

Australian Standard 1716—1984

RESPIRATORY PROTECTIVE DEVICES

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



STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

This Australian standard was prepared by Committee SF/10, Industrial Respiratory Protection. It was approved on behalf of the Council of the Standards Association of Australia on 2 March 1984 and published on 2 July 1984.

The following interests are represented on Committee SF/10:

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 Health, N.S.W.
Department of Industrial Relations, N.S.W.
Department of Mineral Resources, N.S.W.
Department of Science and Technology
Electricity Supply Association of Australia
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

Review of Australian Standards. To keep abreast of progress in industry, Australian standards are subject to periodic 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 they are in possession of the latest edition, and any amendments thereto.

Full details of all SAA publications will be found in the Catalogue of Australian Standards; this information is supplemented each month by SAA's journal 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn standards.

Suggestions for improvements to Australian standards, addressed to the head office of the Association, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian standard should be made without delay in order that the matter may be investigated and appropriate action taken.

AUSTRALIAN STANDARD

RESPIRATORY PROTECTIVE DEVICES

AS 1716—1984

First published (as AS Z18)	1963
AS 1716 first published	1975
Second edition	1982
Third edition	1984

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—1982.

This edition of the standard is technically identical to AS 1716—1982, and differs only by those amendments necessary to clarify some minor ambiguities and errors found by experience gained in the application of the 1982 edition and by incorporation of the cylinder valve requirement introduced by amendment in 1983.

The significant differences between the 1982 edition and the 1975 edition are maintained in this edition and include 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.

©Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1984

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.... .	8	8.11 Type Testing	22
1.12 Instructions for Use	8	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
SECTION 4. PARTICULATE RESPIRATOR— POWERED TYPE		10.4 Connecting Tube	25
4.1 Design and Component Parts	12	10.5 Waist Belt or Body Harness	25
4.2 Construction	12	10.6 Air Hose	26
4.3 Type Testing	13	10.7 Type Testing	26
4.4 Marking	14	10.8 Marking	26
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
SECTION 6. PARTICULATE AND GAS RESPIRATOR—CARTRIDGE TYPE		11.6 Air Hose,	28
6.1 Design and Construction	17	11.7 Type Testing	28
6.2 Particulate Filter and Gas Cartridge	17	11.8 Marking	28
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 32

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 35

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 40

16.18 Body Harness 41

16.19 Mass 41

16.20 Type Testing 41

16.21 Marking 42

APPENDICES

A Type 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 50

G Powered Particulate Respirator Leakage Test 51

H Cylinder Valve Requirements 54

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.

1.2.1 Requirements of This Standard. 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

1.2.2 Referenced Documents. The following standards are referred to in this standard:

AS 1337	Eye Protectors for Industrial Applications
AS 1715	Selection, Use and Maintenance of Respiratory Protective Devices
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.

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 (ori-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.