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

GB/T 43917.3-2024

**Equipment for capture and separation of welding fume - Part 3:
Determination of the capture efficiency of on-torch welding
fume extraction 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 3 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 21904-3:2018 "Health and safety for welding and allied processes - Testing and assessment of air filtration equipment" Part 3: Determination of the capture efficiency of welding fume exhaust devices on welding guns:

The technical differences between this document and ISO 21904-3:2018 and their reasons are as follows:

--- Change "air volume ($Q_{v,n}$ and $Q_{v,c}$)" to "air volume (Q_v) at the nozzle (n) and the joint (c)" (see 6.1:2) for the convenience of this document implement;

--- Replaced ISO/IEC Guide 98 (all parts) with normative references GB/T 27418, GB/T 27419 and GB/T 27430 points) (see 6.2:3) 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 3: Fume suction on welding guns Determination of the capture efficiency of the device";

--- Change the additional information in the definition of "test chamber sampling pipe" to "Note" (see 3.3);

--- Deleted the modified statements about the test principle (see Chapter 4 of ISO 21904-3:2018);

--- Added an informative reference to Appendix A in the general requirements for test apparatus and materials (see 5.1);

--- Deleted the information on the necessity of measuring leakage in Appendix G (informative), and changed the form of the additional information to Note (see 6.1:2);

--- Replaced ISO 5167 with the informative reference GB/T 2624.1 (see 5.2:13, D:2);

--- Replaced ISO 6947 with the informative reference GB/T 16672-1996 (see Appendix F):

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 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 3: Collection efficiency of fume suction devices on welding guns Determination of

1 Scope

This document specifies a laboratory method for measuring the welding fume capture efficiency of a welding gun suction system, including the test principle, test apparatus and Materials, test procedures and test report requirements:

This document applies to exhaust systems integrated in the welding torch and additionally connected to the welding torch close to the arc area and is intended for the evaluation of all Suction air volume, suction nozzle position, shielding gas flow, welding geometry, welding gun angle, smoke emission rate, etc: for continuous wire feeding welding process Effect of

variables on capture efficiency:

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 27418 Evaluation and Expression of Uncertainty in Measurement (GB/T 27418-2017, ISO/IEC Guide 98-3:2008, MOD) GB/T 27419 Evaluation and Expression of Uncertainty in Measurement Supplementary Document 1: Distribution Propagation Based on Monte Carlo Method (GB/T 27419-2018, ISO/IEC Guide 98-3/Suppl:1:2008, IDT) GB/T 27430 The role of measurement uncertainty in conformity assessment (GB/T 27430-2022, ISO/IEC Guide 98-4: 2012, MOD)

3 Terms and definitions

The following terms and definitions apply to this document:

Test chamber Semi-enclosed suction chamber for testing welding fume capture efficiency:

Isokinetic sampler

A device for collecting aerosol samples at the same velocity as the sampled air:

Duct between test chamber and exhaust fan:

Note: In this duct, all the smoke generated can be collected or sampled isokinetically: