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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 15748-2025

Replacing GB/T 15748-2013

**The method of galvanic corrosion test for metallic ship
materials**

船用金属材料电偶腐蚀试验方法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document supersedes GB/T 15748-2013 "Test Method for Galvanic Corrosion of Marine Metallic Materials" and is consistent with GB/T 15748-2013. Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) Some test equipment and technical requirements have been added (see Chapter 4);
- b) Added real-world marine environmental conditions (see Chapter 6);
- c) Added instructions for using the testing equipment under laboratory conditions (see 7.2);
- d) The experimental procedures under actual sea conditions were added, and the reference electrode fixing position was increased (see 7.3);
- e) The sample mounting method has been changed (see 7.3, 6.2 in the 2013 edition);
- f) Increased testing requirements under actual marine environmental conditions (see 7.4);
- g) The calculation of the average galvanic corrosion rate has been modified (see 8.2, 7.2 in the 2013 edition);
- h) Corrosion morphology observation has been added (see 8.4). Please note that some content in this document may involve patents. The issuing organization of this document

assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Marine Ships (SAC/TC12). This document was drafted by: Luoyang Shipbuilding Materials Research Institute (China Shipbuilding Group Corporation No. 725 Research Institute). The main drafters of this document are: Zhang Penghui, Guo Weimin, Peng Wenshan, Ding Kangkang, Liu Shaotong, Fan Lin, Cheng Wenhua, Sun Mingxian, and Lin Cunguo. Xu Likun, Hou Jian, Liu Guangyi, Ma Li, Xing Shaohua, Zheng Guohua, Liu Zhaohui. This document was first published in 1995, revised for the first time in 2013, and this is the second revision. Test methods for galvanic corrosion of marine metallic materials

1 Scope

GB/T 15748-2025 is the Chinese national standard on the method of galvanic corrosion test for metallic ship materials, in the field of shipbuilding and marine structures. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 29 August 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2026. Classification: ICS 47.020.05, CCS A 29. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document describes the galvanic corrosion test method for marine metallic materials. This document applies to the use of two different metals in artificial seawater, natural seawater, or chlorinated water at a mass percentage concentration of 3.5% under laboratory conditions. Galvanic corrosion tests in sodium solution and under electrical connection conditions in a real marine environment. Galvanic corrosion of metallic materials used in marine engineering and other industrial equipment. For reference in corrosion testing.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 1031 Product Geometric Specification (GPS) - Surface Roughness Parameters and Their Values Using the Surface Structure Profile Method

GB/T 6384 Test methods for seawater corrosion of metallic materials used in marine engineering in natural environments

GB/T 10123 Corrosion Terminology for Metals and Alloys

GB/T 42672 Monitoring methods for environmental factors in seawater exposure tests for corrosion of metals and alloys.

3 Terms and Definitions

The terms and definitions defined in GB/T 10123 apply to this document.

4 Test Equipment

4.1 The main test equipment includes. a zero-resistance ammeter and a high-precision multimeter, or a galvanic corrosion measuring instrument, or an electrochemical workstation; a reference electrode; Electronic balance; high-resolution camera and microscope; laboratory testing apparatus also includes a constant temperature water bath and glass container; real marine environment. The testing equipment also includes a multi-parameter water quality analyzer.

4.2 Zero-resistance ammeter. minimum range not greater than $0.1\mu\text{A}$, measurement accuracy can reach $\pm 1\%$.

4.3 High-precision multimeter. minimum range not greater than 0.1mV , measurement accuracy can reach $\pm 1\%$.

4.4 Galvanic corrosion measuring instrument or electrochemical workstation. Minimum range and measurement accuracy are the same as zero-resistance ammeters and high-precision multimeters, and it has self-... It features continuous measurement function, with a minimum time interval of less than 1 hour for timed measurements.

4.5 Reference electrode. Potential fluctuation is less than 5mV , calibration is required before use, and the potential is stable during the test.

4.6 Electronic balance. Measurement accuracy not less than

0.1 mg.

4.7 Camera. Resolution 1920×1080 pixels and above.

4.8 Microscope. Magnification of $100\times$ or higher.

4.9 Constant temperature water bath device. The temperature can be controlled at 35°C with an accuracy of 0.5°C .

4.10 Multi-parameter water quality analyzer. Technical parameters and performance characteristics comply with the provisions of GB/T 42672.

4.11 Glass containers.

5 Test Samples

5.1 The sample size should preferably be 100mm x 30mm, with a thickness of 2mm to 4mm. Other sizes are acceptable if there are special requirements.

5.2 The specimens should preferably be prepared by mechanical processing, and the surface roughness should comply with the requirements of GB/T 1031, with a maximum permissible value of R_a of 3.2 μm . The samples should be cleaned of oil and dried in accordance with GB/T 6384.

5.3 There should be at least 3 pairs of parallel test specimens, and at least 3 uncoupled control test specimens.

5.4 Mark one end of the sample, either by punching a marking hole or by marking with steel lettering.

6 Test conditions

6.1 Under laboratory conditions, the test solution is natural seawater, artificial seawater (see Appendix A), or a solution with a pH of 7-8 and a concentration of 3.5% (by mass). (Fractional) Sodium chloride solution. Artificial seawater and sodium chloride solution are prepared from analytical grade reagents and distilled water (or deionized water). Natural seawater. The test solution should be prepared after sedimentation or filtration, and the salinity and pH of the natural seawater should be measured and recorded before the test begins. Real-world marine environmental conditions. Before the test begins, the salinity and pH of the seawater at the test site shall be measured in accordance with the provisions of GB/T 42672.

6.2 Under laboratory conditions, the solution temperature during the experiment should be $35^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Under actual marine environmental conditions, the temperature during the experiment should be the natural seawater temperature. The seawater temperature shall be measured in accordance with the provisions of GB/T 42672.

6.3 The test period should preferably be 15 days, but can be determined through negotiation as needed.

6.4 Under laboratory conditions, the composition of the test solution and the test temperature can also be determined through negotiation as needed.

7.1 Weigh the sample before and after the test, accurate to

0.1 mg.

7.2 The ratio of the cathode to anode area of the test couple should be as consistent as