

Australian/New Zealand Standard™

Fire hose reels



AS/NZS 1221:1997

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee FP-007, Fire Hose Reels. It was approved on behalf of the Council of Standards Australia on 5 September 1997 and on behalf of the Council of Standards New Zealand on 19 September 1997. It was published on 5 November 1997.

The following are represented on Committee FP-007:

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Australasian Fire Authorities Council
Australian Association of Certification Bodies
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Fire hose reels

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee FP-007 on Fire Hose Reels. This Standard supersedes AS 1221—1991 Fire hose reels and NZS 4504—1981 Specifications for fire hose reels.

This Standard incorporates Amendment 1 (January 2003). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure, or part thereof affected.

The objective of this Standard is to provide specific requirements for fire hose reels to meet the requirements of the appropriate regulatory authority when used in Australia and New Zealand.

It provides requirements for design, construction and performance of fixed and swing type fire hose reels.

It does not include location, installation or maintenance of fire hose reels since these subjects are covered in other Standards.

Hose reels used in Australia are usually fitted with 19 mm nominal diameter hose and those used in New Zealand are usually fitted with 13 mm nominal diameter hose. In cases where the ability to operate at lower inlet pressures or higher flow rates is desirable, a hose reel fitted with a 25 mm nominal diameter hose may be necessary. Hose reels fitted with 25 mm nominal diameter hose are required by some regulatory authorities.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Fire hose reels**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for design, construction and performance of fixed and swing arm type fire hose reels intended for use by one operator.

It does not include requirements for location or maintenance of fire hose reels since these subjects are covered in other Standards.

NOTES:

- 1 Methods for demonstrating compliance with this Standard are given in Appendix 'A'.
- 2 A fire hose reel is generally referred to in this document as a hose reel' or 'the hose reel'.

1.2 NEW DESIGNS AND INNOVATIONS

Any alternative materials, designs, methods of assembly, procedures and the like that do not comply with specific requirements of this Standard or are not mentioned in it, but that give equivalent results to those specified are not necessarily prohibited, but the specified approval remains the prerogative of the regulatory authority.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|---------|--|
| 1180 | Methods of test for hose made from elastomeric materials |
| 1180.4B | Method 4B: Ply adhesion—Autographic method |
| 1180.5 | Method 5: Hydrostatic pressure test |
| 1199 | Sampling procedures and tables for inspection by attributes |
| 1399 | Guide to AS 1199—Sampling procedures and tables for inspection by attributes |
| 1722 | Pipe threads of Whitworth form |
| 1722.1 | Part 1: Sealing pipe threads |
| 1851 | Maintenance of fire protection equipment |
| 1851.2 | Part 2: Fire hose reels |
| 2441 | Installation of fire hose reels |
| 2554 | Hose and hose assemblies for air |
| 2700 | Colour standards for general purposes |
| 2706 | Numerical values—Rounding and interpretation of limiting values |

BS

- | | |
|---------|---|
| 21:1973 | Pipe threads for tubes and fittings where pressure-tight joints are made on the threads |
|---------|---|

AS/NZS

1275 Metric screw threads for fasteners

ISO 9000 Quality management and quality assurance standards

ISO 9000.1 Part 1: Guidelines for selection and use

ISO 9004 Quality management and quality system elements

ISO 9904.1 Part 1: Guidelines

SAA

HB 18 Guidelines for third-party certification and accreditation

HB 18.28 Guide 28: General rules for a model third-party certification scheme for products

NZS

4503 Code of practice for the distribution, installation and maintenance of hand operated fire fighting equipment for use in buildings

7702 (BS 381C:1980) Specification for colours for identification, coding and special purposes

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.4.1 Approved

Approved by the certifying body or regulatory authority.

1.4.2 Automatic fire hose reel

A fixed or swing fire hose reel whereby the stop valve is operated automatically by the rotation of the drum when the hose is withdrawn or rewound.

1.4.3 Fire hose reel

An assembly consisting essentially of a hose, nozzle, drum, inlet pipe, connection fitting, stop valve and, where required, a hose guide.

1.4.4 Fixed fire hose reel

A fire hose reel which is permanently fixed to a structure.

1.4.5 Jet

An undispersed stream of water emitted by the nozzle.

1.4.6 Manual fire hose reel

A fixed or swing fire hose reel whereby the stop valve is operated manually.

1.4.7 Regulatory authority

A Minister of the Crown, a government department, or other authority having power to issue regulations, orders, or other instructions in respect of any subject covered by this Standard.

1.4.8 Spray

A stream of water dispersed into small droplets by the nozzle.

1.4.9 Surface mounted

A fire hose reel designed so that it is mounted on and protrudes from a wall or similar vertical surface with support from one side only.

1.4.10 Swing fire hose reel

A fire hose reel which is hinged on a structure so that it can be swung out.

1.5 INTERPRETATION OF SPECIFIED LIMITING VALUES

For the purpose of assessing compliance with this Standard, the specified limiting values shall be interpreted in accordance with the 'rounding method' described in AS 2706, i.e. the observed or calculated value shall be rounded to the same number of figures as in the specified limiting value and then compared with the specified limiting value. For example, for specified limiting values of 2.5, 2.50, and 2.500, the observed or calculated value would be rounded respectively to the nearest 0.1, 0.01, or 0.001.

SECTION 2 DESIGN AND CONSTRUCTION REQUIREMENTS

2.1 GENERAL

2.1.1 Design

The hose reel shall be designed so that the drum rotates around a horizontal spigot or shaft and the hose can be freely withdrawn. It shall be able to be mounted in position without dismantling it or interfering with the waterways.

A retaining device shall be fitted to ensure that the drum is held in its plane of rotation relative to the horizontal spigot or shaft. This device shall be adequate to withstand the forces acting on it under operating conditions as defined in Section 3.

A swing arm type hose reel shall be so designed that it has sufficient swing to allow the hose to be drawn off the reel in its intended direction, while allowing the hose reel to meet the requirements of Clause 3.2.3.

The method of attaching the hose shall not impart undue stress or cause damage to the components.

The hose reel shall be capable of being installed to comply with AS 2441 or NZS 4503.

Materials used in the construction of fire hose reels shall be mutually compatible.

2.1.2 Operation

The water shall be turned on at the hose reel by—

- (a) the operation of a manual stop valve; or
- (b) an automatic stop valve actuated when the hose is withdrawn.

2.1.3 Anti-corrosion treatment

Unless made of a corrosion-resistant material, all components of a fire hose reel assembly, including swing arm types and the cabinet structure they are mounted in, shall be treated to resist corrosion.

2.1.4 Finish

All burrs and sharp edges shall be removed. The exterior of all components shall be rounded and smooth to prevent injury during use.

2.1.5 Screw threads

These shall comply with the following Standards:

- (a) *Nuts and bolts*—AS/NZS 1275.
- (b) *Pipe threads*—AS 1722.1 or BS21.

All threads on aluminium alloy components shall be coated with an appropriate antiseize compound, such as molybdenum disulfide grease.

2.2 COMPONENTS

2.2.1 Hose

2.2.1.1 Diameter and working pressure

The hose fitted to a hose reel shall have an internal diameter in accordance with Table 2.1 and be suitable for a working pressure of 1 MPa.

2.2.1.2 *Material and construction*

The hose shall be of an elastomeric material, constructed of materials free from manufacturing defects, and shall be—

- (a) of a smooth bore;
- (b) uniform in wall thickness; and
- (c) in accordance with the hose or hose reel manufacturer's specifications.

NOTE: The defects described in Clause 2.2.1.2 cannot be completely quantified. Where the presence, size or frequency of any of these are considered to be of concern, arrangements shall be made between the purchaser/regulatory authority/certifying body (as appropriate), and the manufacturer. This may be achieved by the provision of acceptable type samples or methods of test. Where defects are present and the product is submitted for acceptance, the manufacturer should be able to demonstrate fitness for purpose.

2.2.1.3 *Reinforcement*

The material and construction of the hose reinforcement shall ensure that the hose complies with the performance requirements of this Standard. All yarn used to reinforce the hose shall be of uniform quality, and shall be of a type not affected by rot or mildew. All yarn shall be placed in a regular criss-cross pattern and be completely embedded.

2.2.1.4 *Ultraviolet inhibitor*

The pigment used in the hose construction shall contain a recognized stable inhibitor to prevent accelerated deterioration of the hose when exposed to solar ultraviolet radiation.

NOTE: Protection of a fire hose reel, installed in an external situation or an aggressive environment, is specified in AS 2441 or NZS 4503.

2.2.1.5 *Bursting pressure*

When the hose is tested in accordance with AS 1180.5, the bursting pressure shall be not less than 4 MPa at $23 \pm 2^\circ\text{C}$. The rate of pressurization shall be at a controlled rate over a period of not less than 15 s.

2.2.1.6 *Ply adhesion*

When the hose is tested in accordance with AS 1180.4B, the adhesion between the lining and cover shall be not less than 1.25 kN/m.

2.2.1.7 *Flexibility*

When the hose is tested in accordance with AS 2554, excepting that the test pressure shall be not less than 1 MPa, it shall not have any resultant damage.

2.2.1.8 *Length*

The nominal length of hose fitted on the hose reel shall be in accordance with Table 2.1. Tolerance on the selected length shall be +1m, -0. The hose shall be without joints.

2.2.1.9 *Colour*

The hose shall be red approximating R13 (signal red) of AS 2700 or shade No. 537 of NZS 7702, or black.

2.2.2 *Nozzle*

2.2.2.1 *General*

The nozzle operation shall be off/jet, off/jet/spray or off/spray/jet operating in that sequence, and shall be capable of controlling the discharge of water.

A nozzle in the spray mode, with an inlet flow pressure of 220 ± 10 kPa, shall project a progressive cone of spray with an ultimate included angle not less than 90° .

The nozzle shall be operated by a single action within the force limits given in Clause 3.3.2.

The method of attaching the nozzle to the hose shall not cause damage to the hose or other components.

The tail of the nozzle shall be designed to avoid—

- (a) cutting of the hose when clamped;
- (b) rotation of the nozzle in the hose when a twist nozzle is used; and
- (c) leakage, when tested in accordance with Clause 3.2.1.

When materials are being selected for a nozzle, consideration should be given to the seizing, moulded-in stresses, stress cracking, plasticizer migration, and ultraviolet degradation.

2.2.2.2 *Twist nozzle*

A twist nozzle shall open when twisted in the direction indicated.

The nozzle shall have a grip length not less than 70 mm, and a diameter not less than 25 mm and not more than 35 mm.

The surface of the nozzle, throughout the grip length, shall be designed to provide a slip-resistant surface under operating conditions.

2.2.2.3 *Lever nozzle*

A lever nozzle shall have a lever length not less than 70 mm and not more than 120 mm, and a clearance between the lever and the nozzle not less than 25 mm.

2.2.3 **Drum**

2.2.3.1 *General*

The drum (consisting of the hose support, side plates, spigot or shaft, and mounting plate) shall extend not more than 360 mm from the mounting surface.

2.2.3.2 *Hose support*

Where hose support plates are used, the circumference of the hose support plates, on which the first layer of the hose is wound, shall not have any gap more than one-sixth of the circumference. The edges of the hose support plates shall not damage the hose and the circle encompassing the hose support plates shall have a diameter not less than that given in Table 2.1.

Where hose support rods or tubes are used, there shall be not less than six equally spaced, each with a diameter not less than 10 mm, and the circle encompassing the hose support rods or tubes having a diameter not less than given in Table 2.1.

Hose supports shall be constructed to withstand the tests in Section 3.

2.2.3.3 *Side plates*

The side plates shall have a diameter of not more than 700 mm with a continuous outer rim and shall comply with the strength test requirement of Clause 3.2.2.3.

When the hose is fully wound on the drum and pressurized with water to 1 MPa, the rims of the side plates shall project not less than 10 mm beyond the external circumference of the coiled hose at any point (see Figures 2.1 and 2.2).

The sides of the reel shall be coloured red approximating R13 (signal red) of AS 2700 or shade No. 537 of NZS 7702. Side plates of stainless steel may be left uncoated.

2.2.3.4 Spigot or shaft

The fitting to which the hose is attached on the drum shall be arranged so that the hose is not restricted or flattened by the winding of the hose onto the hose support or the winding of additional layers of hose.

Waterways of the spigot or shaft shall not be unprotected carbon steel.

Galvanized or plated carbon steel surfaces that could rub shall be isolated to prevent damage to the surfaces.

The method of attaching the hose to the spigot or shaft shall not cause damage to the hose or other components.

2.2.4 Inlet pipe

The inlet pipe from the connection fitting to the spigot or shaft shall be galvanized steel, stainless steel, or non-ferrous material and of a length that provides a clearance not less than 150 mm between the centre-line of the spindle of the stop valve and the rim of the side plate (see Figures 2.1 and 2.2). The nominal bore of the inlet pipe shall be in accordance with Table 2.1.

2.2.5 Connection fitting

A connection fitting shall be provided between the stop valve and inlet pipe to enable the remainder of the hose reel to be detached from the stop valve, after installation. The nominal bore of the connection fitting shall be in accordance with Table 2.1.

2.2.6 Water supply

The size of the supply pipe is not specified and shall be determined by calculation.

2.2.7 Stop valve and interlock

2.2.7.1 Stop valve

A stop valve shall be fitted to the hose reel. Every stop valve used shall comply with any approval requirements for connection to the water supply in the intended market.

2.2.7.2 Hose reels fitted with manual stop valve

An interlock shall be provided for the retention of the hose or nozzle to the stop valve (see Figures 2.1 and 2.2) that will prevent the hose from being disengaged until the stop valve is open not less than halfway through its travel. For the purpose of depressurization the nozzle shall be capable of being held in a vertical position, with the nozzle outlet pointing downwards, when the stop valve is closed.

2.2.7.3 Hose reels fitted with automatic stop valve

When the drum is rotated not more than three revolutions, the stop valve shall be fully opened. It shall fully close automatically when the hose is rewound.

2.2.8 Hose guide

A fixed hose reel shall be provided with a hose guide that may swivel to permit easy withdrawal and free running of the hose in the direction of its intended use. There shall be a distance not less than 75 mm between the hose guide and the rim of the side plate, when measured at rest (see Figure 2.1).

Where a hose reel is designed for installation in any cabinet or recess, the hose guide shall be designed so that it will protrude beyond the cabinet or recess in accordance with the installation instructions.

2.3 CABINETS

2.3.1 General

Where a hose reel is mounted in a cabinet or the door of a cabinet, the cabinet shall be designed to be of sufficient size so that when the hose is fully wound on (with nozzle closed) and pressurized with water to 1 MPa and with the hose reel in the stored position, the cabinet shall comply with the following as appropriate:

- A1 |
- (a) *Fixed hose reels*—shall have not less than 100 mm clearance between the cabinet side walls and the hose reel. The clearance of the hose reel to the projected outline of the cabinet door opening shall be not less than 100 mm (see Figure 2.3).
 - (b) *Swing arm hose reels*—shall have sufficient clearance between the cabinet side walls and the hose reel, such that it will not interfere in any way with the operation of the hose reel.
 - (c) Where a manual stop valve is to be fitted to operate the hose reel from inside the cabinet, then the cabinet shall be of sufficient size to allow clearance of not less than 60 mm to permit operation of the stop valve when it is installed in the position recommended by the manufacturer and the reel is in the stored position.
 - (d) Where a cabinet is designed for surface mounting onto a wall, the maximum depth of the cabinet from the wall to its front face shall not exceed 360 mm.

2.3.2 Cabinet doors

The cabinet doors shall—

- (a) be provided with a pull device to allow the door(s) to be opened with a force not exceeding 50 N;
- (b) when opened, not impede in any way the ability to withdraw the hose off the reel in the direction of its intended use;
- (c) be operable by a single-handed operation of the latching mechanism; and
- (d) be marked with the words ‘FIRE HOSE REEL’ in letter not less than 50 mm in height and providing a high contrast with that of the background.

2.3.3 Swing arm

Where a swing arm, with hose reel attached is mounted in the cabinet or on the door of the cabinet in accordance with the manufacturer’s instructions, the assembly shall be capable of withstanding the load test (see Clause 3.2.2.2).

2.4 HOSE REEL SWING ARM

The swing arm shall be so designed that it has sufficient swing to allow the hose to be drawn off the reel in the direction of its intended use, while allowing the hose reel to comply with the unwind test (see Clause 3.2.3).

TABLE 2.1
DESIGN REQUIREMENTS

Component and relevant clause number	Property	Value All dimensions in mm unless otherwise stated
Hose 2.2.1	Bore sizes	Ø13.0, Ø19.0 or Ø25.0 nominal with a +1.0 –0.5 tolerance
	Length	18.0 to 36.0 m nominal with a +1.0 –0 tolerance
Drum 2.2.3	Hose support	The hose support shall be not less than Ø145, for use with hose of bore size Ø13 and not less than Ø200 for use with hoses of bore sizes Ø19 and Ø25 (see Note.)
	Side plates	The outside diameter shall be in accordance with Clause 2.2.3.3
Inlet pipe 2.2.4	Pipe sizes	The inlet pipe shall have a nominal bore of not less than Ø19 when supplying an assembly fitted with Ø13 hose, and not less than Ø25 when supplying an assembly fitted with either a Ø19 or Ø25 hose
Connection fitting 2.2.5	Bore sizes	The connection fitting shall have a nominal bore of not less than Ø19 when supplying an assembly fitted with a Ø13 hose, and not less than Ø25 when supplying an assembly fitted with either Ø19 or Ø25 hose
Stop valve 2.2.7	Bore sizes	The stop valve shall have a nominal bore of not less than Ø19 when controlling supply to an assembly fitted with a Ø13 hose, and not less than Ø25 when controlling supply to an assembly fitted with either Ø19 or Ø25 hose

NOTE: Where a rigid waterway is fitted from the spindle up to the hose support diameter, such as a gooseneck or elbow that allows the centre-line of the hose at its connection point to be tangential to its support diameter, then for Ø19 hose only the support diameter may be reduced to Ø145 minimum.