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

GB/T 46087.4-2025

**Test for shop primers in relation to welding and allied
processes - Part 4: Emission of fumes and gases**

(English Translation)

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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 is Part 4 of GB/T 46087 "Shop Primer Welding and Related Process Tests". GB/T 46087 has been published as follows.

Part 2.

- Workshop primer welding and related process tests, Part 1: General requirements;
- Workshop primer welding and related process tests, Part 2: Welding performance;
- Workshop primer welding and related process tests, Part 3: Thermal cutting;
- Workshop primer welding and related process tests, Part 4: Emission of smoke and gas.

This document is modified to adopt ISO 17652-4:2003."Welding workshop - Primer - Welding and related processes - Tests - Part 4: Fumes and gases".

Emissions of the substance.

The technical differences between this document and ISO 17652-4:2003, and the reasons therefor, are as follows.

- The scope has been changed to conform to the drafting rules of Chinese standards (see Chapter 1);
- The normative reference GB/T 46087.1 replaces ISO 17652-1:2003 (see Chapter 3); the

normative reference...

GB/T 700 replaces EN10025 (see 4.1); GB/T 43905.1, a normative reference, replaces ENISO 15011.

1.GB/T 43905.2 replaces prENISO 15011-2.GB/T 16672, a normative reference, replaces ISO 6947.

In.1990, GB/T 5185 replaced ISO 4063:1998 (see 4.2.1); and the normatively referenced GB/T 43905.1 replaced [the previous standard].

ENISO 15011-1 and GB/T 43905.2 replace prENISO 15011-2 (see 4.2.2); normative references are used.

GB/T 8110 replaces ISO 14341, and the normatively referenced GB/T 39255 replaces ISO 14175 (see Table 1); to adapt to Used in my country's technological conditions.

The following editorial changes have been made to this document.

---The standard title has been changed to "Workshop Primer Welding and Related Process Tests Part 4: Emission of Fumes and Gases";

---Appendix ZA of the international standard has been deleted.

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 Welding Standardization (SAC/TC55).

Introduction

Shop primer, as a key protective layer in steel pretreatment, is widely used in steel structures, shipbuilding, and automobile manufacturing, and its performance directly affects...

It relates to the quality and safety of subsequent processes such as welding and cutting.

GB/T 46087 "Shop Primer Welding and Related Process Tests" aims to establish a complete evaluation system for shop primer processes, including shop primer...

The impact of paint on welding performance, thermal cutting efficiency, and fume emissions can be divided into the following four parts.

---Part 1: General Requirements. The purpose is to specify the basic conditions, terminology definitions, environmental and safety requirements for testing, in order to provide a basis for subsequent testing.

Provide a unified framework.

---Part 2: Weldability. The aim is to assess the effect of shop primer on weldability by evaluating the severity of weld porosity defects.

The impact.

---Part 3: Thermal Cutting. The purpose is to clarify the test method for the maximum thermal cutting speed of the shop primer, using standardized test pieces.

Preparation and cutting parameters were set, and the impact of the primer on cutting efficiency and process stability was evaluated.

---Part 4: Emissions of Smoke and Gases. The aim is to establish an evaluation system for the emission levels of smoke and harmful gases from the primer workshop.

This system provides technical support for reducing occupational health hazards and environmental pollution.

Workshop primer welding and related process tests Part 4: Emissions of Smoke and Gases

1 Scope

This document specifies the classification requirements for the impact of shop primers on fumes and gas emissions during welding, including testing and evaluation requirements.

This document applies to process tests of welding fumes and gas emissions from workshop primer coating.

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 700 Carbon Structural Steel (GB/T 700-2006, ISO 630:1995, NEQ) GB/T 5185 Welding and Related Processes (GB/T 5185-2005, ISO 4063:1998, IDT) GB/T 8110 Solid welding wire for non-alloy steel and fine-grained steel for gas metal arc welding (GB/T 8110-2020) ISO 14341:2010, MOD) GB/T 16672 Definition of the working position angle and rotation angle of weld (GB/T 16672-1996, ISO 6947:1990, IDT) GB/T 39255 Shielding gases for welding and cutting (GB/T 39255-2020, ISO 14175:2008, MOD) GB/T 43905.1 Laboratory methods for sampling fumes and gases in welding and related processes - Part 1: Fumes emissions from arc welding Collection of dust for the determination and analysis of rates (GB/T 43905.1-2024, ISO 15011-1:2009, MOD) GB/T 43905.2 Laboratory methods for sampling fumes and gases in welding and related processes - Part 2: Arc welding,

cutting and gas extraction Determination of emission rates of carbon monoxide, carbon dioxide, nitric oxide, and nitrogen dioxide in soil (GB/T 43905.2-2024, ISO 15011-2.

2009, MOD)

GB/T 46087.1 Shop primer tests for welding and related processes - Part 1: General requirements (GB/T 46087.1-2025) ISO 17652-2:2003, MOD)

3 Terms and Definitions

The terms and definitions defined in GB/T 46087.1 apply to this document.

4.1 Specimen Preparation

For each type of workshop primer, 2x3 coated specimens should be prepared, and an additional 2x3 shot-blasted specimens should be taken as reference samples.

The specimen material should be Q275 grade low-carbon steel plate conforming to GB/T 700, with dimensions of 10mm x 100mm x 500mm.

The specimens should be shot blasted to Sa21/? grade (see GB/T 8923.1) to remove rolling oxide scale. The surface of the specimens should be smooth, flat, and undamaged.

All burrs should be removed to ensure proper assembly.

For the six specimens with shop primer, the top surface should be coated with shop primer before testing, and the coating thickness should meet the manufacturer's recommended requirements.