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

GB/T 7387-2026

Replacing GB/T 7387-1999

Technical requirements for marine reference electrodes

船用参比电极技术条件

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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 replaces GB/T 7387-1999 "Technical Conditions for Marine Reference Electrodes". Compared with GB/T 7387-1999, the only changes are structural adjustments. Aside from editorial changes, the main technical changes are as follows:

- a) Added terms and definitions (see Chapter 3);
- b) The classification, specifications, and structural forms of the reference electrode have been changed (see Chapter 4, Chapter 3 of the 1999 edition);
- c) The requirements for the raw materials used in the electrode body of the reference electrode have been changed (see 5.1, 4.1 of the 1999 edition);
- d) The electrochemical properties of the reference electrode were modified (see 5.2, 4.3 of the 1999 edition);
- e) The watertightness requirements for the reference electrode have been changed (see 5.5, 4.6 of the 1999 edition);

- f) The test method for the reference electrode has been changed (see Chapter 6, Chapter 5 of the.1999 edition);
- g) The testing items for the reference electrode have been changed (see Table 4, Table 5 in the.1999 edition);
- h) An experimental method for measuring the electrode potential of a copper/saturated copper sulfate reference electrode has been added (see Appendix A);
- i) The test method for sealing performance has been changed (see Appendix C, Appendix C of the.1999 edition). 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 (725th Research Institute of China Shipbuilding Group Corporation) and Qingdao Shuangrui Marine Environmental Protection Institute. Environmental Engineering Co., Ltd., Harbin Engineering University. The main drafters of this document are. Xin Yonglei, Xu Likun, Wang Jinfu, Ma Li, Wang Tingyong, Li Rumin, Zhou Juan, Zhang Yu, Wang Haitao, and Zheng Guohua. Guan Xiaoying. The release history of this document and the document it replaces is as follows:

1 Scope

GB/T 7387-2026 is the Chinese national standard covering the reference electrode of a hull's cathodic protection - the sensor that tells the controller what the hull potential actually is, and whose drift silently turns protection into over-protection or none. It replaces GB/T 7387-1999 and has been in force since 1 October 2026, with GB/T 7388-2026 on the anodes and GB/T 3108-2026 on the system. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 7387-1999. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the classification, marking, requirements, inspection rules, and labeling, packaging, and transportation of reference electrodes used for cathodic protection of steel seagoing vessel hulls. The corresponding experimental methods are described for transportation and storage. This document applies to the design, manufacture, and inspection of reference electrodes for cathodic protection of steel seagoing vessel hulls. It also applies to other steel structures in seawater. The reference electrode for cathodic protection should be used in accordance with this reference.

4 Classification and Labeling

4.1 Classification, Specifications and Structural Types Marine reference electrodes can be classified according to their electrode body material into silver/silver chloride reference electrodes, silver/silver halide reference electrodes, and high-purity zinc reference electrodes. There are five types of reference electrodes. zinc, aluminum, silicon, copper/saturated copper sulfate, etc. The specifications and structural types of marine reference electrodes are shown in Table 1 and Figures 1 to 7.

4.3 Marking The markings include the model number and standard number.

5 Requirements

5.1 Raw materials The raw materials used for the electrode body of the reference electrode are shown in Table 2.

5.2 Electrochemical performance The electrode potential, potential stability, and permissible polarization of the reference electrode are shown in Table 3.

5.3 Structure

5.3.1 The reference electrode shall be insulated from the hull and shall be fixed in a reference electrode holder made of insulating material, using a stuffing box. Seal the wiring terminals and add a watertight cover.

5.3.2 The structural dimensions of the reference electrode cable stuffing box shall comply with the relevant provisions of CB/T 3667.1.

5.4 Insulation performance In a dry state, the insulation resistance between the electrode body and terminal block and the electrode watertight cover or stuffing box should be greater than 1MΩ.

5.5 Sealing performance The reference electrode structure should show no water leakage or gas leakage under a water pressure or gas pressure of

0.2 MPa for 15 minutes.

5.6 Surface Quality

5.6.1 After the reference electrode is assembled, there should be no loosening of any fastening components.

5.6.2 The exterior surface should be clean and free from any stains or other defects.

6 Test Methods

6.1 Raw materials Raw materials are inspected by checking quality certification documents.

6.2 Chemical composition analysis of the reference electrode The silicon, iron, and copper

contents of the zinc-aluminum-silicon reference electrode were chemically analyzed according to GB/T 4950, and the aluminum content was analyzed according to GB/T 12689.1. Chemical analysis is required.

6.3 Electrode potential measurement and potential stability test Conduct the test according to Appendix A.

6.4 Polarization value Conduct the test according to the provisions of Appendix B.

6.5 External Dimensions External dimensions are inspected using a steel ruler, tape measure, or vernier caliper.

6.6 Insulation performance After the reference electrode is assembled, a megohmmeter is used to measure the insulation resistance between the electrode body and terminals and the metal bodies such as the watertight cover and stuffing box.

6.7 Sealing performance Conduct the test according to the specifications in Appendix C.

6.8 Surface quality inspection The surface quality of the reference electrode was inspected visually.

7 Inspection Rules

7.1 Inspection Classification The inspection of the reference electrode is divided into type inspection and factory inspection. The inspection types and items are shown in Table 4.

7.2 Type Testing

7.2.1 Type testing shall be performed in any of the following circumstances.

- a) When the design of a new product is finalized;
- b) When products are transferred to another factory for production;
- c) During formal production, if there are significant changes in structure, materials, or processes that may affect product performance;
- d) When the factory inspection results differ significantly from the previous type inspection results;
- e) When the national quality supervision agency requests a type test;
- f) When resuming production of the same type of reference electrode after being shut down for more than 3 years (including 3 years).

7.2.2 Type test items are shown in Table 4.

7.3 Factory Inspection

7.3.1 Products supplied at one time or produced under the same conditions within the