

# Guidance for Battery Systems on Board of Ships

(Development Review : Final)

2022. 2.



Machinery Rule Development Team

Present	Amendment	Remark																																																		
<p>CHAPTER 1 &lt;same as the present Rules&gt;</p> <p>CHAPTER 2 CLASSIFICATION SURVEYS</p> <p>Section 1 – 2 &lt;same as the present Rules&gt;</p> <p>Section 3 Tests and Inspections</p> <p>301. &lt;same as the present Rules&gt;</p> <p>302. Test and Inspection</p> <p>1. The battery system shall be subjected to the test and inspection in accordance with the following tables.</p> <p>2. – 3. &lt;same as the present Rules&gt;</p> <p>Table 2 Battery module <i>(2019)</i></p> <table><tr><th>No.</th><th>Test</th><th>Test Standard</th><th>Subject</th><th>Classification</th></tr><tr><td colspan="5">&lt;New added&gt;</td></tr><tr><td>1</td><td><u>Capacity Checking Test</u></td><td>Specifications / IEC 62620 6.4.1</td><td>Module</td><td>Type Approval</td></tr><tr><td>2–9</td><td colspan="4">&lt;same as the present Rules&gt;</td></tr><tr><td colspan="5">(Notes) (1) – (4) &lt;same as the present Rules&gt; (5) Perform thermal runaway propagation test on battery module or pack basis <i>(2019)</i></td></tr></table>	No.	Test	Test Standard	Subject	Classification	<New added>					1	<u>Capacity Checking Test</u>	Specifications / IEC 62620 6.4.1	Module	Type Approval	2–9	<same as the present Rules>				(Notes) (1) – (4) <same as the present Rules> (5) Perform thermal runaway propagation test on battery module or pack basis <i>(2019)</i>					<p>CHAPTER 1 &lt;same as the present Rules&gt;</p> <p>CHAPTER 2 CLASSIFICATION SURVEYS</p> <p>Section 1 – 2 &lt;same as the present Rules&gt;</p> <p>Section 3 Tests and Inspections</p> <p>301. &lt;same as the present Rules&gt;</p> <p>302. Test and Inspection</p> <p>1. The battery system shall be subjected to the test and inspection in accordance with the following tables.</p> <p>2. – 3. &lt;same as the present Rules&gt;</p> <p>Table 2 Battery module <del><i>(2019)</i></del> <i>(2021)</i></p> <table><tr><th>No.</th><th>Test</th><th>Test Standard</th><th>Subject</th><th>Classification</th></tr><tr><td>1</td><td><u>Discharge performance Test</u></td><td><u>IEC 62620 6.3.1</u></td><td><u>Module</u></td><td><u>Type Approval</u></td></tr><tr><td>1 + 2</td><td><del>Capacity Checking Test</del> <u>Charge Capacity Retention and Recovery Test</u></td><td>Specifications / IEC 62620 6.4.1 6.4</td><td>Module</td><td>Type Approval</td></tr><tr><td>2–9 3–10</td><td colspan="4">&lt;same as the present Rules&gt;</td></tr><tr><td colspan="5">(Notes) (1) – (4) &lt;same as the present Rules&gt; (5) Perform thermal runaway propagation test on battery <u>cell or</u> module or pack basis <del><i>(2019)</i></del> <i>(2021)</i></td></tr></table>	No.	Test	Test Standard	Subject	Classification	1	<u>Discharge performance Test</u>	<u>IEC 62620 6.3.1</u>	<u>Module</u>	<u>Type Approval</u>	1 + 2	<del>Capacity Checking Test</del> <u>Charge Capacity Retention and Recovery Test</u>	Specifications / IEC 62620 6.4.1 6.4	Module	Type Approval	2–9 3–10	<same as the present Rules>				(Notes) (1) – (4) <same as the present Rules> (5) Perform thermal runaway propagation test on battery <u>cell or</u> module or pack basis <del><i>(2019)</i></del> <i>(2021)</i>					<p>(Amended)</p> <p>– The discharge performance test was added for the battery module, and the name of the capacity checking test has been amended to the charge capacity retention and recovery test.</p> <p>– The subject of the thermal runaway propagation test has been clarified.</p>
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<p><b>CHAPTER 3 CONSTRUCTION AND EQUIPMENT</b></p> <p>Section 1 &lt;same as the present Rules&gt;</p> <p>Section 2 System Design</p> <p>201. &lt;same as the present Rules&gt;</p> <p>202. Construction and design</p> <p>1. – 3. &lt;same as the present Rules&gt;</p> <p>4. Installation</p> <p>(1) - (2) &lt;same as the present Rules&gt;</p> <p>(3) The battery room shall not contain other systems related to the essential services of the ship, and cables, pipes, etc. for <u>supplying to systems other than the battery system shall not penetrate.</u></p> <p>5. &lt;same as the present Rules&gt;</p> <p>203. – 206. &lt;same as the present Rules&gt;</p>	<p><b>CHAPTER 3 CONSTRUCTION AND EQUIPMENT</b></p> <p>Section 1 &lt;same as the present Rules&gt;</p> <p>Section 2 System Design</p> <p>201. &lt;same as the present Rules&gt;</p> <p>202. Construction and design</p> <p>1. – 3. &lt;same as the present Rules&gt;</p> <p>4. Installation</p> <p>(1) - (2) &lt;same as the present Rules&gt;</p> <p>(3) The battery room shall not contain other systems related to the essential services of the ship, and <del>cables, pipes, etc. for supplying to systems other than the battery system shall not penetrate.</del> <u>Pipes shall not penetrate into the battery room as leakage of the pipe may cause damage or failure of the battery system. However, in case of unavoidable installation of pipes, the pipe joints shall be welded joints, and flanges, threaded joints or mechanical joints shall not be used(For pipe joint types, refer to Pt 5, Ch 6, 104. 1 of the Rules for the Classification of Steel Ships). (2021)</u></p> <p>5. &lt;same as the present Rules&gt;</p> <p>203. – 206. &lt;same as the present Rules&gt;</p>	<p>(Amended)</p> <p>- If there is adequate protection against leakage for the pipe that penetrates into the battery room, the requirements have been amended to allow pipes to be installed in the battery compartment.</p>

Present	Amendment	Remark
<p style="text-align: center;"><b>Section 3</b> &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 4</b> Fire Protection and Fire Extinction</p> <p>401. – 404. &lt;same as the present Rules&gt;</p> <p>405. Fire extinction and Cooling</p> <p>1. – 2. &lt;same as the present Rules&gt;</p> <p>3. <u>The battery system area shall be equipped with automatic fire extinguishing system. The operation signal of the fire extinguishing system shall be operated as a separate redundant signal and also be operated manually.</u></p> <p>4. &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 5 – 7</b> &lt;same as the present Rules&gt;</p>	<p style="text-align: center;"><b>Section 3</b> &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 4</b> Fire Protection and Fire Extinction</p> <p>401. – 404. &lt;same as the present Rules&gt;</p> <p>405. Fire extinction and Cooling</p> <p>1. – 2. &lt;same as the present Rules&gt;</p> <p>3. <del>The battery system area shall be equipped with automatic fire extinguishing system. The</del> <u>When an automatic fire extinguishing system is applied in the battery system area, the operation signal of the fire extinguishing system shall be operated as a separate redundant signal and also be operated manually.</u></p> <p>4. &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 5 – 7</b> &lt;same as the present Rules&gt;</p>	<p>(Amended)</p> <p>- Among fixed fire extinguishing systems suitable for the FSS Code, CO2 fire extinguishing systems are prohibited from automatically discharging. therefore, the requirements have been amended to not enforce the automatic injection fire extinguishing system.</p>

# Guidance for Battery System on Board of Ships

(Development Review : Final)

2022. 2.



Machinery Rule Development Team

Effective Date : 1 July 2022

(The contract date for ship construction)

Present	Amendment	Remark
<p><b>CHAPTER 2 CLASSIFICATION SURVEYS</b></p> <p><b>Section 1 - 2 &lt;same as the present Rules&gt;</b></p> <p><b>Section 3 Tests and Inspections</b></p> <p><b>301. General <i>(2019)</i></b></p> <ol style="list-style-type: none"> <li>1. Manufacturing, testing, inspection and data shall conform to the specifications and recognized standards required by this Guidance.</li> <li>2. Manufacturing, testing and inspection of equipment related to battery system not covered by this Guidance shall be in accordance with the relevant requirements of <b>Pt 6</b> of the <b>Rules for the Classification of Steel Ships</b>.</li> <li>3. <u>The battery system and related control systems shall be type approved prior to use and the type approval test shall be in accordance with the test standards approved by the Society. However, operating conditions in the marine environment shall be considered.</u></li> </ol> <p><b>302. Test and Inspection</b></p> <ol style="list-style-type: none"> <li>1. <u>The battery system</u> shall be subjected to the test and inspection in accordance with the following tables.</li> </ol> <p><u>&lt;newly added&gt;</u></p>	<p><b>CHAPTER 2 CLASSIFICATION SURVEYS</b></p> <p><b>Section 1 - 2 &lt;same as the present Rules&gt;</b></p> <p><b>Section 3 Tests and Inspections</b></p> <p><b>301. General <i>(2019)</i> <i>(2022)</i></b></p> <ol style="list-style-type: none"> <li>1. Manufacturing, testing, inspection and data shall conform to the specifications and recognized standards required by this Guidance.</li> <li>2. Manufacturing, testing and inspection of equipment related to battery system not covered by this Guidance shall be in accordance with the relevant requirements of <b>Pt 6</b> of the <b>Rules for the Classification of Steel Ships</b>.</li> <li>3. <del>The battery system and related control systems shall be type approved prior to use and the type approval test shall be in accordance with the test standards approved by the Society. However, operating conditions in the marine environment shall be considered.</del></li> </ol> <p><b>302. Test and Inspection</b></p> <ol style="list-style-type: none"> <li>1. <u>The battery cells, moduls, system, and related control system</u> shall be subjected to the <u>type approval</u>, test and inspection in accordance with the following tables. <u>However, operating conditions in the marine environment shall be considered. <i>(2022)</i></u></li> <li>2. <u>The test result conducted by nationally recognized institutes for battery cells in <b>Table 1</b> may be accepted. <i>(2022)</i></u></li> </ol>	<p>(Amended)</p> <ul style="list-style-type: none"> <li>- Type approval, test, and inspection for battery system and related control systems have been integrated in 302. 1.</li> </ul> <p>(newly added)</p> <ul style="list-style-type: none"> <li>- Expanding the scope of test approval for battery cells to nationally recognized test institutes.</li> </ul>





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## 〈Present〉

Table 2 Battery module ~~(2021)~~

No.	Test	Test Standard	Subject	Classification
1-7	〈same as the present Rules〉			
<u>8</u>	Test for degree of Protection	IEC 60529	Module	Type Approval
<u>9</u>	〈same as the present Rules〉			
(Notes) (1) Applied only when installed on open deck				

## 〈Amendment〉

Table 2 Battery module ~~(2021)~~ (2022)

No.	Test	Test Standard	Subject	Classification
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# Guidance for Battery Systems on Board of Ships

(Development Review : For external opinion inquiry)

2021. 4.



Machinery Rule Development Team

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<p>Table 3 Battery system <i>(2019)</i></p> <table><tr><th>No.</th><th>Test</th><th>Test Standard</th><th>Type Approval</th><th>Testing and Inspection</th></tr><tr><td>1-10</td><td colspan="4">〈same as the present Rules〉</td></tr><tr><td colspan="2">〈Newly added〉</td><td></td><td></td><td></td></tr><tr><td><u>11</u></td><td>Electromagnetic Compatibility Test</td><td>Refer to <b>Table 5</b></td><td>O</td><td></td></tr><tr><td colspan="5">(Notes) 〈same as the present Rules〉</td></tr></table> <p>Table 4 - 5 〈same as the present Rules〉</p> <p>Section 4 〈same as the present Rules〉</p>	No.	Test	Test Standard	Type Approval	Testing and Inspection	1-10	〈same as the present Rules〉				〈Newly added〉					<u>11</u>	Electromagnetic Compatibility Test	Refer to <b>Table 5</b>	O		(Notes) 〈same as the present Rules〉					<p>Table 3 Battery system <del><i>(2019)</i></del> <i>(2021)</i></p> <table><tr><th>No.</th><th>Test</th><th>Test Standard</th><th>Type Approval</th><th>Testing and Inspection</th></tr><tr><td>1-10</td><td colspan="4">〈same as the present Rules〉</td></tr><tr><td><u>11</u></td><td><u>Environmental test</u></td><td>Refer to <b>Table 5</b></td><td><u>O</u></td><td></td></tr><tr><td><del>11</del> <u>12</u></td><td>Electromagnetic Compatibility Test</td><td>Refer to <b>Table 5</b></td><td>O</td><td></td></tr><tr><td colspan="5">(Notes) 〈same as the present Rules〉</td></tr></table> <p>Table 4 - 5 〈same as the present Rules〉</p> <p>Section 4 〈same as the present Rules〉</p>	No.	Test	Test Standard	Type Approval	Testing and Inspection	1-10	〈same as the present Rules〉				<u>11</u>	<u>Environmental test</u>	Refer to <b>Table 5</b>	<u>O</u>		<del>11</del> <u>12</u>	Electromagnetic Compatibility Test	Refer to <b>Table 5</b>	O		(Notes) 〈same as the present Rules〉					<p>(Amended)</p> <p>- An environmental test for the battery system has been added.</p>
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<p><b>CHAPTER 3 CONSTRUCTION AND EQUIPMENT</b></p> <p>Section 1 &lt;same as the present Rules&gt;</p> <p>Section 2 System Design</p> <p>201. &lt;same as the present Rules&gt;</p> <p>202. Construction and design</p> <p>1. – 3. &lt;same as the present Rules&gt;</p> <p>4. Installation</p> <p>(1) - (2) &lt;same as the present Rules&gt;</p> <p>(3) The battery room shall not contain other systems related to the essential services of the ship, and cables, pipes, etc. for <u>supplying to systems other than the battery system shall not penetrate.</u></p> <p>5. &lt;same as the present Rules&gt;</p> <p>203. – 206. &lt;same as the present Rules&gt;</p>	<p><b>CHAPTER 3 CONSTRUCTION AND EQUIPMENT</b></p> <p>Section 1 &lt;same as the present Rules&gt;</p> <p>Section 2 System Design</p> <p>201. &lt;same as the present Rules&gt;</p> <p>202. Construction and design</p> <p>1. – 3. &lt;same as the present Rules&gt;</p> <p>4. Installation</p> <p>(1) - (2) &lt;same as the present Rules&gt;</p> <p>(3) The battery room shall not contain other systems related to the essential services of the ship, and <del>cables, pipes, etc. for supplying to systems other than the battery system shall not penetrate.</del> <u>Pipes shall not penetrate into the battery room as leakage of the pipe may cause damage or failure of the battery system. However, in case of unavoidable installation of pipes, the pipe joints shall be welded joints, and flanges, threaded joints or mechanical joints shall not be used(For pipe joint types, refer to Pt 5, Ch 6, 104. 1 of the Rules for the Classification of Steel Ships). (2021)</u></p> <p>5. &lt;same as the present Rules&gt;</p> <p>203. – 206. &lt;same as the present Rules&gt;</p>	<p>(Amended)</p> <p>- If there is adequate protection against leakage for the pipe that penetrates into the battery room, the requirements have been amended to allow pipes to be installed in the battery compartment.</p>

Present	Amendment	Remark
<p style="text-align: center;"><b>Section 3</b> &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 4</b> Fire Protection and Fire Extinction</p> <p>401. – 404. &lt;same as the present Rules&gt;</p> <p>405. Fire extinction and Cooling</p> <p>1. – 2. &lt;same as the present Rules&gt;</p> <p>3. <u>The battery system area shall be equipped with automatic fire extinguishing system. The operation signal of the fire extinguishing system shall be operated as a separate redundant signal and also be operated manually.</u></p> <p>4. &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 5 – 7</b> &lt;same as the present Rules&gt;</p>	<p style="text-align: center;"><b>Section 3</b> &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 4</b> Fire Protection and Fire Extinction</p> <p>401. – 404. &lt;same as the present Rules&gt;</p> <p>405. Fire extinction and Cooling</p> <p>1. – 2. &lt;same as the present Rules&gt;</p> <p>3. <del>The battery system area shall be equipped with automatic fire extinguishing system. The</del> <u>When an automatic fire extinguishing system is applied in the battery system area, the operation signal of the fire extinguishing system shall be operated as a separate redundant signal and also be operated manually.</u></p> <p>4. &lt;same as the present Rules&gt;</p> <p style="text-align: center;"><b>Section 5 – 7</b> &lt;same as the present Rules&gt;</p>	<p>(Amended)</p> <p>- Among fixed fire extinguishing systems suitable for the FSS Code, CO2 fire extinguishing systems are prohibited from automatically discharging. therefore, the requirements have been amended to not enforce the automatic injection fire extinguishing system.</p>