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Australian/New Zealand Standard™

# Respiratory protective devices — Methods of test and test equipment

**Method 5: Breathing machine, metabolic simulator, RPD headforms and torso, tools and verification tools**



AS/NZS ISO 16900.5:2021

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- Australian Industry Group
- Australian Institute of Health and Safety
- Australian Institute of Occupational Hygienists
- Australian Institute of Petroleum
- Better Regulation Division (Fair Trading, Safework NSW, TestSafe)
- Composites Australia
- CSIRO
- Joint Accreditation System of Australia and New Zealand
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## Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-010, Occupational Respiratory Protection.

The objective of this document is to specify the characteristics of breathing machines, metabolic simulators, RPD head forms/torso, RPD tools and RPD verification tools that are common to RPD test laboratories.

This document is identical with, and has been reproduced from, ISO 16900-5:2016, *Respiratory protective devices — Methods of test and test equipment — Part 5: Breathing machine, metabolic simulator, RPD headforms and torso, tools and verification tools* and its Amendment No. 1 (2018), which has been added at the end of the source text.

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- (a) In the source text “this part of ISO 16900” should read “this document”.
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

The committee responsible for this document is ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 15, *Respiratory protective devices*.

ISO 16900 consists of the following parts, under the general title *Respiratory protective devices — Methods of test and test equipment*:

- *Part 1: Determination of inward leakage*
- *Part 2: Determination of breathing resistance*
- *Part 3: Determination of particle filter penetration*
- *Part 4: Determination of gas filter capacity and migration, desorption and carbon monoxide dynamic testing*
- *Part 5: Breathing machine, metabolic simulator, RPD head forms and torso, tools and verification tools*
- *Part 6: Mechanical resistance/strength of components and connections*
- *Part 7: Practical performance test methods*
- *Part 8: Measurement of RPD air flow rates of assisted filtering RPD*
- *Part 9: Determination of carbon dioxide content of the inhaled gas*
- *Part 10: Resistance to ignition, flame, radiant heat and heat*
- *Part 11: Determination of field of vision*
- *Part 12: Determination of volume-averaged work of breathing and peak respiratory pressures*

- *Part 13: RPD using regenerated breathable gas and special application mining escape RPD: Consolidated test for gas concentration, temperature, humidity, work of breathing, breathing resistance, elastance and duration*
- *Part 14: Measurement of sound level*

## NOTES

# Australian/New Zealand Standard

## Respiratory protective devices — Methods of test and test equipment

### Method 5: Breathing machine, metabolic simulator, RPD headforms and torso, tools and verification tools

#### 1 Scope

This part of ISO 16900 specifies the characteristics of breathing machines, metabolic simulators, RPD head forms/torso, RPD tools and RPD verification tools that are common to RPD test laboratories. Standardization of these items is essential for the standardization of the test methods.

Standardization of the RPD verification tools is essential for demonstrating the delivery of comparable results in different test laboratories.

Descriptions on the use of the RPD tools for the different tests are specified in the relevant parts of ISO 16900.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16900-9:2015, *Respiratory protective devices — Methods of test and test equipment — Part 9: Determination of carbon dioxide content of the inhaled gas*

ISO 16900-12:2016, *Respiratory protective devices — Methods of test and test equipment — Part 12: Determination of volume-averaged work of breathing and peak respiratory pressures*

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

ISO 17420-3, *Respiratory protective devices — Performance requirements — Part 3: Thread connection*

ISO/TS 16976-2, *Respiratory protective devices — Human factors — Part 2: Anthropometrics*

#### 3 Terms and definitions

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

##### 3.1

##### **RPD head form**

laboratory test head simulating human heads used in testing RPD

##### 3.2

##### **RPD torso**

generic body form used in combination with an RPD head form used in testing RPD

##### 3.3

##### **trachea tube assembly**

tube that simulates the human trachea, containing ports for the measurement of pressure, carbon dioxide content and temperature of breathed breathable gas, and interface connections permitting seating to the RPD head form, RPD torso or alternative (benchtop) fixture

##### 3.4

##### **RPD head form assembly**

RPD head form with trachea tube assembly included