p> <p>2301. - 2303. <same as the present Rules></p> <p>2304. Type test</p> <p>1. Hardware</p> <p>(1) <same as the present Rules></p> <p>(2) Test methods and criteria</p> <p>(A) After the drawings and documents submitted in accordance with the requirements in 2302. have been examined, tests are to be carried out in accordance with the testing condition and method of Table 3.23.1 in the presence of the Society's surveyor, and they are to be proven to satisfy the criteria of Table 3.23.1.</p> <p>(B) - (D) <same as the present Rules></p> <p>2. - 3. <same as the present Rules></p> <p>Table 3.23.1 Environmental Test Items, Testing Conditions and Methods, and Criteria <u>(2019)</u></p> <p>Section 24 - 37 <same as the present Rules></p>	<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p>Section 1 - 20 <same as the present Rules></p> <p>Section 23 Automatic and Remote Control Systems</p> <p>2301. - 2303. <same as the present Rules></p> <p>2304. Type test</p> <p>1. Hardware</p> <p>(1) <same as the present Rules></p> <p>(2) Test methods and criteria</p> <p>(A) After the drawings and documents submitted in accordance with the requirements in 2302. have been examined, tests are to be carried out in accordance with the testing condition and method of Table 3.23.1 in the presence of the Society's surveyor, and they are to be proven to satisfy the criteria of Table 3.23.1.</p> <p>(B) - (D) <same as the present Rules></p> <p>2. - 3. <same as the present Rules></p> <p>Table 3.23.1 Environmental Test Items, Testing Conditions and Methods, and Criteria (2019)<u>(2020)</u></p> <p><refer to the next page></p> <p>Section 24 - 37 <same as the present Rules></p>

< Amendment >

Table 3.23.1 Environmental Test Items, Testing Conditions and Methods, and Criteria ~~(2019)~~(2020)

No.	Test item	testing condition and method	Criteria
6	Dry heat test	<ul style="list-style-type: none"> · The test shall be carried out at $25 \pm 2 \text{ }^\circ\text{C}$ in atmospheric temperature. · The absolute humidity shall not exceed 20 g of water vapor per cubic meter of air (corresponding approximately to 50 % relative humidity at $35 \text{ }^\circ\text{C}$). · Test A : The equipment is at an operating condition and apply the environmental condition of $+70 \pm 2 \text{ }^\circ\text{C}$ for 16 hours. · Test B : For the equipment installed in air conditioned spaces, the environmental condition of $+55 \pm 2 \text{ }^\circ\text{C}$ for 16 hours may be applied. Where the equipment is attached with other equipments in the console and housing, test A is to be performed. · <u>Dry heat at $70 \text{ }^\circ\text{C}$ is to be carried out to automation, control and instrumentation equipment subject to high degree of heat, for example mounted in consoles, housings, etc. together with other heat dissipating power equipment.</u> · The operation of the equipment during conditioning and testing is to be checked and functional test carry out during the last 1 hour at the test temperature. <u>However, for heat dissipating equipment, the operation of the equipment during conditioning and testing with cooling system on if provided is to be checked.</u> · For equipment specified for increased temperature, the dry heat test is to be conducted at the agreed test temperature and duration. · Detailed test methods are referred to Test Bb or Test Bd of IEC 60068-2-2. the follows. <ul style="list-style-type: none"> - <u>For non-heat dissipating equipment: Test Bb of IEC 60068-2-2</u> - <u>For heat dissipating equipment: Test Be of IEC 60068-2-2</u> <div style="text-align: center;"> </div> <p>Note (*) Raising and lowering rate of temperature is to be within $1^\circ\text{C}/\text{min}$. (mean value for a period within 5 minutes)</p> <p style="text-align: center;">Fig 3.23.1 Program of dry heat test</p>	<ul style="list-style-type: none"> · No abnormality is observed. · The equipment is comply with the requirements of performance test and functional test.

Table 3.23.1 Environmental Test Items, Testing Conditions and Methods, and Criteria (continued)

No.	Test item	Testing condition and method	Criteria								
15	Radiated radio frequency immunity test	<ul style="list-style-type: none"> · Check the operation of the equipment when the radiated radio frequency immunity test is carried out according to the following condition. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black;">Frequency range</td> <td style="border-bottom: 1px solid black;">80 MHz ~ 6 GHz</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Modulation</td> <td style="border-bottom: 1px solid black;">80 % AM at 1,000 Hz</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Field strength</td> <td style="border-bottom: 1px solid black;">10 V/m</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Frequency sweep rate</td> <td style="border-bottom: 1px solid black;"> $\leq 1.5 \times 10^{-3}$ decades/sec. (or 1 %/3 sec.) </td> </tr> </table> <ul style="list-style-type: none"> · If for tests of equipment an input signal with a modulation frequency of 1,000 Hz is necessary, a modulation frequency(80 % AM) of 400 Hz may be chosen. · The test is to be confined to the appliances exposed to direct radiation by transmitters at their place of installation. · <u>If an equipment is intended to receive radio signals for the purpose of radio communication (e.g. wifi router, remote radio controller), then the immunity limits at its communication frequency do not apply, subject to the requirements in Pt 6, Ch 2, 406. 2 of Rules for the Classification of Steel Ships.</u> · Detailed test methods are referred to Test level 3 of IEC 61000-4-3. 	Frequency range	80 MHz ~ 6 GHz	Modulation	80 % AM at 1,000 Hz	Field strength	10 V/m	Frequency sweep rate	$\leq 1.5 \times 10^{-3}$ decades/sec. (or 1 %/3 sec.)	<ul style="list-style-type: none"> · Performance Criterion A(2)
Frequency range	80 MHz ~ 6 GHz										
Modulation	80 % AM at 1,000 Hz										
Field strength	10 V/m										
Frequency sweep rate	$\leq 1.5 \times 10^{-3}$ decades/sec. (or 1 %/3 sec.)										

Table 3.23.1 Environmental Test Items, Testing Conditions and Methods, and Criteria (continued)

No.	Test item	Testing condition and method	Criteria																								
20	Radiated emission test	<p>· Radiated emission test is to be carried out according to the following.</p> <p><Limits below 1,000 Mhz></p> <table border="1" data-bbox="475 448 1106 768"> <thead> <tr> <th colspan="2" data-bbox="475 448 1106 499">For equipment installed in the bridge and deck zone.</th> </tr> <tr> <th data-bbox="475 499 775 551">Frequency range</th> <th data-bbox="775 499 1106 551">Quasi peak limits</th> </tr> </thead> <tbody> <tr> <td data-bbox="475 551 775 602">150 kHz ~ 300 kHz</td> <td data-bbox="775 551 1106 602">80 ~ 52 dBμV/m</td> </tr> <tr> <td data-bbox="475 602 775 654">300 kHz ~ 30 MHz</td> <td data-bbox="775 602 1106 654">52 ~ 34 dBμV/m</td> </tr> <tr> <td data-bbox="475 654 775 705">30 MHz ~ 1,000 MHz</td> <td data-bbox="775 654 1106 705">54 dBμV/m</td> </tr> <tr> <td data-bbox="475 705 775 768">156 MHz ~ 165 MHz</td> <td data-bbox="775 705 1106 768">24 dBμV/m</td> </tr> </tbody> </table> <p>For equipment installed in a zone other than bridge and deck zone</p> <table border="1" data-bbox="475 835 1106 1025"> <tbody> <tr> <td data-bbox="475 835 775 887">150 kHz ~ 30 MHz</td> <td data-bbox="775 835 1106 887">80 ~ 50 dBμV/m</td> </tr> <tr> <td data-bbox="475 887 775 938">30 MHz ~ 100 MHz</td> <td data-bbox="775 887 1106 938">60 ~ 54 dBμV/m</td> </tr> <tr> <td data-bbox="475 938 775 990">100 MHz ~ 1,000 MHz</td> <td data-bbox="775 938 1106 990">54 dBμV/m</td> </tr> <tr> <td data-bbox="475 990 775 1025">156 MHz ~ 165 MHz</td> <td data-bbox="775 990 1106 1025">24 dBμV/m</td> </tr> </tbody> </table> <p><Limits above 1,000 MHz></p> <table border="1" data-bbox="451 1104 1129 1193"> <thead> <tr> <th data-bbox="451 1104 775 1155">Frequency range</th> <th data-bbox="775 1104 1129 1155">Average limit</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 1155 775 1193">1,000 MHz ~ 6,000 MHz</td> <td data-bbox="775 1155 1129 1193">54 dBμV/m</td> </tr> </tbody> </table> <p>· Distance between equipment and antenna is to be 3 m.</p> <p>· For the frequency band 156 MHz to 165 MHz the measurement shall be repeated with a receiver bandwidth of 9 kHz (as per IEC 60945).</p> <p>· Alternatively the radiation limit at a distance of 3 m from the enclosure port over the frequency 156 MHz to 165 MHz is to be 30 dBμV/m peak (as per IEC 60945).</p> <p>· Equipment intended to transmit radio signals for the purpose of radio communication (e.g. wifi router, remote radio controller) may be exempted from limit, within its communication frequency range, subject to the requirements in Pt 6, Ch 2, 406. 2 of Rules for the Classification of Steel Ships..</p> <p>· Detailed test methods are referred to CISPR 16-2-3 and IEC 60945(for 156 ~ 165 MHz).</p>	For equipment installed in the bridge and deck zone.		Frequency range	Quasi peak limits	150 kHz ~ 300 kHz	80 ~ 52 dB μ V/m	300 kHz ~ 30 MHz	52 ~ 34 dB μ V/m	30 MHz ~ 1,000 MHz	54 dB μ V/m	156 MHz ~ 165 MHz	24 dB μ V/m	150 kHz ~ 30 MHz	80 ~ 50 dB μ V/m	30 MHz ~ 100 MHz	60 ~ 54 dB μ V/m	100 MHz ~ 1,000 MHz	54 dB μ V/m	156 MHz ~ 165 MHz	24 dB μ V/m	Frequency range	Average limit	1,000 MHz ~ 6,000 MHz	54 dB μ V/m	<p>· Radiated emission is to be within limits in the table.</p>
For equipment installed in the bridge and deck zone.																											
Frequency range	Quasi peak limits																										
150 kHz ~ 300 kHz	80 ~ 52 dB μ V/m																										
300 kHz ~ 30 MHz	52 ~ 34 dB μ V/m																										
30 MHz ~ 1,000 MHz	54 dB μ V/m																										
156 MHz ~ 165 MHz	24 dB μ V/m																										
150 kHz ~ 30 MHz	80 ~ 50 dB μ V/m																										
30 MHz ~ 100 MHz	60 ~ 54 dB μ V/m																										
100 MHz ~ 1,000 MHz	54 dB μ V/m																										
156 MHz ~ 165 MHz	24 dB μ V/m																										
Frequency range	Average limit																										
1,000 MHz ~ 6,000 MHz	54 dB μ V/m																										

Effective date

**(4) 1 Jan. 2020(Date of application for approval)
& 1 July 2021(Date of which the contract for construction is signed)**

● To reflect IACS UR P4(Rev. 5 Dec 2018)

- It has been amended for requirements relating to testing requirements of plastic piping.

Present	Amendment
<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL <omitted></p> <p style="text-align: center;">Section 16 Plastic Piping System <omitted></p> <p>1602. Data to be submitted <omitted></p> <p style="padding-left: 40px;"><u>(3) Materials</u> <omitted></p> <p style="padding-left: 80px;"><u>(g) <Newly added></u> <omitted></p>	<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL <same as present></p> <p style="text-align: center;">Section 16 Plastic Piping System <same as present></p> <p>1602. Data to be submitted <same as present></p> <p style="padding-left: 40px;"><u>(3) Materials(as applicable)</u> <same as present></p> <p style="padding-left: 80px;"><u>(g) Joint bonding procedures and qualification tests results, see Pt 5, Annex 5-6 6.(8).(E) of the Guidance.</u> <same as present></p>