



Respiratory protective devices— Methods of test and test equipment

Part 2: Determination of breathing resistance



This Australian Standard® was prepared by Committee SF-010, Occupational Respiratory Protection. It was approved on behalf of the Council of Standards Australia on 6 May 2015. This Standard was published on 30 June 2015.

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 - Australasian Fire and Emergency Service Authorities Council
 - Australian Chamber of Commerce and Industry
 - Australian Council of Trade Unions
 - Australian Industry Group
 - Australian Institute of Occupational Hygienists
 - Certification Interests, Australia
 - Composites Australia
 - Department of Defence (Australian Government)
 - Department of Trade and Investment, NSW
 - TestSafe Australia
 - WorkSafe Victoria
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Australian Standard[®]

Respiratory protective devices— Methods of test and test equipment

Part 2: Determination of breathing resistance

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Revised in part and redesignated as AS ISO 16900.2:2015.

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PREFACE

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee SF-010, Occupational Respiratory Protection, to ultimately supersede (in part) AS/NZS 1716:2012, *Respiratory protective devices*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

It is the Committee's intention that AS/NZS 1716:2012 will not be superseded until all relevant test methods and requirements covering respiratory protective devices are published by ISO and adopted as Australian or Australian/New Zealand Standards.

A period of time (to be determined at a later date) will be allowed for manufacturers, regulators and end users to test, assess and obtain appropriate products and programs before AS/NZS 1716:2012 is then withdrawn.

The objective of this Standard is to specify methods of testing breathing resistance for complete respiratory protective devices, filters for respiratory protective devices and respiratory interfaces.

This Standard is identical with, and has been reproduced from ISO 16900-2:2009, *Respiratory protective devices—Methods of test and test equipment, Part 2: Determination of breathing resistance*.

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

- (a) In the source text 'this part of ISO 16900' should read 'this Australian Standard'.
- (b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian Standards or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>	<i>Australian Standard</i>
ISO	AS ISO
16972 Respiratory protective devices—Terms, definitions, graphical symbols and units of measurement	16972 Respiratory protective devices—Terms, definitions, graphical symbols and units of measurement

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The term 'normative' has been used in this Standard to define the application of the annex to which it applies. A 'normative' annex is an integral part of a Standard.

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INTRODUCTION

This part of ISO 16900 is intended as a supplement to the relevant performance standards for respiratory protective devices. Test methods are specified for complete devices or parts of devices. If deviations from the test method given in this part of ISO 16900 are necessary, these deviations will be specified in the relevant performance standard.

AUSTRALIAN STANDARD

Respiratory protective devices—Methods of test and test equipment**Part 2:
Determination of breathing resistance****1 Scope**

This part of ISO 16900 specifies the method(s) of test for breathing resistance for:

- complete respiratory protective devices ¹⁾;
- filters for respiratory protective devices;
- respiratory interfaces.

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 16972, *Respiratory protective devices — Terms, definitions, graphical symbols and units of measurement*

ISO/TS 21748:2004, *Guidance for the use of repeatability, reproducibility and trueness estimates in measurement uncertainty estimation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16972 apply together with the following.

3.1**static breathing resistance**

differential pressure caused by an RPD when the breathing gas is passed through the device at a constant flow

3.2**dynamic breathing resistance**

differential pressure caused by an RPD when the breathing gas is delivered by a breathing machine adjusted to a specified breathing minute volume and waveform

1) Respiratory protective device = RPD.

4 Prerequisites

In order to implement this part of ISO 16900, at least the following parameters need to be specified in the performance standard:

- the number of specimens;
- the selection and type(s) of support such as dummy head/dummy torso;
- any prior conditioning or testing;
- flow rate (static test method);
- breathing minute volume and waveform (dynamic test method);
- test method;
- any deviations from the method(s).

5 General test requirements

Unless otherwise specified, the values stated in this part of ISO 16900 are expressed as nominal values. Except for temperature limits, values which are not stated as maxima or minima shall be subject to a tolerance of $\pm 5\%$. Unless otherwise specified, the ambient temperature for testing shall be between 16 °C and 32 °C and 50 % $\pm$ 30 % RH. Any temperature limits specified shall be subject to an accuracy of $\pm 1^\circ\text{C}$.

6 Method 1: Static breathing resistance

6.1 Principle

The device is mounted on a support as described in the performance standard, and air is drawn through the device at a constant flow.

NOTE The convention of reporting breathing resistance is that if, during the inhalation resistance test, the pressure inside the facepiece relative to atmosphere is negative, no sign is used in front of the result. If the relative pressure inside the facepiece is positive, the result is prefixed with a '+’.

6.2 Equipment

6.2.1 Pressure gauge, calibrated in the appropriate range relevant to the performance standard.

6.2.2 Flowmeter(s), calibrated in the appropriate volumetric flow rate range and corrected for the ambient temperature and ambient atmospheric pressure during use.

6.2.3 Ambient temperature and ambient atmospheric pressure measuring equipment.

6.2.4 Regulated blower/compressed air source and/or a **variable suction device.**

6.2.5 Support for the device, (e.g. filter holder, dummy head or dummy torso) as described in the performance standard.

NOTE It is important that the holder of the filter or facepiece does not reduce the effective working area of the filter or facepiece.