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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 20644.1-2025

Replacing GB/T 20644.1-2006

Special environmental condition - Guidance for choosing - Part 1: Metals protection

特殊环境条件 选用导则 第1部分：金属表面防护

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 1 of GB/T 20644 "Guidelines for the selection of special environmental conditions". GB/T 20644 has been published as follows part.

- Part 1: Protection of metal surfaces;

- Part 2: Polymer materials.

This document replaces GB/T 20644.1-2006 "Guidelines for selection of special environmental conditions Part 1: Metal surface protection" and Compared with GB/T

20644.1-2006, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

a) The content of "scope" has been changed to include special environmental conditions such as humid heat, humid heat ocean and cold (see Chapter 1, 2006 Chapter 1 of the 2011 edition);

b) Added "Terms and Definitions" (see Chapter 3);

c) The "Classification of Metal Surface Protective Layers" has been changed (see Chapter 4, Chapter 3 of the 2006 edition);

d) Deleted the "Classification of Conditions of Use" section (see Chapter 4 of the 2006 edition);

e) The content of "Requirements for protective layer in the use environment" has been changed (see Chapter 5, Chapter 5 of the 2006 edition);

f) Changed "Options for Metal Surface Protection" (see Chapter 6, Chapter 6 of the 2006 edition);

g) Changed "Selection of Evaluation Items" (see Chapter 7, Chapter 8 of the 2006 edition);

h) The content of "Choice of Test Methods" has been modified (see Chapter 8, Chapter 7 of the 2006 edition).

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document is proposed and coordinated by the China Electrical Equipment Industry Association.

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The previous versions of this document and the documents it replaces are as follows.

- First published in 2006 as GB/T 20644.1-2006;

- This is the first revision.

Introduction

GB/T 20644 "Guidelines for the Selection of Special Environmental Conditions" covers China's dry heat, dry hot desert, plateau, humid hot ocean, humid heat, cold, etc.

Special environmental conditions. Currently, GB/T 20644 consists of two parts.

- Part 1: Metal surface protection. The purpose is to give special environments such as dry heat, dry hot desert, plateau, humid hot ocean, humid heat, cold, etc.

Guidelines for the selection of metal surface protection under certain conditions.

- Part 2: Polymer materials. The purpose is to give special environmental conditions such as dry heat, dry hot desert, plateau, humid hot ocean, humid heat, cold, etc.

Guidelines for the selection of polymer materials under certain conditions.

Selection Guidelines for Special Environmental Conditions Part 1: Protection of metal surfaces

1 Scope

This document gives the classification of metal surface protective layers under special environmental conditions such as dry heat, dry hot desert, plateau, humid hot ocean, humid heat, cold, etc.

Type, requirements of the protective layer for the use environment, selection of metal surface protection, selection of evaluation items, selection of test methods, etc.

This document applies to organic coatings, metal coverings and inorganic coverings on metal surfaces.

2 Normative references

GB/T 3138-2015

GB/T 20625-2024

3 Terms and Definitions

The terms and definitions defined in GB/T 20625-2024 and GB/T 3138-2015 apply to this document.

4 Classification of metal surface protective layers

Metal surface protective layers are divided into.

- Organic coating is a protective film layer formed by polymer compounds as the main film-forming substance;

- Metal coating is a coating mainly composed of metal and alloy materials formed on the metal surface by physical, chemical and other methods;

- Inorganic coating is a coating mainly composed of inorganic materials such as metal surface oxides and carbides.

5 Requirements of the operating environment for the protective layer

The requirements of the protective layer for the use environment are as follows.

- The metal surface used in dry heat and dry hot desert environment should be resistant to light aging, high temperature, good adaptability to temperature changes, and resistant to stone impact. A good protective layer;

- The metal surface used in plateau environment should be resistant to light aging, low temperature, corrosion, good adaptability to temperature changes, and resistance to stone impact. Good protective layer;

- Metal surfaces used in hot and humid environments and hot and humid marine environments should be equipped with a corrosion-resistant and light-resistant protective layer;

- Metal surfaces used in cold environments should be equipped with a protective layer that is resistant to low temperatures and has good adaptability to temperature changes.

6.1 Selection of organic coatings

For commonly used organic coatings under special environmental conditions, see Appendix A.