

Health and safety in welding and allied processes - Sampling of airborne particles and gases in the operator's breathing zone - Part 2: Sampling of gases

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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| <p>Käesolev Eesti standard EVS-EN ISO 10882-2:2001 sisaldab Euroopa standardi EN ISO 10882-2:2000 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 16.02.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p> | <p>This Estonian standard EVS-EN ISO 10882-2:2001 consists of the English text of the European standard EN ISO 10882-2:2000.</p> <p>This document is endorsed on 16.02.2001 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p> |
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| <p>Käsitlusala: This part of EN ISO 10882 provides guidance for the determination of personal exposure to gases and vapours in welding and allied processes.</p> | <p>Scope: This part of EN ISO 10882 provides guidance for the determination of personal exposure to gases and vapours in welding and allied processes.</p> |
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ICS 13.040.30, 25.160.10

Võtmesõnad: definition, definitions, health protection, inhaled air, measurement of gases, occupational safety, operating stations, particulate matter measurement, sampling, sampling methods, welders, welders (personnel), welding, working places

ICS 13.040.30; 25.160.10

English version

Health and safety in welding and allied processes
**Sampling of airborne particles and gases in the
operator's breathing zone**
Part 2: Sampling of gases
(ISO 10882-2 : 2000)

Hygiène et sécurité en soudage et
techniques connexes – Echantillon-
nage des particules en suspension et
gaz dans la zone respiratoire des
opérateurs – Partie 2: Echantillon-
nage des gaz (ISO 10882-2 : 2000)

Arbeits- und Gesundheitsschutz beim
Schweißen und bei verwandten
Verfahren – Probenahme von partikel-
förmigen Stoffen und Gasen im
Atembereich des Schweißers – Teil 2:
Probenahme von Gasen
(ISO 10882-2 : 2000)

This European Standard was approved by CEN on 2000-03-17.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Foreword

The text of EN ISO 10882-2:2000 has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS, 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 March 2001, and conflicting national standards shall be withdrawn at the latest by March 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Gases encountered during welding and allied processes are so numerous that it would be impracticable to cover them all in this European Standard. Depending on the process, they can include:

- a) fuel gases which are used in gas welding and cutting which on combustion produce carbon dioxide and in some instances carbon monoxide;
- b) shielding gases such as argon, helium, carbon dioxide or mixtures of these gases, which can be toxic or asphyxiant;
- c) gases produced by the action of heat upon the welding flux or slag, e.g. carbon dioxide and carbon monoxide;
- d) gases produced by the action of heat or ultraviolet radiation upon the atmosphere surrounding the welding arc, e.g. nitric oxide, nitrogen dioxide and ozone; and
- e) vapours produced as a result of thermal degradation of surface coatings in the welding or cutting of metals treated with paint, primer, sealer or other substances. Vapours can also be produced as a result of degradation of solvent vapour from degreasing operations, but their measurement is not dealt with in this standard because good working practices will avoid their production.

The scope of this part of EN ISO 10882 has been limited to those gases which are produced by welding operations. In particular, fuel, oxidant and shielding gases used in welding and allied processes are not covered, since the hazards associated with their use (e.g. asphyxiation, explosion) are different from those arising from the gases dealt with in this guide.

This part of EN ISO 10882 gives a generalised description of measurement methods suitable for the assessment of personal exposure to gases produced by welding and allied processes; gives details of relevant European Standards which specify required characteristics, performance requirements and test methods; augments guidance provided in EN 689 on assessment strategy and measurement strategy; lists basic sampling requirements; and provides specific information about the availability of direct reading electrical apparatus, detector tubes and indirect methods involving laboratory analysis for individual gases.

It has been assumed in the drafting of this standard that the execution of its provisions, and the interpretation of the results obtained, is entrusted to appropriately qualified and experienced people.

1 Scope

This part of EN ISO 10882 provides guidance for the determination of personal exposure to gases and vapours in welding and allied processes. It applies to the following thermal processes used to join, cut, surface or remove metals:

- (111) Manual metal arc welding (metal arc welding with covered electrode); shielded metal arc welding /USA/
- (114) Self-shielded tubular-cored arc welding
- (131) Metal inert gas welding; MIG welding; gas metal arc welding /USA/
- (135) Metal active gas welding; MAG welding; gas metal arc welding /USA/
- (136) Tubular-cored metal arc welding with active gas shield; flux cored arc welding /USA/
- (137) Tubular-cored metal arc welding with inert gas shield; flux cored arc welding /USA/
- (141) Tungsten inert gas arc welding; TIG welding; gas tungsten arc welding /USA/
- (15) Plasma arc welding;
- (31) Oxy-fuel gas welding; oxy-fuel gas welding /USA/
- (52) Laser beam welding;
- (912) Flame brazing; torch brazing /USA/
- (97) Braze welding;
- arc and flame gouging;
- arc and laser cutting processes;
- flame, plasma and laser and plasma cutting processes;
- metal-spraying (see EN ISO 4063).

The following gases and vapours which can be produced or be present during welding and allied processes are covered:

- ozone (O_3);
- carbon monoxide (CO);
- carbon dioxide (CO_2);
- nitric oxide (NO) and nitrogen dioxide (NO_2);
- vapours produced in the welding or cutting of metals having paint or other surface coatings.

Fuel, oxidant and shielding gases used in welding and allied processes are not covered.

The general background level of gases and vapours in the workplace atmosphere influences personal exposure, and therefore the role of fixed point measurements is also considered.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed here after. For dated references, subsequent amendments to or revisions of any of these incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 175, *Personal protection — Equipment for eye and face protection during welding and allied processes.*

EN 482, *Workplace atmospheres — General requirements for the performance of procedures for the measurement of chemical agents.*

EN 689:1995, *Workplace atmospheres — Guidance for the assessment of exposure to chemical agents for comparison with limit values and measurement strategy.*

EN 838, *Workplace atmospheres — Requirements and test methods for diffusive samplers for the determination of gases and vapours.*

EN 1076, *Workplace atmospheres — Pumped sorbent tubes for the determination of gases and vapours — Requirements and test methods.*

EN 1231, *Workplace atmospheres — Short term detector tube measurement systems — Requirements and test methods.*

EN 1232, *Workplace atmospheres — Pumps for personal sampling of chemical agents — Requirements and test methods.*

EN 1540, *Workplace atmospheres — Terminology.*

EN ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers.*

EN ISO 10882-1, *Health and safety in welding and allied processes — Sampling of airborne particles and gases in the operator's breathing zone — Part 1: Sampling of airborne particles.*

prEN 45544-1, *Workplace atmospheres — Electrical apparatus for the direct detection and direct concentration measurement of toxic gases and vapours — Part 1: General requirements and test methods.*

ISO 3534-1, *Statistics — Vocabulary and symbols — Part 1: Probability and general statistical terms.*

ISO 6879, *Air quality — Performance characteristics and related concepts for air quality methods.*

ISO 8756, *Air quality — Handling of temperature, pressure and relative humidity data.*

3 Terms and definitions

For the purposes of this part of EN ISO 10882, the following terms and definitions apply:

3.1

air sampling

process consisting of the collection, withdrawal or isolation of a fractional part of a larger volume of air. It can include the simultaneous isolation of selected components. (EN 1540)

3.2

bias

consistent deviation of the measured value from the value of the air quality characteristic itself or the accepted reference value. (ISO 6879)