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SCREW THREADS AND GASKETS FOR FIRE HOSE CONNECTIONS 1979

NATIONAL FIRE PROTECTION ASSOCIATION, INC.

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SC-FM-79

Standard for

Screw Threads and Gaskets for Fire Hose Connections

NFPA 1963 — 1979

1979 Edition of NFPA 1963

This 1979 edition of NFPA 1963, *Standard for Screw Threads and Gaskets for Fire Hose Connections* (formerly NFPA 194), was prepared by the Committee on Fire Hose and was adopted by the National Fire Protection Association, Inc., on November 13, 1979, at its Fall Meeting in Phoenix, Arizona. It was released by the Standards Council for publication on December 3, 1979.

This revision was undertaken to include metric conversion where applicable, and to make minor revisions and some editorial corrections.

Origin and Development of NFPA 1963

The development of a standard for screw threads and gaskets for fire hose connections has been worked on for nearly a century. Specifications for hose couplings were drawn up by the NFPA as early as 1898. The present standard covers the 10 standard sizes of threaded connections from ¾-in. to 6-in.

An NFPA committee appointed in 1905 established a national standard thread for 2½-in. and larger hose connections. Work on smaller hose threads was started in 1916 and the standard was adopted in 1922. The standard for suction hose coupling threads was adopted in 1955. Editions published in 1956, 1967, 1968, and 1974 incorporated changes adopted by the NFPA upon recommendations of the Committee on Fire Hose. See Appendix C for a detailed history.

(continued)

The need for this standard is most apparent during operations involving mutual aid by various fire fighting organizations, i.e.: nearby municipalities, governmental and industrial departments. When hose couplings, nozzles and other equipment do not conform to this standard it becomes necessary to employ adaptors, thus adding complications and confusion to fire fighting operations.

There are many different screw threads which give the appearance of compatibility. What may appear to be a good connection when the lines are not pressurized may actually be loose, cross threaded or improperly mated connections which have a tendency to fail when the hose lines are pressurized, thus seriously impairing fire fighting operations and possibly causing a hazard to personnel.

Conformity with this standard will result in fire fighting equipment that is intended to be serviceable, economical, easily assembled and provide maximum effectiveness in fire fighting operations.

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Standard for
Screw Threads and Gaskets for Fire Hose Connections

NFPA 1963 — 1979

NOTICE

An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Appendix B.

Chapter 1 Administration

1-1* Scope. This standard gives the dimensions for screw thread connections, gages, gaskets, gasket seats, and the size thread of threaded connections specified herein. It shall apply to all sizes of:

Fire hose couplings	Adaptors
Suction hose couplings	Reducers
Relay supply hose couplings	Caps
Fire pump suctions	Plugs
Discharge valves	Wyes
Fire hydrants	Siamese connections
Nozzles	Standpipe connections
Booster hose	Sprinkler connections

and all other hose fittings, connections and appliances that connect to or with fire pumps, hose and or hydrants. The sizes covered include fire hose connections with nominal sizes from ¾-in. through 6-in.

1-2 Purpose. The purpose of this standard shall be to provide uniformity and interchangeability of fire hose coupling threads and all other hose fittings, connections, and appliances that connect to or with fire pumps, hose, and hydrants.

1-3 Definitions.

1-3.1* Approved. Acceptable to the authority having jurisdiction.

1-3.2* Authority Having Jurisdiction. The organization, office, or individual responsible for "approving" equipment, an installation, or a procedure.

1-3.3 Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

1-3.4* Listed. Equipment or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

1-3.5 May. This term is used to state a permissive use or an alternative method to a specified requirement.

1-3.6 Shall. This term indicates a mandatory requirement.

1-3.7 Should. Indicates a recommendation or that which is advised but not required.

Chapter 2 Form of Thread

2-1 Basic Form of Thread. Basic thread form shall have an included angle of 60 degrees and truncated top and bottom. (*See Figure 4-1.1.*)

2-1.1 Angle of Thread. 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.

2-1.2 Flat at Crest and Root. The flat at the root and crest of the basic thread form shall be ⅛ times the pitch, or 0.125 times the pitch $\left(\frac{p}{8}\right)$. (*See Figure 4-1.1.*)

2-1.3 Height of Thread. The height of the basic thread shall be $h = 0.649519 \times p$, or $h = \frac{0.649519}{n}$ where: p = pitch in inches, or $p = \frac{1}{n}$; n = number of threads per inch; h = basic thread height in inches.

2-2 Blunt Start. The outer ends of all external and internal threads shall be terminated by the blunt start or "Higbee Cut" on full thread to avoid crossing and mutilation of thread. (*See Figure 4-1.2.*)

Chapter 3 Thread Series Designation

3-1 Thread Designation. These threaded connections shall be defined as the "American National Fire Hose Connection Screw Thread" and abbreviated throughout the standard as NH (also known as NST and NS). It shall be designated by specifying in sequence the nominal size of the connection, number of threads per inch, and the thread symbol as shown below:

.75- 8NH	3.5-6NH
1- 8NH	4-4NH
1.5- 9NH	4.5-4NH
2.5-7.5NH	5-4NH
3- 6NH	6-4NH

Chapter 4 Dimensions of American National Fire Hose Connection Screw Threads, NH

4-1 Definitions of Dimensions.

4-1.1 The basic major diameter, basic pitch diameter, and basic minor diameter and tolerances shall be as specifically defined in Figure 4-1.1.

4-1.2 Nominal dimensions shall be as specifically defined in Figure 4-1.2.

4-2 Dimensions.

4-2.1 Basic Dimensions. The basic dimensions for the threads shall be as shown in Table 4-2.1.

4-2.2 Nominal Dimensions. The nominal dimensions for the threads shall be as shown in Table 4-2.2.

4-3 Limiting Dimensions.

4-3.1 The limiting dimensions for external threads (nipple) shall be as shown in Table 4-3.1.

4-3.2 The limiting dimensions for internal threads (coupling) shall be as shown in Table 4-3.2.

4-4 Tolerance.

4-4.1 The pitch diameter tolerances for a mating external (nipple) and internal (coupling) thread shall be the same. Pitch diameter tolerances include lead and half-angle deviations. Values for deviations in lead and half angle consuming one-half of the pitch diameter tolerance shall be as defined in Table 4-4.1.

4-4.2 The tolerance relationships for the external (nipple) threads shall be as follows:

Major Diameter Tolerance = 2 × Pitch Diameter Tolerance.
Minor Diameter Tolerance =
Pitch Diameter Tolerance + 2h/9.

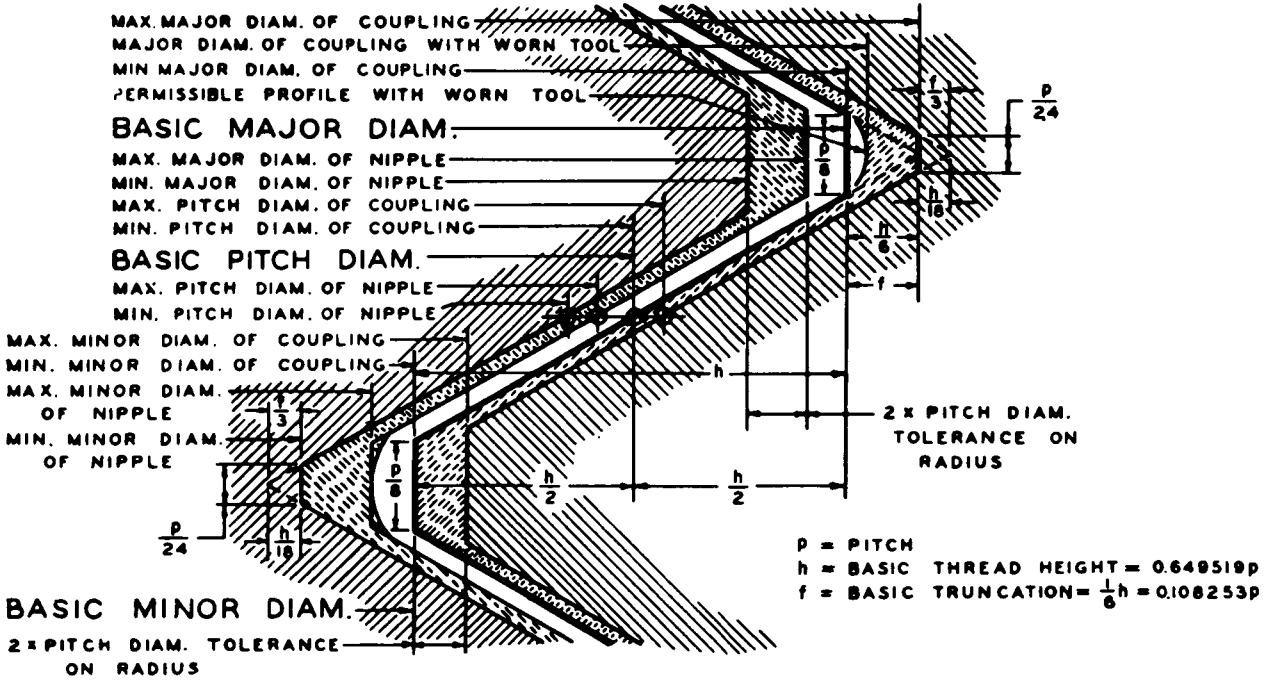

Figure 4-1.1 Form of thread of American National Fire Hose Connection Screw Thread, NH. The left-hand portion shows the external thread (nipple) and the right-hand portion the internal thread (coupling). (*See Table 4-2.1 for dimensions.*)

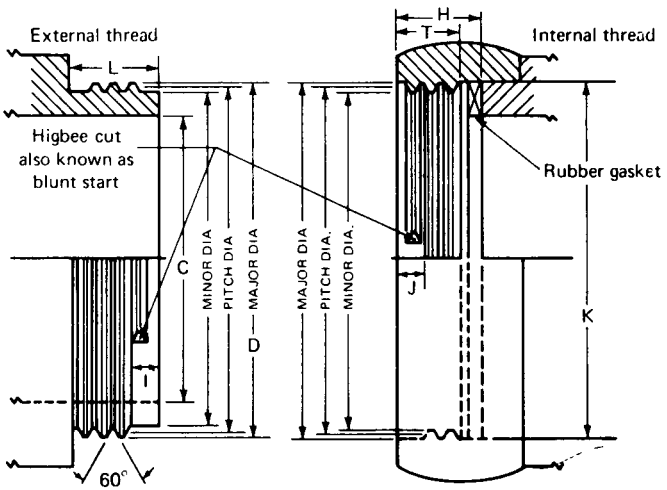

Figure 4-1.2 Nominal dimensions of connections.
(See Table 4-2.2 for dimensions.)

C = Inside diameter of connection waterway. (Nominal size of connection.)

D = Approximate outside diameter of external thread (ODM).

H = Depth of internal connection.

I = Length of the pilot from the face of the external connection to the start of the second thread (higbee cut).

J = Distance from the face of the internal connection to the start of the second thread (higbee cut).

K = Diameter of the gasket seat.

L = Length of external thread.

T = Length of internal thread.

Table 4-2.1 Basic dimensions of NH threads. (*See Figure 4-1.1.*)

Nominal Size of Connection	Threads[a] per Inch (tpi)	Thread[a] Designation (NH)	Pitch (p)	Basic Thread Height (h)	External Thread Dimensions (Nipple)				Minimum Internal Thread Dimensions		
					Allowance	Maximum Major Diameter, D-allow.	Maximum Pitch Diameter, Col. 7-h	Maximum Minor Diameter, Col. 7-2h	Minimum Minor Diameter, D-2h	Basic Pitch Diameter, D-h	Basic Major Diameter, D
1	2	3	4	5	6	7	8	9	10	11	12
¾	8	.75-8 NH	0.12500	0.08119	0.0120	1.3750	1.2938	1.2126	1.2246	1.3058	1.3870
1	8	1-8 NH	0.12500	0.08119	0.0120	1.3750	1.2938	1.2126	1.2246	1.3058	1.3870
1½	9	1.5-9 NH	0.11111	0.07217	0.0120	1.9900	1.9178	1.8457	1.8577	1.9298	2.0020
2½	7.5	2.5-7.5 NH	0.13333	0.08660	0.0150	3.0686	2.9820	2.8954	2.9104	2.9970	3.0836
3	6	3-6 NH	0.16667	0.10825	0.0150	3.6239	3.5156	3.4073	3.4223	3.5306	3.6389
3½	6	3.5-6 NH	0.16667	0.10825	0.0200	4.2439	4.1356	4.0273	4.0473	4.1556	4.2639
4	4	4-4 NH	0.25000	0.16238	0.0250	5.0109	4.8485	4.6861	4.7111	4.8735	5.0359
4½	4	4.5-4 NH	0.25000	0.16238	0.0250	5.7609	5.5985	5.4361	5.4611	5.6235	5.7859
5	4	5-4 NH	0.25000	0.16238	0.0250	6.2600	6.0976	5.9352	5.9602	6.1226	6.2850
6	4	6-4 NH	0.25000	0.16238	0.0250	7.0250	6.8626	6.7002	6.7252	6.8876	7.0500

[a]All other values are given in inches.

Table 4-2.2 Nominal dimensions of NH threads. (*See Figure 4-1.2.*)

Nominal Size of Connection Waterway C	Threads[a] per Inch (tpi) N	Thread[a] Designation (NH)	Approximate Outside Diameter of External Thread D†	Length of External Thread (Min.) L	Length of Pilot to Start of Second Thread (External) I	Depth of Internal Connector H	Diameter of Gasket Seat in Coupling K	Length of Internal Thread T	Length of Pilot to Start of Second Thread (Internal) J
¾	8	.75-8 NH	1⅜	⅝	5/32	19/32	1-7/16	13/32	5/32
1	8	1-8 NH	1⅜	⅝	5/32	19/32	1-7/16	13/32	5/32
1½	9	1.5-9 NH	2	⅝	5/32	19/32	2-1/16	13/32	5/32
2½	7½	2.5-7.5 NH	3-1/16	1	¼	15/16	3-3/16	11/16	3/16
3	6	3-6 NH	3⅝	1⅛	5/16	1-1/16	3¾	¾	¼
3½	6	3.5-6 NH	4¼	1⅛	5/16	1-1/16	4⅜	¾	¼
4	4	4-4 NH	5	1¼	7/16	1-3/16	5⅛	⅞	⅜
4½	4	4.5-4 NH	5¾	1¼	7/16	1-3/16	5⅞	⅞	⅜
5*	4	5-4 NH	6¼	1⅜	7/16	1-5/16	6⅜	1	⅜
6*	4	6-4 NH	7-1/32	1⅜	7/16	1-5/16	7⅛	1	⅜

*These sizes not recommended for fire hydrant connections. (*See Appendix A-7-8.*)

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

[a] All other values are given in inches.

Table 4-3.1 Limits of size and tolerances for NH external threads (nipples).

Nominal Size of Connection	Threads[a] per Inch (tpi)	Thread[a] Designation (NH)	Pitch (p)	Basic Thread Height (h)	External Thread (Nipple)						
					Major Diameter			Pitch Diameter			Minor[b] Diameter
					Maximum	Minimum	Tolerance	Maximum	Minimum	Tolerance	Maximum
1	2	3	4	5	6	7	8	9	10	11	12
¾	8	.75-8 NH	0.12500	0.08119	1.3750	1.3528	0.0222	1.2938	1.2827	0.0111	1.2126
1	8	1-8 NH	0.12500	0.08119	1.3750	1.3528	0.0222	1.2938	1.2827	0.0111	1.2126
1½	9	1.5-9 NH	0.11111	0.07217	1.9900	1.9678	0.0222	1.9178	1.9067	0.0111	1.8457
2½	7.5	2.5-7.5 NH	0.13333	0.08660	3.0686	3.0366	0.0320	2.9820	2.9660	0.0160	2.8954
3	6	3-6 NH	0.16667	0.10825	3.6239	3.5879	0.0360	3.5156	3.4976	0.0180	3.4073
3½	6	3.5-6 NH	0.16667	0.10825	4.2439	4.2079	0.0360	4.1356	4.1176	0.0180	4.0273
4	4	4-4 NH	0.25000	0.16238	5.0109	4.9609	0.0500	4.8485	4.8235	0.0250	4.6861
4½	4	4.5-4 NH	0.25000	0.16238	5.7609	5.7109	0.0500	5.5985	5.5735	0.0250	5.4361
5	4	5-4 NH	0.25000	0.16238	6.2600	6.2100	0.0500	6.0976	6.0726	0.0250	5.9352
6	4	6-4 NH	0.25000	0.16238	7.0250	6.9750	0.0500	6.8626	6.8376	0.0250	6.7002

[a]All other values are given in inches.

[b]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 11h/9 (or 0.7939p) from the minimum pitch diameter of the nipple.

Table 4-3.2 Thread limits of size and tolerances for NH internal threads (couplings).

Nominal Size of Connection	Threads[a] per Inch (tpi)	Thread[a] Designation (NH)	Pitch (p)	Basic Thread Height (h)	Internal Thread (Coupling)						
					Minor Diameter			Pitch Diameter			Major[b] Diameter
					Minimum	Maximum	Tolerance	Minimum	Maximum	Tolerance	Minimum
1	2	3	4	5	6	7	8	9	10	11	12
¾	8	.75-8 NH	0.12500	0.08119	1.2246	1.2468	0.0222	1.3058	1.3169	0.0111	1.3870
1	8	1-8 NH	0.12500	0.08119	1.2246	1.2468	0.0222	1 3058	1.3169	0.0111	1.3870
1½	9	1.5-9 NH	0.11111	0.07217	1.8577	1.8799	0.0222	1.9298	1.9409	0.0111	2.0020
2½	7.5	2.5-7.5 NH	0.13333	0.08660	2.9104	2.9424	0.0320	2.9970	3.0130	0.0160	3.0836
3	6	3-6 NH	0.16667	0.10825	3.4223	3.4583	0.0360	3.5306	3.5486	0.0180	3.6389
3½	6	3.5-6 NH	0.16667	0.10825	4.0473	4.0833	0.0360	4.1556	4.1736	0.0180	4.2639
4	4	4-4 NH	0.25000	0.16238	4.7111	4.7611	0.0500	4.8735	4.8985	0.0250	5.0359
4½	4	4.5-4 NH	0.25000	0.16238	5.4611	5.5111	0.0500	5.6235	5.6485	0.0250	5.7859
5	4	5-4 NH	0.02500	0.16238	5.9602	6.0102	0.0500	6.1226	6.1476	0.0250	6.2850
6	4	6-4 NH	0.25000	0.16238	6.7252	6.7752	0.0500	6.8876	6.9126	0.0250	7.0500

[a]All other values are given in inches.

[b]Dimensions for the minimum major diameter of the coupling correspond to the basic flat (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 may be determined by adding 11h/9 (or 0.7939p) to the maximum pitch diameter of the coupling.

Table 4-4.1 Deviations in lead and half-angle consuming one-half of pitch diameter tolerances for NH threads.

Nominal Size of Connection	Thread[a] per Inch (tpi)	Thread[a] Designation (NH)	Pitch[b] Diameter Tolerance	Lead Deviation[c] Consuming One-Half of Pitch Diameter Tolerance	Half-Angle[a] Deviation Consuming One-Half of Pitch Diameter Tolerance	
					deg	min
¾	8	.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

[a]All other values are in inches.

[b]The 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 Column 4. 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 gage.

[c]Between any two threads not farther apart than the length of engagement.

4-4.3 The minimum minor diameter of the external thread (nipple) shall be such as to result in a flat equal to ⅓ of the p/8 basic flat (p/24) at the root when the pitch diameter of the nipple is at its minimum value. The maximum minor diameter is basic, but may be such as results from the use of a worn or rounded threading tool. This is the maximum minor diameter shown on Figure 4-1.1 and is the diameter on which the minor diameter tolerance formula shown above is based.

4-4.4 The tolerance relationships for the internal (coupling) threads shall be as follows:

Minor diameter tolerance = 2 × Pitch Diameter Tolerance.

The minimum minor diameter of a coupling is 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.

Major diameter tolerance =
pitch diameter tolerance + 2h/9.

Chapter 5 Gages and Gaging NH Threads

5-1 Limits of Size.

5-1.1 The limits of size for the gages to be used in the gaging of fire hose connections shall be as shown in Tables 5-1.1, 5-1.2, and 5-1.3.

5-1.2 Allowable Variation. For these gages, 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 is ± 5 min.

5-1.3* Except as otherwise specified herein, the gages and gaging practices shall conform to the latest edition of ANSI B1.2, *Screw Thread Gages and Gaging*.

5-1.4* Adjustable thread ring gages shall be set by means of threaded setting plug gages, the dimensions of which are given in Table 5-1.1. Means of setting ring gages are specified in ANSI B1.2.

Table 5-1.1 Setting thread plug limits of size for NH thread ring gages[a].

Nominal Size of Connection	Threads[b] per Inch (tpi)	Thread[b] Designation (NH)		X Truncated Setting Plugs						X Basic-Crest[c] Setting Plugs	
				Plug for GO Thread Gage			Plug for LO(NOT GO) Thread Gage			Major Diameter	
				Major Diameter		Pitch Diameter	Major Diameter		Pitch Diameter	Plug for GO Thread Gage	Plug for LO(NOT GO) Thread Gage
				Truncated	Full		Truncated	Full			
Gage Tolerance				−	+	−	−	+	+	+	+
1	2	3	4	5	6	7	8	9	10	11	12
¾	8	.75-8 NH	Max	1.3579	1.3757	1.2938	1.3368	1.3757	1.2831	1.3757	1.3757
			Min	1.3572	1.3750	1.2934	1.3361	1.3750	1.2827	1.3750	1.3750
1	8	1-8 NH	Max	1.3579	1.3757	1.2938	1.3368	1.3757	1.2831	1.3757	1.3757
			Min	1.3572	1.3750	1.2934	1.3361	1.3750	1.2827	1.3750	1.3750
1½	9	1.5-9 NH	Max	1.9742	1.9907	1.9178	1.9548	1.9907	1.9071	1.9907	1.9907
			Min	1.9735	1.9900	1.9174	1.9541	1.9900	1.9067	1.9900	1.9900
2½	7.5	2.5-7.5 NH	Max	3.0507	3.0693	2.9820	3.0237	3.0693	2.9665	3.0693	3.0693
			Min	3.0500	3.0686	2.9815	3.0230	3.0686	2.9660	3.0686	3.0686
3	6	3-6 NH	Max	3.6029	3.6247	3.5156	3.5698	3.6247	3.4981	3.6247	3.6247
			Min	3.6021	3.6239	3.5151	3.5690	3.6239	3.4976	3.6239	3.6239
3½	6	3.5-6 NH	Max	4.2229	4.2452	4.1356	4.1898	4.2452	4.1182	4.2452	4.2452
			Min	4.2216	4.2439	4.1350	4.1885	4.2439	4.1176	4.2439	4.2439
4	4	4-4 NH	Max	4.9828	5.0124	4.8485	4.9318	5.0124	4.8241	5.0124	5.0124
			Min	4.9813	5.0109	4.8479	4.9303	5.0109	4.8235	5.0109	5.0109
4½	4	4.5-4 NH	Max	5.7328	5.7624	5.5985	5.6818	5.7624	5.5741	5.7624	5.7624
			Min	5.7313	5.7609	5.5979	5.6803	5.7609	5.5735	5.7609	5.7609
5	4	5-4 NH	Max	6.2319	6.2615	6.0976	6.1809	6.2615	6.0732	6.2615	6.2615
			Min	6.2304	6.2600	6.0970	6.1794	6.2600	6.0726	6.2600	6.2600
6	4	6-4 NH	Max	6.9969	7.0265	6.8626	6.9459	7.0265	6.8382	7.0265	7.0265
			Min	6.9954	7.0250	6.8620	6.9444	7.0250	6.8376	7.0250	7.0250

[a]Gage limit values in this table have been obtained in accordance with ANSI B1.2

[b]All other values are given in inches

[c]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 5-1.2 Gage limits of size for ring gages for NH external (nipple) thread[a].

Nominal Size of Connection	Threads[b] per Inch (tpi)	Thread[b] Designation (NH)		X Thread Ring Gages				Z Plain Ring Gages	
				GO		LO(NOT GO)		Major Diameter	
				Pitch Diameter	Minor Diameter	Pitch Diameter	Minor Diameter	GO	NOT GO
Gage Tolerance				−	−	+	+	−	−
1	2	3	4	5	6	7	8	9	10
¾	8	.75-8 NH	Max	1.2938	1.2246	1.2831	1.2563	1.37500	1.35292
			Min	1.2934	1.2239	1.2827	1.2556	1.37488	1.35280
1	8	1-8 NH	Max	1.2938	1.2246	1.2831	1.2563	1.37500	1.35292
			Min	1.2934	1.2239	1.2827	1.2556	1.37488	1.35280
1½	9	1.5-9 NH	Max	1.9178	1.8577	1.9071	1.8833	1.99000	1.96796
			Min	1.9174	1.8570	1.9067	1.8826	1.98984	1.96780
2½	7.5	2.5-7.5 NH	Max	2.9820	2.9104	2.9665	2.9378	3.06860	3.03680
			Min	2.9815	2.9097	2.9660	2.9371	3.06840	3.03660
3	6	3-6 NH	Max	3.5156	3.4223	3.4981	3.4623	3.62390	3.58810
			Min	3.5151	3.4215	3.4976	3.4615	3.62370	3.58790
3½	6	3.5-6 NH	Max	4.1356	4.0473	4.1182	4.0828	4.24390	4.20810
			Min	4.1350	4.0460	4.1176	4.0815	4.24370	4.20790
4	4	4-4 NH	Max	4.8485	4.7111	4.8241	4.7709	5.01090	4.96115
			Min	4.8479	4.7096	4.8235	4.7694	5.01065	4.96090
4½	4	4.5-4 NH	Max	5.5985	5.4611	5.5741	5.5209	5.76090	5.71115
			Min	5.5979	5.4596	5.5735	5.5194	5.76065	5.71090
5	4	5-4 NH	Max	6.0976	5.9602	6.0732	6.0200	6.26000	6.21025
			Min	6.0970	5.9587	6.0726	6.0185	6.25975	6.21000
6	4	6-4 NH	Max	6.8626	6.7252	6.8382	6.7850	7.02500	6.97532
			Min	6.8620	6.7237	6.8376	6.7835	7.02468	6.97500

[a]Gage limit values in this table have been obtained in accordance with ANSI B1.2 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.

[b]All other values are given in inches.

Table 5-1.3 Gage limits of size for plug gages for NH internal (coupling) threads[a].

Nominal Size of Connection	Threads[b] per Inch (tpi)	Thread[b] Designation (NH)		X Thread Plug Gages				Z Plain Plug Gages	
				GO		HI(NOT GO)		Minor Diameter	
				Major Diameter	Pitch Diameter	Major Diameter	Pitch Diameter	GO	NOT GO
Gage Tolerance				+	+	−	−	+	
1	2	3	4	5	6	7	8	9	10
¾	8	.75-8 NH	Max	1.3877	1.3062	1.3710	1.3169	1.22472	1.24680
			Min	1.3870	1.3058	1.3703	1.3165	1.22460	1.24668
1	8	1-8 NH	Max	1.3877	1.3062	1.3710	1.3169	1.22472	1.24680
			Min	1.3870	1.3058	1.3703	1.3165	1.22460	1.24668
1½	9	1.5-9 NH	Max	2.0027	1.9302	1.9890	1.9409	1.85786	1.87990
			Min	2.0020	1.9298	1.9883	1.9405	1.85770	1.87974
2½	7.5	2.5-7.5 NH	Max	3.0843	2.9975	3.0707	3.0130	2.91060	2.94240
			Min	3.0836	2.9970	3.0700	3.0125	2.91040	2.94220
3	6	3-6 NH	Max	3.6397	3.5311	3.6208	3.5486	3.42250	3.45830
			Min	3.6389	3.5306	3.6200	3.5481	3.42230	3.45810
3½	6	3.5-6 NH	Max	4.2652	4.1562	4.2458	4.1736	4.04750	4.08330
			Min	4.2639	4.1556	4.2445	4.1730	4.04730	4.08310
4	4	4-4 NH	Max	5.0374	4.8741	5.0068	4.8985	4.71135	4.76110
			Min	5.0359	4.8735	5.0053	4.8979	4.71110	4.76085
4½	4	4.5-4 NH	Max	5.7874	5.6241	5.7568	5.6485	5.46135	5.51110
			Min	5.7859	5.6235	5.7553	5.6479	5.46110	5.51085
5	4	5-4 NH	Max	6.2865	6.1232	6.2559	6.1476	5.96045	6.01020
			Min	6.2850	6.1226	6.2544	6.1470	5.96020	6.00995
6	4	6-4 NH	Max	7.0515	6.8882	7.0209	6.9126	6.72552	6.77520
			Min	7.0500	6.8876	7.0194	6.9120	6.72520	6.77488

[a]Gage limit values in this table have been obtained in accordance with ANSI B1.2.

[b]All other values are given in inches.

Chapter 6 Gaskets for Connections with NH Threads

6-1 Thread Gasket.

6-1.1 Each internal connection shall be provided with a resilient gasket which does not leak under normal use when fitted accurately in the seat specified in this standard.

6-1.2 Each gasket shall meet the dimensions of Table 6-1.2.

Table 6-1.2 Dimensions of thread gaskets for standard internal connections.

Nominal Size of Connection	Inside Diameter	Outside Diameter	Thickness
¾	13/16 (20.6)	1 7/16 (36.5)	⅛ (3.18)
1	1 1/16 (27)	1 7/16 (36.5)	⅛ (3.18)
1½	1 9/16 (40)	2 1/16 (52)	⅛ (3.18)
2½	2 9/16 (65)	3 3/16 (81)	3/16 (4.8)
3	3 1/16 (78)	3¾ (95)	¼ (6.4)
3½	3 9/16 (91)	4⅜ (111)	¼ (6.4)
4	4 1/16 (103)	5⅛ (130)	¼ (6.4)
4½	4 9/16 (117)	5⅞ (149)	¼ (6.4)
5	5 1/16 (129)	6⅜ (162)	¼ (6.4)
6	6 1/16 (154)	7⅛ (181)	¼ (6.4)

All dimensions are given in inches (mm).

6-2 Tail Gasket. Each fire hose coupling end shall be provided with a resilient gasket which keeps the ends of the fabric of the fire hose dry. The nominal dimensions of these gaskets shall be as follows:

I.D. as shown in Table 6-1.2.
O.D. to accurately fit the recess provided.
Thickness 3/16 in. (4.8 mm) minimum.

Chapter 7 Use of NH Standard Threads

7-1* General. This chapter details which size NH standard thread shall be provided on the connections discussed in the scope.

7-2* Hose Coupling Threads.

7-2.1* Booster Hose. All ¾-in. and 1-in. (20-mm and 25-mm) booster hose shall be provided with couplings having the .75-8NH standard thread and 1-8NH standard thread respectively.

7-2.2 1½- Through 2-In. (38- Through 51-mm) Fire Hose. All 1½- through 2-in. (38- through 51-mm) fire hose shall be provided with couplings having the 1.5-9NH standard thread.

7-2.3 2½-In. (65-mm) Fire Hose. All 2½-in. (65-mm) fire hose shall be provided with couplings having the 2.5-7.5NH standard thread.

7-2.4 3-In. (76-mm) Fire Hose. All 3-in. (76-mm) fire hose shall be provided with couplings having the 2.5-7.5NH standard thread for interchangeability with 2½-in. (65-mm) fire hose.

Exception: Where interchangeability is not a factor, the couplings may have the 3-6NH standard thread.

7-2.5 3½-In. (89-mm) Fire Hose. All 3½-in. (89-mm) fire hose shall be provided with couplings having the 3.5-6NH standard thread.

Exception: Where interchangeability with 3-in. (76-mm) hose or other connections is required the couplings may have the 3-6NH standard thread.

7-2.6 4-In. (102-mm) Fire Hose. All 4-in. (102-mm) fire hose shall be provided with couplings having the 4-4NH standard thread.

Exception: Where interchangeability with 3½-in. (89-mm) hose or other connections is required the couplings may have the 3.5-6NH standard thread.

7-2.7 3½-In. (89-mm) Relay Supply Hose. All 3½-in. (89-mm) relay supply hose shall be provided with couplings having the 3.5-6NH standard thread.

Exception: Where interchangeability with 3-in. (76-mm) hose or other connections is required the couplings may have the 3-6NH standard thread.

7-2.8 4-In. (102-mm) Relay Supply Hose. All 4-in. (102-mm) relay supply hose shall be provided with couplings having the 4-4NH standard thread.

Exception: Where interchangeability with 3½-in. (89-mm) hose or other connections is required the couplings may have the 3.5-6NH standard thread.

7-2.9 4½-In. (114-mm) Relay Supply Hose. All 4½-in. (114-mm) relay supply hose shall be provided with couplings having the 4.5-4NH standard thread.

Exception: Where interchangeability with 4-in. (102-mm) hose or other connections is required the couplings may have the 4-4NH standard thread.

7-2.10 5-In. (127-mm) Relay Supply Hose. All 5-in. (127-mm) relay supply hose shall be provided with couplings having the 5-4NH standard thread.

Exception: Where interchangeability with 4½-in. (114-mm) hose or other connections is required the couplings may have the 4.5-4NH standard thread.

7-2.11 6-In. (152-mm) Relay Supply Hose. All 6-in. (152-mm) relay supply hose shall be provided with couplings having the 6-4NH standard thread.

Exception: Where interchangeability with 5-in. (127-mm) hose or other connections is required the couplings may have the 5-4NH standard thread.

7-2.12* Suction Hose. Suction hose shall be provided with expansion ring-type couplings having the NH standard thread. The thread size for 4-in. (102-mm) and larger suction hose shall be standard for the size connections specified in NFPA 1901, *Standard on Automotive Fire Apparatus*. (*See Figure 7-2.12.*)

7-3* Threads for Fire Service Nozzles for Handlines.

7-3.1 Playpipes for connecting shutoff nozzles to 2½-in. (65-mm) fire hose shall have the 2.5-7.5NH standard thread at the base or inlet and the 1.5-9NH standard thread at the discharge end. (*See Figure 7-3.1.*)

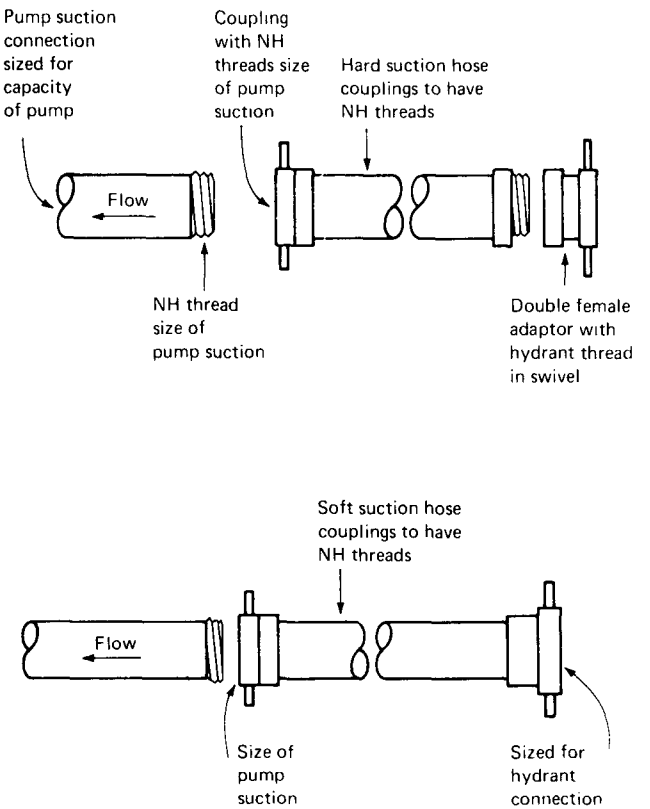

Figure 7-2.12

7-3.2 Nozzle shutoff valves for either 2½-in. nozzles or 1½-in. nozzles shall have the 1.5-9NH standard thread for both the inlet and discharge sides of the valve. (*See Figure 7-3.2 for 1½-in. and Figure 7-3.1 for 2½-in.*)

Exception: Where the valve is an integral nondetachable part of a 2½-in. playpipe the 1.5-9NH standard thread shall be provided only on discharge side of the valve.

7-3.3* All nozzles used on booster hose shall have the 1-8NH standard thread.

7-3.4 All nozzle tips for use on 2½-in. and 1½-in. nozzles shall have the 1.5-9NH standard thread.

Exception: Large stream nozzles as defined in Section 7-4 of this standard are exempt from this requirement.

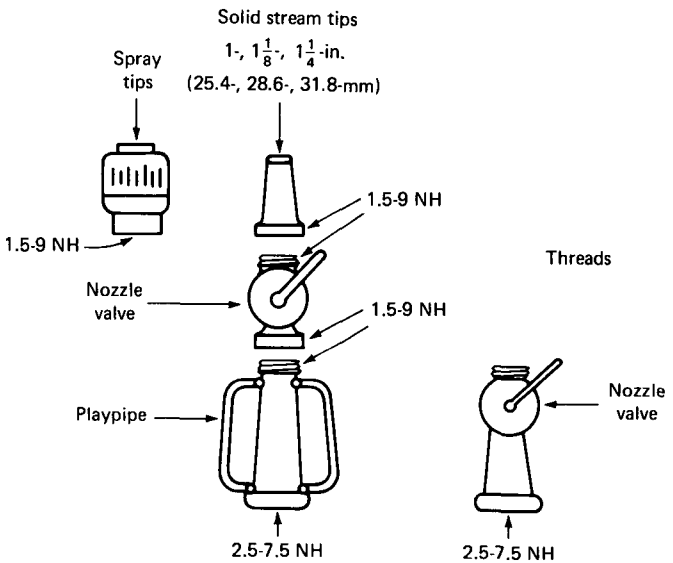

Figure 7-3.1 Nozzle assembly for 2½-in. (65-mm) hose.

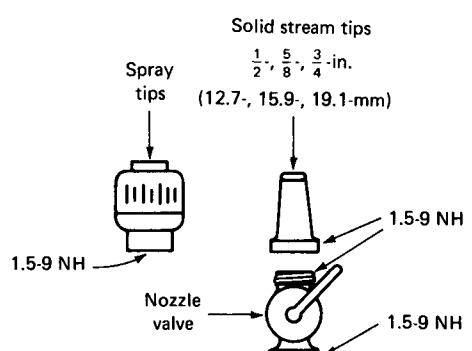

Figure 7-3.2 Nozzle assembly for 1½-in. (38-mm) hose.

7-3.5* All spray nozzles for use on 2½-in. (65-mm) and 1½-in. (38-mm) hose where flows at rated pressure do not exceed 350 gpm (1325 L/m) shall have 1.5-9NH standard thread at the internal connection.

7-4 Appliances and Devices for Large Streams.

7-4.1 All inlet connections for fire department large stream devices (other than connections piped permanently to a pump) shall be fitted with internal swivel connections having the standard thread at least one of which shall be the 2.5-7.5NH standard thread.

7-4.2* Discharge ends of large stream devices designed to discharge from 350 to 1250 gpm (1325 to 4730 L/m) shall have the 2.5-7.5NH standard thread for attaching nozzle tips or spray nozzles. If stacked tips are used, one of these tips may have the 1.5-9NH standard thread. (*See Figure 7-4.2.*)

7-4.3 Discharge ends of large stream devices designed to discharge in excess of 1250 gpm (4730 L/m), but less than 3000 gpm (11 355 L/m), shall have the 3.5-6NH standard thread for attaching nozzle tips or spray nozzles. However, all such large capacity appliances shall be provided with a reducer fitting, 3.5-6NH female x 2.5-7.5NH male. A stacked tip meeting 7-4.6 having the male 2.5-7.5NH standard thread as an integral component shall be accepted as meeting this requirement. (*See Figure 7-4.3.*)

7-4.4 Nozzle tips designed to discharge flows between 350 and 1250 gpm (1325 and 4730 L/m) shall have the 2.5-7.5NH standard thread for the internal inlet thread.

7-4.5 Spray nozzles designed to discharge flows between 350 and 1250 gpm (1325 and 4730 L/m) shall have the 2.5-7.5NH standard thread for the internal inlet thread.

7-4.6 Nozzle tips designed to discharge flows above 1250 gpm (4730 L/m), but less than 3000 gpm (11 355 L/m), at standard operating pressures shall have the 3.5-6NH standard fire hose thread for the internal inlet thread.

7-4.7 Spray nozzles designed to discharge flows above 1250 gpm (4730 L/m), but less than 3000 gpm (11 355 L/m), shall have the 3.5-6NH standard fire hose thread for the internal inlet thread.

7-4.8 Discharge ends and nozzles for large stream devices over 3000 gpm (11 355 L/m) shall be designed such that all inlet and outlet threads are the NH standard thread.

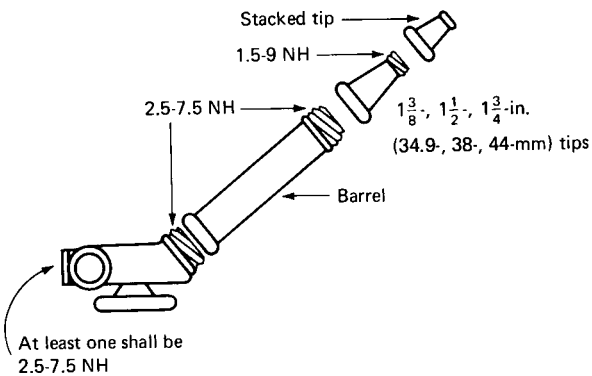

Figure 7-4.2 Large stream device rated under 1250 gpm (4730 L/m).

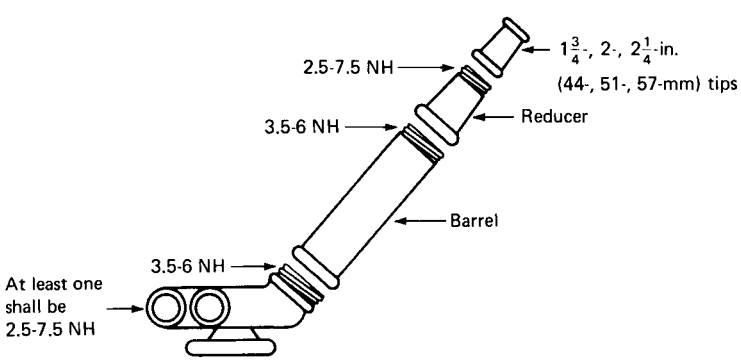

Figure 7-4.3 Large stream device rated over 1250 gpm (4730 L/m) but less than 3000 gpm (11 355 L/m).

7-5 Threads for Fire Department Pump Discharge Outlets.

7-5.1* Pump outlets for 2½-in. (65-mm) and larger fire hose shall have the NH standard thread for the outlet size specified in NFPA 1901, *Standard on Automotive Fire Apparatus,* Paragraphs 3-2.2.5 and 3-2.2.5.1 through 3-2.2.5.5.

7-5.2* Pumper hose outlets for 1½-in. (38-mm) hose shall have the 1.5-9NH standard thread.

7-5.3 Pump outlets supplying booster hose shall have the 1-8NH standard thread.

7-6 Threads for Pump Supply Connections.

7-6.1* Pumper suction inlet connections shall have the NH standard thread for the size specified in NFPA 1901, *Standard on Automotive Fire Apparatus.*

7-6.2 Pump connections for relay supply hose shall have, if necessary, an adaptor for reducing or increasing to the size NH standard thread of the relay supply hose.

7-6.3 Gated suction inlets as required in NFPA 1901, *Standard on Automotive Fire Apparatus,* shall have the NH standard thread for the size specified.

7-7* Threads for Portable and Booster Pumps. Inlet and discharge outlets for portable pumps and booster pumps having a capacity of less than 300 gpm (1135 L/m) shall have the NH standard thread for the size specified in NFPA 1901, *Standard on Automotive Fire Apparatus,* and NFPA 1921, *Portable Pumping Units.*

7-8* Hydrant Threads. Hydrant connections shall have external threaded fitting(s) having the NH standard thread for the size outlet(s) supplied.

7-9 Fire Department Connections for Sprinkler Systems and Standpipes. The fire department connection(s) for sprinkler systems and standpipes as specified in NFPA 13, *Standard on Sprinkler Systems,* and NFPA 14, *Standard on Standpipe and Hose Systems,* shall be internal threaded swivel fitting(s) having the NH standard thread, at least one of which shall be the 2.5-7.5NH standard thread.

Appendix A

This Appendix is not a part of the requirements (recommendations) of this NFPA document but is included for information purposes only

A-1-1 Some fire fighting organizations use small hose fitted with garden hose couplings. Such couplings should have .75-11.5NH (garden hose thread) threads conforming to ANSI B2.4, *Standard on Hose Coupling Screw Threads.*

A-1-3.1 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 or 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 concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

A-1-3.2 The phrase "authority having jurisdiction" is used in NFPA standards in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local, or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, 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 delegated 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-1-3.4 The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

A-5-1.3 See Figure A-5-1.3.

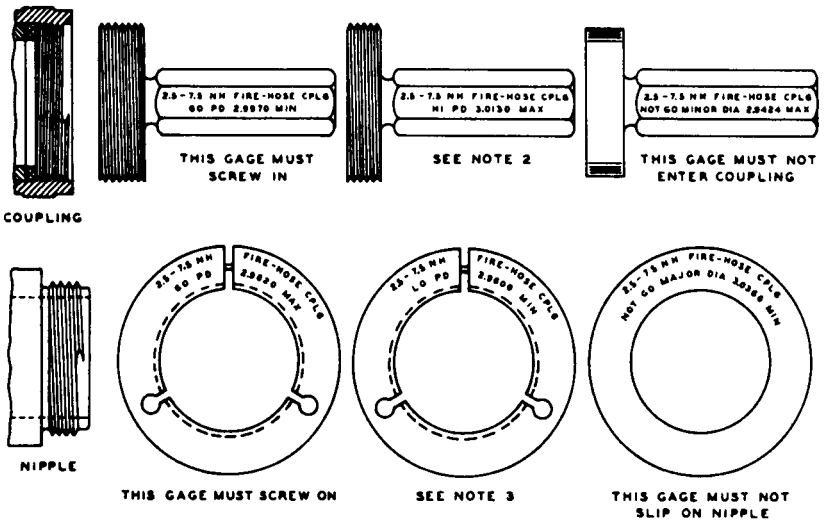

Figure A-5-1.3 Gages for 2.5-7.5NH Threads.

(See Tables 5-1.2 and 5-1.3 for complete dimensions for these gages.)

NOTE 1: The GO plain ring gage and the GO plain plug gage have not been included above since it is considered that the sharpness of the crests of the external and internal threads will be generally acceptable if the GO thread ring gage and the GO thread plug gage assemble on the two mating parts of the coupling.

NOTE 2: Internal threads are acceptable when the HI thread plug is applied to the coupling thread if: (a) it does not enter, or if (b) all complete coupling threads can be entered provided that a *definite* drag (from contact with the coupling material) results on or before the second turn of entry. The gage should not be forced after the drag becomes definite.

NOTE 3: External threads are acceptable when the LO thread ring gage is applied to the nipple *thread* if: (a) it is not entered, or if (b) all complete nipple threads can be entered provided that a *definite* drag (from contact with the nipple material) results from contact on or before the second turn of entry. The gage should not be forced after the drag is definite.

A-5-1.4 Note that setting plug gages are necessary only for setting of adjustable thread ring gages and for checking solid ring gages.

A-7-1 NFPA 1963 recognizes that standard connections are a proper and an essential objective in the national interest. This committee realizes that nonstandard threads and devices do exist. For those who accept this responsibility and whose decision it is to deviate from NFPA 1963, the following recommendations are offered.

A-7-2 Where local fire hose coupling threads are not standard, swivel adaptors, 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, etc.

A-7-2.1 See A-1-1.

A-7-2.12 Where the hydrant connections have local threads, swivel adaptors, with the NH male thread and the local female thread for soft suction hose, and with the NH female thread and the local female thread for hard suction hose, should be provided. Where in service suction hose has couplings that are of a different size, or has threads other than the NH standard, an adaptor to the proper size and to the NH standard thread should be provided and attached to the suction hose couplings. (*See Figure A-7-2.12.*)

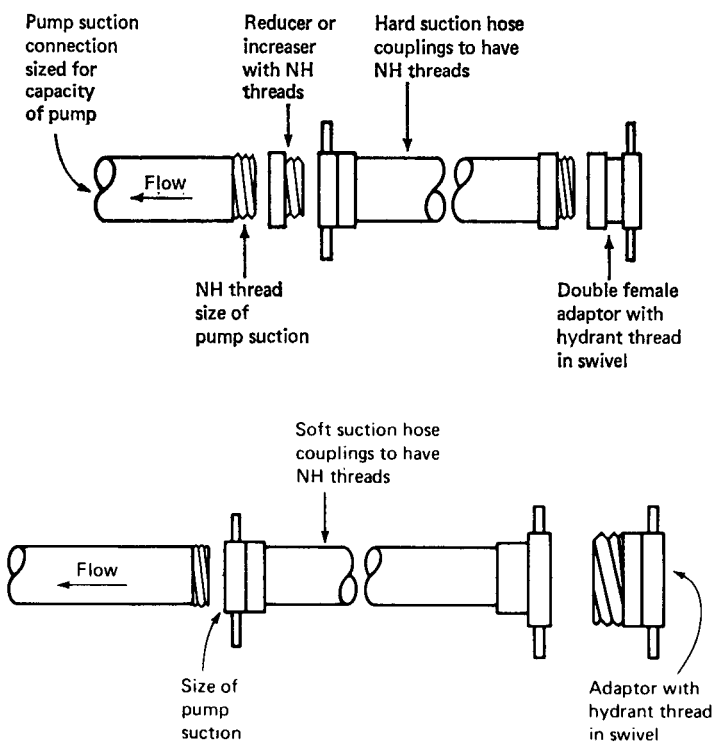

Figure A-7-2.12 Suction inlet for local threads.