

Australian Standard 1716—1982

RESPIRATORY PROTECTIVE DEVICES

[Title allocated by Defence Cataloguing Authority:
RESPIRATORY PROTECTIVE DEVICES ... NSC 42 GP]



STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Council of Trade Unions
Board of Fire Commissioners of New South Wales
Confederation of Australian Industry
Country Fire Authority
Department of Defence
Department of Health
Department of Industrial Relations, N.S.W.
Department of Mineral Resources, N.S.W.
Department of Productivity
Electricity Supply Association of Australia
Health Commission of New South Wales
Health Commission of Victoria
Metal Trades Industry Association of Australia
Metropolitan Fire Brigades Board, Melbourne
Metropolitan Water Sewerage and Drainage Board, N.S.W.
Safety Institute of Australia

This standard, prepared by Committee SF/10, Industrial Respiratory Protection, was approved on behalf of the Council of the Standards Association of Australia on 31 August 1981, and was published on 22 February 1982.

To keep abreast of progress in industry, Australian standards are subject to continuous review and are kept up-to-date by the issue of amendments or new editions as necessary. It is important therefore that standards users ensure that their standards are up-to-date. Full details of all SAA publications will be found in the Annual List of Australian Standards; these details are supplemented by listings in the SAA monthly journal 'The Australian Standard'. Information on the Annual List and 'The Australian Standard' may be obtained from any sales office of the Association, where details are also available of the current status of individual standards. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for comment as DR 79053.

AUSTRALIAN STANDARD

RESPIRATORY PROTECTIVE DEVICES

AS 1716—1982

First published (as AS Z18)	1963
AS 1716 first published	1975
Second edition	1982

**PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.**

ISBN 0 7262 2427 8

PREFACE

This edition of this standard was prepared by the Association's Committee for Industrial Respiratory Protection to supersede AS 1716—1975.

This edition of the standard includes technical and editorial amendments necessary to cover new types of respirators introduced since 1975 and to take account of experience gained in the application of the 1975 edition.

Among the significant differences between this edition and the 1975 edition are the following:

- (a) Requirements for disposable type (limited use) respirators have been included (Section 3).
- (b) Requirements for powered type particulate respirators have been included (Section 4).
- (c) Separate requirements have been included for units operating on negative pressure demand valves or positive pressure demand valves.
- (d) Testing of gas respirators designed for self-rescue from atmospheres containing carbon monoxide has been modified because the earlier method was considered to place the test subjects at risk.
- (e) Reduced limits for noise levels of air supplied and blower units have been specified.
- (f) Advice on compounds against which canister respirators offer protection has been relocated in AS 1715.
- (g) Air purity requirements for air supplies for airline respirators have been updated (see Appendix E).
- (h) Requirements for compressed oxygen (dry breathing) for respirators have been included (see Appendix F).
- (j) Marking requirements for respirators and components have been clarified.
- (k) Wherever possible, design and dimensional requirements which may unnecessarily restrict design and development have been replaced by performance tests and criteria.

In regard to (k) the committee was aware of extensive draft proposals for respirators currently being studied overseas, particularly by the EEC members. However, earlier experience in Australia with inadequate industrial respirators and the heavy reliance which industrial users place on approval of respirators against AS 1716 have necessitated this edition continuing to place some reliance on minimal design criteria. In this regard, the International Organization for Standardization (ISO) has been encouraged to take the initiative in the development of a performance-based international standard. Also, a working group of the Australian Committee SF/10 has been charged with the task of developing a performance-based standard for consideration in the next edition of this standard.

Advice on the selection, use and maintenance of respiratory protective equipment is not covered in this standard but is given in AS 1715.

This standard requires reference to the following standards:

AS 1337	Eye Protectors for Industrial Applications
AS 1715	Respiratory Protection
AS 1801	Industrial Safety Helmets
AS 1944	The Identification of Medical Gas Cylinders
AS 2030	SAA Gas Cylinders Code
AS 2299	Underwater Air Breathing Operations
AS 2409	Interchangeable Conical Ground Glass Joints
AS 2473	Valves for Compressed Gas Cylinders (Threaded Outlet)
BS 2577	Methylene Blue Particulate Test for Respirator Canisters
BS 4400	Sodium Chloride Particulate Test for Respirator Filters

© Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1982

Users of standards are reminded that copyright subsists in all SAA publications. No part of this publication may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing of the Standards Association of Australia.

CONTENTS

	<i>Page</i>		<i>Page</i>
SECTION 1. SCOPE AND GENERAL		SECTION 8. GAS RESPIRATOR—FOR SELF- RESCUE FROM ATMOSPHERES CONTAINING CARBON MONOXIDE	
1.1 Scope	5	8.1 Design and Construction	21
1.2 Application	5	8.2 Carrying Case	21
1.3 Definitions	5	8.3 Mouthpiece and Nose Clip	21
1.4 Nominal Values and Tolerances	6	8.4 Head Harness	21
1.5 Design and Construction	6	8.5 Heat Exchanger	21
1.6 Material	6	8.6 Active Element	21
1.7 Full Facepiece	6	8.7 Chin Guard	21
1.8 Half Facepiece	7	8.8 Outlet Valve	21
1.9 Mouthpiece and Nose Clip	7	8.9 Protection of Filter from Saliva	21
1.10 Head Harness	7	8.10 Mass	21
1.11 Breathing Tube	7	8.11 Type Testing	22
1.12 Instructions for Use	7	8.12 Marking	22
1.13 Marking	8		
SECTION 2. PARTICULATE RESPIRATOR— CARTRIDGE OR CANISTER TYPE		SECTION 9. HOSE MASK RESPIRATOR	
2.1 Design and Construction	9	9.1 Design and Construction	23
2.2 Filter	9	9.2 Waist Belt or Body Harness	23
2.3 Type Testing	9	9.3 Air Hose and Air Supply	23
2.4 Marking	10	9.4 Type Testing	23
		9.5 Marking	24
SECTION 3. PARTICULATE RESPIRATOR— DISPOSABLE TYPE		SECTION 10. AIRLINE RESPIRATOR—FULL FACEPIECE TYPE	
3.1 Design and Construction	11	10.1 Design and Construction	25
3.2 Type Testing	11	10.2 Regulating Device	25
3.3 Marking	11	10.3 Demand Valve	25
		10.4 Connecting Tube	25
SECTION 4. PARTICULATE RESPIRATOR— POWERED TYPE		10.5 Waist Belt or Body Harness	25
4.1 Design and Component Parts	12	10.6 Air Hose	26
4.2 Construction	12	10.7 Type Testing	26
4.3 Type Testing	13	10.8 Marking	26
4.4 Marking	14		
4.5 Information to be Supplied	14	SECTION 11. AIRLINE RESPIRATOR—HALF TYPE	
SECTION 5. GAS RESPIRATOR—CARTRIDGE TYPE		11.1 Design and Construction	27
5.1 Design and Construction	15	11.2 Regulating Device	27
5.2 Cartridge	15	11.3 Demand Valve	27
5.3 Type Testing	15	11.4 Connecting Tube	27
5.4 Marking	15	11.5 Waist Belt or Body Harness	27
		11.6 Air Hose	28
SECTION 6. PARTICULATE AND GAS RESPIRATOR—CARTRIDGE TYPE		11.7 Type Testing	28
6.1 Design and Construction	17	11.8 Marking	28
6.2 Particulate Filter and Gas Cartridge	17		
6.3 Type Testing	17	SECTION 12. AIRLINE RESPIRATOR—HOOD OR HELMET TYPE	
6.4 Marking	17	12.1 Design and Construction	29
SECTION 7. GAS RESPIRATOR—CANISTER TYPE		12.2 Hood or Helmet	29
7.1 Design and Construction	19	12.3 Inner Bib	29
7.2 Canister	19	12.4 Noise Level	29
7.3 Canister Harness	19	12.5 Regulating Device	29
7.4 Type Testing	19	12.6 Waist Belt or Body Harness	29
7.5 Marking	20	12.7 Connecting Tube	29
		12.8 Air Hose	29
		12.9 Type Testing	29
		12.10 Marking	30

SECTION 13. SELF-CONTAINED BREATHING APPARATUS—COMPRESSED AIR OPEN-CIRCUIT TYPE

13.1	Design and Construction	31
13.2	Nominal Effective Life	31
13.3	Pressure Pipe and Hose	31
13.4	Demand Valve	31
13.5	Airline Connection	31
13.6	Manually Operated Bypass Valve	32
13.7	Compressed Air	32
13.8	Cylinders	32
13.9	Cylinder Valve	32
13.10	Pressure Gauge	32
13.11	Pressure Gauge Isolating Valve	32
13.12	Warning Device	32
13.13	Body Harness	32
13.14	Mass	32
13.15	Type Testing	32
13.16	Instructions for Use	32
13.17	Marking	33

SECTION 14. SELF-CONTAINED BREATHING APPARATUS—COMPRESSED AIR OPEN-CIRCUIT TYPE, ESCAPE TYPE

14.1	Design and Construction	34
14.2	Nominal Effective Life	34
14.3	Pressure Pipe and Hose	34
14.4	Demand Valve	34
14.5	Airline Connection	34
14.6	Compressed Air	34
14.7	Cylinders	34
14.8	Cylinder Valve	34
14.9	Pressure Gauge Isolating Valve	35
14.10	Pressure Gauge or Pressure Indicator	35
14.11	Body Harness	35
14.12	Type Testing	35
14.13	Instructions for Use	35
14.14	Marking	35

SECTION 15. SELF-CONTAINED BREATHING APPARATUS—LIQUID OXYGEN CLOSED-CIRCUIT TYPE

15.1	Design and Construction	36
15.2	Nominal Effective Life	36
15.3	Mouthpiece and Nose Clip	36
15.4	Closure of Facepiece or Mouthpiece Orifice	36
15.5	Breathing Bag	37

15.6	Relief Valve	36
15.7	Carbon Dioxide Absorbent	36
15.8	Body Harness	37
15.9	Mass	37
15.10	Type Testing	37
15.11	Marking	38

SECTION 16. SELF-CONTAINED BREATHING APPARATUS—COMPRESSED OXYGEN CLOSED-CIRCUIT TYPE

16.1	Design and Construction	39
16.2	Nominal Effective Life	39
16.3	Mouthpiece and Nose Clip	39
16.4	Closure of Facepiece or Mouthpiece Orifice	39
16.5	Breathing Bag	39
16.6	Relief Valve	40
16.7	Constant-flow Reducing Valve	40
16.8	Manually Operated Bypass Valve	40
16.9	Demand Valve	40
16.10	Compressed Oxygen (Dry Breathing)	40
16.11	Carbon Dioxide Absorbent	40
16.12	Cylinders	40
16.13	Cylinder Valve	40
16.14	Pressure Pipe and Hose	40
16.15	Pressure Gauge	40
16.16	Pressure Gauge Isolating Valve	40
16.17	Warning Device	41
16.18	Body Harness	41
16.19	Mass	41
16.20	Type Testing	41
16.21	Marking	42

APPENDICES

A	Class Designation and Filtering Efficiency Tests for Canisters Against Gases and Vapours	43
B	Methods for the Detection of Penetration of Test Gases Through Cartridges and Canisters	44
C	Typical Arrangement of Canisters and Cartridges During Stability Test	46
D	Method of Selecting Personnel for Assembled Respirator Tests	47
E	Requirements for Air Supplies (Cylinders or Compressors) for Airline Respirators	48
F	Requirements for Compressed Oxygen (Dry Breathing) for Respirators	49
G	Powered Particulate Respirator Leakage Test	50
H	<i>Cylinder Valve Requirements.</i>	
	SEE AMENDMENTS I	

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
RESPIRATORY PROTECTIVE DEVICES

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for respiratory protective devices intended to provide, according to type, varying degrees of protection against atmospheres containing substances which may be harmful if breathed; also, with certain types, protection against atmospheres which may be deficient in oxygen.

The standard lays down requirements to be observed in the design and manufacture of respiratory protective devices and specifies performance and testing criteria which must be met to secure approval for such devices.

It does not purport to give guidance in the selection, use and routine testing of the devices. Reference should be made to AS 1715 for such guidance and for determining the type of protection which should be provided for any particular condition.

The standard does not apply to respiratory protective devices for use in aircraft, or for operations underwater (see AS 2299).

1.2 APPLICATION. Every respirator shall comply with the general requirements of this Section and with the specific requirements of the particular Section applicable to the respirator type, as follows:

Particulate respirator—cartridge or canister type	Section 2
Particulate respirator—disposable type	Section 3
Particulate respirator—powered type	Section 4
Gas respirator—cartridge type	Section 5
Particulate and gas respirator—cartridge type	Section 6
Gas respirator—canister type	Section 7
Gas respirator—for self-rescue from atmospheres containing carbon monoxide	Section 8
Hose mask respirator	Section 9
Airline respirator—full facepiece type	Section 10
Airline respirator—half facepiece type	Section 11
Airline respirator—hood or helmet type	Section 12
Self-contained breathing apparatus—Compressed air—open-circuit type	Section 13
Compressed air—open-circuit type, escape type	Section 14
Liquid oxygen—closed-circuit type	Section 15

Compressed oxygen—closed-circuit type

Section 16

1.3 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.3.1 Respirator—a personal respiratory protective device.

1.3.2 Particulate (dust, mist or fumes) respirator—a respirator, used with a half or full facepiece, that has a particulate filter which removes finely divided solid or liquid matter from the air inhaled by the wearer.

The respirator may incorporate a replaceable cartridge or canister filter or, for disposable type respirators, may be constructed with the filter medium as an integral part of the construction.

1.3.3 Gas Respirator.

1.3.3.1 Canister type—a respirator, used with a full facepiece, that removes limited concentrations of certain gases from the air inhaled by the wearer, by use of a filter contained in a canister connected to a full facepiece. This type may also incorporate a filter to remove particulates.

1.3.3.2 Cartridge type—a respirator which removes low concentrations of gases from the air by use of a cartridge filter usually fitted to a half-mask (or-nasal facepiece). This type may also incorporate a filter to remove particulates.

1.3.4 Hose mask respirator—a respirator, used with a full facepiece through which clean air from a source remote from the workplace is available to the wearer through an air hose at atmospheric or near atmospheric pressure.

1.3.5 Airline respirator—a respirator through which compressed clean air from a source remote from the workplace is supplied to the wearer by means of an airline. This type may be used with either a half or full facepiece, or with a hood or helmet.

1.3.6 Powered respirator—a respirator incorporating a half or full facepiece, hood or helmet, which provides the wearer with air filtered through a powered filtering unit, comprising a filter or filters, and an electrically operated blower unit.

1.3.7 Disposable respirator—a respirator which has no replaceable parts and which is discarded after limited use.

1.3.8 Self-contained breathing apparatus—a respirator which supplies the wearer with air or oxygen from containers carried by him.

1.3.9 Demand valve—a device for the controlled release of air or oxygen actuated by a reduction in pressure created by the action of inhalation.