TECHNICAL SPECIFICATION

ISO/TS 15011-6

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Health and safety in welding and allied processes — Laboratory method for sampling fume and gases —

Part 6: Procedure for quantitative determination of fume and gases from resistance spot welding

Hygiène et sécurité en soudage et techniques connexes — Méthode de laboratoire d'échantillonnage des fumées et des gaz —

Partie 6: Procédure pour la détermination quantitative des fumées et des gaz générés par le soudage par résistance par points

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 15011-6 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 9, *Health and safety*.

ISO 15011 consists of the following parts, under the general title *Health and safety in welding and allied processes — Laboratory method for sampling fume and gases*:

— *Part 1: Determination of fume emission rate during arc welding and collection of fume for analysis*

— *Part 2: Determination of the emission rates of carbon monoxide (CO), carbon dioxide (CO_2), nitrogen monoxide (NO) and nitrogen dioxide (NO_2) during arc welding, cutting and gouging*

— *Part 3: Determination of ozone emission rate during arc welding*

— *Part 4: Fume data sheets*

— *Part 5: Identification of thermal-degradation products generated when welding or cutting through products composed wholly or partly of organic materials using pyrolysis-gas chromatography-mass spectrometry*

— *Part 6: Procedure for quantitative determination of fume and gases from resistance spot welding* (Technical Specification)

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Requests for official interpretations of any aspect of this Technical Specification should be directed to the Secretariat of ISO/TC 44/SC 9 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

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Introduction

Welding and cutting activities generate fume and gases which can be harmful to health and should be controlled within the limits laid down by regulations.

Determination of the particle size distribution and the qualitative analysis (metallic and organic fraction and, if possible, speciation) of the dust collected are part of the current practices in human health risk assessment.

In addition, determination of the emission rate of fume and gases is essential for a proper hazard characterization (qualitative and quantitative analysis).

Emission rates cannot be used directly to assess the welder's exposure, but it is expected that materials giving low emission rates will result in lower welder exposures than materials with high emission rates used in the same working situation.

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Health and safety in welding and allied processes — Laboratory method for sampling fume and gases —

Part 6: Procedure for quantitative determination of fume and gases from resistance spot welding

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1 Scope

This part of ISO 15011 provides guidance on determination of emission rates of fume and gases generated by spot welding of uncoated and coated steel sheets, expressed as the quantity of pollutants per spot weld. It describes the test principle and considers methods for sampling and analysis.

This part of ISO 15011 can be used for determining the influence of the type of material, the coating system, and the material thickness on the possible generation of fume and gases when using a fixed combination of electrodes, welding equipment, and testing conditions.

The data generated can be used by product manufacturers to provide information for inclusion in safety data sheets and by occupational hygienists to evaluate the significant substances emitted by spot welding in the performance of risk assessments and/or workplace exposure measurements.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7708, *Air quality — Particle size fraction definitions for health-related sampling*

ISO 15011-5, *Health and safety in welding and allied processes — Laboratory method for sampling fume and gases — Part 5: Identification of thermal-degradation products generated when welding or cutting through products composed wholly or partly of organic materials using pyrolysis-gas chromatography-mass spectrometry*

ISO 15609-5, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 5: Resistance welding*

ISO 15767, *Workplace atmospheres — Controlling and characterizing uncertainty in weighing collected aerosols*

ISO 18278-2:2004, *Resistance welding — Weldability — Part 2: Alternative procedures for the assessment of sheet steels for spot welding*

CEN/TR 14599, *Terms and definitions for welding purposes in relation with EN 1792*

CEN/TR 15230, *Workplace atmospheres — Guidance for sampling of inhalable, thoracic and respirable aerosol fractions*

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