Australian Standard®

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

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This Australian Standard® was prepared by Committee CH-031, Methods for Examination of Workplace Atmospheres. It was approved on behalf of the Council of Standards Australia on 19 September 2006.
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- Australian Aluminium Council
- Australian Chamber of Commerce and Industry
- Australian Institute of Occupational Hygienists
- Australian Mines and Metals Associations (Incorporated)
- Bureau of Steel Manufacturers of Australia
- Clean Air Society of Australia & New Zealand
- Coal Services
- Commonwealth Department of Health and Ageing
- Department of Administrative and Information Services, SA
- Department of Consumer and Employments Protection Worksafe Division WA
- Department of Mineral Resources, NSW
- National Association of Testing Authorities Australia
- WorkCover New South Wales

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through public comment period.

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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

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PREFACE

This Standard was prepared by the Standards Australia Committee CH-031, Methods for Examination of Workplace Atmospheres to supersede AS 3853.1—1991, *Fume from welding and allied processes*, Part 1: *Guide to methods for the sampling and analysis of particulate matter*.

This Standard is identical with and has been reproduced from ISO 10882-1:2001, *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*.

The objective of this Standard is to provide a method for gravimetric determination of personal exposure to welding fume and provide information about the use of chemical analysis to determine personal exposure to specific particles in welding fume.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text, 'this part of EN ISO 10882' and 'this European Standard' should read 'this Australian Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

This Standard is Part 1 of the following series:

AS	
3853	Health and safety in welding and allied processes—Sampling of airborne particles and gases in the operator's breathing zone
3853.1	Part 1: Sampling of airborne particles (this Standard)
3853.2	Part 2: Sampling of gases

References to international Standards should be replaced by Australian Standards or other publications as follows:

Reference to International Standard		*Australian Standard*	
EN ISO		AS	
4063	Welding and allied processes—Nomenclature of processes and reference numbers	2812	Welding, brazing and cutting of metals—Glossary of terms
EN		AS/NZS	
175	Personal protection—Equipment for eye and face protection during welding and allied processes	1337	Eye protectors for industrial applications
		1338	Filters for eye protectors—Filters for protection against radiation generated in welding and allied operations
481	Workplace atmospheres—Size fraction definitions for measurement of airborne particles	—	See Note 1

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EN		NOHSC	
482	Workplace atmospheres—General requirements for the performance of procedures for the measurement of chemical agents	1003 (1995)	Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment and subsequent updates (See Note 2)
689	Workplace atmospheres—Guidance for the assessment of exposure by inhalation to chemical agents or comparison with limit values and measurement strategy	3008 (1995)	Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment and subsequent updates (See Note 2)
1540	Workplace atmospheres—Terminology	1003 (1995)	Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment and subsequent updates (See Note 2)
ISO			
3534	Statistics—Vocabulary and symbols	—	See Note 3
3534-1	Part 1: Probability and general statistical terms		
6879	Air quality—Performance characteristics and related concepts for air quality measuring method	—	See Note 4
13205	Workplace atmospheres—Assessment of performance of instruments for measurement of airborne particle concentrations	—	See Note 5

NOTES:

1 In Australia, ISO 7708, *Air quality—Particle size fraction definitions for health-related sampling* is widely referenced in place of EN 481.

2 Subsequent updates to NOHSC 1003 (1995), NOHSC 3008 (1995) and all NOHSC exposure standards can be found in the Hazardous Substances Information Systems (HSIS) at http://www.nohsc.gov.au/applications/hsis/

3 ISO 3534-1contains the definition of 'true value' that is reproduced as definition 3.24 in this Standard.

4 ISO 6879 contains terms and definitions of performance characteristics related to air quality measuring methods. It does not include specific methods for determining air quality or obtaining representative samples.

5 Pumps sold in Australia may claim compliance with EN 1232 *Workplace atmospheres—Pumps for personal sampling of chemical agents—Requirements and methods standards*.

The term 'informative' has been used in this Standard to define the application of the annex to which it applies. An 'informative' annex is only for information and guidance.

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INTRODUCTION

This part of EN ISO 10882 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; specifies a procedure for gravimetric determination of personal exposure to welding fume and provides information about the use of chemical analysis to determine personal exposure to specific chemical agents in welding fume.

A person who performs welding and allied processes (the operator) can be exposed to welding fume and to other airborne particles generated by welding related operations, e.g. grinding. In some instances exposure to other airborne particles can be higher than exposure to welding fume. It is therefore necessary to carefully consider this possibility when using the method described in this standard.

Welding fume consists of airborne particles generated by welding and allied processes. In general, these particles are less than 1 µm in diameter, and respirable. However, most countries currently have exposure limits for welding fume, and for specific chemical agents present in welding fume, that apply to the inhalable fraction of airborne particles. This part of EN ISO 10882 therefore specifies a procedure for sampling the inhalable fraction, but the respirable fraction should be sampled in cases where exposure limits apply to that fraction.

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 persons.

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AUSTRALIAN STANDARD

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

1 Scope

This part of EN ISO 10882 specifies a procedure for personal sampling of airborne particles in welding and allied processes.

The procedure describes determination of personal exposure to welding fume and other airborne particles generated by welding related operations.

The general background level of airborne particles in the workplace atmosphere influences personal exposure, and therefore the role of fixed point sampling is also considered.

Guidance is given on the use of chemical analysis to determine personal exposure to specific chemical agents present in welding fume, but analytical methods are not described.

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 hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when 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 481:1993, *Workplace atmospheres — Size fraction definitions for measurement of airborne particles*

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

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

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*

prEN 13205:1998, *Workplace atmospheres - Assessment of performance of instruments for measurement of airborne particle concentrations*

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 measuring methods*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply:

3.1
air sampling
a 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)

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