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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 7388-2026

Replacing GB/T 7388-1999

Technical requirements for marine auxiliary anodes

船用辅助阳极技术条件

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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 7388-1999 "Technical Conditions for Marine Auxiliary Anodes". Compared with GB/T 7388-1999, the only changes are structural adjustments. Aside from editorial changes, the main technical changes are as follows:

a) A new chapter on terms and definitions has been added (see Chapter 3);

b) The classification, specifications, and structural forms of auxiliary anodes have been changed (see Chapter 4, Chapter 3 of the.1999 edition);

c) The raw material requirements for auxiliary anodes have been changed (see 5.1,

4.1 of the.1999 edition);

d) The chemical composition and molding requirements for the auxiliary anode have been changed (see 5.2,

4.2 of the.1999 edition);

e) The electrochemical performance technical requirements for lead-silver alloy anodes,

lead-silver micro-platinum anodes, and platinum-plated titanium anodes have been removed (see

4.4 of the.1999 edition);

f) The watertightness requirements for auxiliary anodes have been changed (see 5.7,

4.7 of the.1999 edition);

g) The test method for auxiliary anodic chemical composition analysis has been removed (see

5.4 in the.1999 edition);

1 Scope

GB/T 7388-2026 is the Chinese national standard covering the impressed current anode on a hull - a mixed metal oxide or platinised element that has to deliver current into seawater for years without consuming itself or damaging the coating around it. It replaces GB/T 7388-1999 and has been in force since 1 October 2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 7388-1999. 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 and marking, requirements, inspection rules and marking, packaging, transportation and storage of marine auxiliary anodes, and describes the corresponding... The experimental method. This document applies to the design, manufacture, and inspection of auxiliary anodes for cathodic protection of steel seagoing vessel hulls. It also applies to other steel structures in seawater. The auxiliary anode for cathodic protection should be used in accordance with the reference.

4 Classification and Labeling

4.1 Classification, Specifications and Structural Types Marine auxiliary anodes are classified into two categories based on their materials. platinum composite anodes and titanium-based metal oxide anodes. Platinum composite anodes include... Platinum-titanium composite anode and platinum-niobium composite anode. The specifications and structural types of marine auxiliary anodes are shown in Table 1 and Figures 1 to 3.

4.2 Model Designation The model designations for marine auxiliary anodes are as follows:

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

5.1 Raw materials

5.1.1 The purity of platinum shall not be lower than that specified in GB/T 1419 for SM-Pt99.95.

5.1.2 The purity of titanium shall not be lower than that specified for TA2G in GB/T 3620.1.

5.1.3 Niobium shall meet the requirements of TNb1 or TNb2 in GB/T 6896.

5.2 Molding

5.2.1 Platinum-titanium composite anodes can be formed by explosively welding a composite platinum layer onto a titanium substrate and then rolling it.

5.2.2 Platinum-niobium composite anodes can be formed by coating a platinum layer onto a niobium matrix and then metallurgically drawing it into wires or rolling it into plates.

5.2.3 Titanium-based metal oxide anodes can be formed by covering a conductive metal oxide layer on a titanium substrate using a pyrolysis method.

5.2.4 The platinum coating and metal oxide layer should be firmly bonded to the substrate, without delamination or peeling; their thickness should meet the requirements of Table 1.

5.3 Operating Current The operating current range of various auxiliary anodes should meet the requirements of Table 1.

5.4 Electrochemical performance The electrochemical performance of various auxiliary anodes should meet the requirements of Table 2.

5.5 Structure

5.5.1 The auxiliary anode shall be insulated from the hull and shall be fixed within the anode bracket, with only the working surface exposed. The conductive rod shall pass through the anode insulatedly. The hull is watertight with a stuffing box and an additional watertight cover.

5.5.2 The anode bracket shall be made of insulating material that is resistant to seawater, alkali and chlorine.

5.5.3 The structural dimensions of the cable stuffing box shall meet the requirements of CB/T 3667.1.

5.6 Insulation performance In a dry state (i.e., before water pressure testing after the anode structure is installed), the anode body or conductive rod is in contact with the anode packing gland or watertight cover. The insulation resistance between them should be greater than 1MOmega.

5.7 Sealing performance The anode structure should show no water seepage or gas leakage under a water or gas pressure of

0.2 MPa for 15 minutes.

5.8 External dimensions and surface quality

5.8.1 The external dimensions of each type of anode shall meet the requirements of 4.1.

5.8.2 The surface of the platinum-titanium and platinum-niobium composite anode is silvery-white with a certain metallic luster and free from defects such as burrs, cracks, and peeling.

5.8.3 The surface of the titanium-based metal oxide anode should be dark black, and the oxide coating should be smooth and free of foreign matter. No more than [number missing] scratches should be visible on each anode surface. Two scratches, each no longer than 20mm, and the depth should not expose the substrate.

5.8.4 The working surface of the anode should be kept clean and free from paint or oil stains.

6 Test Methods

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

6.2 Thickness of platinum layer and oxide layer According to the method of GB/T 6462, the thickness of the platinum layer or oxide layer is measured under a microscope. Ten points are randomly selected on the inspection surface to measure the thickness. Degree value.

6.3 Bonding state of platinum layer and oxide layer For plate-shaped platinum composite anodes, the bonding state between the platinum layer and the substrate is tested according to the method specified in GB/T 23520, and the state of the platinum layer is observed. State; for filamentous platinum-niobium composite anodes, the state of the platinum layer is observed after the sample is wound into a circle with a diameter of phi15mm; for titanium-based metal oxides The bonding state of the oxide layer surface of the anode is inspected according to the method specified in HG/T 2471, and the state of the oxide layer is observed.

6.4 Electrochemical performance The electrochemical performance test of the auxiliary anode shall be conducted in accordance with the test method specified in Appendix A.

6.5 Insulation performance The assembly of the auxiliary anode structure should simulate the conditions of a real ship. A megohmmeter should be used to measure the connection between the auxiliary anode body or conductive rod and the watertight cover and stuffing box. Insulation resistance between metal bodies.

6.6 Sealing performance Perform the procedure as specified in Appendix B.

6.7 External dimensions and surface quality External dimensions are inspected using a steel ruler, tape measure, or vernier caliper, while surface quality is inspected visually.