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

GB/T 43917.4-2024

**Equipment for capture and separation of welding fume - Part 4:
Determination of the minimum air volume flow rate of capture
devices**

(English Translation)

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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 4 of GB/T 43917 "Welding fume capture and separation equipment": GB/T 43917 has been published for the following part:

- Part 1: General requirements;
- Part 2: Testing and marking requirements for separation efficiency;
- Part 3: Determination of the collection efficiency of smoke suction devices on welding guns;
- Part 4: Determination of minimum air volume of capture device:

This document is modified to adopt ISO 21904-4:2020 "Health and safety in welding and

allied processes - Equipment for capturing and separating welding fumes" Part 4:
Determination of minimum air flow rate for capture devices:

The technical differences between this document and ISO 21904-4:2020 and their reasons are as follows:

--- ISO 12100:2010 (see Chapter 3) has been replaced by the normative reference GB/T 15706-2012 to adapt to my country's technology condition;

--- Replaced ISO 21904-1:2020 with the normative reference GB/T 43917.1-2024 (see Chapter 3, 4:1, 4:3:3, 4:4, 5:3:2, 5:4) to adapt to my country's technical conditions:

The following editorial changes were made to this document:

--- In order to coordinate with the existing standards, the name of the standard is changed to "Welding fume capture and separation equipment Part 4: Minimum wind speed of the capture device Determination of quantity";

--- Deleted the modified expressions in Chapter 4 of ISO 21904-4:2020 (see 4.3:2);

--- Replaced ISO 5167 with the informative reference GB/T 2624.1 (see 5.2:2):

Introduction

The fumes and gases produced by welding and related processes can seriously affect human health: Therefore, it is necessary to control the fumes and gases produced by welding to minimize the risk of it is extremely important to minimize the exposure of welders and welding operators: The most effective control method is to prevent smoke and gas from entering welders and welding operators:

The welding fume is captured near the welding source before the welding breathing zone or the working environment: The capture effect of the equipment will directly affect the welder and the welding operator:

Health at work:

GB/T 43917 "Welding fume capture and separation equipment" specifies the design and manufacturing requirements of welding fume capture and separation equipment, various related Component requirements and testing of three basic performance parameters: separation efficiency, capture efficiency of the smoke suction device on the welding gun and minimum air volume of the capture device Method, through the above provisions, ensure that the welding fume capture and separation equipment achieves the desired capture effect:

GB/T 43917 is intended to consist of four parts:

--- Part 1: General requirements: Aims to specify the requirements for collecting and separating materials produced by welding and related processes (such as arc welding and

thermal cutting):

Overall design and manufacturing requirements for smoke and dust ventilation equipment:

--- Part 2: Test and marking requirements for separation efficiency: Aims to specify the test method for the separation efficiency of welding fume separation equipment and marking requirements:

--- Part 3: Determination of the collection efficiency of smoke suction devices on welding guns: Aims to specify the welding smoke collection efficiency of the welding gun suction system Laboratory measurement methods:

--- Part 4: Determination of the minimum air volume of the capture device: Aims to specify the test method for measuring the minimum air volume of welding fume capture and separation equipment:

Test method:

Welding fume capture and separation equipment Part 4: Determination of minimum air volume for capture devices

1 Scope

This document specifies two test methods for determining the minimum air volume for welding fume capture and separation equipment, including the test principles, instruments, test Methods and test reporting requirements:

This document applies to capture hoods, capture nozzles and flat-mouth capture nozzles with a length to hose diameter ratio of 8:1 or less, as well as fume on welding guns:

Suction device, not suitable for downdraft workbench:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document:

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document:

GB/T 15706-2012 General principles for safety design of machinery - Risk assessment and risk reduction (GB/T 15706-2012, ISO 12100:

2010, IDT)

GB/T 43917.1-2024 Welding fume capture and separation equipment Part 1: General requirements (GB/T 43917.1-2024, ISO 21904-1:2020,MOD)

3 Terms and definitions

The terms and definitions defined in GB/T 15706-2012 and GB/T 43917.1-2024 apply to this document:

4 Capture hood, capture nozzle and flat capture nozzle

4.1

Overview

Tests are conducted to determine the minimum air volume that provides a suction field of a given size and wind speed at a measured distance perpendicular to the plane of the hood inlet:

GB/T 43917.1-2024 5:2 stipulates the required speed of the suction field and the required area length at a distance of 1:5D:

1:5D, width 1D, where D is the inner diameter of the exhaust duct: The minimum air volume can be obtained by measurement or numerical simulation (calculation of fluid Mechanics CFD) to achieve this:

4.2

Test equipment

4.2.1

Non-directional anemometer it is suitable for measuring air velocity in the range of 0:2m/s~0:5m/s, with a maximum error of $\pm 0:06$ m/s, and meets the calibration requirements:

4.2.2

Distance measuring instruments the distance measurement error of the instrument is within ± 1 mm: