

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

(외부조회)



2019. 8.

Hull Rule Development Team

Present

Amendment

Note

CHAPTER 3 TYPE APPROVAL

Section 1 ~ General 24 <omit>

Section 25 Securing Devices

2501. Application <omit>

2502. Type tests

1. Type tests to determine the breaking or proof loads are to be carried out on at least two saples of each item used in the securing system. The relationship between minimum design breaking load and safe working load is to be as indicated in **Table 3.25.1**.

- errata

Table 3.25.1 Design Braking Loads and Proof Loads

Item		Min. design breaking load		Min. proof load		
		<i>SWL</i> ≤ 40	<i>SWL</i> > 40	<i>SWL</i> ≤ 40	<i>SWL</i> > 40	
Lashings	Wire ripe		$3 \times SWL$	-	-	-
	Rod	mild steel	$3 \times SWL$		$1.5 \times SWL$	
		higher tensile steel	$2 \times SWL$		$1.5 \times SWL$	
	Chain	mild steel	$3 \times SWL$		-	
		higher tensile steel	$2.5 \times SWL$			
	Fittings and securing devices		$2 \times SWL$		$SWL + 40\text{ t}$	
NOTES: 1. Higher tensile steel is defined for this purpose as steel having a yield stress not less than 315 N/mm ² (32 kg/mm ²). 2. Breaking and proof loads for lashings of material other than steel will be considered.						

2. The Surveyor is to be satisfied that the design and materials of the fitting are in accordance with the approved plans. The mode of load application is to represent as closely as possible the in-service operational modes. Jigs are to be employed where necessary in order that satisfactory simulation is obtained. For guidance purposes, test modes which are required for the more commonly used fittings are shown in **Table 3.25.2**.

3. ~ 5. <omit>

















Present	Amendment	Note																																				
	<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p style="text-align: center;">Section 1 ~ General 24 <omit></p> <p style="text-align: center;">Section 25 Securing Devices</p> <p>2501. Application <omit></p> <p>2502. Type tests</p> <p>1. Type tests to determine the breaking or proof loads are to be carried out on at least two <u>samples</u> of each item used in the securing system. The relationship between minimum design breaking load and safe working load is to be as indicated in Table 3.25.1.</p> <p style="text-align: center;">Table 3.25.1 Design Braking Loads and Proof Loads</p> <table border="1" data-bbox="577 751 1771 1125"> <thead> <tr> <th colspan="2" rowspan="2">Item</th> <th colspan="2">Min. design breaking load (kN)</th> <th colspan="2">Min. proof load (kN)</th> </tr> <tr> <th>$SWL \leq 400$</th> <th>$SWL > 400$</th> <th>$SWL \leq 400$</th> <th>$SWL > 400$</th> </tr> </thead> <tbody> <tr> <td rowspan="6" style="text-align: center;">Lashings</td> <td colspan="2" style="text-align: center;">Wire rope</td> <td>$3 \times SWL$</td> <td rowspan="6" style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td rowspan="6" style="text-align: center;">-</td> </tr> <tr> <td rowspan="2" style="text-align: center;">Rod</td> <td style="text-align: center;">mild steel</td> <td>$3 \times SWL$</td> <td style="text-align: center;">$1.5 \times SWL$</td> </tr> <tr> <td style="text-align: center;">higher tensile steel</td> <td>$2 \times SWL$</td> <td style="text-align: center;">$1.5 \times SWL$</td> </tr> <tr> <td rowspan="2" style="text-align: center;">Chain</td> <td style="text-align: center;">mild steel</td> <td>$3 \times SWL$</td> <td rowspan="2" style="text-align: center;">-</td> </tr> <tr> <td style="text-align: center;">higher tensile steel</td> <td>$2.5 \times SWL$</td> </tr> <tr> <td colspan="2" style="text-align: center;">Fittings and securing devices</td> <td>$2 \times SWL$</td> <td style="text-align: center;">$SWL + 400$</td> <td style="text-align: center;">$1.5 \times SWL$</td> <td style="text-align: center;">$SWL + 200$</td> </tr> </tbody> </table> <p>NOTES:</p> <ol style="list-style-type: none"> 1. Higher tensile steel is defined for this purpose as steel having a yield stress not less than 315 N/mm². 2. Breaking and proof loads for lashings of material other than steel will be considered. <p>2. ~ 5. <omit></p>	Item		Min. design breaking load (kN)		Min. proof load (kN)		$SWL \leq 400$	$SWL > 400$	$SWL \leq 400$	$SWL > 400$	Lashings	Wire rope		$3 \times SWL$	-	-	-	Rod	mild steel	$3 \times SWL$	$1.5 \times SWL$	higher tensile steel	$2 \times SWL$	$1.5 \times SWL$	Chain	mild steel	$3 \times SWL$	-	higher tensile steel	$2.5 \times SWL$	Fittings and securing devices		$2 \times SWL$	$SWL + 400$	$1.5 \times SWL$	$SWL + 200$	<p style="text-align: center;">- ton → kN (x 10)</p>
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Present

Amendment

Note

Table 3.25.2 Test Loads and Test Modes (2018)





Item No	Description	Required test modes	Recommended minimal in tonnes		
			SWL	Proof load	Breaking load
1	Lashing rod (H.T.S)	 <p>Tensile load</p>	<u>25</u>	<u>37.5</u>	<u>50</u>
2	Lashing rod (M.S)		<u>18</u>	<u>27</u>	<u>36</u>
3	Lashing chain (H.T.S)		<u>10</u>	-	<u>30</u>
4	Lashing chain (M.S)		<u>8</u>	-	<u>20</u>
5	Lashing steel wire rope		<u>12</u>	-	<u>36</u>
6	Turnbuckle	 <p>Tensile load</p>	<u>25</u>	<u>37.5</u>	<u>50</u>
7	Twistlock (single)	 <p>Shear load</p>	<u>20</u>	<u>30</u>	<u>40</u>
		 <p>Tensile load</p>	<u>25</u>	<u>37.5</u>	<u>50</u>
		 <p>Compression load (bottom)</p>	<u>110</u>	<u>130</u>	<u>150</u>
8	Twistlock (linked)	 <p>As for item 7+ tensile load</p>	<u>5</u>	<u>7.5</u>	<u>10</u>
9	Midlock	 <p>Shear load</p>	<u>20</u>	<u>30</u>	<u>40</u>
		 <p>Tensile load</p>	<u>25</u>	<u>37.5</u>	<u>50</u>
		 <p>Compression load (bottom)</p>	<u>110</u>	<u>130</u>	<u>150</u>
10	Stacker (single)	 <p>Shear load</p>	<u>20</u>	<u>30</u>	<u>40</u>
11	Stacker (double)	 <p>As for item 10+ tensile load</p>	<u>5</u>	<u>7.5</u>	<u>10</u>
12	Flush socket	 <p>Pull-out load</p>	<u>25</u>	<u>37.5</u>	<u>50</u>
13	Pedestal socket	 <p>Pull-out load</p>	<u>25</u>	<u>37.5</u>	<u>50</u>
		 <p>Tangential load</p>	<u>20</u>	<u>30</u>	<u>40</u>
		 <p>Compression load</p>	<u>110</u>	<u>130</u>	<u>150</u>
14	'D' ring	 <p>Tensile load</p>	<u>25</u>	<u>37.5</u>	<u>50</u>

















Present





Amendment

Note

Table 3.25.2 Test Loads and Test Modes (2018)

15	Lashing plate		Tensile load	<u>25</u>	<u>37.5</u>	<u>50</u>
16	Penguin hook		Tangential load	<u>18</u>	<u>27</u>	<u>36</u>
17	Bridge fitting		Tensile load	<u>5</u>	<u>7.5</u>	<u>10</u>
18	Buttress		Tensile load	See Note 5		
<p>(Notes)</p> <ol style="list-style-type: none"> For items 6, 14, 15 and 16 where specially designed for use with chain or wire rope lashings a less SWL may be considered. For items 8, 11 and 17 the recommended minimum loads quoted in the Table refer to the fittings when employed in a location in container stacks which do not transfer load to an adjacent slack. Where items 8, 11 and 17 are fitted in line with a buttress/shore support at stowage sides, test loads are to be determined in association with Note 5. For items 12 and 13, where multiple flush sockets or pedestal sockets are involved test loads are to be applied simultaneously to each socket opening which can be loaded simultaneously in service. For item 15, where multiple lashing points are fitted in one deck plate fitting, testing is to be similarly arranged as for Note 3. For item 18, test loads for buttress fittings are to be determined by detailed consideration of the individual stowage arrangement proposed in association with Table 3.25.1. Where special containers are used consideration will be given to the required minimum loads. 						

Present	Amendment				Note			
	Table 3.25.2 Test Loads and Test Modes (2019)				- ton → kN (x 10)			
Item No	Description	Required test modes		Recommended minimal in kN				
			SWL	Proof load		Breaking load		
1	Lashing rod (H.T.S)	 Tensile load		<u>250</u>		<u>375</u>	<u>500</u>	
2	Lashing rod (M.S)			<u>180</u>		<u>270</u>	<u>360</u>	
3	Lashing chain (H.T.S)			<u>100</u>		-	<u>300</u>	
4	Lashing chain (M.S)			<u>80</u>		-	<u>200</u>	
5	Lashing steel wire rope			<u>120</u>		-	<u>360</u>	
6	Turnbuckle		Tensile load	<u>250</u>		<u>375</u>	<u>500</u>	
7	Twistlock (single)		Shear load	<u>200</u>		<u>300</u>	<u>400</u>	
			Tensile load	<u>250</u>		<u>375</u>	<u>500</u>	
			Compression load (bottom)	<u>1100</u>		<u>1300</u>	<u>1500</u>	
8	Twistlock (linked)		As for item 7+ tensile load	<u>50</u>		<u>75</u>	<u>100</u>	
9	Midlock		Shear load	<u>200</u>		<u>300</u>	<u>400</u>	
			Tensile load	<u>250</u>	<u>375</u>	<u>500</u>		
			Compression load (bottom)	<u>1100</u>	<u>1300</u>	<u>1500</u>		
10	Stacker (single)		Shear load	<u>200</u>	<u>300</u>	<u>400</u>		
11	Stacker (double)		As for item 10+ tensile load	<u>50</u>	<u>75</u>	<u>100</u>		
12	Flush socket		Pull-out load	<u>250</u>	<u>375</u>	<u>500</u>		
13	Pedestal socket		Pull-out load	<u>250</u>	<u>375</u>	<u>500</u>		
			Tangential load	<u>200</u>	<u>300</u>	<u>400</u>		
			Compression load	<u>1100</u>	<u>1300</u>	<u>1500</u>		
14	'D' ring	 45°	Tensile load	<u>250</u>	<u>375</u>	<u>500</u>		

Present	Amendment						Note
	Table 3.25.2 Test Loads and Test Modes (2018)						- ton → kN (x 10)
15	Lashing plate		Tensile load	<u>250</u>	<u>375</u>	<u>500</u>	
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Guidance for Approval of Manufacturing Process and Type Approval, Etc.

(Development Review : For external opinion inquiry)

2019. 8.



Machinery Rule Development Team

– Main Amendments –

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

● Amendments of IACS UR P4(Rev.5) has been reflected.

Present	Amendment	Remark
<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: 20px;"><u>(3) Materials</u> <omitted></p> <p style="padding-left: 40px;"><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: 20px;"><u>(3) Materials(as applicable)</u> <same as present></p> <p style="padding-left: 40px;"><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>	<p>(amendment) - IACS UR P4(Rev.5)</p>

GUIDANCE FOR APPROVAL OF MAUFACTURING PROCESS AND TYPE APPROVAL, ETC.

(Development Review : External Opinion Inquiry)



2019. 11.

– Main Amendments –

(1) Reflecting IACS Res. <2020.01.01.>

● IACS UI GC 24 (Rev.1, Feb 2019)

– exception of Fire Test for Emergency Shutdown Valves

Present	Amendment	Reason								
<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p>Section 15 Machinery and Equipment for Ships</p> <p>1503. Type tests</p> <p>1. <same as the present></p> <p>2. Details of Tests</p> <p><same as the present></p> <p>Table 3.15.1 Type test item of machinery and equipment of ship (continued) (2018)</p> <table border="1" data-bbox="161 635 909 1281"> <thead> <tr> <th data-bbox="161 635 331 683">Kinds</th> <th data-bbox="331 635 909 683">Type test item</th> </tr> </thead> <tbody> <tr> <td data-bbox="161 683 331 1281">Cargo pipings, pumps and cargo hoses of ships carrying liquefied gases in bulk</td> <td data-bbox="331 683 909 1281"> 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. (A) Valve : <omitted> (a) <omitted> (b) <omitted> (c) <omitted> (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 <u>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.</u> </td> </tr> </tbody> </table>	Kinds	Type test item	Cargo pipings, pumps and cargo hoses of ships carrying liquefied gases in bulk	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. 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Details of Tests</p> <p><same as the present></p> <p>Table 3.15.1 Type test item of machinery and equipment of ship (continued) (2018)</p> <table border="1" data-bbox="990 635 1738 1281"> <thead> <tr> <th data-bbox="990 635 1160 683">Kinds</th> <th data-bbox="1160 635 1738 683">Type test item</th> </tr> </thead> <tbody> <tr> <td data-bbox="990 683 1160 1281">Cargo pipings, pumps and cargo hoses of ships carrying liquefied gases in bulk</td> <td data-bbox="1160 683 1738 1281"> 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. 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GUIDANCE RELATING TO THE RULES FOR CLASSIFICATION OF STEEL SHIPS

(Development Review : For external opinion inquiry)

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

2019. 11.



Machinery Rule Development Team

– Main Amendments –

(1) Effective date : 1 July. 2020 (based on the application date for certification of product))

- Some testing item of IACS Rec.86(Rev.2) have been reflected in Table 2 in Ch. 3 Sec. 16 Plastic Piping System.

Present	Remark															
<p>CHAPTER 3 TYPE APPROVAL</p> <p>[omitted]</p> <p>Section 16 Plastic Piping System</p> <p>[omitted]</p>	<p>(amendment)</p> <p>- Some testing item of IACS Rec.86 (Rev.2) have been reflected.</p>															
<p>Table 3.16.1 Testing methods and Criteria of Plastic piping system</p>																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="89 519 376 555">Testing items</th> <th data-bbox="376 519 708 555">Testing method</th> <th data-bbox="708 519 1305 555">Criteria</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="89 555 1305 976" style="text-align: center; height: 188px;">[omitted]</td> </tr> <tr> <td data-bbox="89 976 376 1052">Durability against chemicals</td> <td data-bbox="376 976 708 1052" style="text-align: center;"><i>ASTM C581</i>⁽¹⁾</td> <td data-bbox="708 976 1305 1052">*(The material properties will not be affected by the intended fluids)</td> </tr> <tr> <td colspan="3" data-bbox="89 1052 1305 1102" style="text-align: center;">[Newly added]</td> </tr> <tr> <td colspan="3" data-bbox="89 1102 1305 1209"> <p>Notes</p> <p>1. Recognized laboratory's test reports, manufacturer's test reports or service records may be accepted instead of type test provided that the Society considers appropriate.</p> </td> </tr> </tbody> </table>	Testing items	Testing method	Criteria	[omitted]			Durability against chemicals	<i>ASTM C581</i> ⁽¹⁾	*(The material properties will not be affected by the intended fluids)	[Newly added]			<p>Notes</p> <p>1. Recognized laboratory's test reports, manufacturer's test reports or service records may be accepted instead of type test provided that the Society considers appropriate.</p>			
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[Newly added]																
<p>Notes</p> <p>1. Recognized laboratory's test reports, manufacturer's test reports or service records may be accepted instead of type test provided that the Society considers appropriate.</p>																
[omitted]																

Amendment		Remark	
CHAPTER 3 TYPE APPROVAL [same as present] Section 16 Plastic Piping System [same as present]		(amendment) - Some testing item of IACS Rec.86 (Rev.2) have been reflected.	
Table 3.16.1 Testing methods and Criteria of Plastic piping system			
Testing items	Testing method		Criteria
[same as present]			
Durability against chemicals	<i>ASTM C581</i> ⁽¹⁾		*(The material properties will not be affected by the intended fluids)
<u>Smoke generation</u>	<i>IMO Res. A753(18), Appendix 3</i>	*	
<u>Toxicity</u>	<i>IMO Res. A753(18), Appendix 3</i>	*	
Notes 1. Recognized laboratory's test reports, manufacturer's test reports or service records may be accepted instead of type test provided that the Society considers appropriate.			
[same as present]			

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

(External review)



2019. 11.

Hull Rule Development Team

Present

Amendment

Note

CHAPTER 3 TYPE APPROVAL

Section 1 ~ General 24 <omit>

Section 25 Securing Devices

2501. Application <omit>







2502. Type tests

1. <omit>

2. The Surveyor is to be satisfied that the design and materials of the fitting are in accordance with the approved plans. The mode of load application is to represent as closely as possible the in-service operational modes. Jigs are to be employed where necessary in order that satisfactory simulation is obtained. For guidance purposes, test modes which are required for the more commonly used fittings are shown in **Table 3.25.2**.

3. ~ 5. <omit>

Table 3.25.2 Test Loads and Test Modes (2019)




Item No	Description	Required test modes	Recommended minimal in kN		
			SWL	Proof load	Breaking load
1~6	<omit>	<omit>	<omit>	<omit>	<omit>
7	Twistlock (single)	 Shear load	200	300	400
		 Tensile load	250	375	500
		 Compression load (bottom)	1100	1300	1500
8	<omit>	<omit>	<omit>	<omit>	<omit>
9	Midlock	 Shear load	200	300	400
		 Tensile load	250	375	500
		 Compression load (bottom)	1100	1300	1500



















Present










Amendment

Note

Table 3.25.2 Test Loads and Test Modes (2019)

10~ 12	<omit>	<omit>	<omit>	<omit>	<omit>	
13	Pedestal socket		Pull-out load	250	375	500
			Tangential load	200	300	400
			Compression load	<u>1100</u>	<u>1300</u>	<u>1500</u>
14~ 18	<omit>	<omit>	<omit>	<omit>	<omit>	
(Notes) 1. ~ 6. <omit>						

Present	Amendment	Note																																																	
	<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p style="text-align: center;">Section 1 ~ General 24 <omit></p> <p style="text-align: center;">Section 25 Securing Devices</p> <p>2501. Application <omit></p> <p>2502. Type tests</p> <p>1. <omit></p> <p>2. The Surveyor is to be satisfied that the design and materials of the fitting are in accordance with the approved plans. The mode of load application is to represent as closely as possible the in-service operational modes. Jigs are to be employed where necessary in order that satisfactory simulation is obtained. For guidance purposes, test modes which are required for the more commonly used fittings are shown in Table 3.25.2.</p> <p>3. ~ 5. <omit></p> <p>Table 3.25.2 Test Loads and Test Modes (2019)</p> <table border="1" data-bbox="544 863 1776 1393"> <thead> <tr> <th rowspan="2">Item No</th> <th rowspan="2">Description</th> <th rowspan="2">Required test modes</th> <th colspan="3">Recommended minimal in kN</th> </tr> <tr> <th>SWL</th> <th>Proof load</th> <th>Breaking load</th> </tr> </thead> <tbody> <tr> <td>1~6</td> <td><same as current></td> <td><same as current></td> <td colspan="3" style="text-align: center;"><same as current></td> </tr> <tr> <td rowspan="3">7</td> <td rowspan="3">Twistlock (single)</td> <td style="text-align: center;"> Shear load</td> <td>200</td> <td>300</td> <td>400</td> </tr> <tr> <td style="text-align: center;"> Tensile load</td> <td>250</td> <td>375</td> <td>500</td> </tr> <tr> <td style="text-align: center;"> Compression load (bottom)</td> <td><u>1200</u></td> <td><u>1400</u></td> <td><u>1600</u></td> </tr> <tr> <td>8</td> <td><same as current></td> <td><same as current></td> <td colspan="3" style="text-align: center;"><same as current></td> </tr> <tr> <td rowspan="3">9</td> <td rowspan="3">Midlock</td> <td style="text-align: center;"> Shear load</td> <td>200</td> <td>300</td> <td>400</td> </tr> <tr> <td style="text-align: center;"> Tensile load</td> <td>250</td> <td>375</td> <td>500</td> </tr> <tr> <td style="text-align: center;"> Compression load (bottom)</td> <td><u>1200</u></td> <td><u>1400</u></td> <td><u>1600</u></td> </tr> </tbody> </table>	Item No	Description	Required test modes	Recommended minimal in kN			SWL	Proof load	Breaking load	1~6	<same as current>	<same as current>	<same as current>			7	Twistlock (single)	 Shear load	200	300	400	 Tensile load	250	375	500	 Compression load (bottom)	<u>1200</u>	<u>1400</u>	<u>1600</u>	8	<same as current>	<same as current>	<same as current>			9	Midlock	 Shear load	200	300	400	 Tensile load	250	375	500	 Compression load (bottom)	<u>1200</u>	<u>1400</u>	<u>1600</u>	
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	<p data-bbox="544 244 1124 268">Table 3.25.2 Test Loads and Test Modes (2019)</p> <table border="1" data-bbox="544 276 1776 775"> <tbody> <tr> <td data-bbox="544 276 618 336">10~ 12</td> <td data-bbox="618 276 893 336"><same as current></td> <td data-bbox="893 276 1404 336"><same as current></td> <td colspan="3" data-bbox="1404 276 1776 336"><same as current></td> <td></td> <td></td> </tr> <tr> <td data-bbox="544 336 618 536" rowspan="3">13</td> <td data-bbox="618 336 893 536" rowspan="3">Pedestal socket</td> <td data-bbox="893 336 1404 400">  </td> <td data-bbox="1404 336 1503 400">Pull-out load</td> <td data-bbox="1503 336 1621 400">250</td> <td data-bbox="1621 336 1727 400">375</td> <td data-bbox="1727 336 1776 400">500</td> <td></td> </tr> <tr> <td data-bbox="893 400 1404 469">  </td> <td data-bbox="1404 400 1503 469">Tangential load</td> <td data-bbox="1503 400 1621 469">200</td> <td data-bbox="1621 400 1727 469">300</td> <td data-bbox="1727 400 1776 469">400</td> <td></td> </tr> <tr> <td data-bbox="893 469 1404 536">  </td> <td data-bbox="1404 469 1503 536">Compression load</td> <td data-bbox="1503 469 1621 536"><u>1200</u></td> <td data-bbox="1621 469 1727 536"><u>1400</u></td> <td data-bbox="1727 469 1776 536"><u>1600</u></td> <td></td> </tr> <tr> <td data-bbox="544 536 618 612">14~ 18</td> <td data-bbox="618 536 893 612"><same as current></td> <td data-bbox="893 536 1404 612"><same as current></td> <td colspan="3" data-bbox="1404 536 1776 612"><same as current></td> <td></td> <td></td> </tr> <tr> <td colspan="8" data-bbox="544 612 1776 775"> (Notes) 1. ~ 6. <same as current> </td> </tr> </tbody> </table>						10~ 12	<same as current>	<same as current>	<same as current>					13	Pedestal socket		Pull-out load	250	375	500			Tangential load	200	300	400			Compression load	<u>1200</u>	<u>1400</u>	<u>1600</u>		14~ 18	<same as current>	<same as current>	<same as current>					(Notes) 1. ~ 6. <same as current>								
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AMENDMENTS FOR OTHER GUIDANCE

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

- For external opinion inquiries -

2020.01.



Machinery Rule Development Team

- Main Amendments -

(1) Enter into force on 1st July 2020(the date of application for certification of material & welding)

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

Present	Amendment	reason
<p style="text-align: center;">CHAPTER 1 <Omitted></p> <p style="text-align: center;">CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS</p> <p style="text-align: center;">Section 1 ~ Section 2-2 <Omitted></p> <p style="text-align: center;">Section 2-3 Other Semi Finished Products (2019)</p> <p>221. Application</p> <p>1. The requirements in this Section apply to tests and inspection for the approval of manufacturing process of semi-finished products such as slabs, blooms, billets and hot worked bars for rolled and forged steels (excluding semi finished products for hull structural steel).</p> <p>2. Requirements of semi finished products for hull structural steel are to be in accordance with the requirements of Section 2-3.</p> <p>222. ~ 225. <Omitted></p> <p style="text-align: center;">Section 2-4 ~ Section 2-6 <Omitted></p>	<p style="text-align: center;">CHAPTER 1 <Same as the present Guidance></p> <p style="text-align: center;">CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS</p> <p style="text-align: center;">Section 1 ~ Section 2-2 <Same as the present Guidance></p> <p style="text-align: center;">Section 2-3 Other Semi Finished Products (2019)</p> <p>221. Application</p> <p>1. The requirements in this Section apply to tests and inspection for the approval of manufacturing process of semi-finished products such as slabs, blooms, billets and hot worked bars for rolled and forged steels. (2020)</p> <p>2. Requirements of semi finished products for hull structural steel are to be in accordance with the requirements of Section 2-2.</p> <p>222. ~ 225. <Same as the present Guidance></p> <p style="text-align: center;">Section 2-4 ~ Section 2-6 <Same as the present Guidance></p>	<p>- To eliminate misunderstandings</p>

Present	Amendment	reason																																
<p>Section 2-7 High Strength Steels for Welded Structures (2017)</p> <p>261. ~ 262. <Omitted></p> <p>263. Approval tests</p> <p>1. ~ 2. <Omitted></p> <p>3. Weldability test</p> <p>(1) ~ (2) <Omitted></p> <p>(3) Approval test and acceptance criteria Approval test items, test methods and acceptance criteria are to be as given in Table 2.2.9.</p> <p>Table 2.2.9 Weldability test Items, test methods and acceptance criteria</p> <table border="1" data-bbox="219 659 974 1066"> <thead> <tr> <th>Test items</th> <th>Direction of the test specimens</th> <th>Test method</th> <th>Acceptance criteria</th> </tr> </thead> <tbody> <tr> <td>Tensile test</td> <td>T (Transverse)</td> <td><Omitted></td> <td>To meet the requirements in Pt 2, Ch 2, Sec 4 of the Rules</td> </tr> <tr> <td>Charpy V-notch Impact test</td> <td>T</td> <td><Omitted></td> <td>To meet the requirements in Pt 2, Ch 1, Sec 3, Table 2.1.35 of the Rules.</td> </tr> <tr> <td>CTOD test</td> <td>T</td> <td><Omitted></td> <td>The results are to comply with the requirements of the scheme of initial approval.</td> </tr> </tbody> </table>	Test items	Direction of the test specimens	Test method	Acceptance criteria	Tensile test	T (Transverse)	<Omitted>	To meet the requirements in Pt 2, Ch 2, Sec 4 of the Rules	Charpy V-notch Impact test	T	<Omitted>	To meet the requirements in Pt 2, Ch 1, Sec 3, Table 2.1.35 of the Rules.	CTOD test	T	<Omitted>	The results are to comply with the requirements of the scheme of initial approval.	<p>Section 2-7 High Strength Steels for Welded Structures (2017)</p> <p>261. ~ 262. <Same as the present Guidance></p> <p>263. Approval tests</p> <p>1. ~ 2. <Same as the present Guidance></p> <p>3. Weldability test</p> <p>(1) ~ (2) <Same as the present Guidance></p> <p>(3) Approval test and acceptance criteria Approval test items, test methods and acceptance criteria are to be as given in Table 2.2.10.</p> <p>Table 2.2.10 Weldability test Items, test methods and acceptance criteria</p> <table border="1" data-bbox="1059 659 1814 1066"> <thead> <tr> <th>Test items</th> <th>Direction of the test specimens</th> <th>Test method</th> <th>Acceptance criteria</th> </tr> </thead> <tbody> <tr> <td>Tensile test</td> <td>T (Transverse)</td> <td><Same as the present Guidance></td> <td>To meet the requirements in Pt 2, Ch 2, Sec 4 of the Rules</td> </tr> <tr> <td>Charpy V-notch Impact test</td> <td>T</td> <td><Same as the present Guidance></td> <td>To meet the requirements in Pt 2, Ch 1, Sec 3, Table 2.1.35 of the Rules.</td> </tr> <tr> <td>CTOD test</td> <td>T</td> <td><Same as the present Guidance></td> <td>It is to be at the discretion of the Society. (2020)</td> </tr> </tbody> </table>	Test items	Direction of the test specimens	Test method	Acceptance criteria	Tensile test	T (Transverse)	<Same as the present Guidance>	To meet the requirements in Pt 2, Ch 2, Sec 4 of the Rules	Charpy V-notch Impact test	T	<Same as the present Guidance>	To meet the requirements in Pt 2, Ch 1, Sec 3, Table 2.1.35 of the Rules.	CTOD test	T	<Same as the present Guidance>	It is to be at the discretion of the Society. (2020)	<p>- To ensure flexibility of Acceptance criteria for specific test</p>
Test items	Direction of the test specimens	Test method	Acceptance criteria																															
Tensile test	T (Transverse)	<Omitted>	To meet the requirements in Pt 2, Ch 2, Sec 4 of the Rules																															
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Charpy V-notch Impact test	T	<Same as the present Guidance>	To meet the requirements in Pt 2, Ch 1, Sec 3, Table 2.1.35 of the Rules.																															
CTOD test	T	<Same as the present Guidance>	It is to be at the discretion of the Society. (2020)																															

Present				Amendment				reason
Table 2.2.9 Weldability test Items, test methods and acceptance criteria (continued)				Table 2.2.9 Weldability test Items, test methods and acceptance criteria (continued)				- To ensure flexibility of Acceptance criteria for specific test
Test items	Direction of the test specimens	Test method	Acceptance criteria	Test items	Direction of the test specimens	Test method	Acceptance criteria	
Maximum hardness tests	-	<Omitted>	<Omitted>	Maximum hardness tests	-	<Same as the present Guidance>	<Same as the present Guidance>	
Macro structure tests	T	<Omitted>	To be free from crack, incomplete penetration, lack of fusion, other harmful defects	Macro structure tests	T	<Same as the present Guidance>	To be free from crack, incomplete penetration, lack of fusion, other harmful defects	
Hydrogen crack test	-	<Omitted>	<u>The results are to comply with the requirements of the scheme of initial approval.</u>	Hydrogen crack test	-	<Same as the present Guidance>	<u>It is to be at the discretion of the Society. (2020)</u>	
Section 3 ~ Section 14 <Omitted>				Section 3 ~ Section 14 <Same as the present Guidance>				

Present	Amendment	reason
<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p style="text-align: center;">Section 1 ~ Section 27 <Omitted> Section 28 Materials of Reinforced Plastics</p> <p>2801. ~ 2802. <Omitted> 2803. Type tests</p> <p>1. ~ 2. <Omitted></p> <p>3. Reinforcements</p> <p>(1) Tests of the mechanical properties are to be made on laminate samples containing the reinforcement and prepared as follows: (A) ~ (C) <Omitted> (D) for glass reinforcements, the glass/resin ratios, by weight, as shown in Table 3.28.3 are to be used; (E) for reinforcement type other than glass, a fibre volume fraction, as shown in Table 3.28.4, is to be used.</p> <p>(2) <Omitted> (3) The laminate is to be tested in air in the directions indicated by Table 3.28.5. (4) The following tests are to be made on the samples: (A) ~ (J) (5) <Omitted> (6) The test methods and acceptance criteria applied to laminate specimens of <u>reinforcement</u> are to comply with Table 3.28.6.</p> <p>(7) <u><New></u></p>	<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p style="text-align: center;">Section 1 ~ Section 27 <Same as the present Guidance> Section 28 Materials of Reinforced Plastics</p> <p>2801. ~ 2802. <Same as the present Guidance> 2803. Type tests</p> <p>1. ~ 2. <Same as the present Guidance></p> <p>3. Reinforcements</p> <p>(1) Tests of the mechanical properties are to be made on laminate samples containing the reinforcement and prepared as follows: (A) ~ (C) <Same as the present Guidance> (D) for glass reinforcements, the glass/resin ratios, by weight, as shown in Table 3.28.3 are to be used; (E) for reinforcement type other than <u>glass and carbon</u>, a fibre volume fraction, as shown in Table 3.28.4, is to be used. (2020)</p> <p>(2) <Same as the present Guidance> (3) The laminate is to be tested in air in the directions indicated by Table 3.28.5. (4) <u>For reinforcement type other than carbon</u>, the following tests are to be made on the samples (2020): (A) ~ (J) (5) <Same as the present Guidance> (6) The test methods and acceptance criteria applied to laminate specimens of <u>glass reinforcement</u> are to comply with Table 3.28.6. (2020) (7) <u>The test methods and acceptance criteria applied to laminate specimens of carbon reinforcement are to comply with Table 3.28.6</u>. (2020)</p>	<p>- Added requirements related to carbon fiber reinforcement</p>

Present	Amendment	reason
<p>4. Core materials</p> <p>(1) ~ (2) <Omitted></p> <p>(3) Specific requirements for end-grain balsa (A) ~ (B) <Omitted> (C) The test methods and acceptance criteria for end-grain balsa are to comply with Table 3.28.7.</p> <p>(4) Specific requirements for rigid foams (PVC, Polyurethane and other types) (A) ~ (B) <Omitted> (C) The test methods and acceptance criteria for rigid foams are to comply with Table 3.28.7.</p> <p>2804. <Omitted></p>	<p>4. Core materials</p> <p>(1) ~ (2) <Same as the present Guidance></p> <p>(3) Specific requirements for end-grain balsa (A) ~ (B) <Same as the present Guidance> (C) The test methods and acceptance criteria for end-grain balsa are to comply with Table 3.28.8.</p> <p>(4) Specific requirements for rigid foams (PVC, Polyurethane and other types) (A) ~ (B) <Same as the present Guidance> (C) The test methods and acceptance criteria for rigid foams are to comply with Table 3.28.8.</p> <p>2804. <Same as the present Guidance></p>	<p>- Added requirements related to carbon fiber reinforcement</p>

<Present>

Table 3.28.6 Test methods and acceptance criteria of reinforcement specimens

Test	Standard	Acceptance criteria
Tensile properties Flexural properties Compressive properties Interlaminar shear Water absorption Glass content	<ul style="list-style-type: none"> • ISO 527-4, ISO 527-5 (Test speed = 2 mm/min, Specimens Types II or III) • ISO 14125 (Test speed = Thickness/2 mm/min, Method A) • ISO 14126 (Test speed : 1 mm/min) • ISO 14130 • ISO 62 (Method 1) • ISO 1172 	To comply with the requirements of Pt 2, Annex 2-8 of the Guidance relating to the Rules for Classification of steel Ships.
<p>Notes :</p> <p>(1)ISO 62 : where resins are intended for use under ambient conditions to avoid additional post-curing, the requirement in ISO 62 for pre-drying the test specimen at 50 °C is to be omitted. The test result is to be expressed as mg of water.</p> <p>(2)ISO 527-4 : tensile properties are to be measured using extensometry.</p> <p>(3)Tensile modulus values are to be determined using an extensometer which may be removed for strain to failure.</p> <p>(4)Testing method other than those given in this Table is to be in accordance with the requirements as deemed appropriate by the Society.</p>		

Table 3.28.7 Test methods and acceptance criteria of end-grain balsa

Test	Standard	Acceptance criteria
Density Tensile properties Compressive properties Shear properties	<ul style="list-style-type: none"> • ISO 845 • ASTM C297-61 (Test speed=Thickness/10 mm/min) • ISO 844 (Test speed=Thickness/10 mm/min) • ISO 1922 (Test speed=Thickness/1 mm/min) 	To comply with the requirements of Pt 2, Annex 2-8 of the Guidance relating to the Rules for Classification of steel Ships.

<Amendment>

Table 3.28.6 Test methods and acceptance criteria of glass reinforcement specimens (2020)

Test	Standard	Acceptance criteria
Tensile properties Flexural properties Compressive properties Interlaminar shear Water absorption Glass content	<ul style="list-style-type: none"> • ISO 527-4, ISO 527-5 (Test speed = 2 mm/min, Specimens Types II or III) • ISO 14125 (Test speed = Thickness/2 mm/min, Method A) • ISO 14126 (Test speed : 1 mm/min) • ISO 14130 • ISO 62 (Method 1) • ISO 1172 	To comply with the requirements of Pt 2, Annex 2-8 of the Guidance relating to the Rules for Classification of steel Ships.
<p>Notes :</p> <p>(1)ISO 62 : where resins are intended for use under ambient conditions to avoid additional post-curing, the requirement in ISO 62 for pre-drying the test specimen at 50 °C is to be omitted. The test result is to be expressed as mg of water.</p> <p>(2)ISO 527-4, 527-5 : tensile properties are to be measured using extensometry.</p> <p>(3)Tensile modulus values are to be determined using an extensometer which may be removed for strain to failure.</p> <p>(4)Testing method other than those given in this Table is to be in accordance with the requirements as deemed appropriate by the Society.</p>		

Table 3.28.7 Test methods and acceptance criteria of carbon reinforcement specimens (2020)

Test	Standard	Acceptance criteria
Tensile properties Flexural properties Compressive properties Carbon content	<ul style="list-style-type: none"> • ISO 527-4, ISO 527-5 (Test speed = 2 mm/min, Specimens Types II or III) • ISO 14125 (Test speed = Thickness/2 mm/min, Method A) • ISO 14126 (Test speed : 1 mm/min) • ISO 14127 	To comply with the requirements of Pt 2, Annex 2-8 of the Guidance relating to the Rules for Classification of steel Ships.
<p>Notes :</p> <p>(1)The dimensions of laminate samples are to be in accordance with the test standards.</p> <p>(2)The carbon fiber volume fraction of laminates is to be 50±5%.</p> <p>(3)ISO 527-4, 527-5 : tensile properties are to be measured using extensometry.</p> <p>(4)Testing method other than those given in this Table is to be in accordance with the requirements as deemed appropriate by the Society.</p>		

Table 3.28.8 Test methods and acceptance criteria of end-grain balsa

Test	Standard	Acceptance criteria
Density Tensile properties Compressive properties Shear properties	<ul style="list-style-type: none"> • ISO 845 • ASTM C297-61 (Test speed=Thickness/10 mm/min) • ISO 844 (Test speed=Thickness/10 mm/min) • ISO 1922 (Test speed=Thickness/1 mm/min) 	To comply with the requirements of Pt 2, Annex 2-8 of the Guidance relating to the Rules for Classification of steel Ships.

Present	Amendment	reason																		
<p style="text-align: center;">Section 29 <Omitted></p> <p>Section 30 Protective Coating Systems for Ballast Tanks</p> <p>3001. ~ 3003. <Omitted></p> <p>3004. Performance standard</p> <p>1. Protective coating systems are, in principal, to be an epoxy-based systems. All systems that are not an epoxy-based system applied according to this requirements are defined as an alternative system.</p> <p>2. ~ 5. <Omitted></p> <p>3005. <Omitted></p> <p>3006. Type test</p> <p>1. <Omitted></p> <p>2. Test on Simulated Ballast Tank Conditions</p> <p>(1)~(2) <Omitted></p> <p>(3) Acceptance criteria</p> <p>(a) The test results based on (2) shall satisfy the criteria specified in Table 3.30.1.</p> <p>Table 3.30.1. Acceptance criteria for the test on Simulated Ballast Tank Conditions</p> <table border="1" data-bbox="228 1043 983 1248"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based systems</th> <th>Acceptance criteria for alternative systems</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blisters</td> <td>No blisters</td> </tr> <tr> <td><Omitted></td> <td><Omitted></td> <td><Omitted></td> </tr> </tbody> </table>	Item	Acceptance criteria for epoxy-based systems	Acceptance criteria for alternative systems	Blisters on panel	No blisters	No blisters	<Omitted>	<Omitted>	<Omitted>	<p style="text-align: center;">Section 29 <Same as the present Guidance></p> <p>Section 30 Protective Coating Systems for Ballast Tanks</p> <p>3001. ~ 3003. <Same as the present Guidance></p> <p>3004. Performance standard</p> <p>1. Protective coating systems are, in principal, to be an epoxy-based systems.</p> <p>2. ~ 5. <Same as the present Guidance></p> <p>3005. <Same as the present Guidance></p> <p>3006. Type test</p> <p>1. <Same as the present Guidance></p> <p>2. Test on Simulated Ballast Tank Conditions</p> <p>(1)~(2) <Same as the present Guidance></p> <p>(3) Acceptance criteria</p> <p>(a) The test results based on (2) shall satisfy the criteria specified in Table 3.30.1.</p> <p>Table 3.30.1. Acceptance criteria for the test on Simulated Ballast Tank Conditions (2020)</p> <table border="1" data-bbox="1066 1029 1821 1292"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based systems based on <u>this Guidance</u></th> <th>Acceptance criteria for alternative systems</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blisters</td> <td>No blisters</td> </tr> <tr> <td><Same as the present Guidance></td> <td><Same as the present Guidance></td> <td><Same as the present Guidance></td> </tr> </tbody> </table>	Item	Acceptance criteria for epoxy-based systems based on <u>this Guidance</u>	Acceptance criteria for alternative systems	Blisters on panel	No blisters	No blisters	<Same as the present Guidance>	<Same as the present Guidance>	<Same as the present Guidance>	<p>- To distinguish between alternative systems and epoxy-based systems</p>
Item	Acceptance criteria for epoxy-based systems	Acceptance criteria for alternative systems																		
Blisters on panel	No blisters	No blisters																		
<Omitted>	<Omitted>	<Omitted>																		
Item	Acceptance criteria for epoxy-based systems based on <u>this Guidance</u>	Acceptance criteria for alternative systems																		
Blisters on panel	No blisters	No blisters																		
<Same as the present Guidance>	<Same as the present Guidance>	<Same as the present Guidance>																		

Present	Amendment	reason																		
<p>(b) Epoxy-based systems shall satisfy the criteria for epoxy-based systems and alternative systems shall satisfy the criteria for alternative systems as indicated in Table 3.30.1.</p> <p>(4) <Omitted></p> <p>3. Condensation Chamber Test</p> <p>(1)~(2) <Omitted></p> <p>(3) Acceptance criteria</p> <p>(A) The test results based on (2) shall satisfy the criteria specified in Table 3.30.2.</p> <p>Table 3.30.2. Acceptance criteria for the Condensation Chamber Test</p> <table border="1" data-bbox="266 635 985 938"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based systems</th> <th>Acceptance criteria for alternative systems</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blisters</td> <td>No blisters</td> </tr> <tr> <td><Omitted></td> <td><Omitted></td> <td><Omitted></td> </tr> </tbody> </table> <p>(B) Epoxy-based systems shall satisfy the criteria for epoxy-based systems and alternative systems shall satisfy the criteria for alternative systems as indicated in Table 3.30.2.</p> <p>(4) <Omitted></p> <p>4. <Omitted></p> <p>3007. ~ 3010. <Omitted></p> <p>Section 31 ~ Section 32 <Omitted></p>	Item	Acceptance criteria for epoxy-based systems	Acceptance criteria for alternative systems	Blisters on panel	No blisters	No blisters	<Omitted>	<Omitted>	<Omitted>	<p>(b) Epoxy-based systems <u>based on this Guidance</u> shall satisfy the criteria for epoxy-based systems <u>based on this Guidance</u> and alternative systems shall satisfy the criteria for alternative systems as indicated in Table 3.30.1.</p> <p>(4) <Same as the present Guidance></p> <p>3. Condensation Chamber Test</p> <p>(1)~(2) <Same as the present Guidance></p> <p>(3) Acceptance criteria</p> <p>(A) The test results based on (2) shall satisfy the criteria specified in Table 3.30.2.</p> <p>Table 3.30.2. Acceptance criteria for the Condensation Chamber Test (2020)</p> <table border="1" data-bbox="1106 635 1825 970"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based systems <u>based on this Guidance</u></th> <th>Acceptance criteria for alternative systems</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blisters</td> <td>No blisters</td> </tr> <tr> <td><Same as the present Guidance></td> <td><Same as the present Guidance></td> <td><Same as the present Guidance></td> </tr> </tbody> </table> <p>(B) Epoxy-based systems <u>based on this Guidance</u> shall satisfy the criteria for epoxy-based systems <u>based on this Guidance</u> and alternative systems shall satisfy the criteria for alternative systems as indicated in Table 3.30.2.</p> <p>(4) <Same as the present Guidance></p> <p>4. <Same as the present Guidance></p> <p>3007. ~ 3010. <Same as the present Guidance></p> <p>Section 31 ~ Section 32 <Same as the present Guidance></p>	Item	Acceptance criteria for epoxy-based systems <u>based on this Guidance</u>	Acceptance criteria for alternative systems	Blisters on panel	No blisters	No blisters	<Same as the present Guidance>	<Same as the present Guidance>	<Same as the present Guidance>	<p>- To distinguish between alternative systems and epoxy-based systems</p>
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Present	Amendment	reason																		
<p>Section 33 Protective Coating Systems for Cargo Oil Tanks</p> <p>3301. ~ 3303. <Omitted></p> <p>3304. Performance standard</p> <p>1. Protective coating systems are, in principal, to be an epoxy-based systems. All systems that are not an epoxy-based system applied according to this requirements are defined as an alternative system.</p> <p>2. ~ 5. <Omitted></p> <p>3305. <Omitted></p> <p>3306. Type test</p> <p>1. <Omitted></p> <p>2. Gastight cabinet test</p> <p>(1)~(2) <Omitted></p> <p>(3) Acceptance criteria</p> <p>(A) The test results based on (2) above shall satisfy the following criteria, the poorest performing of the duplicate test panels shall be used in the report:</p> <table border="1" data-bbox="264 885 992 1082"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based system</th> <th>Acceptance criteria for alternative system</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blister</td> <td>No blister</td> </tr> <tr> <td>Rust on panel</td> <td>Ri 0 (0%)</td> <td>Ri 0 (0%)</td> </tr> </tbody> </table> <p>(B) <Omitted></p> <p>(4) <Omitted></p>	Item	Acceptance criteria for epoxy-based system	Acceptance criteria for alternative system	Blisters on panel	No blister	No blister	Rust on panel	Ri 0 (0%)	Ri 0 (0%)	<p>Section 33 Protective Coating Systems for Cargo Oil Tanks</p> <p>3301. ~ 3303. <Same as the present Guidance></p> <p>3304. Performance standard</p> <p>1. Protective coating systems are, in principal, to be an epoxy-based systems.</p> <p>2. ~ 5. <Same as the present Guidance></p> <p>3305. <Same as the present Guidance></p> <p>3306. Type test</p> <p>1. <Same as the present Guidance></p> <p>2. Gastight cabinet test</p> <p>(1)~(2) <Same as the present Guidance></p> <p>(3) Acceptance criteria</p> <p>(A) The test results based on (2) above shall satisfy the following criteria, the poorest performing of the duplicate test panels shall be used in the report (2020):</p> <table border="1" data-bbox="1104 869 1834 1098"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based system based on this Guidance</th> <th>Acceptance criteria for alternative system</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blister</td> <td>No blister</td> </tr> <tr> <td>Rust on panel</td> <td>Ri 0 (0%)</td> <td>Ri 0 (0%)</td> </tr> </tbody> </table> <p>(B) <Same as the present Guidance></p> <p>(4) <Same as the present Guidance></p>	Item	Acceptance criteria for epoxy-based system based on this Guidance	Acceptance criteria for alternative system	Blisters on panel	No blister	No blister	Rust on panel	Ri 0 (0%)	Ri 0 (0%)	<p>- To distinguish between alternative systems and epoxy-based systems</p>
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Present	Amendment	reason																		
<p>3. Immersion test</p> <p>(1)~(2) <Omitted></p> <p>(3) Acceptance criteria</p> <p>(A) The test results based on (2) above shall satisfy the following criteria, the poorest performing of the duplicate test panels shall be used in the report.:</p> <table border="1" data-bbox="264 391 992 587"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based system</th> <th>Acceptance criteria for alternative system</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blister</td> <td>No blister</td> </tr> <tr> <td>Rust on panel</td> <td>Ri 0 (0%)</td> <td>Ri 0 (0%)</td> </tr> </tbody> </table> <p>(B) <Omitted></p> <p>(4) <Omitted></p> <p>3307. ~ 3310. <Omitted></p> <p>Section 34 ~ Section 37 <Omitted></p>	Item	Acceptance criteria for epoxy-based system	Acceptance criteria for alternative system	Blisters on panel	No blister	No blister	Rust on panel	Ri 0 (0%)	Ri 0 (0%)	<p>3. Immersion test</p> <p>(1)~(2) <Same as the present Guidance></p> <p>(3) Acceptance criteria</p> <p>(A) The test results based on (2) above shall satisfy the following criteria, the poorest performing of the duplicate test panels shall be used in the report (2020):</p> <table border="1" data-bbox="1104 391 1832 619"> <thead> <tr> <th>Item</th> <th>Acceptance criteria for epoxy-based system based on this Guidance</th> <th>Acceptance criteria for alternative system</th> </tr> </thead> <tbody> <tr> <td>Blisters on panel</td> <td>No blister</td> <td>No blister</td> </tr> <tr> <td>Rust on panel</td> <td>Ri 0 (0%)</td> <td>Ri 0 (0%)</td> </tr> </tbody> </table> <p>(B) <Same as the present Guidance></p> <p>(4) <Same as the present Guidance></p> <p>3307. ~ 3310. <Same as the present Guidance></p> <p>Section 34 ~ Section 37 <Same as the present Guidance></p>	Item	Acceptance criteria for epoxy-based system based on this Guidance	Acceptance criteria for alternative system	Blisters on panel	No blister	No blister	Rust on panel	Ri 0 (0%)	Ri 0 (0%)	<p>- To distinguish between alternative systems and epoxy-based systems</p>
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Present	Amendment	reason
<p style="text-align: center;">CHAPTER 4 <Omitted></p> <p style="text-align: center;">CHAPTER 5 APPROVAL OF QUALITY ASSURANCE SYSTEM</p> <p style="text-align: center;">Section 1 ~ Section 2 <Omitted> Section 3 Approval</p> <p>301. ~ 302. <Omitted></p> <p>303. Suspension and withdrawal of certification</p> <p>1. <Omitted></p> <p>2. The Society can withdraw the approval of a quality assurance system if any of the following conditions happens:</p> <p>(1) When important changes having significant effect on the quality system is not communicated to the Society.</p> <p>(2) When the periodical, occasional or renewal audit is not carried out in the relevant period.</p> <p>(3) When a request for withdrawal is made by the manufacturer.</p> <p>(4) When the approval fees are not paid.</p> <p>(5) In case where forged or falsified stamps or certificates are used. (2019)</p> <p>(6) <New></p> <p>(6) When considered inappropriate for approved condition by the Society.</p> <p>3. ~ 5. <Omitted></p> <p>304. <Omitted></p> <p>305. Handling after approval (permission of manufacturer's tests and inspection)</p> <p>1. ~ 4. <Omitted></p>	<p style="text-align: center;">CHAPTER 4 <Same as the present Guidance></p> <p style="text-align: center;">CHAPTER 5 APPROVAL OF QUALITY ASSURANCE SYSTEM</p> <p style="text-align: center;">Section 1 ~ Section 2 <Same as the present Guidance> Section 3 Approval</p> <p>301. ~ 302. <Same as the present Guidance></p> <p>303. Suspension and withdrawal of certification</p> <p>1. <Same as the present Guidance></p> <p>2. The Society can withdraw the approval of a quality assurance system if any of the following conditions happens:</p> <p>(1) When important changes having significant effect on the quality system is not communicated to the Society.</p> <p>(2) When the periodical, occasional or renewal audit is not carried out in the relevant period.</p> <p>(3) When a request for withdrawal is made by the manufacturer.</p> <p>(4) When the approval fees are not paid.</p> <p>(5) In case where forged or falsified stamps or certificates are used. (2019)</p> <p>(6) <u>When the manufacturer's quality is questionable in accordance with 305. 5 (2020)</u></p> <p>(7) When considered inappropriate for approved condition by the Society.</p> <p>3. ~ 5. <Same as the present Guidance></p> <p>304. <Same as the present Guidance></p> <p>305. Handling after approval (permission of manufacturer's tests and inspection)</p> <p>1. ~ 4. <Same as the present Guidance></p>	<p>- Established a plan to secure the quality of QA type F</p>

Present	Amendment	reason
<p data-bbox="181 177 320 204"><u>5.</u> <New></p> <p data-bbox="181 563 448 590"><u>5.</u> ~ <u>6.</u> <Omitted></p>	<p data-bbox="1023 177 1832 512"><u>5.</u> For material manufacturers (rolled steels, castings, forgings, etc.) with the approval of fully entrusted quality assurance system, the Surveyor may unexpectedly request witnessing of tests even after submitting the self-test reports. For this purpose, the manufacturer is to keep enough specimens or samples for at least one week after the application date. Chemical composition and mechanical properties are to be verified in the presence of the Surveyor and the results are not to show a significant deviation from those already submitted. If the results are suspicious or do not meet the requirements, the Surveyor may request re-tests and, if necessary, suspend or withdraw the approval. (2020)</p> <p data-bbox="1023 531 1592 558"><u>6.</u> ~ <u>7.</u> <Same as the present Guidance></p>	<p data-bbox="1841 209 2123 320">- Established a plan to secure the quality of QA type F</p>

GUIDANCE RELATING TO THE RULES FOR THE CLASSIFICATION OF STEEL SHIPS

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

-External Opinion Inquiry-

2020. 1.



Hull Rule Development Team

- Main Amendments -

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

Present	Amendment	reason																		
<p style="text-align: center;">Chapter 3. Type Approval</p> <p style="text-align: center;">Section 1. ~ Section 5.<Omitted></p> <p style="text-align: center;">Section 6. High Holding Power Anchors and Super High Holding Power Anchors</p> <p>601.~602.<Omitted></p> <p>603. Type tests</p> <p>(1)~(2) <Omitted></p> <p>Table 3.6.2 Items of Holding Power Test and Numbers of Attempts</p> <table border="1" data-bbox="197 699 958 880"> <tr> <td>Type of anchor</td> <td colspan="2"><Omitted></td> </tr> <tr> <td>High Holding Power Anchor</td> <td><Omitted></td> <td><Omitted></td> </tr> <tr> <td>Super High Holding Power Anchor</td> <td><Omitted></td> <td><Omitted></td> </tr> </table> <p>Notes</p> <p>(1) <Omitted></p> <p>(2) Anchors “A” and “B” are to have nearly compatible masses, and the mass of anchor “a” and “b” are to, in principle, have a mass equivalent to 1/10(1/5 for the super high holding power anchor) of that of anchor “A” and “B” or more.</p> <p>Anchor “A” and “B” are to, in principle, have a mass a equivalent to 1/10(1/5 for the super high holding power anchor) of the maximum mass to be approved or more.</p> <p><Omitted></p> <p>(3) <Omitted></p> <p>(4) <Omitted></p>	Type of anchor	<Omitted>		High Holding Power Anchor	<Omitted>	<Omitted>	Super High Holding Power Anchor	<Omitted>	<Omitted>	<p style="text-align: center;">Chapter 3. Type Approval</p> <p style="text-align: center;">Section 1. ~ Section 5.<Same as the present rules></p> <p style="text-align: center;">Section 6. High Holding Power Anchors and Super High Holding Power Anchors</p> <p>601.~602.<Same as the present rules></p> <p>603. Type tests</p> <p>(1)~(2) <Same as the present rules></p> <p>Table 3.6.2 Items of Holding Power Test and Numbers of Attempts</p> <table border="1" data-bbox="1041 699 1803 917"> <tr> <td>Type of anchor</td> <td colspan="2"><Same as the present rules></td> </tr> <tr> <td>High Holding Power Anchor</td> <td><Same as the present rules></td> <td><Same as the present rules></td> </tr> <tr> <td>Super High Holding Power Anchor</td> <td><Same as the present rules></td> <td><Same as the present rules></td> </tr> </table> <p>Notes</p> <p>(1) <Same as the present rules></p> <p>(2) Anchors “A” and “B” are to have nearly compatible masses, and the mass of anchor “a” and “b” are to, in principle, have a mass equivalent to 1/10(<u>the minimum of the approval mass range</u> for the super high holding power anchor) of that of anchor “A” and “B” or more.</p> <p>Anchor “A” and “B” are to, in principle, have a mass a equivalent to 1/10(<u>the maximum of the approval mass range</u> for the super high holding power anchor) of the maximum mass to be approved or more. <Same as the present rules></p> <p>(3) <Same as the present rules></p> <p>(4) <Same as the present rules></p>	Type of anchor	<Same as the present rules>		High Holding Power Anchor	<Same as the present rules>	<Same as the present rules>	Super High Holding Power Anchor	<Same as the present rules>	<Same as the present rules>	<p>* It is reflected with Request for Establishment/Revision of Classification Technical Rules.</p>
Type of anchor	<Omitted>																			
High Holding Power Anchor	<Omitted>	<Omitted>																		
Super High Holding Power Anchor	<Omitted>	<Omitted>																		
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Guidance for Approval of Manufacturing Process and Type Approval, Etc.

(Final)

2020. 1.



Machinery Rule Development Team

Effective Date

- ✓ Equipment for which the date of application for type approval certification is dated on or after 1 January 2020.
- ✓ 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	Remark
<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 (2019)</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)(2020)</p> <p><refer to the next page></p> <p>Section 24 - 37 <same as the present Rules></p>	<p>(Amended)</p> <p>- Reflecting IACS UR E10 (Rev.7), the requirements for type test of automatic and remote control systems have been amended.</p>

< Amendment >

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

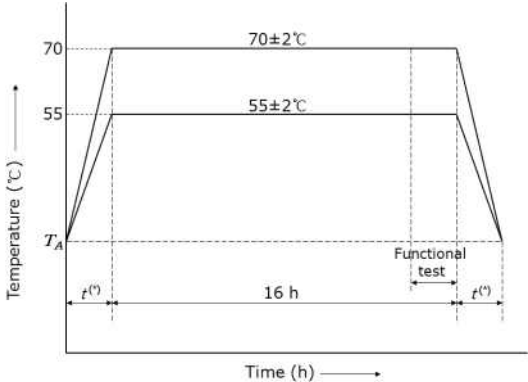
No.	Test item	testing condition and method	Criteria
6	Dry heat test	<ul style="list-style-type: none"> · The test shall be carried out at $25 \pm 2 \text{ }^\circ\text{C}$ in atmospheric temperature. · The absolute humidity shall not exceed 20 g of water vapor per cubic meter of air (corresponding approximately 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;">  <p>The graph plots Temperature (°C) on the y-axis against Time (h) on the x-axis. Two test profiles are shown. The first profile starts at an initial temperature T_A, rises to a plateau at $70 \pm 2 \text{ }^\circ\text{C}$, maintains this temperature for a total duration of 16 hours, and then falls back to T_A. A 'Functional test' period of 1 hour is marked at the end of the 16-hour plateau. The second profile follows a similar path but reaches a lower plateau at $55 \pm 2 \text{ }^\circ\text{C}$. The rising and falling slopes are labeled with t^*.</p> </div> <p>Note (*) Raising and lowering rate of temperature is to be within $1 \text{ }^\circ\text{C}/\text{min}$. (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: none;">Frequency range</td> <td style="border: none;">80 MHz ~ 2 6 GHz</td> </tr> <tr> <td style="border: none;">Modulation</td> <td style="border: none;">80 % AM at 1,000 Hz</td> </tr> <tr> <td style="border: none;">Field strength</td> <td style="border: none;">10 V/m</td> </tr> <tr> <td style="border: none;">Frequency sweep rate</td> <td style="border: none;"> $\leq 1.5 \times 10^{-3}$ 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 ~ 2 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 ~ 2 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="475 654 775 721">30 MHz ~ 2,000 <u>1,000</u> MHz</td> <td data-bbox="775 654 1106 721">54 dBμV/m</td> </tr> <tr> <td data-bbox="475 721 775 768">156 MHz ~ 165 MHz</td> <td data-bbox="775 721 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="475 828 1106 1025"> <tbody> <tr> <td data-bbox="475 828 775 880">150 kHz ~ 30 MHz</td> <td data-bbox="775 828 1106 880">80 ~ 50 dBμV/m</td> </tr> <tr> <td data-bbox="475 880 775 931">30 MHz ~ 100 MHz</td> <td data-bbox="775 880 1106 931">60 ~ 54 dBμV/m</td> </tr> <tr> <td data-bbox="475 931 775 999">100 MHz ~ 2,000 <u>1,000</u> MHz</td> <td data-bbox="775 931 1106 999">54 dBμV/m</td> </tr> <tr> <td data-bbox="475 999 775 1025">156 MHz ~ 165 MHz</td> <td data-bbox="775 999 1106 1025">24 dBμV/m</td> </tr> </tbody> </table> <p><Limits above 1,000 MHz></p> <table border="1" data-bbox="475 1104 1129 1193"> <thead> <tr> <th data-bbox="475 1104 775 1155">Frequency range</th> <th data-bbox="775 1104 1129 1155">Average limit</th> </tr> </thead> <tbody> <tr> <td data-bbox="475 1155 775 1193"><u>1,000 MHz ~ 6,000 MHz</u></td> <td data-bbox="775 1155 1129 1193"><u>54 dBμV/m</u></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 ~ 2,000 <u>1,000</u> 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 ~ 2,000 <u>1,000</u> MHz	54 dB μ V/m	156 MHz ~ 165 MHz	24 dB μ V/m	Frequency range	Average limit	<u>1,000 MHz ~ 6,000 MHz</u>	<u>54 dBμV/m</u>	<p>· Radiated emission is to be within limits in the table.</p>
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<u>1,000 MHz ~ 6,000 MHz</u>	<u>54 dBμV/m</u>																										

Effective Date : 1 July 2020

(The contract date for ship construction)

Present	Amendment	Remark
<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p>Section 1 - 20 <same as the present Rules></p> <p>Section 21 Electrical Equipment and Cables</p> <p>2101. - 2108. <same as the present Rules></p> <p>2109. Other electrical equipment</p> <p>1. <same as the present Rules></p> <p>2. The items of the type tests are, in general, to be in accordance with the requirements given in Table 3.21.5. In case where the Society specifically deems necessary, additional test items or number of test samples may be required.</p> <p>3. - 4. <same as the present Rules></p> <p>Table 3.21.5 Type test item of other electrical equipment <refer to the next page></p> <p style="text-align: center;">Section 22 <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 21 Electrical Equipment and Cables</p> <p>2101. - 2108. <same as the present Rules></p> <p>2109. Other electrical equipment</p> <p>1. <same as the present Rules></p> <p>2. The items of the type tests are, in general, to be in accordance with the requirements given in Table 3.21.5. In case where the Society specifically deems necessary, additional test items or number of test samples may be required.</p> <p>3. - 4. <same as the present Rules></p> <p>Table 3.21.5 Type test item of other electrical equipment <refer to the next page></p> <p style="text-align: center;">Section 22 <same as the present Rules></p>	<p>(Amended)</p> <p>- As the type approval test items of generators and motors are different from IACS UR E13, the requirements have been amended so that the test items of UR E13 are in conformity with the type approval test items.</p>

<Present>

Table 3.21.5 Type test item of other electrical equipment

Electrical equipment	The items of the type tests
Generators	(1) Construction inspection (2) Running test: Temperature rising test, overload test, over-current test, overspeed test (3) Characteristics test: Voltage variation test, transient voltage variation test (4) Insulation resistance test (5) High voltage test (6) Vibration measurement, noise level measurement (7) Performance test of air cooler (8) Other tests
Electric motors	(1) Construction inspection (2) Operational test: Temperature rising test, overload test, over-torque test, commutation test and overspeed test (3) Characteristics test: Load characteristics test (4) Insulation resistance test (5) High voltage test (6) Vibration measurement and hose test (7) Other tests
<hereafter, same as the present Rules>	

<Amendment>

Table 3.21.5 Type test item of other electrical equipment (2020)

Electrical equipment	The items of the type tests
<u>a.c.</u> Generators	(1) Construction inspection (2) Running test: Temperature rising test, overload test, over-current test, overspeed test (3) Characteristics test: Voltage variation test, transient voltage variation test (4) Insulation resistance test (5) High voltage test (6) Vibration measurement, noise level measurement (7) Performance test of air cooler (8) Other tests <u>In accordance with the test items for the first batch of each type in the table for tests of rotating machinery of Pt 6, Ch 1, 309. 16 of Rules for the Classification of Steel Ships.</u>
Electric motors <u>a.c. Motors</u>	(1) Construction inspection (2) Operational test: Temperature rising test, overload test, over-torque test, commutation test and overspeed test (3) Characteristics test: Load characteristics test (4) Insulation resistance test (5) High voltage test (6) Vibration measurement and hose test (7) Other tests <u>In accordance with the test items for the first batch of each type in the table for tests of rotating machinery of Pt 6, Ch 1, 309. 16 of Rules for the Classification of Steel Ships.</u>
<u>d.c. Machines</u>	<u>In accordance with the test items for the first batch of each type in the table for tests of rotating machinery of Pt 6, Ch 1, 309. 16 of Rules for the Classification of Steel Ships.</u>
<hereafter, same as the present Rules>	

GUIDANCE FOR APPROVAL OF MANUFACTURING PROCESS AND TYPE APPROVAL, Etc.

(Development Review : For external opinion inquiry)

2020. 01.



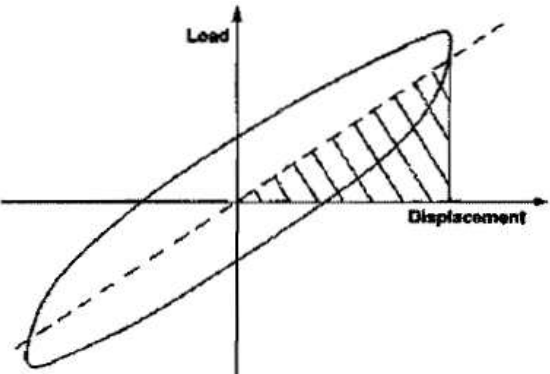
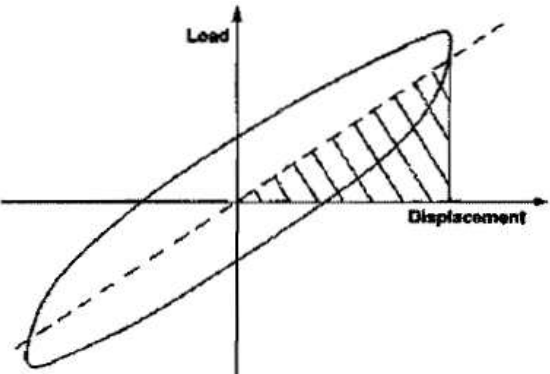
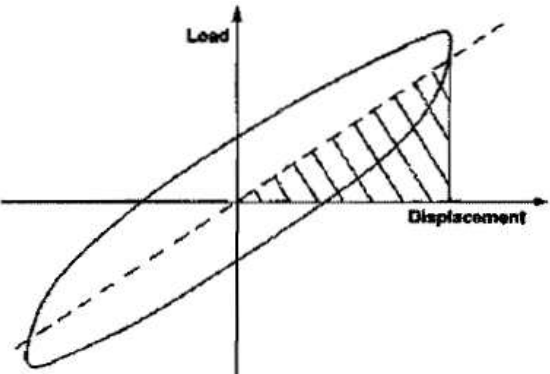
Machinery Rule Development Team

– Main Amendments –

- (1) Effective date : 1 Jul. 2020 (Date of which the contract for construction is signed)
- The requirements of type approval for resilient mountings have been newly added.
 - The tests and the test methods for dynamic torsional stiffness and the damping for flexible couplings have been newly added.
 - The reference has been modified according to totally revised Guidance for Fuel cell systems on board of ships.

Present	Amendment	Reason
<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p>Section 15 Machinery and Equipment for Ships</p> <p>1501. Application</p> <p>1. The requirements of this Section apply to tests and inspection for the approval of the machinery and equipment listed below for which approval of the Society is to be obtained in advance before being fitted in ships. (2018)</p> <p>(1) ~ (2) <omitted></p> <p>(3) ~ (8) <omitted></p> <p>(9) Fuel pipings and pumps for fuel cell systems on board of ships (Ch 3, 605., 606. and 607. of the Guidance for fuel cell systems on board of ships)</p> <p>(10) Others as deemed necessary by the Society</p> <p>2. <omitted></p> <p>1502. <omitted></p> <p>1503. Type tests</p> <p>1. ~ 2. <omitted></p>	<p style="text-align: center;">CHAPTER 3 TYPE APPROVAL</p> <p>Section 15 Machinery and Equipment for Ships</p> <p>1501. Application</p> <p>1. The requirements of this Section apply to tests and inspection for the approval of the machinery and equipment listed below for which approval of the Society is to be obtained in advance before being fitted in ships. (2018)</p> <p>(1) ~ (2) <same as the present></p> <p>(3) <u>Resilient mountings for internal combustion engine (Pt 5, Ch 2, 202. 1 (3) of the Rules). In addition, this guidance may apply for type approval of the resilient mountings for gear transmissions, generators, steam turbines, gas turbines and auxiliary machinery at the request of the manufacturers. (2020)</u></p> <p>(4) ~ (9) <same as the present></p> <p>(10) <u>Expansion bellows for fuel cell fuel system (Ch 2, 701. 1 of the Guidance for Fuel Cell Systems on board of ships)</u></p> <p>(11) Others as deemed necessary by the Society</p> <p>2. <same as the present></p> <p>1502. <same as the present></p> <p>1503. Type tests</p> <p>1. ~ 2. <same as the present></p>	<p><Guidance for Approval of Manufacturing Process and Type Approval, Etc.></p> <p>(amendment)</p> <p>- add the requirements of type approval for resilient mountings</p> <p>- Numbering change</p> <p>- modify according to totally revised Guidance for Fuel cell systems on board of ships</p>

Present		Amendment		Reason
Table 3.15.1 Type test item of machinery and equipment of ship (continued)		Table 3.15.1 Type test item of machinery and equipment of ship (continued)		<Guidance for Approval of Manufacturing Process and Type Approval, Etc.> (amendment) - Reflect Circular 2010-03-E and DNVGL-CP-0144 - add the tests and the test methods for dynamic torsional stiffness and the damping.
Kinds	Type test item	Kinds	Type test item	
Resin chock	<omitted>	Resin chock	<same as the present>	
<new>	<new>		(A) General (a) Type tests are to be performed with “as new” elements and normally also with elements having the maximum permissible permanent set. (b) Testing equipment has the function to adjust the parameters such as mean load, vibratory load, vibration frequency, heating of element surface (optional) on the test rig. (c) Testing equipment is to measure load, displacement, frequency, temperature at the surface of the rubber (optional). (B) Static vertical stiffness test (a) Test elements are to be subjected to the test load with constant load interval from 0 to the permissible load for 30 seconds by types, dimensions and hardness and, then, displacements are to be measured for calculating the static vertical stiffness. (b) The load and displacement readings are to be recorded simultaneously and results plotted in load-displacement diagrams. (c) In case where the resilient mountings can be loaded in both compression and shear, both directions are to be tested. (d) The spring constant is to be evaluated. (C) Dynamic stiffness test (a) Test is to be carried out repeatedly by types, dimensions and hardness in accordance with the manufacturer's practice. However, if there is no manufacturer's practice, it may comply with the following method. (i) With mean load and vibratory load fixed, the tests are to be repeated with frequency f changed as following steps. $f = 2, 5, 10, 20$ and 40 (Hz) (ii) With frequency and vibratory load fixed, the tests are to be repeated with mean load F_M changed as following steps. $F_M = 50\%, 75\%$ and 100% of the maximum nominal element load	
		Resilient Mountings for internal combustion engine (2020)		

Present		Amendment		Reason								
<p>Table 3.15.1 Type test item of machinery and equipment of ship (continued)</p> <table border="1"> <thead> <tr> <th>Kinds</th> <th>Type test item</th> </tr> </thead> <tbody> <tr> <td><new></td> <td><new></td> </tr> </tbody> </table>		Kinds	Type test item	<new>	<new>	<p>Table 3.15.1 Type test item of machinery and equipment of ship (continued)</p> <table border="1"> <thead> <tr> <th>Kinds</th> <th>Type test item</th> </tr> </thead> <tbody> <tr> <td>Resilient Mountings for internal combustion engine (2020)</td> <td> <p>(iii) With frequency and mean load fixed, the tests are to be repeated with vibratory load F_V changed as following steps.</p> <p>$F_V = 5\%, 10\%, 20\%$ and 40% of the maximum nominal element load</p> <p>(b) For elements designed so that a permanent set is likely to occur and to alter the dynamic properties significantly, the tests with various mean and vibratory loads are to be repeated with the maximum permissible permanent set.</p> <p>(c) The vibratory load and displacement readings by frequency and mean load are to be recorded simultaneously and results plotted in load-displacement diagrams as shown in Fig 3.15.1.</p>  <p>Fig 3.15.1 An example of the load-displacement diagram in dynamic stiffness test</p> </td> </tr> </tbody> </table>		Kinds	Type test item	Resilient Mountings for internal combustion engine (2020)	<p>(iii) With frequency and mean load fixed, the tests are to be repeated with vibratory load F_V changed as following steps.</p> <p>$F_V = 5\%, 10\%, 20\%$ and 40% of the maximum nominal element load</p> <p>(b) For elements designed so that a permanent set is likely to occur and to alter the dynamic properties significantly, the tests with various mean and vibratory loads are to be repeated with the maximum permissible permanent set.</p> <p>(c) The vibratory load and displacement readings by frequency and mean load are to be recorded simultaneously and results plotted in load-displacement diagrams as shown in Fig 3.15.1.</p>  <p>Fig 3.15.1 An example of the load-displacement diagram in dynamic stiffness test</p>	<p><Guidance for Approval of Manufacturing Process and Type Approval, Etc.></p>
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<new>	<new>											
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Present		Amendment		Reason								
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For flexible couplings not to be used in diesel engines the tests at reference condition may be sufficient. However, for typically flexible couplings which the stiffness progressively increase with torque, all permissible combinations of mean and vibratory torques are to be tested.</p> <p>(B) ~ (E) <same as the present></p> </td> </tr> </tbody> </table>		Kinds	Type test item	<same as the present>		flexible couplings	<p>In the type tests of flexible couplings, the followings are to be included. For systems intended to control a deflection as well as a torsion, the tests in the followings are to be carried out under the condition of imposing the maximum allowable deflection.</p> <p>(A) Test to confirm the <u>dynamic torsional stiffness and the damping</u>. Test is to be carried out in accordance with the <u>manufacturer's practice</u>. However, if there is no <u>manufacturer's practice</u>, it may comply with the <u>following method</u>. 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flexible couplings	<p>In the type tests of flexible couplings, the followings are to be included. For systems intended to control a deflection as well as a torsion, the tests in the followings are to be carried out under the condition of imposing the maximum allowable deflection.</p> <p>(A) Test to confirm the <u>dynamic torsional stiffness and the damping</u>. Test is to be carried out in accordance with the <u>manufacturer's practice</u>. However, if there is no <u>manufacturer's practice</u>, it may comply with the <u>following method</u>. (2020)</p> <p>(a) With mean torque and vibratory torque fixed, the tests are to be repeated with vibration frequency f changed as following steps.</p> <p>$f = 2, 10^*, 20$ (Hz)</p> <p>(b) With vibration frequency and vibratory torque fixed, the tests are to be repeated with mean torque T_M changed as following steps.</p> <p>$T_M/T_{KN} = 0, 0.25, 0.5, 0.75^*, 1$</p> <p>where:</p> <p>$T_{KN}$ = permissible nominal torque</p> <p>(c) With vibration frequency and mean torque fixed, the tests are to be repeated with vibratory torque T_V changed as following steps.</p> <p>$T_V/T_{KV} = 0.5, 1^*, 2.0$ (2.0 is for the purpose of transient vibrations)</p> <p>where:</p> <p>T_{KV} = permissible vibratory torque</p> <p>(d) Testing all the possible combinations of the conditions mentioned above (a), (b), (c) is not required. When the one parameter is tested, the other parameters are kept constant as reference conditions (* marked above). For flexible couplings not to be used in diesel engines the tests at reference condition may be sufficient. However, for typically flexible couplings which the stiffness progressively increase with torque, all permissible combinations of mean and vibratory torques are to be tested.</p> <p>(B) ~ (E) <same as the present></p>															

Present		Amendment		Reason										
Table 3.15.1 Type test item of machinery and equipment of ship (continued)		Table 3.15.1 Type test item of machinery and equipment of ship (continued)		<Guidance for Approval of Manufacturing Process and Type Approval, Etc.> - modify according to totally revised Guidance for Fuel cell systems on board of ships										
<table border="1"> <thead> <tr> <th>Kinds</th> <th>Type test item</th> </tr> </thead> <tbody> <tr> <td>Gas fuel pipings and pumps for gas fuelled ships</td> <td>Type tests specified in Ch 16, 701. and 703. of the Rules for ships using low-flashpoint fuels are to be carried out in accordance with the type test requirements of cargo pipings and pumps of ships carrying liquefied gases in bulk.</td> </tr> <tr> <td>Fuel pipings and pumps for fuel cell systems on board of ships</td> <td>Type tests specified in Ch 3, 605., 606. and 607. of the Guidance for fuel cell systems on board of ships are to be carried out in accordance with the type test requirements of cargo pipings and pumps of ships carrying liquefied gases in bulk.</td> </tr> </tbody> </table>	Kinds	Type test item	Gas fuel pipings and pumps for gas fuelled ships		Type tests specified in Ch 16, 701. and 703. of the Rules for ships using low-flashpoint fuels are to be carried out in accordance with the type test requirements of cargo pipings and pumps of ships carrying liquefied gases in bulk.	Fuel pipings and pumps for fuel cell systems on board of ships	Type tests specified in Ch 3, 605., 606. and 607. of the Guidance for fuel cell systems on board of ships are to be carried out in accordance with the type test requirements of cargo pipings and pumps of ships carrying liquefied gases in bulk.	<table border="1"> <thead> <tr> <th>Kinds</th> <th>Type test item</th> </tr> </thead> <tbody> <tr> <td>Low-flashpoint fuel pipings and pumps for gas fuelled ships</td> <td>Type tests specified in Ch 16, 701. and 703. of the Rules for ships using low-flashpoint fuels are to be carried out in accordance with the type test requirements of cargo pipings and pumps of ships carrying liquefied gases in bulk.</td> </tr> <tr> <td>Expansion bellows for fuel cell fuel system</td> <td>Type tests specified in Ch 2, 701. 2 of the Guidance for Fuel Cell Systems on board of ships are to be carried out in accordance with the type test requirements of <u>expansion bellows</u> of ships carrying liquefied gases in bulk.</td> </tr> </tbody> </table>	Kinds	Type test item	Low-flashpoint fuel pipings and pumps for gas fuelled ships	Type tests specified in Ch 16, 701. and 703. of the Rules for ships using low-flashpoint fuels are to be carried out in accordance with the type test requirements of cargo pipings and pumps of ships carrying liquefied gases in bulk.	Expansion bellows for fuel cell fuel system	Type tests specified in Ch 2, 701. 2 of the Guidance for Fuel Cell Systems on board of ships are to be carried out in accordance with the type test requirements of <u>expansion bellows</u> of ships carrying liquefied gases in bulk.
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(hereafter, omitted)		(hereafter, same as the present)												

GUIDANCE RELATING TO THE RULES FOR THE CLASSIFICATION OF STEEL SHIPS

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



Hull Rule Development Team

- Main Amendments -

(1) Enter into force on 1 January 2020 (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)

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 ⁽¹⁰⁾	<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) Weldment tensile test
(r) Weldment impact test (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)

Approval test items		Position of the Sample ⁽⁶⁾	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 I of KS D 0234 . Others to be free from any defects deemed to have negative effect.