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Australian Standard 2473—1981

VALVES FOR COMPRESSED GAS CYLINDERS (THREADED OUTLET)

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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

Aluminium Development Council

Australasian Steamship Owners Federation

Australian Chamber of Commerce

Australian Liquefied Petroleum Gas Association

Australian Underwater Federation

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of the Capital Territory

Department of Defence

Department of Industrial Affairs and Employment, S.A.

Department of Industrial Relations, N.S.W.

Department of Labour and Industry, Vic.

Department of Labour and Industry, W.A.

Department of Labour and Industry, Tas.

Department of Labour Relations, Qld

Department of Mines, Qld

Department of Mines and Energy, N.T.

Insurance Council of Australia

Railways of Australia Committee

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EX 6717.

AUSTRALIAN STANDARD

VALVES FOR COMPRESSED GAS CYLINDERS (THREADED OUTLET)

AS 2473—1981

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PREFACE

This standard was prepared by the Association's Committee on Gas Cylinders. It supersedes AS B240—1966, Valve Fittings for Compressed Gas Cylinders. Two other standards have been prepared for valves, one being a replacement for Supplement 1 to AS CB4 for pin-index type medical valves (AS 2472), and the other for a new range of diameter-indexed connections (AS 2474). The latter provides an alternative system of connection to those provided by this standard, for some industrial gases.

This standard does not include any major departure from AS B240. Changes include provision for a parallel stem thread in common usage, i.e. 3/4 NGS, and provision to pressure-test assembled valves with any pressure relief device fitted. An alternative outlet connection for nitrogen is provided to enable one unusual but most hazardous confusion with oxygen to be avoided.

The committee proposes to devise impact tests for the valve in-situ, to take into account protection from any valve protection ring or valve cap.

True metrication of valve threads is not feasible at this time owing to the very great number of cylinders in traffic with imperial threads. Soft metrication has been made.

As in AS B240, a left-hand thread is listed for combustible gases generally. There are small cylinders in use in Australia that have right-hand threads and are used for combustible gases, and the committee considers that these should not be included in the standard but be treated as special cases.

Committee ME/2 issued Interpretation No 11 (April 1977) for ⅜ in BSP Parallel Thread Cylinder Valve With Soft-soldered Seat. This interpretation is incorporated into the standard without technical change as an appendix.

This standard requires reference to the following standards:

AS 1391	Methods for Tensile Testing of Metals
AS 1544	Methods for Impact Tests on Metals Part 1—Izod
AS 1677	SAA Refrigeration Code
AS 1722	Pipe Threads of Whitworth Form Part 2—Fastening Pipe Threads
AS 2030	SAA Gas Cylinders Code
AS B154	Fastening Threads of BSP Sizes*
ANSI B57.1	Compressed Gas Cylinder Valve Outlet and Inlet Connections
ANSI B2.1	Pipe Threads (Except Dryseal)

*Superseded by AS 1722, Part 2.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
VALVES FOR COMPRESSED GAS CYLINDERS (THREADED OUTLET)

1 SCOPE. This standard specifies inlet and outlet connection threads, material, testing, valve spindle dimensions and operations, and marking requirements, for compressed gas cylinder valves with threaded outlet connections for a nominated range of gases. It also specifies dimensional details of the outlet connecting parts.

NOTES:
1. Requirements for compressed gas cylinder valves with a diameter-indexed system of outlet connections, or with a pin-index system of outlet connections (for medical application) are specified in AS 2472 and AS 2474.
2. For convenience the special valve (previously specified in Interpretation No 11 to AS CB4) for use on small seamless gas cylinders for carbon dioxide, is now specified in Appendix C.

This standard does not apply to valves for portable gas cylinders of less than 11 kg water capacity for self-contained breathing apparatus, or to valves for fire extinguishers.

2 DEFINITIONS. For the purpose of this standard, the definitions given in AS 2030 apply.

3 THREADS.

3.1 Valve Stem (Inlet) Thread. The valve stem (inlet) thread shall be one of the following:
(a) Taper thread listed in Table 1.
(b) Parallel thread listed in Table 2.
(c) Thread compatible with one of the threads listed in Clause 1.5 of AS 2030.

NOTE: Recommended limit gauges for checking the specified taper threads are detailed in Appendix A.

3.2 Valve Outlet Connection Thread. The valve outlet connection thread shall be that shown in column 4 of Table 3 for the designated gas or, where the gas is not listed in Table 3, shall be that shown in column 4 of Table 4 for the gas for which the valve is to be used.

Where the gas is not listed in Table 3 or Table 4, or is a gas mixture, the valve outlet connection thread, and type of outlet connection, shall comply with Table 6 for the appropriate classification of gas or gas mixture.

4 DIMENSIONS.

4.1 Spindle. Valves operated by a spindle shall have a handwheel not separable from the spindle without the use of tools, or shall have a squared end to the spindle. The dimension of the squared end shall be that nominated in column 6 of Table 3 or Table 4 for the designated gas, and as specified in Table 5.

4.2 Outlet Connection. The outlet connection shall conform to the dimensions given in Tables 7 to 21 as appropriate for the type of connection specified in Table 3 for the particular gas. If the particular gas is not listed in Table 3, the outlet connection shall conform to the dimensions given in Table 8 or Table 10 as appropriate for the type of connection specified in Table 4 for the particular gas.

5 VALVE OPERATION. Spindles for valve operation shall close the valve when rotated clockwise (when viewed from the spindle end). The spindle gland and spindle-retaining nut shall not be loosened by operation of the spindle.

The spindle shall not be separable from the valve body without the prior removal of the spindle-retaining device by the use of tools.

6 MATERIALS.

6.1 Compatibility. Materials used for valve components in contact with the contained gas shall be compatible with the contained gas.

NOTE: Some compatible materials are listed in column 5 of Tables 3 and 4.

The copper content of the material of valve bodies for use with acetylene gas shall not exceed 70 percent.

6.2 Valve Body Mechanical Properties. The mechanical properties shall comply with all of the following requirements when tested in accordance with Clauses 9.2 and 9.3:

(a) Minimum tensile strength .... 430 MPa.

NOTE: 430 MPa is appropriate to a valve not protected by a valve protection ring or protective cap, but until alternative minimum tensile strengths are established no other value is recommended.

(b) Minimum elongation (on $5.65\sqrt{S_o}$, where S_o = gauge length) .... 17 percent.

(c) Impact strength—
(i) for steel .... 54 J;
(ii) for copper alloys .... 27 J.

NOTE: It may be necessary to oil-quench and temper steel to obtain a value of 54 J.

7 MANUFACTURE. Valve bodies shall not be manufactured as castings.

8 PRESSURE RATING. The maximum service pressure for which the valve is rated shall be nominated by the valve manufacturer and shall be verified by testing in accordance with Clause 9.4.

NOTE: Appendix B provides a basis for selection of valves to be tested.

9 TESTING.

9.1 Tests. Mechanical tests shall be in accordance with Clauses 9.2 and 9.3. Test pieces for mechanical tests should be taken from a valve blank, but where this is not practicable a test piece of identical material shall be subjected to similar treatment to the valve body to