

# GUIDANCE RELATING TO THE RULES FOR THE CLASSIFICATION OF STEEL SHIPS

(Guidance Part 2 Materials and Welding)

- For external opinion inquiry -

2022. 09.



Machinery Rule Development Team

## - Main Amendments -

(1) Enter into force on 1 January 2023 (the date of application for certification of material & welding or the contract date for ship construction)

- Circular -

© IACS UR W14(Rev.3 Sep 2021)

Present	Amendment	reason
<p align="center"><b>CHAPTER 1 MATERIALS</b></p> <p align="center"><b>Section 1 ~ Section 2 &lt;Omitted&gt;</b></p> <p align="center"><b>Section 3 Rolled Steels</b></p> <p><b>301. ~ 309. &lt;Omitted&gt;</b></p> <p><b>310. Additional requirements for through thickness properties</b></p> <p><b>1. ~ 2. &lt;Omitted&gt;</b></p> <p><b>3. Ultrasonic tests</b></p> <p>(1) Ultrasonic test procedures and acceptance criteria, specified in <b>310. 7</b> (2) of the Rules, are to be in accordance with either <i>EN 10160 Level SI/EI</i>, <i>ASTM A 578 Level C</i> or accepted standard at the discretion of the Society <b>【See Rule】</b></p>	<p align="center"><b>CHAPTER 1 MATERIALS</b></p> <p align="center"><b>Section 1 ~ Section 2 &lt;Same as the present Guidance&gt;</b></p> <p align="center"><b>Section 3 Rolled Steels</b></p> <p><b>301. ~ 309. &lt;Same as the present Guidance&gt;</b></p> <p><b>310. Additional requirements for through thickness properties</b></p> <p><b>1. ~ 2. &lt;Same as the present Guidance&gt;</b></p> <p><b>3. Ultrasonic tests</b></p> <p>(1) Ultrasonic test procedures and acceptance criteria, specified in <b>310. 7</b> (2) of the Rules, are to be in accordance with either <i>EN 10160 Level SI/EI</i>, <i>ASTM A 578:2027 Level C</i> or accepted standard at the discretion of the Society <i>(2023)</i> <b>【See Rule】</b></p>	<p>- To reflect IACS UR W14(Rev.3 Sep 2021)</p>

## - Main Amendments -

(1) Enter into force on 1 July 2023 (the date of application for certification of material & welding or the contract date for ship construction)

- IACS UR W7(Rev.4 Feb 2022)
- IACS UR W8(Rev.3 Mar 2022)
- To reflect Request for Establishment/Revision of Classification Technical Rules

Present	Amendment	reason
<p style="text-align: center;"><b>CHAPTER 1 MATERIALS</b></p> <p style="text-align: center;"><b>Section 1 ~ Section 4 &lt;Omitted&gt;</b></p> <p style="text-align: center;"><b>Section 5 Castings</b></p> <p><b>501. Steel castings</b></p> <p>1. ~ 4. &lt;Omitted&gt;</p> <p><b>5. Repair of defects</b></p> <p>Repairs by welding for steel casting specified in <b>501. 11 (1) (ii)</b> of the Rules are to be dealt with as follows : <b>【See Rule】</b></p> <p>(1) Repairs by welding of crank throws made of steel castings are to comply with the <b>Annex 2-4.</b></p> <p>(2) Repairs by welding of steel alloy castings are to comply with <b>7</b> (the preparatory tests) of the <b>Annex 2-4.</b></p> <p><del>(3) Repairs of steel castings such as stern frame, rudder frame and others intended for important parts of hull structure are to comply with the <b>Annex 2-2, 8.</b></del></p> <p><b>502. ~ 507. &lt;Omitted&gt;</b></p>	<p style="text-align: center;"><b>CHAPTER 1 MATERIALS</b></p> <p style="text-align: center;"><b>Section 1 ~ Section 4 &lt;Same as the present Guidance&gt;</b></p> <p style="text-align: center;"><b>Section 5 Castings</b></p> <p><b>501. Steel castings</b></p> <p>1. ~ 4. &lt;Same as the present Guidance&gt;</p> <p><b>5. Repair of defects</b></p> <p>Repairs by welding for steel casting specified in <b>501. 11 (1) (ii)</b> of the Rules are to be dealt with as follows : <b>【See Rule】</b></p> <p>(1) Repairs by welding of crank throws made of steel castings are to comply with the <b>Annex 2-4.</b></p> <p>(2) Repairs by welding of steel alloy castings are to comply with <b>7</b> (the preparatory tests) of the <b>Annex 2-4.</b></p> <p>(3) <u>&lt;Deleted&gt;</u></p> <p><b>502. ~ 507. &lt;Same as the present Guidance&gt;</b></p>	<p>- To reflect IACS UR W8(Rev.3 Mar 2022)</p>

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<div>Section 6 Steel Forgings</div> <div>601. Steel Forgings</div> <div>1. ~ 2. &lt;Omitted&gt;</div> <div>3. Mechanical properties</div> <div>In application to 601. 6 Note (4) of Table 2.1.89 of the Rules, the kinds and average absorbed energy for alloys steel forgings intended to be used for important parts of machinery which the impact test may be required are to comply with the requirements of Table 2.1.22 of the Guidance. [See Rule]</div> <div>Table 2.1.22 Kinds and Average Absorbed Energy for Alloys Steel Forgings</div> <table><tr><th rowspan="3">Grades</th><th rowspan="3">Alloys Steel forging applied</th><th colspan="2">Charpy V notch Impact test</th></tr><tr><th colspan="2">Average absorbed energy(J)</th></tr><tr><th>L</th><th>T</th></tr><tr><td>RSF 600AM</td><td rowspan="5">- Crankshaft - Forgings for gears</td><td>41 min.</td><td>24 min.</td></tr><tr><td>RSF 700AM</td><td>32 min.</td><td>22 min.</td></tr><tr><td>RSF 800AM</td><td>32 min.</td><td>20 min.</td></tr><tr><td>RSF1000AM</td><td>25 min.</td><td>16 min.</td></tr><tr><td>RSF1100AM</td><td>21 min.</td><td>13 min.</td></tr></table> <div>(Note) Impact tests are to be carried out at ambient temperature (18~25 °c).</div>	Grades	Alloys Steel forging applied	Charpy V notch Impact test		Average absorbed energy(J)		L	T	RSF 600AM	- Crankshaft - Forgings for gears	41 min.	24 min.	RSF 700AM	32 min.	22 min.	RSF 800AM	32 min.	20 min.	RSF1000AM	25 min.	16 min.	RSF1100AM	21 min.	13 min.	<div>Section 6 Steel Forgings</div> <div>601. Steel Forgings</div> <div>1. ~ 2. &lt;Same as the present Guidance&gt;</div> <div>3. Mechanical properties</div> <div>In application to 601. 6 Note (4) of Table 2.1.89 of the Rules, the kinds and average absorbed energy for alloys steel forgings intended to be used for important parts of machinery which the impact test may be required are to comply with the requirements of Table 2.1.22 of the Guidance. [See Rule]</div> <div>Table 2.1.22 Kinds and Average Absorbed Energy for Alloys Steel Forgings</div> <table><tr><th rowspan="3">Grades</th><th rowspan="3">Alloys Steel forging applied</th><th colspan="2">Charpy V notch Impact test</th></tr><tr><th colspan="2">Average absorbed energy(J)</th></tr><tr><th>L</th><th>T</th></tr><tr><td>RSF 600AM</td><td rowspan="5">- Crankshaft - Forgings for gears</td><td>41 min.</td><td>24 min.</td></tr><tr><td>RSF 700AM</td><td>32 min.</td><td>22 min.</td></tr><tr><td>RSF 800AM</td><td>32 min.</td><td>20 min.</td></tr><tr><td>RSF1000AM</td><td>25 min.</td><td>16 min.</td></tr><tr><td>RSF1100AM</td><td>21 min.</td><td>13 min.</td></tr></table> <div>(Note) Impact tests are to be carried out at ambient temperature (23±5 °c). (2023)</div>	Grades	Alloys Steel forging applied	Charpy V notch Impact test		Average absorbed energy(J)		L	T	RSF 600AM	- Crankshaft - Forgings for gears	41 min.	24 min.	RSF 700AM	32 min.	22 min.	RSF 800AM	32 min.	20 min.	RSF1000AM	25 min.	16 min.	RSF1100AM	21 min.	13 min.	<div>- To reflect IACS UR W7(Rev.4 Feb 2022)</div>
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Present	Amendment	reason
<p>4. ~ 5. &lt;Omitted&gt;</p> <p><b>6. Non-destructive inspection</b></p> <p>(1) Non-destructive inspection of steel forgings specified in <b>601.10</b> (1) and (2) of the Rules are to be dealt with as follows:  <b>[See Rule]</b></p> <p>(A) The non-destructive inspection of steel forgings are to comply with the <b>Annex 2-5, 2 and 3.</b></p> <p>(B) ~ (E) &lt;New&gt;</p> <p>(2) ~ (4) &lt;Omitted&gt;</p> <p>7. ~ 8. &lt;Omitted&gt;</p> <p><b>603. &lt;Omitted&gt;</b></p>	<p>4. ~ 5. &lt;Same as the present Guidance&gt;</p> <p><b>6. Non-destructive inspection</b></p> <p>(1) Non-destructive inspection of steel forgings specified in <b>601.10</b> (1) and (2) of the Rules are to be dealt with as follows:  <b>[See Rule]</b></p> <p>(A) The non-destructive inspection of steel forgings are to comply with the <b>Annex 2-5, 2 and 3.</b></p> <p>(B) <u>Ultrasonic examination is to be carried out after the forgings have been machined to a condition suitable for this type of examination and after the final heat treatment. Both radial and axial scanning are to be carried out where appropriate for the shape and the dimensions of the forgings being examined. (2023)</u></p> <p>(C) <u>Unless otherwise agreed, examinations are to be carried out by the manufacturer, although Surveyors may request to be present in order to verify that the examination is being carried out in accordance with the agreed procedure. (2023)</u></p> <p>(D) <u>If the forging is supplied in the ‘as forged’ condition for machining at a separate works, the manufacturer is to ensure that a suitable ultrasonic examination is carried out to verify the internal quality of the forging. (2023)</u></p> <p>(E) <u>Where advanced ultrasonic testing methods are applied, e.g. PAUT or TOFD, reference is made to <b>Annex 2-12</b>, for general approach in adopting and application of these advanced methods. In such cases, acceptance levels regarding accept/reject criteria may be as per the applicable section in <b>Annex 2-5.</b> (2023)</u></p> <p>(2) ~ (4) &lt;Same as the present Guidance&gt;</p> <p>7. ~ 8. &lt;Same as the present Guidance&gt;</p> <p><b>603. &lt;Same as the present Guidance&gt;</b></p>	<p>- To reflect IACS UR W7(Rev.4 Feb 2022)</p>

Present	Amendment	reason
<p style="text-align: center;"><b>Section 7</b> &lt;Omitted&gt; <b>Section 8 Aluminium Alloys</b></p> <p><b>801.</b> &lt;Omitted&gt; <b>802.</b> &lt;New&gt;</p> <p>&lt;hereafter, omitted&gt;</p>	<p style="text-align: center;"><b>Section 7</b> &lt;Same as the present Guidance&gt; <b>Section 8 Aluminium Alloys</b></p> <p><b>801.</b> &lt;Same as the present Guidance&gt; <b>802. Aluminium/steel transition joints (2023)</b></p> <p><b>1. Quality and repair of defects</b></p> <p><u>Ultrasonic test generally complies with KS D0234.(Testing methods for clad steel) or national/international Standards recognised by the Society. [See Rule]</u></p> <p><b>2.</b> <u>In application to 802. 2 (4) and 7 of the Rules, the term "the discretion of the Society" means the acceptance in accordance with Pt 1, Ch 1, 105. of the Rules. [See Rule]</u></p> <p>&lt;hereafter, same as the present Guidance&gt;</p>	<p>- The requirements for Aluminium/steel transition joints are newly established.</p>