

## FRNSW compatible hose connections

### 1 Purpose

This technical information sheet details Fire & Rescue NSW (FRNSW) requirements for compatible hose connections on any new or upgraded fire hydrant and fire sprinkler system.

### 2 Scope

This technical information sheet details:

- (a) the regulations and standards for hose connections
- (b) the design and installation requirements for a fire brigade thread (FBT) to Storz adapter fitted to hose connections to ensure compatibility with FRNSW equipment
- (c) how to verify compliance of hose connections on fire hydrant and fire sprinkler systems.

### 3 Application

This document applies to all hose connections on new or upgraded fire hydrant and fire sprinkler systems installed in a building, facility or site where FRNSW appliances may attend. Hose connections are required on fire brigade boosters, feed fire hydrants and attack fire hydrants.

FRNSW considers the hose connection part of the fixed system to which Australian Standard *AS 2419.1-2005* and the *Plumbing Code of Australia* relates. Hose connections should be checked during compliance inspections and tested as part of commissioning of the system.

This document is intended to be used by fire service/protection engineers and installers, hydraulic consultants, certifiers, and Local Government Authorities (LGAs) within NSW.

### 4 Regulations and standards

Clause E1.3 of the *National Construction Code (NCC)*<sup>1</sup> requires a fire hydrant system serving a building to be installed in accordance with *AS 2419.1-2005*.

Clauses 3.1 and 8.5.11.1 of *AS 2419.1-2005*, and clauses 1.2 and 3.4 of *AS 2419.2-2009* specify fire hydrant valves are to be fitted with hose connections compatible with the local fire brigade.

Appendix E1 and E2 of *AS 2419.1-2005* states that FRNSW use 64 mm x 4.88 mm pitch (2 $\frac{1}{2}$  x 5 $\frac{1}{5}$  TPI i.e. teeth per inch) FBT and Storz hermaphrodite hose connections. Appendix B2 of *AS 2419.2-2009* states that 64 mm x 4.88 mm pitch (i.e. FBT) and Storz hermaphrodite hose couplings are used within Australia.

Clauses 1.2 and 3.5 of *AS 2419.3-2012* specify fire brigade booster inlet connections are to be fitted with hose connections compatible with the local fire brigade.

Appendix B of *AS 2419.3* states FRNSW use NEN 3374 Storz hermaphrodite hose couplings.

Clause 4.4.3 of *AS 2118.1-1999* requires an automatic fire sprinkler system to be fitted with a fire brigade booster connection (i.e. *AS 2419.3-2012*) to enable the fire brigade to pressurise the system. Any fire brigade booster connection fitted to a fire sprinkler system must also therefore be fitted with hose connections compatible with the local fire brigades.

<sup>1</sup> *National Construction Code Series Volume One, Building Code of Australia Class 2 to Class 9 Buildings.*

Clause 3.4 of AS 2419.2-2009 and clause 3.5 of AS 2419.3-2012 specify that Storz hose connections shall be manufactured in aluminium or copper alloy using forged processes, or stainless steel using investment casting. Cast aluminium hose connections are not permitted.

## 5 Background

FRNSW fire hoses were historically connected with FBT couplings. FRNSW fire hoses are now connected with *NEN 3374:1971* Storz 65 mm hermaphrodite couplings. FBT is specific to NSW.

**Note:** Other screw threads used in other states and territories (e.g. 64 mm x 5.08 mm pitch) are not compatible with FRNSW equipment.

Cast and semi-cast aluminium Storz hose connections have failed when connected fire hose has been pressurised. This presents a serious risk to firefighter and public safety, and renders the connection unusable (see Figure 1). Forged aluminium has yield strength up to three times greater than cast aluminium.

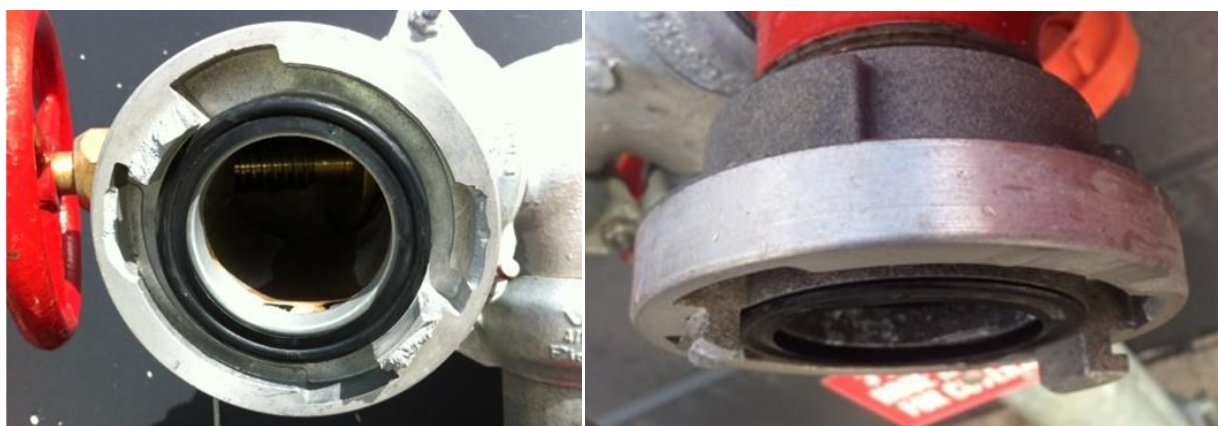


Figure 1 Examples of cast aluminium Storz hose connection failure

## 6 Hose connections compatible with FRNSW

### 6.1 Fire brigade boosters

6.1.1 Hose connections on fire brigade booster inlets (i.e. AS 2419.3) are to be fitted with a Storz 65 mm 'permanent pressure coupling' complying with *NEN 3374:1971*, having 2½ inch gas thread (i.e. British standard pipe (BSP) parallel thread).

### 6.2 Fire hydrant valves

6.2.1 Hose connections on fire hydrant valves (*AS 2419.2*) shall be male FBT semi-permanently fitted with a female FBT Storz adapter (refer to Figure 2).

6.2.2 The FBT Storz adapter shall have:

- (a) a Storz 65 mm connection conforming to *NEN 3374:1971*, Section 3, *Dimensions and Coding, Parts*, Part No. 5
- (b) an FBT connection with female 64 mm x 4.88 mm pitch ( $2\frac{1}{2} \times 5\frac{1}{5}$  TPI) to match the opposing thread on the fixed system
- (c) a rubber gasket (packing ring) between the male and female connection that conforms to *NEN 3374:1971*, Section 3, *Dimensions and Coding, Parts*, Part No. 49.

**Note:** The rubber gasket is fitted at the FBT thread's end of the adaptor to mate and seal against the male threaded outlet of the fire hydrant valve.

6.2.3 The FBT Storz adapter should be manufactured as a single piece with sealing rings, using materials and processes that conform to *NEN 3374:1971*, Section 4, *Material*.

6.2.4 The FBT Storz adapter must:

(a) be forged aluminium alloy according to *DIN 1725 Sheet 1* or later (AlMgSi with copper content not exceeding 0.05% by mass), unless being used in brackish environments

**Note:** Copper alloy or stainless steel should be used in brackish environments.

(b) be fitted with a delivery sealing ring suitable for pressure operation made from nitrile rubber with a hardness of  $(75 \pm 5)$  Shore A according to *NEN 5601:1977*

(c) have a nominal waterway diameter of 58 mm (refer to Figure 2)

(d) have a lug spacing measured from lug to lug of 81 mm (refer to Figure 2)

(e) have a Storz connection/disconnection torque range of 3 Nm to 8 Nm

(f) not leak or permanently change shape when pressurised with water at 1600 kPa.

6.2.5 The FBT Storz adapter must be permanently marked in raised lettering with:

- the manufacturer's name, trademark or logo
- the manufacturer's forging mark.

6.2.6 The manufacturer should provide certification that the adapter has been type tested to a working pressure of 1,600 kPa from a body accredited by a member of the International Accreditation Forum, or test results to the same effect from a facility accredited by a member of the International Laboratory Accreditation Cooperation.

### 6.3 Installation requirements

6.3.1 The FBT Storz adapter is to be tightly and securely fitted with the rubber gasket (packing ring) in the female portion of the connection (e.g. female adapter) providing all thread locking resistance.

**Note:** A hose connection that has a damaged or vandalised FBT Storz adapter should be able to be forcibly removed using hose/lug spanners and temporarily replaced with a spare FBT Storz adapter that is carried on the fire appliance.

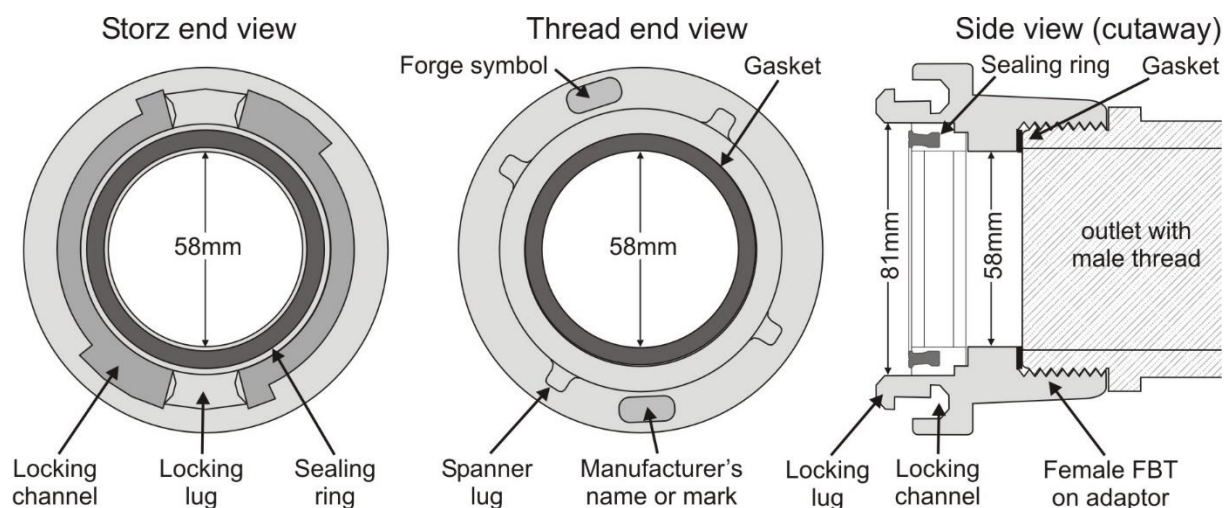


Figure 2 Female FBT Storz adapter

**6.4 Protective end cap and retaining chain/wire**

- 6.4.1 Each hose connection must be provided with a protective blanking cap which is securely attached to the fixed system by a retaining chain or wire (refer to Figure 3).
- 6.4.2 The protective end cap must be compatible with the FBT Storz adapter. This includes material compatibility (e.g. Aluminium alloy, inert polymer).
- 6.4.3 The protective end cap must have a 3 mm pressure relief hole.
- 6.4.4 The retaining chain or wire may be an S-hook and chain, S-hook and stainless steel wire cable, or stainless steel wire cable crimped with a ferrule as per AS 2419.2-2009, part 3.10 and AS 2419.3-2012, part 3.9.

**Note:** FRNSW recommends using nylon coated stainless steel wire cable crimped by ferrule. The S-hook is prone to being easily damaged and the end cap lost.

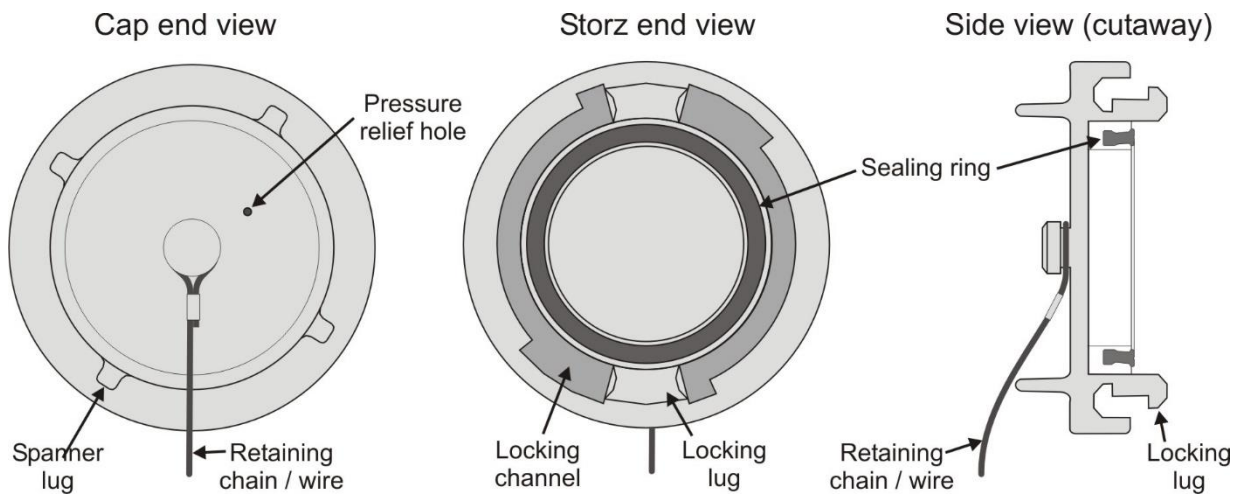


Figure 3 Storz protective end cap

- 6.4.5 The free length of the retaining chain or wire must allow easy removal of the protective end cap so the end cap does not obstruct any hose connection when connecting a fire hose.

**Note:** FRNSW recommends a free length of approximately 200 mm longer than the distance from the anchor point to the fitted position (refer to Figure 4).

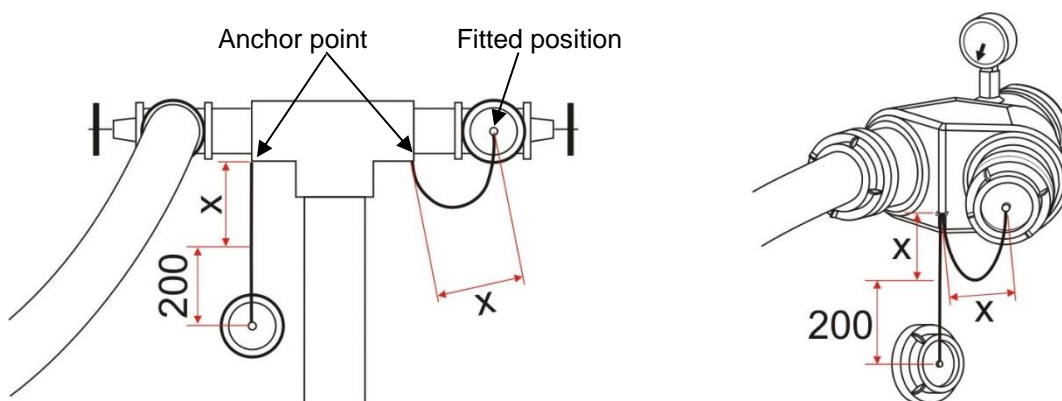


Figure 4 Example of free length required of retaining chain/wire

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## 6.5 Assessing compliance

- 6.5.1 Fitted FBT Storz adapters must satisfy the requirements of this document for the hose connection to be compatible with FRNSW equipment. The purchaser (i.e. installer) should supply information from this document at the time of making enquiry or order, as recommended in Appendix C of AS 2419.2-2009 and AS 2419.3-2012.
- 6.5.2 Hose connections should be checked and tested as part of system commissioning.
- 6.5.3 The principal certifying authority should check hose connections, including fitted FBT Storz adapters, are compliant before determining an application for occupation certificate.
- 6.5.4 Regulatory authorities should check hose connections, including any fitted FBT Storz adapters, are compliant when inspecting an existing building that may be subject to a fire safety order.
- 6.5.5 FRNSW may check hose connection compliance when inspecting any building, including a destructive test of any FBT Storz adapter to validate it is forged and not cast.

**Note:** FRNSW may take action to have all non-complying cast FBT Storz adapters replaced, where cast adapters have been installed rather than forged adapters.

## 7 Contact us

For further information contact the Fire Safety Branch on (02) 9742 7434 or email [firesafety@fire.nsw.gov.au](mailto:firesafety@fire.nsw.gov.au).

