BRITISH STANDARD

BS EN ISO 15011-4:2006 +A1:2008

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

Part 4: Fume data sheets

ICS 13.100; 25.160.10

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National foreword

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The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment 1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee WEE/40, Health and safety in welding.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Foreword

This document (EN ISO 15011-4:2006) has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 44 "Welding and allied processes".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2006, and conflicting national standards shall be withdrawn at the latest by September 2006.

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Foreword to amendment A1

This document (EN ISO 15011-4:2006/A1:2008) has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 44 "Welding and allied processes".

This Amendment to the European Standard EN ISO 15011-4:2006 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2009, and conflicting national standards shall be withdrawn at the latest by June 2009.

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Introduction

Welding and allied processes produce airborne particles and gaseous by-products that can be harmful to human health. Knowledge of the quantity and composition of the airborne particles and gases emitted can be useful for occupational hygienists in assessing workplace exposure and in determining appropriate control measures.

Welding processes, consumables and parameters give rise to various fume emission rates, which in turn lead to different welder exposures. Emission rate cannot be used directly to assess exposure. However, processes, consumables and welding parameters that give lower emission rates generally result in lower welder exposures than processes with higher emission rates used in the same working situation.

The purpose of this part of ISO 15011 is to specify conditions under which fume is generated for the purpose of obtaining fume emission and chemical composition data for use in health and safety applications. Clear instructions and supporting informative guidance is provided in order to ensure that the welding conditions used are selected thoughtfully according to a standardized procedure. At the same time, the need to fully report the welding conditions used in the test is emphasised, and an example is provided of how such information is to be conveyed on a fume data sheet. This part of ISO 15011 also gives information about how the data obtained can be used.

It has been assumed in the drafting of this part of ISO 15011 that the execution of its provisions and the interpretation of the results obtained are entrusted to appropriately qualified and experienced people.

Requests for official interpretations of any aspect of this part of ISO 15011 should be directed to the Secretariat of ISO/TC 44/SC 9 via your national standards body, a complete of listing of which can be found at http://www.iso.org.

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

Part 4: Fume data sheets

1 Scope

This part of ISO 15011 covers health and safety in welding and allied processes. It specifies requirements for determination of the emission rate and chemical composition of welding fume in order to prepare fume data sheets.

It applies to all filler materials used for joining or surfacing by arc welding using a manual, partly mechanised or fully automatic process, depositing unalloyed steel, alloyed steel and non-ferrous alloys. Manual metal arc welding, gas-shielded metal arc welding with solid wires, metal-cored and flux-cored wires and arc welding with self-shielded flux-cored wires are included within the scope of this part of ISO 15011.

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.

EN 1540, *Workplace atmospheres — Terminology*

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

EN 14610, *Welding and allied processes — Definitions of metal welding processes*

ISO 15011-1, *Health and safety in welding and allied processes — Laboratory method for sampling fume and gases generated by arc welding — Part 1: Determination of emission rate and sampling for analysis of particulate fume*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1540, EN/TR 14599, EN 14610 and the following apply.

3.1
additive limit value
limit value that, in the absence of specific knowledge of the combined health effects of a mixture of chemical agents, is calculated on the basis that the health effects of the various components are at least additive

NOTE For complex substances that are mixtures of chemical agents, such as welding fume, individual substances can have specific, independent health effects or they can have synergistic, additive or antagonistic health effects.

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3.2
additive welding fume limit value
additive limit value for welding fume

3.3
key component of a welding fume
component of a welding fume that has the greatest occupational hygienic significance and therefore requires the most stringent control measures to ensure that a welder is not exposed to an excessive level of the substance concerned, i.e. it is the component whose limit value is exceeded at the lowest welding fume concentration

3.4
key-component welding fume limit value
limit value which, if not exceeded, will ensure that no component of the welding fume has a concentration above its limit value

3.5
principal components of a welding fume
components of a welding fume that are of occupational hygienic significance

3.6
single-component welding fume limit value
limit value calculated for a single component which, if not exceeded, will ensure that the component does not have a concentration above its limit value

4 Principle

4.1 Tests are carried out to determine the emission rate and chemical composition of welding fume produced when a welding consumable is used under a defined set of operating conditions. The welding fume is generated in accordance with the procedure described in ISO 15011-1 and under the conditions specified in this part of ISO 15011.

4.2 Emission rate and chemical composition data are reported in a recommended format, and various ways in which the data may be used are described.

5 Procedure

5.1 Determine the fume emission rate and/or collect fume samples for analysis, as required, in accordance with the procedure described in ISO 15011-1. Carry out the tests under the conditions prescribed in 6.2, 6.3 and 6.4, as appropriate.

NOTE In practice, emission rates can vary significantly from those determined under the test conditions specified in 6.2, 6.3 and 6.4. This is because the welding conditions used in the workplace can be significantly different from those specified in this part of ISO 15011. The conditions specified are typical of common practice and have been standardized to generate comparative data for a welding fume consumable classification.

5.2 Analyse the welding fume samples to generate chemical composition data for all the principal components of the welding fume (see Table E.1). Identify these, if necessary, by carrying out an initial qualitative analysis of the fume.

5.3 Estimate and report the uncertainty of measurements in accordance with the ISO GUM. See Annex C for examples of performance data obtained in an interlaboratory comparison.

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6 Test conditions

6.1 Generic test parameters

Table 1 lists the test parameters that apply to all the welding processes included in the scope of this part of ISO 15011 and it also gives cross-references for parameters that are process-specific.

Where it is specified in Tables 1 to 6 that a test condition is established by an experienced welder, if possible use the median of test conditions established by a number of experienced welders.

All instruments used for measuring test parameters shall have a calibration traceable to national standards.

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