Second Revision No. 4-NFPA 1962-2017 [Section No. 2.2]

2.2 NFPA Publications.

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

NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances,* 2016 edition.

NFPA 1961, *Standard on Fire Hose,* ~~2018~~ 2013 edition.

NFPA 1963, *Standard for Fire Hose Connections,* 2014 edition.

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Submittal Date: Tue Jun 20 09:23:51 EDT 2017

Committee Statement

Committee Statement: This change was made in order to comply with the NFPA MOS.
Response Message:

Second Revision No. 3-NFPA 1962-2017 [Section No. 2.4]

2.4 References for Extracts in Mandatory Sections.

NFPA 1901, *Standard for Automotive Fire Apparatus,* 2016 edition.

NFPA 1961, *Standard on Fire Hose,* ~~2018~~ 2013 edition.

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Committee Statement

Committee Statement: This change was made in order to comply with the NFPA MOS.
Response Message:

Second Revision No. 2-NFPA 1962-2017 [Chapter 6]

Chapter 6 Care, Use, Inspection, Maintenance, Service Testing, and Replacement of Fire Hose Appliances

6.1 Care, Use, and ~~Use~~ Maintenance of Fire Hose Appliances.

6.1.1

All appliances shall be used only for their designed purpose.

6.1.2*

No appliance shall be operated at a pressure above its maximum operating pressure as marked on the appliance by the manufacturer.

6.1.2.1*

Where an operating pressure is not marked on the appliance and the manufacturer cannot be located, the appliance shall be service tested to 300 psi (20.7 bar or 2070 kPa).

6.1.2.2

If the appliance passes the service test, it shall be permanently marked “Max operating pressure 200 psi (13.8 bar or 1380 kPa).”

6.1.3

All appliances shall be operated as recommended by the manufacturer.

6.1.4

To prevent mechanical damage, appliances shall not be dropped or dragged.

6.1.5

Valves shall be opened and closed slowly to eliminate unnecessary strain on connecting hose and couplings and to reduce pressure surges (water hammer).

6.1.6

If the appliance is not continuously connected to the fire apparatus, the appliance shall be rinsed with clear water and visually inspected for obvious damage in accordance with 6.2.1(1) through 6.2.1(5) after each use.

6.1.7*

Where appliances are left continuously connected to the fire apparatus or other devices or are used where standing water is trapped inside the appliance (e.g., inlet elbows and valves), the appliance shall be flushed to the extent possible with fresh water following each use and visually inspected for obvious damage in accordance with 6.2.1(1) through 6.2.1(5).

6.1.8 ~~Maintenance.~~

All appliances shall be maintained in accordance with the appliance manufacturer’s instructions.

6.2 Inspection of Fire Hose Appliances.

6.2.1

All appliances shall be visually inspected at least quarterly to verify the following:

(1) All valves open and close smoothly and fully.

(2) The waterway is clear of obstructions.

(3) There is no damage to any thread or other type connection.

(4) The pressure setting of the relief valve, if any, is set correctly.

(5) All locks and hold-down devices work properly.

(6) Internal gaskets are in accordance with Section 7.2.

(7) There is no damage to the appliance (e.g., dents, cracks, or other defects that could impair operation).

(8) All swiveling connections rotate freely.

(9) There are no missing parts or components.

(10) There is no corrosion on any surface.

(11) The marking for maximum operating pressure is visible.

(12) There are no missing, broken, or worn lugs on couplings.

6.2.2*

If the appliance fails an inspection for any reason, the appliance shall be removed from service and the problem corrected or repaired in accordance with the manufacturer's instructions and service tested in accordance with Section 6.3 before it is placed back in service.

6.2.2.1

If the appliance requires repair to correct a problem identified in 6.2.1(7) through 6.2.1(9), the appliance shall be service tested in accordance with Section 6.3 before it is placed back in service.

6.2.2.2

If the appliance fails inspection because corrosion is found, the appliance shall be cleaned to remove all corrosion, service tested in accordance with Section 6.3, and lubricated with an anticorrosive lubricant acceptable to the appliance manufacturer on all surfaces that showed corrosion.

6.3 Service Testing of Fire Hose Appliances.

6.3.1 Hydrostatic Test.

Each fire hose appliance with the exception of elbows shall be service tested in accordance with this section at least annually.

6.3.1.1*

The appliance being tested shall be positioned in a protective device or cover capable of holding the appliance and tested to a minimum hydrostatic pressure of 300 psi (20.7 bar or 2070 kPa).

6.3.1.2

Test caps capable of withstanding the required hydrostatic pressure shall be attached to openings, and a device capable of exerting the required hydrostatic pressure shall be attached to the appliance.

6.3.1.2.1

Appliances with relief valves shall have the relief valve outlet blanked off or otherwise closed during the test.

6.3.1.2.2

All air shall be bled from the system.

6.3.1.3

The gauge pressure shall be increased by 50 psi (3.45 bar or 345 kPa) increments and held for 30 seconds at each pressure up to the maximum pressure for which the appliance is being tested and held for 1 minute without leakage.

6.3.2 Relief Valve Test.

6.3.2.1

Hydrostatic testing of the appliance shall be conducted prior to testing the relief valve.

6.3.2.2

The relief valve shall be tested separately from any device it is connected to.

6.3.2.3

The relief valve shall be set to its lowest setting and pressurized.

6.3.2.4

If the relief valve does not operate at or below a pressure 10 percent over the setting, the test shall be discontinued and the relief valve repaired or replaced.

6.3.2.5

A calibrated test gauge shall be used to verify the setting.

6.3.2.6

After successful completion of the relief valve test, the relief valve shall be reset to the pressure designated by the authority having jurisdiction.

6.3.2.7

The final setting of the relief valve shall be confirmed by pressure testing.

6.3.3 Shutoff Valve Test.

6.3.3.1

If the appliance has a shutoff valve, the intake side of the shutoff valve shall be hydrostatically pressurized to the maximum working pressure of the appliance with the valve in the shutoff position.

6.3.3.2

There shall be no leakage through the valve.

6.3.3.3

A water flow through the fire hose appliance at 100 psi (6.9 bar or 690 kPa) shall be established.

6.3.3.4

The valve shall be closed and reopened twice and shall operate smoothly without evidence of binding or other problems.

6.3.4 Check Valve Test.

6.3.4.1

If the appliance has a check valve, and the check valve can be pressurized by valves being closed downstream of the check valve, the output side of the check valve shall be hydrostatically pressurized to the maximum working pressure of the appliance.

6.3.4.2

There shall be no leakage through the check valve.

6.4 Fire Hose Appliance Records.

6.4.1

A record for each fire hose appliance shall be maintained from the time the fire hose appliance is purchased until it is discarded.

6.4.2

Each fire hose appliance shall be assigned an identification number for use in recording its history throughout its service life.

6.4.3

The identification number shall be marked on the fire hose appliance in a manner that prevents damage to the appliance.

6.4.4

The following information, if applicable, shall be included on the record for each fire hose appliance:

(1) Assigned identification number

(2) Manufacturer

(3) Product or model designation

(4) Vendor

(5) Warranty

(6) Hose connection size

(7) Maximum operating pressure

(8) Flow rate or range

(9) Date received and date put in service

(10) Date of each service test and service test results

(11) Damage and repairs including who made the repairs and the cost of repair parts

(12) Reason removed from service

6.5 Fire Hose Appliance Replacement.

Fire hose appliance users and the authority having jurisdiction shall establish a replacement schedule for their fire hose appliances that takes into consideration the use and age of the fire hose appliance and testing results.

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Submittal Date: Mon Jun 19 08:28:10 EDT 2017

Committee Statement

Committee Statement: These changes were made in order to comply with the NFPA MOS.
Response Message:

Second Revision No. 1-NFPA 1962-2017 [Section No. B.2.1]

B.2.1

The first consideration in planning the purchase of fire hose is determining the characteristics desired of the new hose. Desired characteristics should be identified and then prioritized *(for a guide, see Figure B.2.1)*. Those characteristics can include the following:

(1) *Size/diameter.* The hose size or diameter will affect the flow capabilities of the hose. If the hose is going to be used for handheld hose lines, it is important to match the size of the hose with the flow of the nozzle. A nozzle that flows 200 gpm attached to a hose line that has friction loss of 60 psi/100 ft when flowing 200 gpm is not a good match.

(2) *Length.* In what lengths is the hose to be coupled? Hose is typically coupled in either 50 ft (15 m) or 100 ft (30 m) lengths but can be coupled in any length, which will affect the number of couplings required.

(3) *Application.* How is the hose to be used? For example, a fire department might want attack hose to be used in a standpipe pack to have characteristics different from those of attack hose that will be carried preconnected on a pumper. Large-diameter hose that will be supplying a pumper from a hydrant is different from large-diameter hose that will be supplying elevated stream fire apparatus or a standpipe system in a building.

(4) *Color.* Hose is available in a variety of jacket colors. Fire departments often like to color code hose to specific applications. If specific colors are desired, the purchaser needs to specify the amount of hose to be purchased in each color.

(5) *Construction.* Fire hoses use a variety of natural and synthetic fabrics and elastomers in their construction. These materials allow the hoses to be stored wet without rotting and to resist the damaging effects of exposure to sunlight and chemicals. Modern hoses are also lighter weight than older designs, which has helped reduce the physical strain on firefighters. The synthetic fibers provide additional strength and better resistance to abrasion, and the fiber yarns can be dyed various colors or left natural. Coatings and liners include synthetic rubbers such as styrene butadiene, ethylene propylene, chloroprene, polyurethane, and nitrile butadiene. These compounds provide various degrees of resistance to chemicals, temperature, ozone, ultraviolet (UV) radiation, mold, mildew, and abrasion. Different coatings and liners are chosen for specific applications.

(6) *Packability.* Fire apparatus has limited space for the storage of fire hose, whether that hose is stored preconnected to the pump for initial attack or in a hose bed where the amount needed can be deployed and the remainder left on the apparatus. Some hose is packed lying flat while other hose is packed standing on its edge. It is important to consider the space on the apparatus where the hose will be carried and how a specific type of hose will pack into that space. Does it fold tightly at the ends of the hose bed? Is it easily deployed? A hose bed with a rigid hose bed cover could limit how the hose can be packed or how much hose can be packed in the hose bed and still allow quick and easy deployment. The coupling on the fire hose can affect the packability of the hose into a given space. Hose can be purchased in longer lengths to reduce the number of couplings that must be accommodated in a given space. If preconnected hose lines are in multiples of 100 ft (30 m), consider buying 100 ft (30 m) lengths of hose rather than 50 ft (15 m) lengths.

(7) *Friction loss.* The friction loss per 100 ft (30 m) of fire hose can vary tremendously for the same diameter hose. While a fire department may want a hose with as low a friction loss as possible, other desired characteristics can affect the availability of hose with all the desired characteristics. As part of the planning, the department should look at how the hose will be used and the importance of reducing the friction loss on that application. The effects of various friction loss on the application should be taken into account when considering what is an acceptable friction loss.

(8) *Weight.* If the weight of the hose is a factor, the maximum weight per 50 ft (15 m) or 100 ft (30 m) needs to be considered. Does that weight include the couplings? Weight is especially critical in two areas. If large-diameter hose is to be carried on older fire apparatus, the gross vehicle weight rating (GVWR) of the apparatus can limit the amount

of hose that can be carried. Also, if hose is to be carried by fire fighters in bundles such as high-rise or standpipe packs, lighter is better as long as the hose meets the requirements for the operating pressure at which it will be used.

(9) *Kink resistance.* Layflat fire hose has a tendency to fold, or “kink,” when used at low pressures. This is common in operational use, an example being a hose dragged around a doorway. When a hose kinks, two things happen. First, the waterflow through the hose is throttled and therefore reduced. Second, at the point of kinking, a high spot is formed that leads to excessive abrasion and early failure of the hose. Fire hose should be flexible when there is no water in it to allow easy packing but resist bending to the point of kinking when charged with water.

(10) *Cost.* The amount of money budgeted is always part of the purchasing process, but other costs also should be considered, such as higher quality or longer service life relative to the long-term cost of the purchase. Spending a little more money initially can save money in the future because of a less frequent replacement schedule.

(11) *Expected service life.* The expected service life is how long the purchaser expects to be able to use the hose before its scheduled or planned replacement. Fire departments should have an established replacement schedule for fire hose. The characteristics of fire hose can change as new materials and methods of construction are introduced. The improved characteristics of newer hose could warrant replacement of existing hose on an accelerated schedule.

(12) *Warranty.* The expected service life and the warranty period are not the same. The warranty is an assurance by the manufacturer to the buyer that specific facts or conditions are true or will happen for a specified period of time; the buyer is permitted to rely on that assurance and seek some type of remedy if it is not true or not followed. The purchaser should evaluate what the warranty covers and what it does not cover and for what periods of time.

(13) *Manufactured in accordance with NFPA standards.* At a minimum, any hose purchased should meet the edition of NFPA 1961~~,~~ ~~*Standard on Fire Hose*~~ ~~,~~ that is in effect at the time of purchase. However, it is important to recognize that the standard establishes minimum requirements. The purchaser should carefully review the standard and determine if requirements that go beyond the minimum are desired.

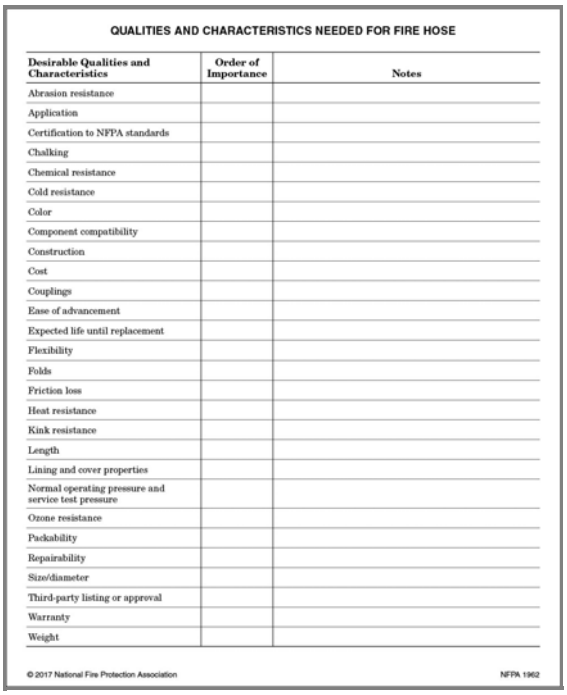
(14) *Independent third-party listing or approval.* Currently, NFPA 1961 does not require fire hose manufacturers to have an independent third-party test or to certify the test results of fire hose. However, such services are available and should be considered, particularly if the purchaser does not have a good program for checking new fire hose before it is placed in service.

(15) *Normal operating pressure.* NFPA 1961 establishes minimum service test pressures for different types of fire hose. These service test pressures are about 110 percent of the expected normal operating pressure. If the hose will be used at pressures above the minimum service test pressure, the hose should be required to have a higher service test pressure and thus a higher operating pressure.

(16) *Service test pressure.* Fire hose often has a designed service test pressure higher than the user plans to operate the hose at or service test it to. NFPA 1961 allows fire hose to be marked with a service test pressure lower than the manufacturer's design service test pressure as long as it is not below the minimum specified in the standard.

(17) *Thermal resistance.* Consider the thermal resistance of different fire hose products as reported by the manufacturer’s testing results.

Figure B.2.1 Guide to Determining Qualities and Characteristics Needed for Fire Hose.



QUALITIES AND CHARACTERISTICS NEEDED FOR FIRE HOSE

Desirable Qualities and Characteristics	Order of Importance	Notes
Abrasion resistance		
Application		
Certification to NFPA standards		
Chalking		
Chemical resistance		
Cold resistance		
Color		
Component compatibility		
Construction		
Cost		
Couplings		
Ease of advancement		
Expected life until replacement		
Flexibility		
Folds		
Friction loss		
Heat resistance		
Kink resistance		
Length		
Lining and cover properties		
Normal operating pressure and service test pressure		
Ozone resistance		
Packability		
Repairability		
Size/diameter		
Third-party listing or approval		
Warranty		
Weight		

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Committee Statement

Committee Statement: The committee has added this text in order to provide the end user with further clarification and to also coincide with the table to ensure that this was being considered when procuring fire hose.

Response Message: