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First edition  
2008-04-01

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## **Health and safety in welding and allied processes — Requirements, testing and marking of equipment for air filtration —**

Part 2:

### **Determination of the minimum air volume flow rate of captor hoods and nozzles**

*Hygiène et sécurité en soudage et techniques connexes — Exigences, essais et marquage des équipements de filtration d'air —*

*Partie 2: Détermination du débit volumique minimal d'air des bouches de captage*



Reference number  
ISO 15012-2:2008(E)

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Published in Switzerland

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

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 15012-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding*, in collaboration with Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 9, *Health and safety*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 15012 consists of the following parts, under the general title *Health and safety in welding and allied processes — Requirements, testing and marking of equipment for air filtration*:

- *Part 1: Testing of the separation efficiency for welding fume*
- *Part 2: Determination of the minimum air volume flow rate of captor hoods and nozzles*

The following part is under preparation:

- *Part 3: Determination of the capture efficiency of welding fume extraction devices using tracer gas*

Requests for official interpretations of any aspect of this part of ISO 15012 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](http://www.iso.org).

## Introduction

Welding and allied processes generate fume and gases, which, if inhaled, can be harmful to human health. Control is often required to maintain exposure at acceptable levels and this can be achieved by capturing the fume and gases using local exhaust ventilation (LEV), which consists of a capture device, such as a captor hood or nozzle, connected, via ducting, to an exhaust system.

The plume of welding fume rises at a velocity of about 0,3 m/s and the air draughts commonly encountered in workshops are of the same order and can be higher. Effective capture of welding fume and gases can only be achieved when the extracted air velocity at the emission point exceeds the resulting velocity of the draught and the plume, so a velocity of 0,4 m/s has been selected for testing. For a particular capture device, this capture velocity can only be achieved by applying a minimum air volume flow rate, which is dependent upon the aspect ratio, the cross-sectional area of the device and its distance from the emission point. Consequently, capture devices need to be used with exhaust systems that provide, at least, the minimum air volume flow rate.

The design of capture devices can be very different. Aspect ratios range from those applicable to circular hoods to those of slots, so the size and shape of the area (capture zone) where fume and gases are captured, while using the minimum air volume flow rate, also varies considerably. Therefore, this part of ISO 15012 requires manufacturers of capture devices to measure the minimum air volume flow rate at measurement points selected to give an estimate of the size and shape of the capture zone.