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

GB/T 46613-2025

**Corrosion of metals and alloys - Test and evaluation for the
corrosion of steel bars embedded in concrete structures
exposed to total corrosion zones in marine environments**

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1 Scope

GB/T 46613-2025 is the Chinese national standard covering reinforcement corrosion across the whole marine exposure range at once - submerged, tidal, splash and atmospheric - with the half-cell potential and resistivity measurements, the chloride profiles, and the rating of a structure from the results. The splash zone corrodes fastest, and a survey that samples only one zone misses it. First edition, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026.

This document specifies the methods for determining and evaluating steel reinforcement corrosion in concrete structures within the fully corrosive marine environment, including test conditions and test setup. Application, materials and reagents, specimen preparation, testing procedures, test maintenance and test reports. This document applies to the testing and evaluation of steel reinforcement corrosion in concrete structures under chloride-dominant corrosive environments. This document includes the following two methods for determining steel reinforcement corrosion. When using these methods, choose the appropriate method based on the actual conditions. Method A - Three-dimensional laser scanning method. This method describes the corrosion state of reinforcing bars by analyzing changes in their cross-sectional area before and after corrosion. Method B - Weight Loss Method. This method describes the corrosion state of steel bars by measuring the average weight loss rate before and after corrosion.

2 Normative references

The contents of the following documents, through normative references within the text,

constitute essential provisions of this document. Dated citations are listed below. 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 175 General Purpose Portland Cement

GB/T 5462 Industrial Salt

GB/T 6682 Specifications and test methods for water used in analytical laboratories

GB/T 10125 Corrosion test under artificial atmosphere - Salt spray test

GB/T 16545-2025 Corrosion of Metals and Alloys - Removal of Corrosion Products from Corrosion Specimens

GB/T 50152 Standard for Test Methods of Concrete Structures

GB 50204 Code for Acceptance of Construction Quality of Concrete Structures JGJ

52 Standard for Quality and Testing Methods of Sand and Aggregate for Ordinary Concrete JGJ

55 Specification for Mix Proportioning Design of Ordinary Concrete JGJ/T 322 Technical Specification for Testing Chloride Ion Content in Concrete

3 Terms and Definitions

3.1 Total corrosion zones All vertical corrosion zones in the marine environment, from top to bottom, include the atmospheric zone, splash zone, tidal zone, fully submerged zone, and marine mud zone.

Note. The splash zone is also called the splash zone, and the tidal zone is also called the tidal range zone.

8 Test Steps

9. Testing and maintenance 10.

11 Appendix A (Informative) 3D Scan Results and Analysis Examples 12

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. 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

by the China Iron and Steel Association. This document is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183). This document was drafted by: China Twenty-Second Metallurgical Construction Group Co., Ltd., Metallurgical Industry Information and Standardization Research Institute, and Beijing University of Science and Technology. The main drafters of this document are. Xu Ning, Li Qian, Li Xiaogang, Zhang Ji, Hou Jie, Du Cuiwei, Xu Haiyan, Tian Zijian, Zhao Jianli, Sun Menghan, and Gong Junsong. Wei Shangqi and Li Xiaolong. Corrosion of metals and alloys in marine environments. full corrosion zone Methods for Determination and Evaluation of Steel Corrosion in Concrete Structures Warning

---This document pertains to a simulated full corrosion zone environmental testing facility. Personnel entering the testing facility face a risk of electric shock. Therefore, use of this facility is prohibited. Personnel using this document should take measures to prevent electrical leakage from the facilities. Personnel using this document should undergo pre-job training, and the testing facilities should be equipped with insulation. Erect rubber mats, install fire hydrants and necessary electrical and fire-fighting equipment; at least two people should take turns entering the facility. This document does not specify all possible safety measures. Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.