



NFPA STANDARDS DEVELOPMENT SITE FIRST DRAFT REPORT



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NFPA 1963, Standard for Fire Hose Connections, 2014 Edition



Chapter 1 Administration

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1.1* Scope.

1.1.1

This standard gives the performance and requirements for new fire hose couplings and adapters with nominal sizes from $\frac{3}{4}$ in. (19 mm) through 8 in. (200 mm) and the specifications for the screw thread connections on those couplings and adapters.

1.1.2

This standard also gives the performance and requirements for the mating surfaces of nonthreaded fire hose couplings and adapters with nominal sizes of 4 in. (100 mm) and in. (125 mm).

1.2 Purpose.

The purpose of this standard is to provide a uniform standard for safe couplings and adapters for the users of fire hose connections.

1.3 Application.

1.3.1

The requirements of this standard shall apply to the following coupling and adapters in the sizes defined in Section 1.1.

- (1) Fire hose couplings
- (2) Booster hose couplings
- (3) Suction hose couplings
- (4) Adapters
- (5) Reducers
- (6) Caps
- (7) Plugs
- (8) Connections on fire hose appliances where they attach to fire hose

1.3.2

The requirements of this standard shall also apply to screw thread connections and nonthreaded mating surfaces on the following devices in the sizes defined in Section 1.1.

- (1) Pump intake connections on fire apparatus
- (2) Pump discharge connections on fire apparatus
- (3) Sprinkler connections
- (4) Standpipe connections
- (5) Hose connections on fire hydrants
- (6) Connections on all other hose fittings and appliances that attach to fire pumps, fire hose, or hydrants

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2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2007 2018 edition.

2.3 Other Publications.

2.3.1 ANSI/ASME Publications.

~~American National Standards Institute, 25 West 43rd Street, 4th floor~~ [ASME International, Two Park Avenue](#), New York, NY 10036 10016-5990.

~~ANSI/ASME B1.2, *Gages and Gaging for Unified Inch Screw Threads*, 1983~~ 83rd edition, 1991, reaffirmed 2007.

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2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM B30, *Standard Specification for Copper Alloys in Ingot Form*, 2011 2016.

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, 2011 2016.

ASTM B584, *Standard Specification for Copper Alloy Sand Castings for General Applications*, 2011 2014.

ASTM D395-B, *Standard Test Methods for Rubber Property — Compression Set (Method B)*, 2008 2016.

ASTM D573, *Standard Test Method for Rubber Deterioration in an Air Oven*, 2010 2004, reapproved 2015.

ASTM D3183, *Standard Practice for Rubber — Preparation of Pieces for Test Purposes from Products*, 2010, reapproved 2015.

2.3.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield MA, 2003.

2.4 References for Extracts in Mandatory Sections. ~~(Reserved)~~

NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, 2019 edition.

NFPA 1961, *Standard for Fire Hose*, 2013 2019 edition.

NFPA 1964, *Standard for Spray Nozzles*, 2018 edition.

Chapter 3 Definitions

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3.1 General.

The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved.

Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ).

An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Shall.

Indicates a mandatory requirement.

3.2.4 Should.

Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Adapter.

Any device that allows fire hose couplings to be safely interconnected with couplings of different sizes, threads, or mating surfaces, or that allows fire hose couplings to be safely connected to other appliances.

3.3.1.1 Nonthreaded Coupling or Adapter.

A coupling or adapter in which the mating is achieved with locks or cams but without the use of screw threads.

3.3.1.2 Screw Thread Coupling or Adapter.

A coupling or adapter in which the mating is achieved with the use of threads.

3.3.2 Blunt Start.

The removal of the incomplete thread at the end of the thread. This is a feature of threaded parts that are repeatedly assembled by hand. Also known as the "Higbee cut."

3.3.3 Bowl Gasket.

See 3.3.8.1.

3.3.4 Coupling Assembly.

A complete coupling including its gaskets and the expansion rings or collar pieces used in attaching the coupling to the hose.

3.3.5 Couplings.

One set or pair of connection devices attached to a fire hose that allow the hose to be interconnected to additional lengths of hose or adapters and other fire-fighting appliances.

3.3.6 Face Gasket.

See 3.3.8.2.

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3.3.7 Fire Department Connection.

A connection through which the fire department can pump supplemental water into the sprinkler system, standpipe, or other ~~system furnishing water for fire extinguishment to supplement based fire protection systems, thereby supplementing~~ existing water supplies. [24, 2013 2019]

3.3.8 Gasket.

3.3.8.1 Bowl Gasket.

See *Tail Gasket*.

3.3.8.2 Face Gasket.

The water pressure seal at the mating surfaces of nonthreaded couplings or adapters.

3.3.8.3 Tail Gasket.

A gasket in the bowl of a coupling used to provide a watertight seal between the couplin and the hose in an expansion ring-type coupling.

3.3.8.4 Thread Gasket.

A gasket used in a female threaded connection to provide a watertight seal between the male and female threaded connections.

3.3.9 Large-Stream Device.

Any device that discharges water at a flow rate greater than 400 gpm (1600 L/min).

3.3.10 NH.

An American National Fire Hose Connection Screw Thread. (See Section 5.2.)

3.3.11 Nonthreaded Coupling or Adapter.

See 3.3.1.1.

3.3.12 Nozzle.

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3.3.12.1 Spray Nozzle.

~~An appliance~~ A nozzle intended for connection to a hose line or monitor to discharge water in either a spray pattern or a straight stream pattern as selected by the operator. [1964, 2013 2018]

3.3.12.2 Straight Tip Nozzle.

A smooth-bore nozzle for producing a solid stream.

3.3.13 Primary Inlet.

The inlet where an appliance connects to a hose.

3.3.14 Screw Thread Coupling or Adapter.

See 3.3.1.2.

3.3.15 Spray Nozzle.

See 3.3.12.1.

3.3.16 Straight Tip Nozzle.

See 3.3.12.2.

3.3.17 Suction Hose.

A hose that is designed to prevent collapse under vacuum conditions so that it can be used for drafting water from below the pump (lakes, rivers, wells, etc). [**1961,2013 2019**]

3.3.18 Tail Gasket.

See 3.3.8.3.

3.3.19 Thread Gasket.

See 3.3.8.4.

Chapter 4 General Coupling and Adapter Requirements

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4.1* Workmanship.

The coupling assembly or adapter shall be made and finished in a workmanship-like manner throughout.

4.1.1

All edges shall be chamfered and free from burrs.

4.1.2

Hose bowl or tailpiece lips shall be rounded to prevent damage to the hose.

4.2 Materials.

Materials used shall be free of defects that would adversely affect the performance or maintenance of individual components or of the overall assembly.

4.3 Minimum Waterway.

The design of the shank-type and nonthreaded expansion ring coupling shall be such that the coupling shall not restrict the waterway by more than ¼ in. (6.4 mm) on couplings of nominal size 2½ in. (65 mm) or less and not more than ½ in. (12.7 mm) on couplings of nominal size greater than 2½ in. (65 mm). Gaskets shall not protrude into the waterway.

4.3.1

The waterway of a size-increasing-style coupling, other than a shank-type coupling, shall be no smaller than the nominal size of the hose to which it is attached.

4.3.2

The waterway of a size-reducing-style coupling, other than a shank-type coupling, shall be no smaller than the nominal size of the attachment face.

4.4 Gasket Groove.

All sizes of internal NH threaded couplings, connections, or adapters shall have a standard gasket groove diameter as shown in Table 5.4.2, column *K*. (See also Figure 5.1.5.1, dimension *K*.)

4.5 Testing.

Tests required by this standard shall be conducted by the manufacturer or by an approved testing facility designated by the manufacturer.

4.5.1

All tests shall be conducted on standard commercially available product.

4.5.2

Any test that requires the use of hose shall use hose with the highest service test pressure commercially available to which the coupling can be attached.

4.6 Internal Strength.

4.6.1

The coupling or adapter shall be capable of withstanding a hydrostatic pressure equal to the service test pressure without leakage, two times service test pressure with no leakage more severe than 12 drops per minute ($\frac{1}{2}$ ml per minute), and three times the service test pressure plus 100 psi (690 kPa) without separation. It shall be tested in accordance with 4.6.2 to prove compliance.

4.6.2 Internal Strength Test.

4.6.2.1

The coupling or adapter shall be plugged and adapted on one end to accept a pump connection from a hydrostatic test table.

4.6.2.2

The other end shall be plugged or adapted to accept a petcock to remove air.

4.6.2.3

The coupling or adapter shall be filled with water until all air has been exhausted and the petcock closed.

4.6.2.4

Pressure shall be applied until the test pressure is reached.

4.6.2.5

The test pressure shall be held for at least 15 seconds but not more than 60 seconds.

4.7 Tensile Strength.

4.7.1

Couplings shall have a tensile strength of at least 1200 lb/in. (210 N/mm) of diameter. They shall be tested in accordance with 4.7.2 to prove compliance.

4.7.2 Tensile Strength Test.

4.7.2.1

A pair of couplings shall be attached to a section of hose.

4.7.2.2

The couplings shall be connected together and the hose installed in a tension testing machine such that the tension will be on the couplings.

4.7.2.3

A tensile load shall be applied at a rate of not more than 2 in. (51 mm) per minute up to 1200 lb/in. (210 N/mm) of nominal hose diameter.

4.7.3

After the tensile strength test, the couplings shall be subjected to a test pressure equal to the service test pressure of the hose to which they are attached. Any leakage or deformation shall constitute failure of this test.

4.8 Connect/Disconnect Capability.

4.8.1

Couplings shall be capable of being connected and disconnected at least 3000 times without leakage or failure. They shall be tested in accordance with 4.8.2 to prove compliance.

4.8.2 Connect/Disconnect Capability Test.

4.8.2.1

Tests shall be conducted on standard commercial product without lubrication.

4.8.2.2

Hose couplings shall be completely connected and disconnected to each other at least 3000 times.

4.8.2.3

At the completion of this portion of the test, the couplings shall be attached to hose such that tested couplings can be connected together.

4.8.2.4

The tested couplings when connected together shall withstand the service test pressure of the hose without leakage or failure.

4.9 Rough Usage.

4.9.1

Couplings shall be capable of being dropped up to 6 ft (1.8 m) without deformation or damage that impairs operation. They shall be tested in accordance with 4.9.2 to prove compliance.

4.9.2 Rough Usage Test.

4.9.2.1

Couplings shall be installed on approximately 10 ft (3 m) lengths of fire hose.

4.9.2.2

The couplings shall be coupled together, forming a loop in the hose.

4.9.2.3

The coupling assembly shall then be dropped onto a concrete surface from a height of 6 ft (1.8 m) so as to land as squarely as possible on the swivel ring.

4.9.2.4

The procedure in 4.9.2.3 shall be repeated three times.

4.9.2.5

The couplings shall operate freely and shall show no signs of deformation when inspected inside and outside.

4.9.2.6

Samples showing distortion or binding of the swivel mechanism shall be judged acceptable if the mechanism can be corrected to turn freely and evenly when straightened by the use of a hammer.

4.9.2.7

Samples developing cracks or broken sections either before or after attempts to straighten damaged portions shall be deemed as having failed the test. The coupling/hose assembly shall withstand the service test pressure of the hose without leakage or failure.

4.10 Coupling Retention.

4.10.1

Couplings shall remain on the hose without movement up to the rated burst pressure of the hose. They shall be tested in accordance with 4.10.2 to prove compliance.

4.10.2 Coupling Retention Test.

4.10.2.1

The couplings shall be attached to a 3 ft (1 m) length of hose.

4.10.2.2

The hose and coupling as an assembly shall be pressurized to the service pressure of the hose for 1 minute, and then the pressure shall be released.

4.10.2.3

The position of the coupling with relation to the hose shall be marked.

4.10.2.4

The pressure in the hose/coupling assembly shall then be raised at a rate of 300 psi/min to 1000 psi/min (2068 kPa/min to 6895 kPa/min) until the rated burst pressure of the hose is reached.

4.10.2.5

The pressure shall be held for a minimum of 15 seconds but not longer than 60 seconds

4.10.2.6

The hose shall show no signs of movement from the coupling.

4.11 Vacuum Tightness.

4.11.1

When couplings are used on suction hose, they shall be capable of holding a vacuum of 22 in. Hg (74.2 kPa) for 5 minutes. They shall be tested in accordance with 4.11.2 to prove compliance.

4.11.2 Vacuum Tightness Test.

4.11.2.1

The coupling shall be attached to a suitable section of suction hose.

4.11.2.2

A blank cap shall be attached to the coupling on one end, and a vacuum pump shall be attached to the other end.

4.11.2.3

A vacuum of 22 in. Hg (74.2 kPa) shall be developed within the assembly, and the assembly shall hold the vacuum for 5 minutes without any loss of vacuum.

4.12 Corrosion Resistance.

4.12.1

Couplings having parts other than high-strength yellow brass No. 8A as defined in ASTM B30, *Standard Specification for Copper Alloys in Ingot Form*, or ASTM B584, *Standard Specification for Copper Alloy Sand Castings for General Applications*, shall be capable of being coupled and uncoupled using accepted standard practices and shall not show any evidence of galvanic corrosion between dissimilar metals after testing in accordance with 4.12.2.

4.12.2

Coupling assemblies, including expansion rings and gaskets, shall be supported vertically in a fog chamber and exposed to salt spray (fog) as specified by ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, for a period of 120 hours.

4.13 Nonmetallic Materials.

Any nonmetallic material used in couplings except for the gaskets shall be certified by the manufacturer of the nonmetallic material as fit for the service intended.

4.14 High-Temperature Performance.

4.14.1

Temperatures up to 275°F (135°C) shall not affect the ease with which a coupling assembly is coupled or uncoupled. Couplings shall be tested in accordance with 4.14.2 to prove compliance.

4.14.2 High-Temperature Performance Test.

4.14.2.1

Dry couplings with gaskets installed shall be conditioned in an oven at 275°F (135°C) for 4 hours.

4.14.2.2

Immediately upon their removal from the oven, the torque to connect and disconnect the couplings shall be measured and shall be within the original torque range.

4.15 Low-Temperature Performance.

4.15.1

Temperatures down to $-25^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ($-32^{\circ}\text{C} \pm 1^{\circ}\text{C}$) shall not affect the performance of the coupling assembly. Couplings shall be tested in accordance with 4.15.2 to prove compliance.

4.15.2 Low-Temperature Performance Test.

4.15.2.1

With the gasket(s) installed, a coupling assembly shall be subjected to an environment of $0^{\circ}\text{F} \pm 1^{\circ}\text{F}$ ($-18^{\circ}\text{C} \pm 1^{\circ}\text{C}$) for a period of 24 hours and subsequently to an environment of $-25^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ($-32^{\circ}\text{C} \pm 1^{\circ}\text{C}$) for a period of 2 hours.

4.15.2.2

Following this exposure, the coupling shall be dropped from a height of 10 ft (3 m) onto its longitudinal axis.

4.15.2.3

The torque to connect and disconnect the couplings shall then be measured and shall be no greater than the torque required before the test.

4.16 Gasket Performance.

The gasket material used with any coupling or adapter shall meet the test requirements of 4.16.1 through 4.16.3.

4.16.1 Low-Temperature Test.

4.16.1.1

Gaskets shall be subjected to an environment of $0^{\circ}\text{F} \pm 1^{\circ}\text{F}$ ($-18^{\circ}\text{C} \pm 1^{\circ}\text{C}$) for a period of 24 hours and subsequently to an environment of $-25^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ($-32^{\circ}\text{C} \pm 1^{\circ}\text{C}$) for a period of 2 hours.

4.16.1.2

Immediately upon removal from the test chamber, the gasket shall not crack when squeezed from any two opposite points into a figure 8 configuration.

4.16.2 Accelerated Aging Test.

4.16.2.1

Samples of the gasket material shall be prepared in accordance with the procedures described in ASTM D3183, *Standard Practice for Rubber — Preparation of Pieces for Test Purposes from Products*.

4.16.2.2

The samples of the gaskets shall then be subjected to oven aging at $212^{\circ}\text{F} \pm 3^{\circ}\text{F}$ ($100^{\circ}\text{C} \pm 2^{\circ}\text{C}$) for 70 hours in accordance with ASTM D573, *Standard Test Method for Rubber - Deterioration in an Air Oven*.

4.16.2.3

The samples shall then be tested for tensile strength and ultimate elongation, and the tensile strength shall be not less than 80 percent, and the ultimate elongation shall be not less than 50 percent of the corresponding properties of samples that have not been so treated.

4.16.3 Compression Set Test.

4.16.3.1

A sample of gasket material shall be compressed as defined in Method B of ASTM D39: *Standard Test Methods for Rubber Property — Compression Set*, and subjected to heat treatment at $158^{\circ}\text{F} \pm 1^{\circ}\text{F}$ ($70^{\circ}\text{C} \pm 1^{\circ}\text{C}$) for a period of 24 hours.

4.16.3.2

The compression set of the sample of gasket material so tested shall not exceed 15 percent of the original thickness.

4.17 Marking.

The fire hose connection or fitting shall be permanently and legibly marked on the outside surface of the product, with the manufacturer's name or trademark, the thread size, and designation (e.g., $1\frac{1}{2}$ in. NH). Minimum letter height shall be 0.1 in. (2.55 mm) Also, the fire hose connection or fitting shall be permanently and legibly marked on the outside surface of the product, with the country of manufacturing origin.

Chapter 5 Screw Threads for Couplings and Adapters

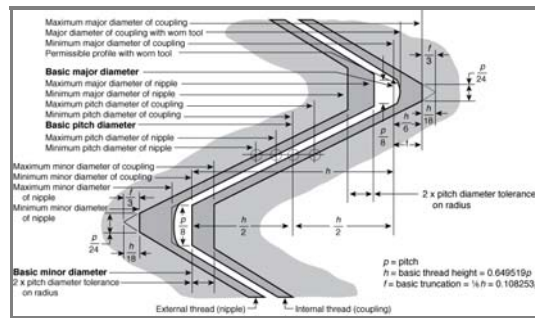
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5.1 Basic Form of Thread.

5.1.1

Basic thread form, as specified in Figure 5.1.1, shall have an included angle of 60 degrees and truncated top and bottom.

Figure 5.1.1 Form of Thread of American National Fire Hose Connection Screw Thread (NH) (See Table 5.4.1 for dimensions.)



5.1.2

The basic angle of the thread between the sides of the thread measured in an axial plane shall be 60 degrees. The line bisecting this 60-degree angle shall be perpendicular to the axis of the screw thread.

5.1.3

The flat at the root and crest of the basic thread, as specified in Figure 5.1.1, shall be $\frac{1}{8}$ times the pitch or 0.125 times the pitch (p).

5.1.4

The height of the basic thread shall be

$$\text{OR } h = 0.649519 \times p$$

$$h = \frac{0.649519}{n} \quad \text{[5.1.4]}$$

where:

h = basic thread height in inches

p = pitch in inches ($p = 1/n$)

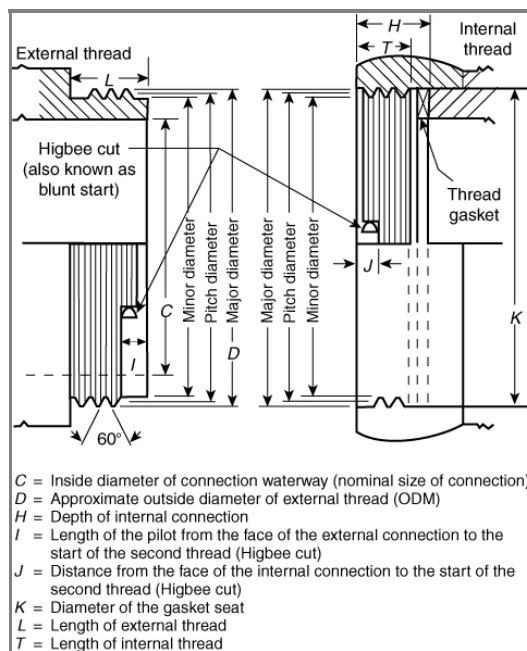
n = number of threads per inch

5.1.5* Blunt Start.

5.1.5.1

The outer ends of all external and internal threads shall be terminated by the blunt start, or Higbee cut, as shown in Figure 5.1.5.1, on full thread to avoid crossing and mutilation of thread.

Figure 5.1.5.1 Nominal Dimensions of Connections (See Table 5.4.2 for dimensions.)



5.1.5.2

The blunt start shall have a minimum length of not less than the radius formed by a cut with a radius not less than the height of the thread.

5.1.5.3

The maximum length of the blunt start shall not exceed 10 degrees of arc.

5.2 Thread Series Designation.

5.2.1*

Fire hose connection threads that meet the requirements of this chapter shall be identified as “American National Fire Hose Connection Screw Threads” (abbreviated throughout the standard with the thread symbol NH).

5.2.2

The fire hose connection threads shall be designated by specifying in sequence the nominal size of the connection, the number of threads per inch, and the thread symbol “NH” as shown in the following example:

0.75-8 NH	3.5-6 NH
1-8 NH	4-4 NH
1.5-9 NH	4.5-4 NH
2.5-7.5 NH	5-4 NH
3-6 NH	6-4 NH
	8-4 NH

5.3 Dimensions of American National Fire Hose Connection Screw Threads (NH).

5.3.1

The basic major diameter, basic pitch diameter, and basic minor diameter and tolerance of the thread shall be as specified in Figure 5.1.1.

5.3.2

Nominal dimensions shall be as specified in Figure 5.1.5.1.

5.4 Thread Dimensions.**5.4.1**

The basic dimensions for the threads shall be as specified in Table 5.4.1.

Table 5.4.1 Basic Dimensions of NH Threads (See Figure 5.1.1.)

Nominal Size of Connection	Threads per Inch (tpi)	Thread Designation (NH)	Pitch (p)	Basic Thread Height (h)	External Thread Dimensions		
					Allowance	Maximum Major Diameter, D - Col. 6	Maximum Pitch Diameter, D_p - Col. 7
1	2	3	4	5	6	7	8
$\frac{3}{4}$	8	0.75-8 NH	0.12500	0.08119	0.0120	1.3750	1.3750
1	8	1-8 NH	0.12500	0.08119	0.0120	1.3750	1.3750
$1\frac{1}{2}$	9	1.5-9 NH	0.11111	0.07217	0.0120	1.9900	1.9900
$2\frac{1}{2}$	7.5	2.5-7.5 NH	0.13333	0.08660	0.0150	3.0686	2.9900
3	6	3-6 NH	0.16667	0.10825	0.0150	3.6239	3.5450
$3\frac{1}{2}$	6	3.5-6 NH	0.16667	0.10825	0.0200	4.2439	4.1650
4	4	4-4 NH	0.25000	0.16238	0.0250	5.0109	4.9350
$4\frac{1}{2}$	4	4.5-4 NH	0.25000	0.16238	0.0250	5.7609	5.6850
5	4	5-4 NH	0.25000	0.16238	0.0250	6.2600	6.1850
6	4	6-4 NH	0.25000	0.16238	0.0250	7.0250	6.9400
8	4	8-4 NH	0.25000	0.16238	0.0250	9.0250	8.9400

Note: All values are in inches except for columns 2 and 3.

5.4.2

The nominal dimensions for the threads shall be as specified in Table 5.4.2.

Table 5.4.2 Nominal Dimensions of NH Threads (See Figure 5.1.5.1.)

Nominal Size of Connection Waterway, <i>C</i>	Threads per Inch (tpi)	Thread Designation (NH)	Approximate Outside Diameter of External Thread, <i>D</i> *	Length of External Thread (Min), <i>L</i>	Length of Pilot to Start of Second Thread (External), <i>I</i>	Depth of Internal Connect, <i>H</i>
1	2	3	4	5	6	7
$\frac{3}{4}$	8	0.75-8 NH	$1\frac{3}{8}$	$\frac{5}{8}$	$\frac{5}{32}$	$1\frac{9}{32}$
1	8	1-8 NH	$1\frac{3}{8}$	$\frac{5}{8}$	$\frac{5}{32}$	$1\frac{9}{32}$
$1\frac{1}{2}$	9	1.5-9 NH	2	$\frac{5}{8}$	$\frac{5}{32}$	$1\frac{9}{32}$
$2\frac{1}{2}$	$7\frac{1}{2}$	2.5-7.5 NH	$3\frac{1}{16}$	1	$\frac{1}{4}$	$1\frac{5}{16}$
3	6	3-6 NH	$3\frac{5}{8}$	$1\frac{1}{8}$	$\frac{5}{16}$	$1\frac{1}{16}$
$3\frac{1}{2}$	6	3.5-6 NH	$4\frac{1}{4}$	$1\frac{1}{8}$	$\frac{5}{16}$	$1\frac{1}{16}$
4	4	4-4 NH	5	$1\frac{1}{4}$	$\frac{7}{16}$	$1\frac{3}{16}$
$4\frac{1}{2}$	4	4.5-4 NH	$5\frac{3}{4}$	$1\frac{1}{4}$	$\frac{7}{16}$	$1\frac{3}{16}$
5	4	5-4 NH	$6\frac{1}{4}$	$1\frac{3}{8}$	$\frac{7}{16}$	$1\frac{5}{16}$
6	4	6-4 NH	$7\frac{1}{32}$	$1\frac{3}{8}$	$\frac{7}{16}$	$1\frac{5}{16}$
8	4	8-4 NH	$9\frac{1}{32}$	$1\frac{1}{2}$	$\frac{7}{16}$	$1\frac{7}{16}$

Note: All values are in inches except for columns 2 and 3.

* Approximate dimensions are for field identification purposes only. Exact basic manufacturing dimensions and tolerances are given in subsequent tables.

5.4.3

The limiting dimensions for external threads (nipples) shall be as specified in Table 5.4.3.

Table 5.4.3 Limits of Size and Tolerances of NH External Threads (Nipples)

Nominal Size of Connection	Threads per Inch (tpi)	Thread Designation (NH)	Pitch (p)	Basic Thread Height (h)	E		
					Major Diameter		
					Maximum	Minimum	Tolerance
1	2	3	4	5	6	7	8
¾	8	0.75-8 NH	0.12500	0.08119	1.3750	1.3528	0.0022
1	8	1-8 NH	0.12500	0.08119	1.3750	1.3528	0.0022
1½	9	1.5-9 NH	0.11111	0.07217	1.9900	1.9678	0.0022
2½	7.5	2.5-7.5 NH	0.13333	0.08660	3.0686	3.0366	0.0020
3	6	3-6 NH	0.16667	0.10825	3.6239	3.5879	0.0040
3½	6	3.5-6 NH	0.16667	0.10825	4.2439	4.2079	0.0040
4	4	4-4 NH	0.25000	0.16238	5.0109	4.9609	0.0050
4½	4	4.5-4 NH	0.25000	0.16238	5.7609	5.7109	0.0050
5	4	5-4 NH	0.25000	0.16238	6.2600	6.2100	0.0050
6	4	6-4 NH	0.25000	0.16238	7.0250	6.9750	0.0050
8	4	8-4 NH	0.25000	0.16238	9.0250	8.9750	0.0050

Note: All values are in inches except for columns 2 and 3.

* Dimensions given for the maximum minor diameter of the nipple are figured to the intersection of the worn tool arc with a centerline through crest and root. The minimum minor diameter of the nipple shall be that corresponding to a flat at the minor diameter of the minimum nipple equal to $p/24$ and may be determined by subtracting $11 h/9$ (or $0.7939p$) from the minimum pitch diameter of the nipple.

5.4.4

The limiting dimensions for internal threads (couplings) shall be as specified in Table 5.4.4.

Table 5.4.4 Thread Limits of Size and Tolerances of NH Internal Threads (Couplings)

Nominal Size of Connection	Threads per Inch (tpi)	Thread Designation (NH)	Pitch (p)	Basic Thread Height (h)	In		
					Minor Diameter		
					Minimum	Maximum	Toler
1	2	3	4	5	6	7	8
¾	8	0.75-8 NH	0.12500	0.08119	1.2246	1.2468	0.02
1	8	1-8 NH	0.12500	0.08119	1.2246	1.2468	0.02
1½	9	1.5-9 NH	0.11111	0.07217	1.8577	1.8799	0.02
2½	7.5	2.5-7.5 NH	0.13333	0.08660	2.9104	2.9424	0.03
3	6	3-6 NH	0.16667	0.10825	3.4223	3.4583	0.04
3½	6	3.5-6 NH	0.16667	0.10825	4.0473	4.0833	0.04
4	4	4-4 NH	0.25000	0.16238	4.7111	4.7611	0.05
4½	4	4.5-4 NH	0.25000	0.16238	5.4611	5.5111	0.05
5	4	5-4 NH	0.25000	0.16238	5.9602	6.0102	0.05
6	4	6-4 NH	0.25000	0.16238	6.7252	6.7752	0.05
8	4	8-4 NH	0.25000	0.16238	8.7252	8.7752	0.05

Note: All values are in inches except for columns 2 and 3.

* Dimensions for the minimum major diameter of the coupling correspond to the basic flange $p/8$, and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the coupling shall be that corresponding to a flat at the major diameter of the maximum coupling equal to $p/24$ and can be determined by adding $11h/9$ (or $0.7939p$) to the maximum pitch diameter of the coupling

5.5 Tolerance.**5.5.1**

The pitch-diameter tolerances for a mating external (nipple) and internal (coupling) thread shall be the same.

5.5.1.1

Pitch-diameter tolerances shall include lead and half-angle deviations.

5.5.1.2

Values for lead and half-angle deviations consuming one-half of the pitch-diameter tolerance shall be as specified in Table 5.5.1.2.

Table 5.5.1.2 Lead and Half-Angle Deviations Consuming One-Half of Pitch-Diameter Tolerances for NH Threads

Nominal Size of Connection	Thread per Inch (tpi)	Thread Designation (NH)	Pitch-Diameter Tolerance ^a	Lead Deviation Consuming One-Half of Pitch-Diameter Tolerance ^b	Half-Angle Deviation Consuming One-Half of Pitch-Diameter Tolerance	
					Degree	Minute
1	2	3	4	5	6	7
¾	8	0.75-8 NH	0.0111	0.0032	1	42
1	8	1-8 NH	0.0111	0.0032	1	42
1½	9	1.5-9 NH	0.0111	0.0032	1	54
2½	7.5	2.5-7.5 NH	0.0160	0.0046	2	17
3	6	3-6 NH	0.0180	0.0052	2	4
3½	6	3.5-6 NH	0.0180	0.0052	2	4
4	4	4-4 NH	0.0250	0.0072	1	55
4½	4	4.5-4 NH	0.0250	0.0072	1	55
5	4	5-4 NH	0.0250	0.0072	1	55
6	4	6-4 NH	0.0250	0.0072	1	55
8	4	8-4 NH	0.0250	0.0072	1	55

Note: All values are in inches except for columns 2, 3, and 6.

^aThe tolerances specified for pitch diameter include all deviations of pitch diameter, lead and angle. The full tolerance cannot, therefore, be used on pitch diameter unless the lead and angle of the thread are perfect. The last two columns give, for information, the deviations in lead and in angle, each of which can be compensated for by half the pitch-diameter tolerance given in this column. If lead and angle deviations both exist to the amount tabulated, the pitch diameter of a nipple, for example, must be reduced by the full tolerance or it will not enter the GO gauge.

^bBetween any two threads not farther apart than the length of engagement.

5.5.2

The tolerance relationships for the external (nipple) threads shall be as follows:

$$\text{Major diameter tolerance} = 2 \times \text{pitch diameter tolerance}$$

$$\text{Minor diameter tolerance} = \text{pitch diameter tolerance} + 2h/9.$$

5.5.2.1

The minimum minor diameter of the external thread (nipple) shall be such as to result in a flat equal to $\frac{1}{3}$ of the $p/8$ basic flat ($p/24$) at the root when the pitch diameter of the nipple is at its minimum value.

5.5.2.2

The maximum minor diameter is basic but shall be permitted to be such as results from the use of a worn or rounded threading tool.

5.5.2.3

The maximum minor diameter shall be as specified in Figure 5.1.1 and is the diameter c which the minor diameter tolerance formula shown in 5.5.2 shall be based.

5.5.3

The tolerance relationships for the internal (coupling) threads shall be as follows:

$$\begin{aligned}\text{Minor diameter tolerance} &= \\ &2 \times \text{pitch diameter tolerance} \\ \text{Major diameter tolerance} &= \\ &\text{pitch diameter tolerance} + 2h/g.\end{aligned}$$

5.5.3.1

The minimum minor diameter of a coupling shall be such as to result in a basic flat, $p/8$, at the crest when the pitch diameter of the coupling is at its minimum value.

5.6 Gauges and Gauging NH Threads.

5.6.1

The limits of size for the gauges to be used in the gauging of fire hose connections shall be as specified in Table 5.6.1(a), Table 5.6.1(b), and Table 5.6.1(c).

Table 5.6.1(a) Setting Thread Plug Limits of Size for NH Thread Ring Gauges

Nominal Size of Connection	Threads per Inch (tpi)	Thread Designation (NH)		X Truncated Setting Plug			
				Plug for GO Thread Gauge			Plug for Thread
				Major Diameter		Pitch Diameter	Major Diameter
				Truncated	Full		
Gauge Tolerance				-	+	-	-
1	2	3	4	5	6	7	8
¾	8	0.75-8 NH	Max	1.3579	1.3757	1.2938	1.3368
			Min	1.3572	1.3750	1.2934	1.3361
1	8	1-8 NH	Max	1.3579	1.3757	1.2938	1.3368
			Min	1.3572	1.3750	1.2934	1.3361
1½	9	1.5-9 NH	Max	1.9742	1.9907	1.9178	1.9548
			Min	1.9735	1.9900	1.9174	1.9541
2½	7.5	2.5-7.5 NH	Max	3.0507	3.0693	2.9820	3.0237
			Min	3.0500	3.0686	2.9815	3.0230
3	6	3-6 NH	Max	3.6029	3.6247	3.5156	3.5698
			Min	3.6021	3.6239	3.5151	3.5690
3½	6	3.5-6 NH	Max	4.2229	4.2452	4.1356	4.1898
			Min	4.2216	4.2439	4.1350	4.1885
4	4	4-4 NH	Max	4.9828	5.0124	4.8485	4.9318
			Min	4.9813	5.0109	4.8479	4.9303
4½	4	4.5-4 NH	Max	5.7328	5.7624	5.5985	5.6818
			Min	5.7313	5.7609	5.5979	5.6803
5	4	5-4 NH	Max	6.2319	6.2615	6.0976	6.1809
			Min	6.2304	6.2600	6.0970	6.1794
6	4	6-4 NH	Max	6.9969	7.0265	6.8626	6.9459
			Min	6.9954	7.0250	6.8620	6.9444
8	4	8-4 NH	Max	8.9969	9.0265	8.8626	8.9459
			Min	8.9954	9.0250	8.8620	8.9444

Notes:

(1) Gauge limit values in this table have been obtained in accordance with ANSI/ASME

B1.2, *Gages and Gaging for Unified Inch Screw Threads.*

(2) All other values are in inches.

*Pitch-diameter limits for basic-crest GO setting plugs are the same as those shown in column 7. Pitch-diameter limits for basic-crest LO (NOT GO) setting plugs are the same as those shown in column 10.

Table 5.6.1(b) Gauge Limits of Size for Ring Gauges for NH External (Nipple) Threads

Nominal Size of Connection	Threads per Inch (tpi)	Thread Designation (NH)		X Thread Ring Gauges			
				GO		LO (NOT GO)	
				Pitch Diameter	Minor Diameter	Pitch Diameter	Minor Diameter
Gauge Tolerance				-	-	+	+
1	2	3	4	5	6	7	8
¾	8	0.75-8 NH	Max	1.2938	1.2246	1.2831	1.2563
			Min	1.2934	1.2239	1.2827	1.2556
1	8	1-8 NH	Max	1.2938	1.2246	1.2831	1.2563
			Min	1.2934	1.2239	1.2827	1.2556
1½	9	1.5-9 NH	Max	1.9178	1.8577	1.9071	1.8833
			Min	1.9174	1.8570	1.9067	1.8826
2½	7.5	2.5-7.5 NH	Max	2.9820	2.9104	2.9665	2.9378
			Min	2.9815	2.9097	2.9660	2.9371
3	6	3-6 NH	Max	3.5156	3.4223	3.4981	3.4623
			Min	3.5151	3.4215	3.4976	3.4615
3½	6	3.5-6 NH	Max	4.1356	4.0473	4.1182	4.0828
			Min	4.1350	4.0460	4.1176	4.0815
4	4	4-4 NH	Max	4.8485	4.7111	4.8241	4.7709
			Min	4.8479	4.7096	4.8235	4.7694
4½	4	4.5-4 NH	Max	5.5985	5.4611	5.5741	5.5209
			Min	5.5979	5.4596	5.5735	5.5194
5	4	5-4 NH	Max	6.0976	5.9602	6.0732	6.0200
			Min	6.0970	5.9587	6.0726	6.0185
6	4	6-4 NH	Max	6.8626	6.7252	6.8382	6.7850
			Min	6.8620	6.7237	6.8376	6.7835
8	4	8-4 NH	Max	8.8626	8.7252	8.8382	8.7850
			Min	8.8620	8.7237	8.8376	8.7835

Notes:

(1) Gauge limit values in this table have been obtained in accordance with ANSI/ASME B1.2, *Gages and Gaging for Unified Inch Screw Threads*, except for the values shown in

column 6. The maximum values shown in column 6 are values for the minimum minor diameter of the internal thread.

(2) All other values are in inches.

Table 5.6.1(c) Gauge Limits of Size for Plug Gauges for NH Internal (Coupling) Threads

Nominal Size of Connection	Threads per Inch (tpi)	Thread Designation (NH)		X Thread Plug Gauges			
				GO		HI (NOT GO)	
				Major Diameter	Pitch Diameter	Major Diameter	Pitch Diameter
Gauge Tolerance				+	+	-	-
1	2	3	4	5	6	7	8
¾	8	0.75-8 NH	Max	1.3877	1.3062	1.3710	1.3169
			Min	1.3870	1.3058	1.3703	1.3165
1	8	1-8 NH	Max	1.3877	1.3062	1.3710	1.3169
			Min	1.3870	1.3058	1.3703	1.3165
1½	9	1.5-9 NH	Max	2.0027	1.9302	1.9890	1.9409
			Min	2.0020	1.9298	1.9883	1.9405
2½	7.5	2.5-7.5 NH	Max	3.0843	2.9975	3.0707	3.0130
			Min	3.0836	2.9970	3.0700	3.0125
3	6	3-6 NH	Max	3.6397	3.5311	3.6208	3.5486
			Min	3.6389	3.5306	3.6200	3.5481
3½	6	3.5-6 NH	Max	4.2652	4.1562	4.2458	4.1736
			Min	4.2639	4.1556	4.2445	4.1730
4	4	4-4 NH	Max	5.0374	4.8741	5.0068	4.8985
			Min	5.0359	4.8735	5.0053	4.8979
4½	4	4.5-4 NH	Max	5.7874	5.6241	5.7568	5.6485
			Min	5.7859	5.6235	5.7553	5.6479
5	4	5-4 NH	Max	6.2865	6.1232	6.2559	6.1476
			Min	6.2850	6.1226	6.2544	6.1470
6	4	6-4 NH	Max	7.0515	6.8882	7.0209	6.9126
			Min	7.0500	6.8876	7.0194	6.9120
8	4	8-4 NH	Max	9.0515	8.8882	9.0209	8.9126
			Min	9.0500	8.8876	9.0194	8.9120

Notes:

(1) Gauge limit values in this table have been obtained in accordance with ANSI/ASME B1.2, *Gages and Gaging for Unified Inch Screw Threads*.

(2) All other values are in inches.

5.6.2

For these gauges, the allowable variation in lead between any two threads not farther apart than the length of engagement shall be ± 0.0004 in. The allowable variation in half-angle of thread shall be ± 5 minutes.

5.6.3*

Except as otherwise specified herein, the gauges and gauging practices shall conform to ANSI/ASME B1.2, *Gages and Gauging for Unified Inch Screw Threads*.

5.6.4*

Adjustable thread ring gauges shall be set by means of threaded setting plug gauges, the dimensions of which are given in Table 5.6.1(a). Means of setting ring gauges shall be as specified in ANSI/ASME B1.2, *Gages and Gauging for Unified Inch Screw Threads*

Chapter 6 Nonthreaded Connections

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6.1* General.

The requirements of Chapters 1 through 4 and the requirements of this chapter shall apply to nonthreaded connections in the 4 in. (100 mm) and 5 in. (125 mm) sizes.

6.2* Gauges.

6.2.1

The dimensional characteristics and tolerances for the metal-face gauges to be used in the gauging of nonthreaded connections shall be as specified in Figure 6.2.1(a) for a Type A test gauge and Figure 6.2.1(b) for a Type B test gauge.

Figure 6.2.1(a) Dimensions for Type A Test Gauge (No Ramp Angle).

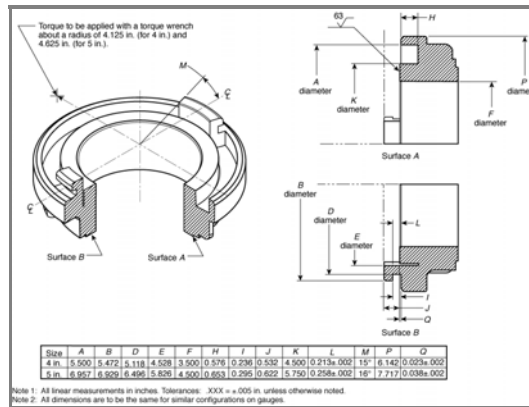
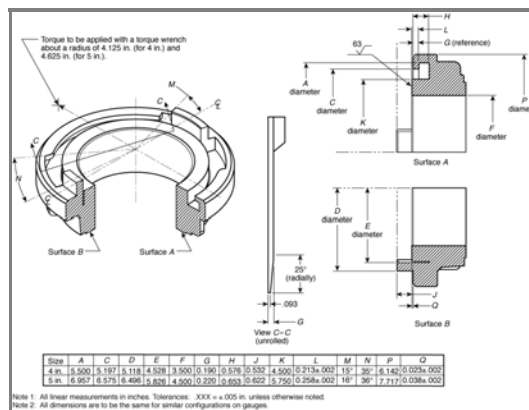


Figure 6.2.1(b) Dimensions for Type B Test Gauge (with Lugs Removed).



6.2.2

In addition, the 4 in. (100 mm) metal-face gauge shall meet the dimensional characteristics of Figure 6.2.2(a), and the 5 in. (125 mm) metal-face gauge shall meet the dimensional characteristics of Figure 6.2.2(b).

Figure 6.2.2(a) End View of 4 in. (100 mm) Metal-Face Gauge and Nonthreaded 4 in. (100 mm) Connections.

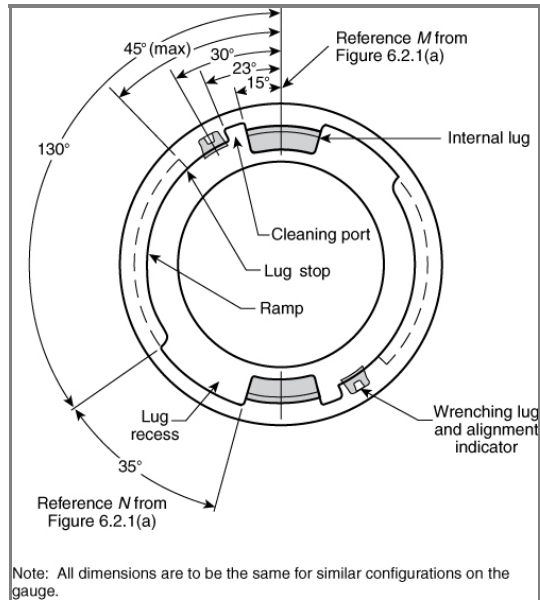
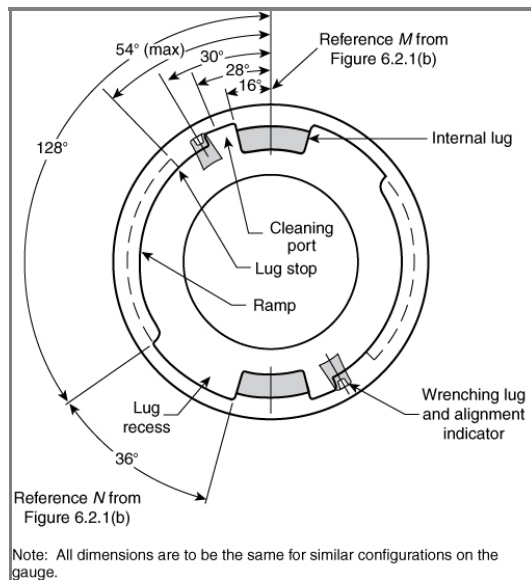


Figure 6.2.2(b) End View of 5 in. (125 mm) Metal-Face Gauge and Nonthreaded 5 in. (125 mm) Connections.



6.3 Locks.

6.3.1*

All gasketed nonthreaded connections shall be provided with locks within the confines of the nonthreaded connection to ensure against unintentional disconnection.

6.3.2

Caps for use with nonthreaded connections shall be permitted without a lock.

6.3.3

The locks shall be located so that the nonthreaded connection will connect to the Type A metal-face test gauge and lock.

6.3.4

The locks shall be designed so as to lock automatically when connecting two nonthreaded connections without additional action needed to engage the locks. The lock shall not be capable of being secured (mechanically) in the open (unlocked) position.

6.3.5

The locks shall be field repairable.

6.3.6

The locks shall be designed so as to be disengaged by hand in a separate action other than that needed to disconnect the nonthreaded connection.

6.3.6.1

The locks shall be capable of being unlocked by a fire fighter wearing gloves meeting the requirements of NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

6.3.6.2

A device such as a wrench incorporating actions to disengage the lock and disconnect the nonthreaded connection in one motion shall be permitted to be used.

6.3.7

The lock mechanism shall not shear when a force of 300 lb × ft (407 N × m) is applied to the nut on the test wrench.

6.4 Indicators.

Permanent indicators, obvious to sight and touch, shall be located at two points 180 degrees apart, as shown on Figure 6.2.2(a) and Figure 6.2.2(b), to indicate the fully engaged position of the connections.

6.5 Force to Connect and Disconnect.

6.5.1*

All nonthreaded pressure connections shall be capable of connection and disconnection to both the Type A and the Type B metal-face test gauges at a force of between 6.0 lb × in. (0.68 N × m) and 30 lb × in. (3.4 N × m) when measured as described in 6.5.3 and under the conditions described in 6.5.4. The force to connect and disconnect nonthreaded pressure connections to each other shall not exceed 40 lb × in. (4.5 N × m) when measured as described in 6.5.3 and under the conditions described in 6.5.4.

6.5.2

All nonthreaded suction connections shall be capable of connection and disconnection to both the Type A and the Type B metal-face test gauges at a force of between 168 lb × in. (19.0 N × m) and 312 lb × in. (35.3 N × m) when measured as described in 6.5.3 and under the conditions described in 6.5.4. The force to connect and disconnect nonthreaded suction connections to each other shall not exceed 360 lb × in. (40.7 N × m) when measured as described in 6.5.3 and under the conditions described in 6.5.4.

6.5.3*

The force to connect and disconnect shall be tested as described in 6.5.3.1 through 6.5.3.4.2.

6.5.3.1

One of the metal-face test gauges, or one-half of a pressure or suction connector, depending on the force to be checked, shall be secured in a vise or similar device. The connector to be tested shall be free to turn without constraint or assistance.

6.5.3.2

For 4 in. (100 mm) connectors, a test wrench with dimensions as shown in Figure 6.5.3.2(a) shall be attached over the external lugs of the connector being tested. For 5 in. (125 mm) connectors, a test wrench with dimensions as shown in Figure 6.5.3.2(b) shall be attached over the external lugs of the connector to be tested.

Figure 6.5.3.2(a) Test Wrench for Force to Connect Test of 4 in. (100 mm) Connectors.

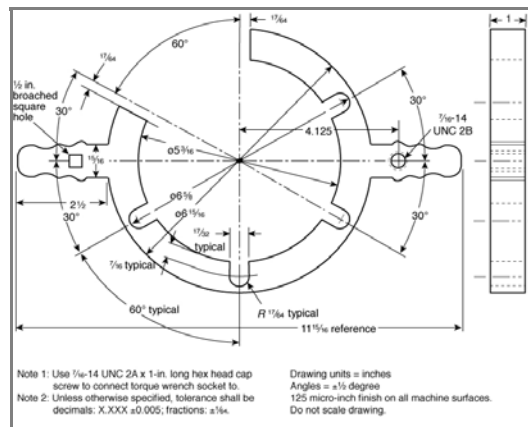
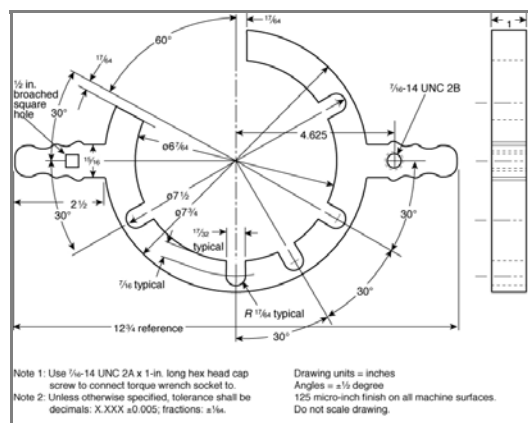


Figure 6.5.3.2(b) Test Wrench for Force to Connect Test of 5 in. (125 mm) Connectors.



6.5.3.3

A standard torque wrench measuring inch-pounds shall be connected to the test wrench

6.5.3.4

The torque wrench shall be moved in the direction necessary to connect or disconnect the connector being tested.

6.5.3.4.1

The lock shall be held open only when the connector is being disconnected.

6.5.3.4.2

The torque wrench shall be in direct line with the center of the connector when the torque reading is being taken.

6.5.4

The force to connect and disconnect test shall be done at 70°F (21°C) ambient temperature. The gaskets shall be clean but not lubricated.

6.6* Caps.

All nonthreaded caps shall have gaskets installed.

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6.6.1 Installation and Removal of Nonthreaded Caps.

~~Nonthreaded caps shall be permitted to have suction gaskets installed for suction-only applications.~~

6.6.1.1 Utilization without a tool.

Nonthreaded caps designed to be removed without the use of a tool shall require a force between 6 lbf in. and 30 lbf in. to install and remove.

6.6.1.2 Utilization with a tool.

Nonthreaded caps designed for the use of a tool to remove shall require a force of 168 lbf in. to 312 lbf in. to install and remove.

6.6.2*

The cap used for a nonthreaded fire department connection shall be provided with a means of indicating water pressure behind the cap.

6.7 Adapters.

All nonthreaded adapters shall have gaskets installed.

6.8 Hydrant and Fire Department Connections.

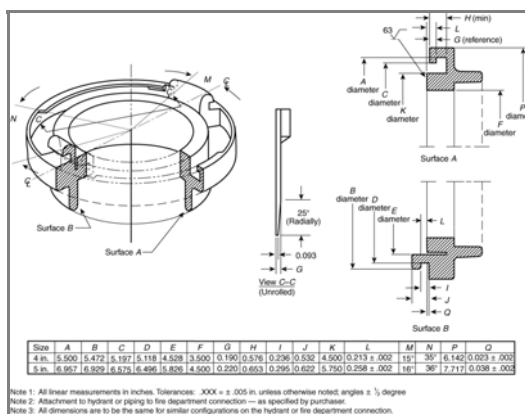
6.8.1

Nonthreaded hydrant and fire department connections shall be metal-faced, without gaskets.

6.8.2

Nonthreaded hydrant and fire department connections shall be made to the dimensions specified in Figure 6.8.2.

Figure 6.8.2 Metal-Faced Hydrant and Fire Department Connections Showing Required Dimensions.



6.8.3

In addition, 4 in. (100 mm) metal-faced hydrant and fire department connections shall meet the dimensional characteristics of Figure 6.2.2(a), and the 5 in. (125 mm) metal-faced hydrant and fire department connections shall meet the dimensional characteristic of Figure 6.2.2(b).

Chapter 7 Gaskets

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7.1 Threaded Coupling Gasket.

7.1.1

Each internal connection shall be provided with a resilient thread gasket that does not leak under normal use when fitted accurately in the seat specified in this standard.

7.1.2

Each thread gasket shall meet the dimensions specified in Table 7.1.2.

Table 7.1.2 Dimensions of Thread Gaskets for Standard Internal Threaded Connections

Nominal Size of Connection	Inside Diameter	Outside Diameter	Thickness
$\frac{3}{4}$	$1\frac{3}{16}$ (20.6)	$1\frac{7}{16}$ (36.5)	$\frac{1}{8}$ (3.18)
1	$1\frac{1}{16}$ (27)	$1\frac{7}{16}$ (36.5)	$\frac{1}{8}$ (3.18)
$1\frac{1}{2}$	$1\frac{9}{16}$ (40)	$2\frac{1}{16}$ (52)	$\frac{1}{8}$ (3.18)
$2\frac{1}{2}$	$2\frac{9}{16}$ (65)	$3\frac{3}{16}$ (81)	$\frac{3}{16}$ (4.8)
3	$3\frac{1}{16}$ (78)	$3\frac{3}{4}$ (95)	$\frac{1}{4}$ (6.4)
$3\frac{1}{2}$	$3\frac{9}{16}$ (91)	$4\frac{3}{8}$ (111)	$\frac{1}{4}$ (6.4)
4	$4\frac{1}{16}$ (103)	$5\frac{1}{8}$ (130)	$\frac{1}{4}$ (6.4)
$4\frac{1}{2}$	$4\frac{9}{16}$ (117)	$5\frac{7}{8}$ (149)	$\frac{1}{4}$ (6.4)
5	$5\frac{1}{16}$ (129)	$6\frac{3}{8}$ (162)	$\frac{1}{4}$ (6.4)
6	$6\frac{1}{16}$ (154)	$7\frac{1}{8}$ (181)	$\frac{1}{4}$ (6.4)
8	$8\frac{1}{16}$ (205)	$9\frac{1}{8}$ (232)	$\frac{1}{4}$ (6.4)

Note: All dimensions are in inches (mm).

7.1.3

The durometer of the thread gasket shall be 70 ± 5 Shore A.

7.2 Nonthreaded Connection Gaskets.

7.2.1

Each nonthreaded connection, with the exception of metal-faced hydrants and fire department connections that meet the requirement in Section 6.8, shall be fitted with a resilient face gasket that does not leak under normal use.

7.2.2

The durometer of the gasket shall be 70 ± 5 Shore A.

7.2.3

The face gasket shall be either a suction gasket or a pressure gasket, depending on the application in which the connection is to be used.

7.2.3.1

Pressure gaskets shall be designed to withstand the pressure requirements of Sections 4.6 and 4.10 without leakage. They shall be black in color.

7.2.3.2

Suction gaskets shall be designed to allow couplings equipped with the gasket to meet the requirements of Section 4.11. They shall be gray in color.

7.3* Tail Gasket.

7.3.1

Each coupling that is installed on a fire hose with an expansion ring shall be equipped with a resilient gasket of durometer 60 ± 5 Shore A in the hose bowl that keeps the ends of the fabric of the fire hose dry.

7.3.2

The nominal dimensions of these gaskets shall be as follows:

- (1) Minimum inside diameter as specified in Table 7.1.2
- (2) Outside diameter to accurately fit the recess provided
- (3) Thickness $\frac{3}{16}$ in. (4.8 mm) minimum

Chapter 8 Use of NH Threads and Nonthreaded Connections

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8.1* Hose Coupling Threads.

8.1.1* $\frac{3}{4}$ in. and 1 in. (19 mm and 25 mm) Hose.

All $\frac{3}{4}$ in. and 1 in. (19 mm and 25 mm) hose shall be provided with couplings having the 0.75-8 NH standard thread and 1-8 NH standard thread, respectively.

8.1.2 $1\frac{1}{2}$ in. Through 2 in. (38 mm Through 52 mm) Fire Hose.

All $1\frac{1}{2}$ in. through 2 in. (38 mm through 52 mm) fire hose shall be provided with couplings having the 1.5-9 NH standard thread.

8.1.3 $2\frac{1}{2}$ in. (65 mm) Fire Hose.

All $2\frac{1}{2}$ in. (65 mm) fire hose shall be provided with couplings having the 2.5-7.5 NH standard thread.

8.1.4 3 in. (75 mm) Fire Hose.

All 3 in. (75 mm) fire hose shall be provided with couplings having the 2.5-7.5 NH standard thread.

[FR-6](#) [Hide Legis](#)

8.1.4.1

Where interchangeability with $2\frac{1}{2}$ in. (65 mm) fire hose is not required, the couplings shall be permitted to have the 3-6 NH standard thread.

8.1.5 $3\frac{1}{2}$ in. (90 mm) Fire Hose.

All $3\frac{1}{2}$ in. (90 mm) fire hose shall be provided with couplings having the 3.5-6 NH standard thread.

8.1.5.1

Where interchangeability with 3 in. (75 mm) fire hose or other connections is required, the couplings shall be permitted to have the 3-6 NH standard thread.

8.1.6 4 in. (100 mm) Fire Hose.

All 4 in. (100 mm) fire hose shall be provided with couplings having the 4-4 NH standard thread.

8.1.6.1

Where interchangeability with 3½ in. (90 mm) fire hose or other connections is required, the couplings shall be permitted to have the 3.5-6 NH standard thread.

8.1.6.2

Where the authority having jurisdiction permits, 4 in. (100 mm) nonthreaded couplings shall be permitted to be used.

8.1.7 4½ in. (114 mm) Fire Hose.

All 4½ in. (114 mm) fire hose shall be provided with couplings having the 4.5-4 NH standard thread.

8.1.7.1

Where interchangeability with 4 in. (100 mm) fire hose or other connections is required, the couplings shall be permitted to have the 4-4 NH standard thread.

8.1.8 5 in. (125 mm) Fire Hose.

All 5 in. (125 mm) fire hose shall be provided with couplings having the 5-4 NH standard thread.

8.1.8.1

Where interchangeability with 4½ in. (114 mm) fire hose or other connections is required, the couplings shall be permitted to have the 4.5-4 NH standard thread.

8.1.8.2

Where the authority having jurisdiction permits, 5 in. (125 mm) nonthreaded couplings shall be permitted to be used.

8.1.9 6 in. (150 mm) Fire Hose.

All 6 in. (150 mm) fire hose shall be provided with couplings having the 6-4 NH standard thread.

8.1.9.1

Where interchangeability with 5 in. (125 mm) fire hose or other connections is required, the couplings shall be permitted to have the 5-4 NH standard thread.

8.1.10 8 in. (200 mm) Fire Hose.

All 8 in. (200 mm) fire hose shall be provided with couplings having the 8-4 NH standard thread.

8.1.11 Suction Hose.

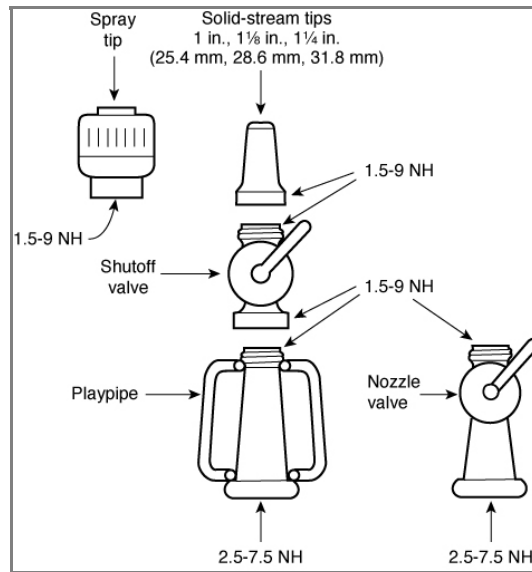
Suction hose shall be provided with couplings having the NH standard thread compatible with the nominal size of the suction hose .

8.2* Connections for Fire Service Nozzles for Handlines.

8.2.1

Playpipes for connecting shutoff nozzles to 2½ in. (65 mm) fire hose shall have the 2.5-7.5 NH standard thread at the base or primary inlet and the 1.5-9 NH standard thread at the discharge end, as shown in Figure 8.2.1.

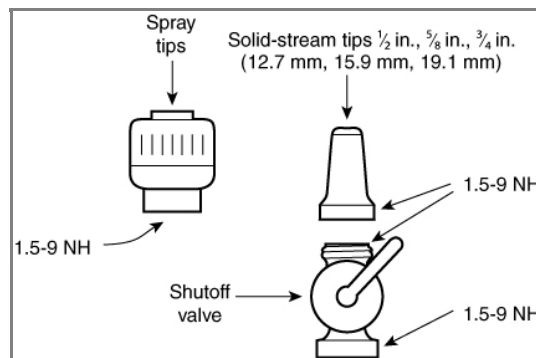
Figure 8.2.1 Nozzle Assembly for 2½ in. (65 mm) Hose.



8.2.2

Nozzle shutoff valves for either 2½ in. (65 mm) nozzles or 1½ in. (38 mm) nozzles shall have the 1.5-9 NH standard thread for both the inlet and discharge sides of the valve, as shown in Figure 8.2.1 for 2½ in. (65 mm) and Figure 8.2.2 for 1½ in. (38 mm).

Figure 8.2.2 Nozzle Assembly for 1½ in. (38 mm) Hose.



8.2.2.1

Where the valve is an integral nondetachable part of a 2½ in. (65 mm) playpipe, the 1.5-9 NH standard thread shall be provided only on the discharge side of the valve.

8.2.3

All nozzles used on booster hose shall have the 1-8 NH standard thread.

8.2.4

All nozzle tips for use on 2½ in. (65 mm) and 1½ in. (38 mm) nozzles shall have the 1.5-9 NH standard thread.

8.2.5*

All spray nozzles with a shutoff valve for use on 1½ in. (38 mm) and 2½ in. (65 mm) hose where flows at rated pressure do not exceed 400 gpm (1600 L/min) shall have at least the 1.5-9 NH standard thread at the internal connection.

8.3 Connections for Large-Stream Devices.

8.3.1* Primary Inlet.

At least one inlet connection on each fire department large-stream device equipped with multiple primary inlets (other than devices piped permanently to a pump) shall be fitted with at least one female swivel connection, which shall have the 2.5-7.5 NH standard thread as shown in Figure 8.3.1(a) and Figure 8.3.1(b). An adapter shall be permitted to meet this intent.

Figure 8.3.1(a) Large-Stream Device Rated Under 1250 gpm (5000 L/min).

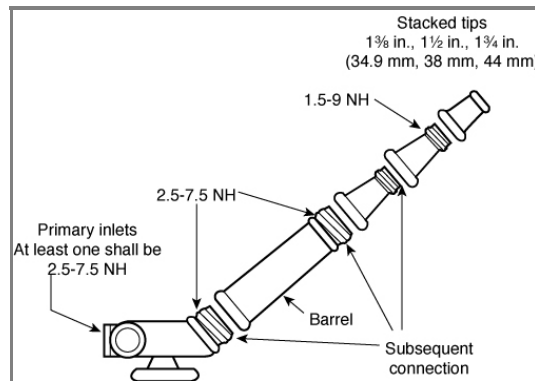
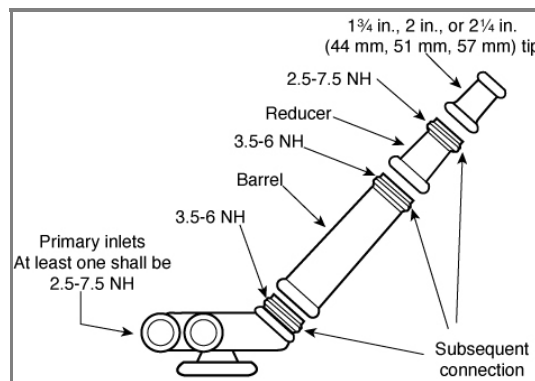


Figure 8.3.1(b) Large-Stream Device Rated Over 1250 gpm (5000 L/min) But Less Than 3000 gpm (12,000 L/min).



8.3.2* Subsequent Connections and Nozzles.

8.3.2.1

The discharge end of large-stream devices designed to discharge from 400 gpm to 1250 gpm (1600 L/min to 5000 L/min) shall have the 2.5-7.5 NH thread for attaching straight tip nozzle tips or spray nozzles.

8.3.2.1.1

If stacked straight tip nozzles are used, one of the tips shall have the 1.5-9 NH thread as shown in Figure 8.3.1(a).

8.3.2.1.2

Straight tip nozzles and spray nozzles designed to discharge between 400 gpm and 1250 gpm (1600 L/min and 5000 L/min) shall have the 2.5-7.5 NH thread on their inlet.

8.3.2.2

The discharge end of large-stream devices designed to discharge in excess of 1250 gpm (5000 L/min) but less than 3000 gpm (12,000 L/min) shall have the 3.5-6 NH thread for attaching straight tip nozzles or spray nozzles.

8.3.2.2.1

A 3.5-6 NH female × 2.5-7.5 NH male reducer fitting, or a stacked tip having the male 2.5-7.5 NH thread as an integral component as shown in Figure 8.3.1(b) shall be provided.

8.3.2.2.2

Straight tip nozzles and spray nozzles designed to discharge flows in excess of 1250 gpm (5000 L/min) but less than 3000 gpm (12,000 L/min) shall have the 3.5-6 NH thread on their inlet.

8.3.2.3

Subsequent connections, straight tip nozzles, and spray nozzles on large-stream device designed to discharge 3000 gpm (12,000 L/min) or more shall have an NH standard thread consistent with the nominal inlet or outlet size.

Annex A Explanatory Material

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Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1

Some fire-fighting organizations use small hose less than ¾ in. (19 mm) nominal diameter fitted with garden hose couplings. Such couplings should have 0.75-11.5 NH (garden hose thread) threads conforming to ANSI/ASME B1.20.7, *Standard on Hose Coupling Screw Threads*.

A.3.2.1 Approved.

The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ).

The phrase “authority having jurisdiction,” or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do the responsibilities. Where public safety is primary, the authority having jurisdiction may be : federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.4.1

Figure A.4.1(a) shows an expansion ring coupling set for a set of threaded couplings. Figure A.4.1(b) shows a typical nonthreaded fire hose connection that connects to the fire hose with a tailpiece and external reattachable collar.

Figure A.4.1(a) An Expansion Ring Coupling Set.

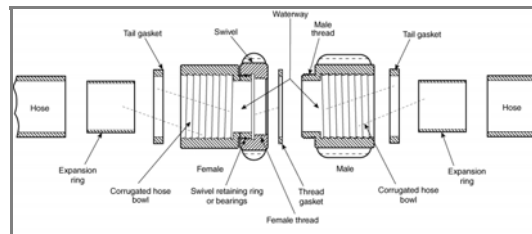
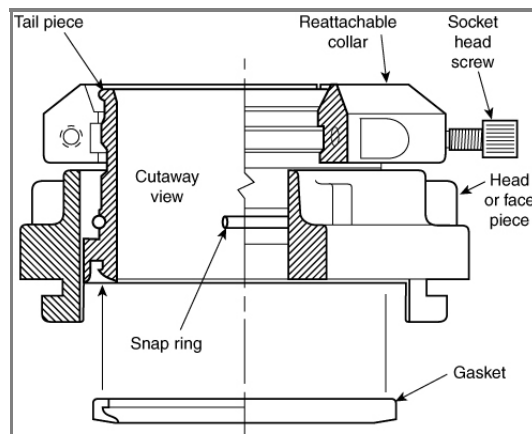


Figure A.4.1(b) A Nonthreaded Fire Hose Connection.



A.5.1.5

Blunt starts are required on the entering ends of the NH screw thread on all sizes of fire hose connections that meet the requirements of this standard. The blunt start is formed by cutting off the entering ends of the screw threads completely to where, at the blunt start, the dimension from the face of the connection to the root of the start of the second thread is as specified in Table 5.4.2 (Column *I* for external threads and Column *J* for internal threads), as illustrated in Figure 5.1.5.1.

When the entering threads are cut back as required, it forms a pilot on the male coupling and a counter bore in the female coupling, making it easier to align the connections and start the thread engagement.

When the starting ends of the threads are cut off, the following occur:

- (1) It takes fewer turns to connect the connection — over one turn less on a 2½ in. (65 mm) connection.
- (2) There are no threads at the ends of the connections to be damaged when dropped.
- (3) The sharp entering threads are gone, reducing cuts to hands.

A good blunt start does the following:

- (1) Helps ream dirt out of the threads when a coupling has been dropped in the dirt
- (2) Prevents cross-threading
- (3) Makes it easier and faster to connect fire hose connections

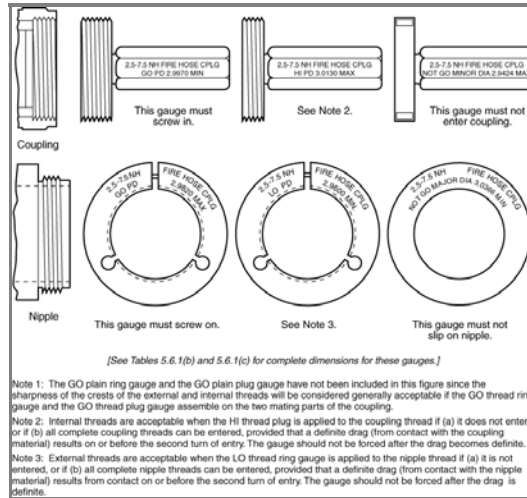
A.5.2.1

American National Fire Hose Connection Screw Threads are also sometimes known by the abbreviations NST and NS.

A.5.6.3

See Figure A.5.6.3.

Figure A.5.6.3 Gauges for 2.5-7.5 NH Threads.



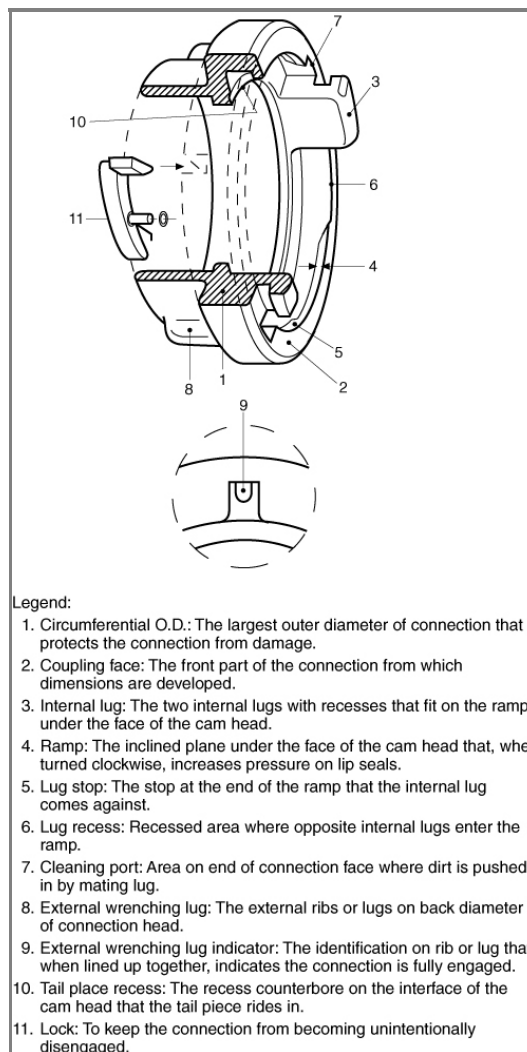
A.5.6.4

Note that setting plug gauges is necessary only for setting of adjustable thread ring gauges and for checking solid ring gauges.

A.6.1

Figure A.6.1 shows the names of the various parts of a nonthreaded coupling.

Figure A.6.1 Diagram of a Nonthreaded Connection.



A.6.2

The Type A test gauge checks the distance from under the high point of the two ramps of a nonthreaded connection to the corresponding connection's gasket face, which is at the centerline between the gauge and the connection when they are connected. The Type E test gauge checks the distance from under the two lugs of a nonthreaded connection to the corresponding connection's gasket face, which is at the centerline between the gauge and the connection when they are connected.

A.6.3.1

During the transition in a fire department from couplings without locks to couplings with locks, there will be times when hose will be coupled together with one coupling being a locking type and the other a nonlocking type. Because disconnection procedures are different for couplings with locks, consideration should be given to painting a ring in a distinctive color on the hose near the couplings with locks to alert the fire fighter to the presence of the lock.

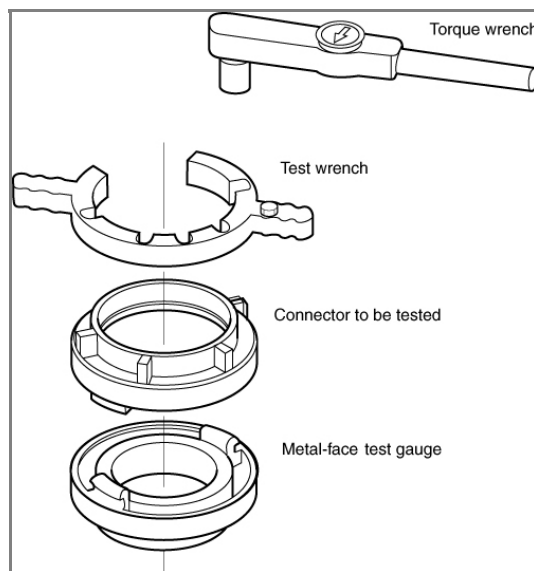
A.6.5.1

The forces defined in this requirement are intended to provide nonthreaded connections that are able to be connected and disconnected easily by hand and without the use of wrenches when the connectors are not under pressure.

A.6.5.3

Figure A.6.5.3 shows an example of the setup and location of the torque wrench, test wrench, nonthreaded connector, and test gauge.

Figure A.6.5.3 Arrangement for Testing Nonthreaded Connections.



Other methods of measuring force to connect and disconnect can be used if they produce the same results. A second method of testing the force to connect and disconnect against the test gauges is to fit the metal-face gauge with a plug that has a hex head connection for the torque wrench on the back side of the gauge at the center of rotation. The nonthreaded connector to be tested is then held stationary in a vise or similar device, and the metal-face gauge is mated to the nonthreaded connection with the torque wrench measuring the amount of force to connect and disconnect the two parts. When the force is measured at any point other than as defined in 6.5.3, the acceptable range of force values will need to be calculated for the position of the torque wrench.

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[FR-3](#) [Hide Legis](#)

A.6.6

Suction gaskets will work in both pressure and suction applications but are difficult to compress by hand when mated to a pressure connection. In some areas a more tamper resistant nonthread cap could be desired by the end user. Caps with a force between 6 lbf in. and 30 lbf in. to remove are considered readily removable by hand. Caps with a force between 168 lbf in. and 312 lbf in. to remove generally would require the use of a tool to remove.

A.6.6.2

A $\frac{1}{8}$ in. (3.18 mm opn) diameter or larger hole in the cap that could be exposed to internal pressure can be used to indicate water is present.

A.7.3

It is important when ordering couplings and tail gaskets for recoupling hose with expansion ring couplings that the appropriate tail gasket be obtained. The coupling manufacturer needs the outside diameter of the hose and the wall thickness of the hose to provide the proper coupling and gasket. Also, the length of the expansion ring must be consistent with the length of the coupling bowl.

A.8.1

Where local fire hose coupling threads are not standard, swivel adapters, with the NH female thread and the local male thread, and with the local female thread and the NH male thread, should be carried on the apparatus, stored in hose houses, and so forth.

A.8.1.1

Some fire-fighting organizations use small hose less than $\frac{3}{4}$ in. (19 mm) nominal diameter fitted with garden hose couplings. Such couplings should have 0.75-11.5 NH (garden hose thread) threads conforming to ANSI/ASME B1.20.7, *Standard on Hose Coupling Screw Threads*.

A.8.2

Connections with NH threads covered in 8.2.1 through 8.2.5 should have adapters with the internal local thread preconnected to the appliance.

The various subsequent connections on a fire service nozzle are designed with standard NH thread to allow the nozzle tip to be removed and hose connected to extend the line. This operation is particularly beneficial when the attack starts with large hand-held lines, and these are later reduced to smaller lines for overhaul.

A.8.2.5

The use of the specified size thread makes it possible to attach these nozzles to any standard $2\frac{1}{2}$ in. (65 mm) or $1\frac{1}{2}$ in. (38 mm) playpipe or shutoff valve and also to advance the nozzle by connecting $1\frac{1}{2}$ in. (38 mm) hose between the valve and the spray nozzle.

A.8.3.1

Fire department large-stream devices with a single large-diameter input are designed to rely on the positioning of the hose for part of the device's stability. The manufacturer's instructions for use should be carefully followed with all large-stream devices. A device designed with a single hose-line inlet system is different from a device designed with a multiline inlet system, and trying to supply one device with adapters and fittings from different size hose can create a dangerous situation.

A.8.3.2

A flow of 400 gpm (1600 L/min) is the maximum normally obtained with a handline nozzle using a standard $1\frac{1}{4}$ in. (32 mm) straight tip nozzle. A flow of 1250 gpm (5000 L/min) is the maximum normally obtained with a portable turret nozzle using a 2 in. (51 mm) straight tip nozzle.

Annex B History of Fire Hose

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Coupling Thread Standardization in the United States.

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1

The need for securing uniformity and interchangeability of fire hose coupling threads was demonstrated by the Boston conflagration of November 1872. The following year, standardization was proposed by the International Association of Fire Engineers (IAFE), now the International Association of Fire Chiefs (IAFC). In subsequent years, various suggested standard threads were considered. A special committee of the IAFE prepared a report adopted by its 1891 convention in which the present principal dimensions for 2½ in. fire hose coupling screw threads were suggested, but no specifications for the shape of thread were included.

Little more was done toward standardization until difficulties with nonstandard threads were encountered by fire departments called to assist at the Baltimore conflagration of 1904. The following year, the National Fire Protection Association (NFPA) took up the project actively, appointing a Committee on Standard Thread for Fire Hose Couplings. The committee developed general screw thread specifications covering the 2½ in., 3 in., 3½ in., and 4½ in. sizes, using as a basis the earlier report of the IAFE committee and working with the active cooperation of the American Water Works Association (AWWA). The principal dimensions for the 2½ in. couplings of 7½ threads per inch and 3¼ in. outside diameter of the external thread (ODM) were selected to facilitate conversion of existing couplings, the majority of which had either 7 or 8 threads per inch, and 3 in. or 3½ in. ODM.

During the years that followed until 1917, the committee worked diligently to secure recognition of these specifications as a "National Standard" and their adoption by cities and towns throughout the United States. Its efforts were rewarded with considerable success, and, in addition, as many as 20 organizations officially approved and adopted the standard. It was also published by the National Board of Fire Underwriters (NBFU) in 1911, the American Society of Mechanical Engineers (ASME) in 1913, the U.S. Bureau of Standards as Circular No. 50 (1914 and 1917), and the AWWA.

Between 1920 and 1923, a series of conferences were held that were attended by representatives of the manufacturers of fire hose couplings, the NBFU, the National Screw Thread Commission (NSTC), and the ASME. These conferences resulted in an agreement concerning the standardization of screw thread tolerances, allowances, and methods of gauging. Efforts to bring about the general adoption of the standard throughout the country were continued.

In October 1923, NBFU, NFPA, and ASME asked the American Standards Association (ASA) to approve and designate this standard as an "American Standard." Shortly afterwards, ASA assigned joint sponsorship for the project to NBFU, AWWA, and ASME. At that time, through the cooperation of a group of gauging experts, including members of NSTC, the limiting dimensions were added to the original specifications, and the standard for fire hose coupling screw threads for sizes 2½ in. and larger was approved by the ASA in May 1925.

In 1917, by mutual agreement, the field work of the NFPA committee concerned with encouraging adoption and application of the standard was taken over by a Committee on Fire Prevention and Engineering Standards of the NBFU. At the same time, NFPA organized a Committee on Small Hose Couplings to develop standards on fire hose screw threads in sizes from ½ in. to 2 in. nominal diameters. A standard covering these sizes was developed and adopted by NFPA in 1922. These smaller size couplings had the same general characteristics of thread design as the standard couplings for 2½ in. and larger hose. The NFPA's *Standard for Small Hose Coupling Screw Threads* was submitted to the ASA for approval in 1926 and is the basis for the current fire hose screw thread dimensions included in this standard.

The National Screw Thread Commission also had prepared dimensions for the screw threads of small hose couplings ½ in. to 2 in., inclusive, which were published in 1921, 1924, and 1928 reports. The pitches and other dimensions of these threads, except for the garden hose size, varied from those proposed by the NFPA for use on fire hose,

which requires a heavier thread that can be connected quickly in the field.

In January 1927, the ASME requested that the ASA authorize the organization of a sectional committee to complete the standardization of fire hose couplings and to attempt to unify and complete the dimensions of small hose couplings. A sectional committee was organized in October 1928, under the sponsorship of the ASME, to prepare specifications for screw threads for small hose couplings ranging from $\frac{1}{2}$ in. to 2 in. nominal size. Data on these smaller threads were published by ASA.

Subsequently, it was found that almost every pump manufacturer was using different threads on 4 in., 5 in., and 6 in. supply hose and fittings required on certain sizes of fire department pumping engines, so the supply hose from one pumper could not be used on another pumper at the same time. Accordingly, in 1955, NFPA adopted standards for threads on these three sizes of fire hose.

In 1956, NFPA adopted dimensions for gaskets for standard fire hose couplings of all sizes from $\frac{3}{4}$ in. to 6 in. couplings, as well as data on the required gasket seat dimensions. Gaskets were felt to be an essential feature of a fire hose coupling standard because hose connections feature swivel or "female" fittings that must provide a tight waterway when connected to the opposing thread.

NFPA also prepared a text showing the suggested application of the standard to various items of fire-fighting equipment because experience had shown that the wrong size of standard thread was sometimes used, limiting the effectiveness of the equipment.

In 1961, the duties of the ASA sectional committee were transferred to a newly established subcommittee of the ASA Sectional Committee on the Standardization of Pipe Threads, for which the ASME and the American Gas Association (AGA) were joint sponsors. The subcommittee was organized to deal with threads for fire hose couplings and fittings. New material from the ASA subcommittee was subsequently included in the NFPA document.

A survey conducted by NFPA in 1965 showed that 65 percent of the fire departments serving U.S. communities with populations greater than 20,000 used standard fire hose coupling screw threads on all sizes of hose. The percentage of fire departments using standard threads on each of the sizes were as follows: $\frac{3}{4}$ in. and 1 in. threads, 95 percent standard; $1\frac{1}{2}$ in. threads, 84 percent standard; $2\frac{1}{2}$ in. threads, 73 percent standard. The degree of standardization is believed to be considerably higher in smaller communities, many of which organized their fire departments subsequent to the adoption of the standard. Approximately half of the U.S. states have laws supporting fire hose thread standardization.

In 1965, at its 69th annual meeting, the NFPA passed a resolution to intensify its efforts to accomplish complete standardization of fire hose screw threads throughout the country by asking for assistance from all fire chiefs, fire organizations, industrial organizations, manufacturers, and governmental agencies.

The NFPA, the IAFC, the International Association of Fire Fighters, the American National Standards Institute (ANSI), the AWWA, and many others have assisted on the standardization program.

Annex C Informational References [Save As Word](#) [Show Revisions/Notes](#) [Show P/PC's](#) [Quick Pri](#)

C.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

C.1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

Standard for Small Hose Coupling Screw Threads, 1926 edition.

C.1.2 Other Publications.**C.1.2.1 ANSI Publications.**

American National Standards Institute, 25 West 43rd Street, 4th floor, New York, NY, 10036.

ANSI/ASME B1.20.7, *Standard on Hose Coupling Screw Threads*, 1991.

C.2 Informational References. (Reserved)**C.3 References for Extracts in Informational Sections. (Reserved)**



Public Input No. 1-NFPA 1963-2016 [Chapter 2]

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2007 edition.

2.3 Other Publications.

2.3.1 ANSI- ASME Publication.

~~American National Standards Institute, 25 West 43rd Street, 4th floor,~~ ASME International ,
Two Park Avenue , New York, NY 10036 - 10016-5990 .

~~ANSI/ ASME B1.2, *Gages and Gaging for Unified Inch Screw Threads*, 1983~~ - 83rd
edition, 1991, reaffirmed 2007 .

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM B30, *Standard Specification for Copper Alloys in Ingot Form*, 2014 - 2014a .

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, 2011.

ASTM B584, *Standard Specification for Copper Alloy Sand Castings for General Applications*, 2014 - 2014 .

ASTM D395- B , *Standard Test Methods for Rubber Property — Compression Set- (Method B)* , 2008 - 2014 .

ASTM D573, *Standard Test Method for Rubber Deterioration in an Air Oven*, 2010 - 2004,
reapproved 2015 .

ASTM D3183, *Standard Practice for Rubber — Preparation of Pieces for Test Purposes from Products*, 2010, reapproved 2015 .

2.3.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.- (~~Reserved~~)

NFPA 1961, *Standard for Fire Hose*, 2013 edition

Statement of Problem and Substantiation for Public Input

Referenced current SDO names, addresses, standard names, numbers, and editions.

Submitter Information Verification

Submitter Full Name: Aaron Adamczyk

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Sun Feb 07 19:04:25 EST 2016

Committee Statement

Resolution: FR-1-NFPA 1963-2017

Statement: Referenced current SDO names, addresses, standard names, numbers, and editions.



Public Input No. 4-NFPA 1963-2017 [Section No. 2.3.2]

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM B30, *Standard Specification for Copper Alloys in Ingot Form*, 2011 2016 .

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, 2011 _ 2016 .

ASTM B584, *Standard Specification for Copper Alloy Sand Castings for General Applications*, 2011 2014 .

ASTM D395- B , *Standard Test Methods for Rubber Property — Compression Set (Method B)*, 2008 2016 .

ASTM D573, *Standard Test Method for Rubber Deterioration in an Air Oven*, 2010 2004 (2015) .

ASTM D3183, *Standard Practice for Rubber — Preparation of Pieces for Test Purposes from Products*, 2010 (2015) .

Statement of Problem and Substantiation for Public Input

updates

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler

Organization: GBH International

Street Address:

City:

State:

Zip:

Submission Date: Thu Jan 05 12:32:48 EST 2017

Committee Statement

Resolution: FR-1-NFPA 1963-2017

Statement: Referenced current SDO names, addresses, standard names, numbers, and editions.



Public Input No. 2-NFPA 1963-2016 [Section No. 6.6.1]

6.6.1

Installation and removal of nonthreaded caps

6.6.1.1 Utilization without a tool. Nonthreaded caps

shall be permitted to have suction gaskets installed for suction-only applications..
designed to be removed without the use of a tool shall require a force between 6 lbf in – 30 lbf
in to install and remove.

6.6.1.2 Utilization with a tool. Nonthreaded caps designed for the use of a tool to remove shall
require a force of 168 lbf in – 312 lbf in to install and remove

Statement of Problem and Substantiation for Public Input

The current text of NFPA 1963 is unclear regarding force to install and remove caps for nonthreaded connections. This revision provides options to the end user to install caps consistent with the forces associated with pressure connections where desirable, and will also allow end users to install caps that require higher forces to remove where a form of tamper resistant cap is desired. A higher force to install and remove cap may be desirable to mitigate un-intended cap removal and tampering with the hydrant. Utilizing the force to connect and disconnect for pressure and suction applications provides force criteria that the industry is familiar with and essentially categorizes caps into two groups, those that can be removed by hand and those that require a tool to remove.

Submitter Information Verification

Submitter Full Name: Jeff Hebenstreit

Organization: UL LLC

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 27 12:42:32 EDT 2016

Committee Statement

Resolution: FR-2-NFPA 1963-2017

Statement: The current text of NFPA 1963 is unclear regarding force to install and remove caps for nonthreaded connections. This revision provides options to the end user to install caps consistent with the forces associated with pressure connections where desirable, and will also allow end users to install caps that require higher forces to remove where a form of tamper resistant cap is desired. A higher force to install and remove cap may be desirable to mitigate un-intended cap removal and tampering with the hydrant. Utilizing the force to connect and disconnect for pressure and suction applications provides force criteria that the industry is familiar with and essentially categorizes caps into two groups, those that can be removed by hand and those that require a tool to remove.



Public Input No. 3-NFPA 1963-2016 [Section No. A.6.6]

A.6.6

Suction gaskets will work in both pressure and suction applications but are difficult to compress by hand when mated to a pressure connection. In some areas a more tamper resistant non-thread cap may be desired by the end user. Caps with a force between 6 lbf in – 30 lbf in to remove are considered readily removable by hand. Caps with a force between 168 lbf in – 312 lbf in to remove generally would require the use of a tool to remove.

Statement of Problem and Substantiation for Public Input

The current text of NFPA 1963 is unclear regarding force to install and remove caps for nonthreaded connections. This revision provides options to the end user to install caps consistent with the forces associated with pressure connections where desirable, and will also allow end users to install caps that require higher forces to remove where a form of tamper resistant cap is desired. A higher force to install and remove cap may be desirable to mitigate un-intended cap removal and tampering with the hydrant. Utilizing the force to connect and disconnect for pressure and suction applications provides force criteria that the industry is familiar with and essentially categorizes caps into two groups, those that can be removed by hand and those that require a tool to remove.

Submitter Information Verification

Submitter Full Name: Jeff Hebenstreit

Organization: UL LLC

Street Address:

City:

State:

Zip:

Submission Date: Mon Jun 27 12:44:37 EDT 2016

Committee Statement

Resolution: [FR-3-NFPA 1963-2017](#)

Statement: The current text of NFPA 1963 is unclear regarding force to install and remove caps for nonthreaded connections. This revision provides options to the end user to install caps consistent with the forces associated with pressure connections where desirable, and will also allow end users to install caps that require higher forces to remove where a form of tamper resistant cap is desired. A higher force to install and remove cap may be desirable to mitigate un-intended cap removal and tampering with the hydrant. Utilizing the force to connect and disconnect for pressure and suction applications provides force criteria that the industry is familiar with and essentially categorizes caps into two groups, those that can be removed by hand and those that require a tool to remove.

MEMORANDUM

TO: Technical Committee on Fire Hose

FROM: Yiu Lee, *Project Administrator*

DATE: August 22, 2017

SUBJECT: NFPA 1963 First Draft Technical Committee FINAL Ballot Results (F2018)

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot.

29 Members Eligible to Vote

6 Members Not Returned (*Goodale, Cedrone, Farruggia, Kazmierzak, Lighthill, Walsh*)

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for each revision.

To pass ballot, each revision requires: (1) a simple majority of those eligible to vote and (2) an affirmative vote of $\frac{2}{3}$ of ballots returned. See Sections 3.3.4.3.(c) and 4.3.10.1 of the *Regulations Governing the Development of NFPA Standards*.



First Revision No. 1-NFPA 1963-2017 [Chapter 2]

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2007 2018 edition.

2.3 Other Publications.

2.3.1 ANSI/ASME Publications .

~~American National Standards Institute, 25 West 43rd Street, 4th floor~~ ASME International, Two Park Avenue , New York, NY 10036 10016-5990 .

~~ANSI/ ASME B1.2, Gages and Gaging for Unified Inch Screw Threads, 1983~~ 83rd edition, 1991, reaffirmed 2007 .

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM B30, *Standard Specification for Copper Alloys in Ingot Form*, 2011 2016 .

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, 2011 2016 .

ASTM B584, *Standard Specification for Copper Alloy Sand Castings for General Applications*, 2011 2014 .

ASTM D395-B , *Standard Test Methods for Rubber Property — Compression Set (Method B)* , 2008 2016 .

ASTM D573, *Standard Test Method for Rubber Deterioration in an Air Oven*, 2010 2004, reapproved 2015 .

ASTM D3183, *Standard Practice for Rubber — Preparation of Pieces for Test Purposes from Products*, 2010, reapproved 2015 .

2.3.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.-(Reserved)

NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances , 2019 edition.

NFPA 1961, *Standard for Fire Hose*, 2013 2019 edition.

NFPA 1964, *Standard for Spray Nozzles* , 2018 edition.

Submitter Full Name: Ken Holland

Organization: National Fire Protection Assoc

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 12 13:15:47 EDT 2017

Committee Statement

Committee Statement: Referenced current SDO names, addresses, standard names, numbers, and editions.

Response Message:

[Public Input No. 4-NFPA 1963-2017 \[Section No. 2.3.2\]](#)

[Public Input No. 1-NFPA 1963-2016 \[Chapter 2\]](#)

Ballot Results

✔ **This item has passed ballot**

29 Eligible Voters

6 Not Returned

22 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

1 Abstention

Not Returned

Cedrone, Michael

Farruggia, Thomas G.

Goodale, Jason

Kazmierzak, Brian P.

Lighthill, Mark Allen

Walsh, David

Affirmative All

Aubuchon, Sr., Michael S.

Betz, Bill C.

Cares, Jonathan R.

Ellison, Andrew D.

Fink, Brian

Glatts, James E.

Graves, William T.

Gray, Sean

Hebenstreit, Jeff

Jackson, Stephen

Kahle, Jayme L.

Larrabee, Jonathan

Leonhardt, Duane

Mayer, Michael

Nava, Nicholas A.

Quick, David

Radecky, Marc T.

Riggenbach, Jason D.

Schreiber, John D.

Stacey, John W.

Vanderlip, Tim

Wu, Samuel

Abstention

Budzinski, Christopher B.

I am unclear if the changes are accurate.



First Revision No. 4-NFPA 1963-2017 [Section No. 3.3.7]

3.3.7 Fire Department Connection.

A connection through which the fire department can pump supplemental water into the sprinkler system, standpipe, or other ~~system furnishing water for fire extinguishment to supplement~~ based fire protection systems, thereby supplementing existing water supplies.
[24, 2013 2019]

Submitter Information Verification

Submitter Full Name: Ken Holland

Organization: National Fire Protection Assoc

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jul 31 11:25:33 EDT 2017

Committee Statement

Committee Statement: These changes are being made as the extracted definition in the source document has changed, thus these changes needed to be made. This was identified after the first draft meeting and during the editorial process.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters

6 Not Returned

23 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cedrone, Michael

Farruggia, Thomas G.

Goodale, Jason

Kazmierzak, Brian P.

Lighthill, Mark Allen

Walsh, David

Affirmative All

Aubuchon, Sr., Michael S.

Betz, Bill C.

Budzinski, Christopher B.

Cares, Jonathan R.

Ellison, Andrew D.

Fink, Brian

Glatts, James E.

Graves, William T.

Gray, Sean

Hebenstreit, Jeff

Jackson, Stephen

Kahle, Jayme L.

Larrabee, Jonathan

Leonhardt, Duane

Mayer, Michael

Nava, Nicholas A.

Quick, David

Radecky, Marc T.

Riggenbach, Jason D.

Schreiber, John D.

Stacey, John W.

Vanderlip, Tim

Wu, Samuel



First Revision No. 5-NFPA 1963-2017 [Section No. 3.3.12.1]

3.3.12.1 Spray Nozzle.

~~An appliance.~~ A nozzle intended for connection to a hose line or monitor to discharge water in either a spray pattern or a straight stream pattern as selected by the operator. [1964, 2013 2018]

Submitter Information Verification

Submitter Full Name: Ken Holland

Organization: National Fire Protection Assoc

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jul 31 11:27:20 EDT 2017

Committee Statement

Committee Statement: These changes are being made as the extracted definition in the source document has changed, thus these changes needed to be made. This was identified after the first draft meeting and during the editorial process.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters

6 Not Returned

23 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cedrone, Michael

Farruggia, Thomas G.

Goodale, Jason

Kazmierzak, Brian P.

Lighthill, Mark Allen

Walsh, David

Affirmative All

Aubuchon, Sr., Michael S.

Betz, Bill C.

Budzinski, Christopher B.

Cares, Jonathan R.

Ellison, Andrew D.

Fink, Brian

Glatts, James E.

Graves, William T.

Gray, Sean

Hebenstreit, Jeff

Jackson, Stephen

Kahle, Jayme L.

Larrabee, Jonathan

Leonhardt, Duane

Mayer, Michael

Nava, Nicholas A.

Quick, David

Radecky, Marc T.

Riggenbach, Jason D.

Schreiber, John D.

Stacey, John W.

Vanderlip, Tim

Wu, Samuel



First Revision No. 2-NFPA 1963-2017 [Section No. 6.6.1]

6.6.1 Installation and Removal of Nonthreaded Caps.

~~Nonthreaded caps shall be permitted to have suction gaskets installed for suction-only applications.~~

6.6.1.1 Utilization without a tool.

Nonthreaded caps designed to be removed without the use of a tool shall require a force between 6 lbf in. and 30 lbf in. to install and remove.

6.6.1.2 Utilization with a tool.

Nonthreaded caps designed for the use of a tool to remove shall require a force of 168 lbf in. to 312 lbf in. to install and remove.

Submitter Information Verification

Submitter Full Name: Ken Holland

Organization: National Fire Protection Assoc

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 12 14:00:16 EDT 2017

Committee Statement

Committee Statement: The current text of NFPA 1963 is unclear regarding force to install and remove caps for nonthreaded connections. This revision provides options to the end user to install caps consistent with the forces associated with pressure connections where desirable, and will also allow end users to install caps that require higher forces to remove where a form of tamper resistant cap is desired. A higher force to install and remove cap may be desirable to mitigate un-intended cap removal and tampering with the hydrant. Utilizing the force to connect and disconnect for pressure and suction applications provides force criteria that the industry is familiar with and essentially categorizes caps into two groups, those that can be removed by hand and those that require a tool to remove.

Response

Message:

Public Input No. 2-NFPA 1963-2016 [Section No. 6.6.1]

Ballot Results

✔ **This item has passed ballot**

29 Eligible Voters

6 Not Returned

23 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cedrone, Michael

Farruggia, Thomas G.

Goodale, Jason

Kazmierzak, Brian P.

Lighthill, Mark Allen

Walsh, David

Affirmative All

Aubuchon, Sr., Michael S.

Betz, Bill C.

Budzinski, Christopher B.

Cares, Jonathan R.

Ellison, Andrew D.

Fink, Brian

Glatts, James E.

Graves, William T.

Gray, Sean

Hebenstreit, Jeff

Jackson, Stephen

Kahle, Jayme L.

Larrabee, Jonathan

Leonhardt, Duane

Mayer, Michael

Nava, Nicholas A.

Quick, David

Radecky, Marc T.

Riggenbach, Jason D.

Schreiber, John D.

Stacey, John W.

Vanderlip, Tim

Wu, Samuel



First Revision No. 3-NFPA 1963-2017 [Section No. A.6.6]

A.6.6

Suction gaskets will work in both pressure and suction applications but are difficult to compress by hand when mated to a pressure connection. In some areas a more tamper-resistant nonthread cap could be desired by the end user. Caps with a force between 6 lbf in. and 30 lbf in. to remove are considered readily removable by hand. Caps with a force between 168 lbf in. and 312 lbf in. to remove generally would require the use of a tool to remove.

Submitter Information Verification

Submitter Full Name: Ken Holland

Organization: National Fire Protection Assoc

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 12 14:02:06 EDT 2017

Committee Statement

Committee Statement: The current text of NFPA 1963 is unclear regarding force to install and remove caps for nonthreaded connections. This revision provides options to the end user to install caps consistent with the forces associated with pressure connections where desirable, and will also allow end users to install caps that require higher forces to remove where a form of tamper resistant cap is desired. A higher force to install and remove cap may be desirable to mitigate un-intended cap removal and tampering with the hydrant. Utilizing the force to connect and disconnect for pressure and suction applications provides force criteria that the industry is familiar with and essentially categorizes caps into two groups, those that can be removed by hand and those that require a tool to remove.

Response Message:

[Public Input No. 3-NFPA 1963-2016 \[Section No. A.6.6\]](#)

Ballot Results

✔ This item has passed ballot

29 Eligible Voters

6 Not Returned

23 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cedrone, Michael
Farruggia, Thomas G.
Goodale, Jason
Kazmierzak, Brian P.
Lighthill, Mark Allen
Walsh, David

Affirmative All

Aubuchon, Sr., Michael S.
Betz, Bill C.
Budzinski, Christopher B.
Cares, Jonathan R.
Ellison, Andrew D.
Fink, Brian
Glatts, James E.
Graves, William T.
Gray, Sean
Hebenstreit, Jeff
Jackson, Stephen
Kahle, Jayme L.
Larrabee, Jonathan
Leonhardt, Duane
Mayer, Michael
Nava, Nicholas A.
Quick, David
Radecky, Marc T.
Riggenbach, Jason D.
Schreiber, John D.
Stacey, John W.
Vanderlip, Tim
Wu, Samuel