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NFPA 1962 Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles 1988 Edition

National Fire Protection Association Batterymarch Park, Quincy, MA 02269

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Policy Adopted by NFPA Board of Directors on December 3, 1982

The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

Statement on NFPA Procedures

This material has been developed under the published procedures of the National Fire Protection Association, which are designed to assure the appointment of technically competent Committees having balanced representation. While these procedures assure the highest degree of care, neither the National Fire Protection Association, its members, nor those participating in its activities accepts any liability resulting from compliance or noncompliance with the provisions given herein, for any restrictions imposed on materials or processes, or for the completeness of the text.

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NATIONAL FIRE PROTECTION ASSOCIATION

NFPA 1962

Standard for

the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles

1988 Edition

This edition of NFPA 1962, *Standard for the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles* was prepared by the Technical Committee on Fire Hose and acted on by the National Fire Protection Association, Inc. at its Fall Meeting held November 9-11, 1987 in Portland, Oregon. It was issued by the Standards Council on December 2, 1987 with an effective date of December 22, 1987, and supersedes all previous editions.

The 1988 edition of this standard has been approved by the American National Standards Institute.

Origin and Development of NFPA 1962

Although the NFPA had recommended practices for the Care, Maintenance, and Use of Fire Hose, known as NFPA 198, it was withdrawn at the 1979 Annual Meeting. This original NFPA 198 was prepared by the NFPA Committee on Field Practices in 1936, and has been extensively revised through the intervening years. Since 1954, NFPA 198 was a project of the Fire Hose Committee. The Fire Hose Committee agreed that NFPA 198 had inaccuracies, that it was not technically up-to-date, and that it needed to be rewritten to conform to the present Manual of Style.

The 1979 edition of NFPA 1962, although containing part of the original NFPA 198, was completely rewritten and issued as a new Standard in June 1979. The Fire Hose Committee spent four years in the development of that Standard. The mandatory requirements of NFPA 1962 were carefully developed and chosen to help assure a reasonable level of safety and reliability for the public and industrial, private, and governmental fire suppression agencies.

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This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred.

NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or any document developed by the Committee on which the member serves.

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the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles

1988 Edition

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 Chapter 6 and Appendix B.

Chapter 1 Administration

1-1 Scope.

1-1.1 This standard shall apply to the care of all types of fire hose and coupling assemblies while in service, in use, and after use; including record keeping, inspecting, and service testing.

1-2 Purpose.

1-2.1 The purpose of this standard is to provide a reasonable level of safety for users of fire hose, and a reasonable degree of assurance that the hose and coupling assembly will perform as designed.

1-2.2 Unless otherwise noted, it is intended that the provisions of this standard be applied to equipment or installations that were existing or approved for construction or installation prior to the effective date of the standard.

1-3 Definitions.

Approved. Acceptable to the "authority having jurisdiction."

NOTE: 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 installation 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 any organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

Attack Hose. Hose designed to be used to combat fires beyond the incipient stage, by trained fire fighters and fire brigade members to supply handline nozzles, distributor nozzles, master stream appliances, portable hydrants, manifolds, standpipe and sprinkler systems, pumps, fire department pumpers, and a supply hose.

Authority Having Jurisdiction. The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents 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 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."

Braided. A nonwoven rubber hose manufactured by braiding one or more layers of yarn, each separated by a rubber layer over a rubber tube and encased in a rubber cover. Usually manufactured for use as booster hose in sizes up to 1½ in. (38 mm).

Coating. A jacket of which the yarn is impregnated or saturated with the protective materials or coated with the protective material so the outside of the jacket is relatively smooth.

Covered. Jacket covered and lined with a continuous synthetic rubber or plastic, the cover usually being thicker than that of a coating.

Fire Hose. A woven-jacketed, lined, flexible conduit for conveying water for fire fighting purposes.

Fold. The fold is that transverse fold occurring when the hose is lengthwise doubled over on itself as on a pin rack.

Forestry Fire Hose. A hose designed to meet specialized requirements for fighting wildland.

In Service. Hose ready for use kept in hose houses, on racks or reels, or apparatus, etc., but not including hose in storage where it is not available to be put into service.

In Use. Hose being used during fire suppression or training.

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.

Large-Diameter Hose. Attack or supply hose of 3½-in. (90-mm) diameter or larger used to move large volumes of water.

Large-Diameter Supply-Hose. A hose which may be used at operating pressures not to exceed 185 psi (1275kpa) to supply fire department pumpers from hydrants and in relay from pumper to pumper to directly supply attack lines, master stream appliances, portable hydrants, manifolds, standpipe and sprinkler systems.

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.

NOTE: 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.

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

Multiple Jacket. A construction consisting of a combination of two separately woven jackets (double jacket), or two or more jackets interwoven.

Nonwoven Rubber Hose. See spiral, braided, and wrapped.

Rack and Reel Hose. A hose designed for fighting incipient fires.

Relay-Supply Hose. A single jacket fire hose of 3½ in. (90 mm) diameter and larger used to move large volumes of water at low pressure and manufactured prior to January 1987 to meet the requirements of the 1979 edition and prior editions of NFPA 1961, *Standard for Fire Hose*.

Service Test. Hydrostatic test conducted by users on all in-service hose to determine suitability for continued service.

Shall. Indicates a mandatory requirement.

Should. This term, as used in the Appendix, indicates a recommendation.

Single Jacket. A construction consisting of one woven jacket.

Spiral. A nonwoven hose manufactured by spirally laying layers of yarn enmeshed in or layered between a tube and cover having the same uses as braided hose.

Suction, Hard. A rubber-lined, rubber-covered hose whose reinforcement contains a semi-rigid or rigid helix to resist collapse under vacuum.

Suction, Soft. Collapsible hose used to supply pumpers from hydrants.

Unlined Hose. A hose, usually made of linen yarns, consisting of only the woven jacket and having such qualities that the yarn of the jacket swells when wetted, tending to seal the hose.

Water Hammer.* The surge of pressure caused when a high velocity flow of water is abruptly shut off. The pressure exerted by the flowing water against the closed system can be seven times or more than the static pressure.

Wrapped. A nonwoven rubber hose manufactured by wrapping rubber-impregnated woven fabric around a rubber tube and encasing in a rubber cover. In the fire service this hose is primarily used for hard suction and has an added spiral wire reinforcement to prevent the hose from collapsing under a vacuum. It is usually manufactured in sizes 1½ in. through 6 in. (38 mm through 152 mm) and called hard suction hose.

1-4 Units.

1-4.1* Metric units of measurement in this standard are in accordance with the modernized metric system known as international system of units (SI). The unit liter, outside of but recognized by SI, is commonly used in international fire protection. The SI units used in this standard are listed in Table 1-4.1 with conversion factors.

1-4.2 In this standard, values for measurements are followed by an equivalent in SI units. The first stated value shall be regarded as the requirement because the given equivalent value may be approximate. As all 2½-in. hose shall have an internal waterway of 2 $^{9}/_{16}$ in., as specified in NFPA 1961, *Standard for Fire Hose*, Section 3-1, the SI unit for 2 $^{9}/_{16}$ in. (65 mm) is used.

Table 1-4.1

Quantity	US Unit/Symbol	SI Unit/Symbol	Conversion Factor
Length	inch/in.	millimeter/mm	1 in. = 25.4 mm
	foot/ft	meter m	1 ft = 0.305m
Volume	gallon/gal	liter/l	1 gal = 3.785L
Flow Rate	gallon per minute/ gpm	Liter per minute/ L/m	1 gpm = 3.785 L/m
Pressure	pounds per square inch/psi	kilopascal/kPa	1 psi = 6.895 kPa

Chapter 2 Care and Use of Fire Hose

2-1 Attack Hose, Supply Hose, and Forestry Hose.

2-1.1 In-service hose shall be inspected and service tested at least annually as specified in Chapter 5 of this standard.

2-1.2* Hose carried on fire apparatus shall be loaded in such a way that air can circulate under the hose load to eliminate or reduce the growth of mildew in the hose jackets and rust and corrosion in the hose compartment. Only clean, dry hose shall be placed into service. Wet hose accelerates mildew and rusting and shall be thoroughly dried before being placed in service.

2-1.3* To prevent damage and permanent set to the rubber lining, hose shall be removed from apparatus at least once quarterly and, when reloaded, loaded so the folds occur at different positions. When the hose is removed from the apparatus, it shall be replaced by spare hose, so that the required amount will always be available for fire fighting purposes.

2-1.4* Large-diameter hose used to supply a pumper from a hydrant shall be carried in a location where it can be replaced in a different position after each use to avoid folds and strains occurring at the same place.

2-1.5 Large-diameter hose used to supply a pumper from a hydrant shall be protected from chafing with chafing blocks or similar protection where it comes in contact with the pavement or curbing. When connecting a pumper to a hydrant, there shall be a slight bend in the hose to avoid kinks when the water is turned on.

2-1.6 Large-diameter hose marked "Supply Hose" shall be used at operating pressures not to exceed 185 psi (1275 kPa) to supply fire department pumpers from hydrants and in relay from pumper to pumper, to directly supply attack lines, master stream appliances, portable hydrants, manifolds, and standpipe and sprinkler systems.

2-1.6.1* A pressure and volume relief device with adequate capabilities and a maximum setting, not to exceed the service test pressure of the hose being used, shall be used on the discharge side of the pump, when large-diameter supply hose is being used to supply attack lines, manifolds, standpipe and sprinkler systems. Rapid closing or opening valves shall not be used with large-diameter supply hose.

2-1.7 When hose marked "Supply Hose" is used in relay between fire department pumpers, the suction of each receiving pumper shall be equipped with a relief valve. The maximum pressure setting of the relief valve(s) shall be 50 psi (345 kPa).

2-1.8* Hose while in use shall be positioned to minimize mechanical damage and heat exposure; nozzles and valves shall be opened and closed slowly to prevent pressure surges and water hammer that may burst the hose and in turn cause injury to people or damage to the pump. Care shall be taken to prevent the hose from chafing.

2-1.9 When in-use hose is subjected to subfreezing weather, care shall be taken to prevent water from freezing inside the hose. To help prevent freezing once the water is turned on, some water shall be left running through the hose until the line is no longer needed. When the line is no longer needed, it shall be uncoupled and drained.

2-1.10* Hose that has been frozen during use shall be thawed and service tested as specified in Chapter 5 of this standard before being put back in service or in storage.

2-1.11* After use and before being placed in storage or back in service, the hose shall be drained, cleaned, dried and inspected as specified in Sections 2-5 and 2-6 of this chapter.

2-2 Relay-Supply Hose.

2-2.1* THIS SECTION SHALL ONLY APPLY TO RELAY-SUPPLY HOSE MANUFACTURED TO THE REQUIREMENTS OF THE 1979 EDITION AND PRIOR EDITIONS OF NFPA 1961, *STANDARD FOR FIRE HOSE*.

2-2.2 In-service hose shall be inspected and service tested at least annually as specified in Chapter 5 of this standard.

2-2.3 Hose carried on fire apparatus shall be loaded in such a way that air can circulate under the hose load to eliminate or reduce the growth of mildew in the hose jackets and rust and corrosion in the hose compartment. Only clean, dry hose shall be placed into service. Wet hose accelerates mildew and rusting and shall be thoroughly dried before being placed in service.

2-2.4 To prevent damage and permanent set to the rubber lining, hose shall be removed from apparatus at least once quarterly and, when reloaded, loaded so the folds occur at different positions. When the hose is removed from the apparatus, it shall be replaced by spare hose, so that the required amount will always be available for fire fighting purposes.

2-2.5 Relay-supply hose used to supply a pumper from a hydrant shall be carried in a location where it can be replaced in a different position after use to avoid folds and strains occurring at the same place.

2-2.6 Relay-supply hose used to supply a pumper from a hydrant shall be protected from chafing with chafing blocks or similar protection where it comes in contact with the pavement or curbing. When connecting a pumper to a hydrant there shall be a slight bend in the hose to avoid kinks when the water is turned on.

2-2.7 The highest operating pressure while the hose is in use shall not exceed 185 psi (1275 kPa).

2-2.8 Relay-supply hose shall not be used to directly supply attack lines, master stream appliances, portable hydrants, manifolds and standpipe and sprinkler systems that require pressures greater than those specified in 2-2.7.

2-2.9* Fire departments shall establish operational procedures for relay-supply operations. Special precautions shall be used when relaying water from a pump at a water source to a pump near the fireground or to other pumps in a relay in order to control pressure surges and water hammer. The pump receiving the relay shall be provided with a relay-relief valve on the inlet (suction) to which the relay-supply hose is attached. A maximum pressure setting of 50 psi (345 kPa) shall be used on the relay relief valve.

2-2.10 Care shall be taken to avoid dragging the hose. If it must be dragged, it shall be dragged flat.

2-2.11* Vehicles shall not be driven over relay-supply lines unless the hose is bridged.

2-2.12 When in-use hose is subjected to subfreezing weather, care shall be taken to prevent water from freezing inside the hose. To help prevent freezing once the water is turned on, some water shall be left running

through the hose until the line is no longer needed. When the line is no longer needed, it shall be uncoupled and drained.

2-2.13 Hose that has been frozen during use shall be thawed and service tested as specified in Chapter 5 of this standard before being put back in service or in storage.

2-2.14 After use and before being placed in storage or back in service, the hose shall be drained, cleaned, dried, and inspected as specified in Sections 2-5 and 2-6 of this chapter.

2-3* Rack and Reel Hose.

2-3.1* Hose stored on racks and reels and in hose houses shall be removed and service tested as specified in Chapter 5 of this standard at intervals not exceeding five years after purchase date and every three years thereafter. In-service hose shall be unracked, unreeled, or unrolled and physically inspected at least annually as specified in Section 2-5 of this chapter.

2-3.2 When hose is reracked, rereeled, or rerolled it shall be done so that the transverse folds shall not occur at the same places.

2-3.3 Hose stored on racks or reels shall be protected from the weather and any local condition that may be harmful to the hose.

2-3.4* Where hose is installed for fire protection at or near yard hydrants, it shall be kept in well-ventilated enclosures. Enclosures shall be constructed and the hose stored in accordance with NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.

2-3.5 In areas where rodents may be a problem, hose shall be considered for its rodent resistance.

2-3.6 Hose while in use shall be positioned to minimize kinking, mechanical damage, and exposure to heat.

2-3.7 After each use and before being placed in service, the hose shall be service tested as specified in Chapter 5 of this standard and inspected, washed and dried as specified in Sections 2-5 and 2-6 of this chapter.

2-4 Nonwoven Rubber Hose.

2-4.1* Hose shall be stored out of direct sunlight and as recommended by the manufacturer. The hose shall not be stored kinked and, if stored on a reel, care shall be taken to avoid twisting the hose when rolling onto the reel. At least annually the hose shall be service tested as specified in Section 5-4 of this standard.

2-4.2 Hose which has the braid exposed shall be removed from service and repaired or condemned. The defective section may be cut out and the length recoupled and service tested as specified in Section 5-4 of this standard.

2-4.3 Foreign objects of any kind including items of equipment shall not be carried inserted in the ends of the hose.

2-5 Inspecting.

2-5.1 Physical inspection shall determine that the hose, couplings, and nozzle when required on rack and reel hose, have not been vandalized, are free of debris, and that there is no evidence of mildew, rot, or damage by chemicals, burns, cuts, abrasion, and vermin.

2-5.2 If the hose fails the physical inspection, it shall be removed from service, repaired as necessary, and service tested as specified in Chapter 5 of this standard or condemned.

2-5.3 The couplings shall be inspected as specified in 4-2.1 of this standard.

2-5.4 Where nozzles are required on rack and reel hose, they shall be inspected as specified in 4-1.1, 4-1.2 and 4-1.3 of this standard.

2-6 Cleaning and Drying.

2-6.1* After each use all hose shall be cleaned. If the dirt and dust cannot be thoroughly brushed from it or it has come in contact with harmful materials, the hose shall be washed.

2-6.2 If during use the hose has been exposed to hazardous materials, it shall be decontaminated by the approved method for the contaminate.

2-6.3* All hose shall be drained and thoroughly dried before being placed in service or in storage. Covered hose may be wiped dry. Hose shall not be dried on hot pavements or under intense sunlight.

2-7 Storage.

2-7.1* Hose in storage shall be kept out of direct sunlight ready for service. Hose shall be kept in a well-ventilated location. Hose shall be stored only after it is properly inspected, service tested if required, brushed or washed, dried and rolled.

2-7.2 Hose out of service for repair shall be properly tagged as specified in Chapter 3 of this standard and if temporarily stored kept apart from any hose in storage ready for service.

Chapter 3 Hose Records

3-1 Attack Hose, Supply Hose, and Rack and Reel Hose.

3-1.1* Accurate hose records shall be established and maintained.

3-1.2* Each length of hose shall be assigned an identification number for use in recording its history throughout its service life. The identification number shall be stenciled on the jacket or cover using an ink or paint that is not harmful to the hose. The identification number may be stamped on the bowl or swivel of the female coupling utilizing a procedure to prevent damage to the coupling.

3-1.3* Records of hose used by fire departments shall be recorded as part of the department's or individual company's complete equipment inventory.

3-1.4 Records for hose on racks, or reels, or in enclosures may be kept at the hose location or at a control location on the premises where the hose is located.

3-1.5* The following information shall be included for each length of hose:

(a) Assigned identification number.

(b) Manufacturer and part number.

(c) Vendor.

(d) Size (Internal Diameter of Waterway).

(e) Length.

(f) Type of hose.

(g) Construction.

(h) Date received and date put in service.

(i) The date of each service test and the service test pressure.

(j) Repairs and new length if shortened.

(k) Actual damage.

(l) If exposed to possible damage.

(m) Reason removed from service.

(n) Reason if condemned.

(o) If the hose is removed from service or condemned within the warranty period because of an in-warranty failure, it shall be so indicated.

3-1.6* Out-of-service hose shall be properly tagged with the reason it has been removed from service noted on the tag. This tag may also include information required in 3-1.7 of this section.

3-1.7 Personnel responsible for the repair and maintenance of fire hose shall see that a hose work report for each repaired length is prepared and forwarded through established channels for recording on the permanent hose record.

3-2 Forestry Hose.

3-2.1* The authority having jurisdiction shall determine the records necessary to achieve an effective hose management program.

Chapter 4 Nozzles and Couplings

4-1 Nozzles.

4-1.1 Nozzle valves attached to in-service hose shall be kept in the closed position.

4-1.2* All nozzles shall be inspected at least annually and after each use. The nozzle inspection shall include:

(a) Clear of obstructions in waterway.

(b) No damage to tip.

(c) Full operation of adjustments such as pattern selection, etc.

(d) Proper operation of shutoff valve, if so equipped.

(e) No parts are missing.

(f) Internal gasket per 4-2.7 of this standard.

4-1.3 If the nozzle fails the inspection for any reason, it shall be removed from service and repaired or replaced.

4-1.4 If, during use, there is an obstruction that cannot be removed by flushing the nozzle, the nozzle shall be taken from the hose line and the obstruction removed through the connection end, as soon as is practicable, since any further attempt to force it out through the tip may damage the nozzle.

4-1.5 Care shall be taken to avoid dents or nicks in nozzle tips, as this can seriously affect the reach of the stream. To prevent mechanical damage, nozzles shall be handled with care. They shall not be dropped or thrown.

4-1.6 Nozzle control valves shall be opened and closed slowly to eliminate unnecessary strain on the hose and couplings and reduce pressure surges.

4-1.7* After each use, all nozzles shall be thoroughly washed and inspected before being placed back in service.

4-2 Couplings.

4-2.1* Couplings shall be kept in serviceable condition. After each use, and at each service test of the hose, they shall be visually inspected for the following:

(a) Damaged threads.

(b) Corrosion.

(c) Slippage on the hose.

(d) Out-of-round.

(e) Swivel not rotating freely.

(f) Missing lugs.

(g) Other defects that impair operation.

Couplings found defective shall be removed from service and repaired or replaced. The internal gasket shall be inspected as specified in Section 4-2.9 of this chapter. A lubricant specified by the coupling manufacturer may be used on coupling swivels and threads.

4-2.2* Care shall be taken not to drop the couplings on pavement or other hard surfaces which may cause damage to the swivel section or exposed threads.

4-2.3 Care shall be taken not to allow vehicles to drive over couplings.

4-2.4 Special care shall be taken when couplings of dissimilar metals are connected, as corrosion can occur due to the difference in the metals and moisture will tend to accelerate this corrosion. When couplings of dissimilar metals are left connected, they shall be disconnected and inspected at least quarterly. If corrosion exists, the couplings shall be cleaned and a protective coating specified by the coupling manufacturer shall be applied to the

threads. This coating shall be applied after each use and during each inspection.

4-2.5* In attaching new or used couplings, care shall be taken to have the hose fit properly in the bowl of the coupling. The outside diameter of the hose shall fit in snugly the internal diameter of the bowl of the coupling. The expansion ring shall be of the proper size and length for the coupling used.

4-2.6* When couplings are attached or reattached to hose, the hose shall be service tested in accordance with Chapter 5 of this standard.

4-2.7* *Warning*: Retesting repaired or recoupled fire hose can be extremely dangerous. After repairing or recoupling, the hose shall be retested to at least 50 percent greater than the service test pressure. The tests should be performed according to 5-2.2.

The date and nature of the repair and/or recoupling and the person performing the repair shall be recorded for each length of hose as specified in 3-1.5.

4-2.8* The thread gasket in couplings and nozzles shall be inspected for presence, tight fit, and lack of deterioration. If defective, it shall be replaced with a new gasket.

4-2.9* The tail gasket at the end of the hose shall be replaced when attaching a coupling.

4-2.10* Gaskets shall not protrude into the waterway.

Chapter 5 Service Testing

5-1 Service Test Pressure.

5-1.1 HOSE MANUFACTURED PRIOR TO JULY, 1987.

5-1.1.1 The service test pressure for hose manufactured prior to July, 1987 to meet the requirements of the 1979 edition and previous editions of NFPA 1961, *Standard for Fire Hose*, shall be determined by noting the ACCEPTANCE OR PROOF TEST PRESSURE stenciled on each length of hose and shown as "Tested to - - -PSI," and then finding the ACCEPTANCE OR PROOF TEST PRESSURE by type of hose and the corresponding service test pressure specified in Table 5-1.1.

5-1.1.2 The new hose rated ACCEPTANCE OR PROOF TEST PRESSURE that is stenciled on hose manufactured prior to July, 1987 SHALL NOT BE USED FOR THE SERVICE TEST PRESSURE.

5-1.1.3 The new hose rated ACCEPTANCE OR PROOF TEST PRESSURE tests shall only be conducted at the point of manufacture or at a facility properly equipped and staffed for these tests, and SHALL NOT BE CONDUCTED IN THE FIELD.

5-1.2 Hose Manufactured July, 1987 and After.

5-1.2.1 The Service Test Pressure for hose manufactured in July, 1987 and after to meet the requirements of the 1987 edition of NFPA 1961, *Standard for Fire Hose*, shall be determined by the service test pressure stenciled on each length of hose and shown as "Service Test to --- PSI per NFPA 1962."

Service Test Pressures for Hose Manufactured prior to July, 1987

Trade Size in. (mm)	Jackets	New Hose Rated Acceptance Test Pressure psi	(kPa)	Service Test Pressure psi	(kPa)
Lined Industrial, Standpipe, and Fire Department					
1½ (38) thru 2½ (65) *	Single	300	(2070)	150	(1030)
1½ (38) thru 4½ (114)	Single	400	(2760)	250	(1720)
1½ (38) thru 2½ (65)	Single	500	(3450)	250	(1720)
1½ (38) thru 4 (102)	Multiple	400	(2760)	250	(1720)
1½ (38) thru 4 (102)	Multiple	600	(4140)	250	(1720)
Unlined Standpipe					
1½ (38) and 2½ (65)	Single			150	(1030)
Lined Forestry					
1 (25) and 1½ (38)	Single	450	(3100)	250	(1720)
Unlined Forestry					
1 (25) and 1½ (38)	Single	450	(3100)	250	(1720)
Relay Supply					
3½ (89) thru 4½ (114)	Single	400	(2760)	200	(1380)
5 (127) and 6 (152)	Single	300	(2070)	150	(1030)
Pumper Supply (Soft Suction)					
4 (102) thru 6 (152)	Multiple	400	(2760)	200	(1380)

* 1½ (38) thru 2½ (65) single jacket hose with a new hose rated acceptance test pressure of 300 psi (2070 kPa) shall not be maintained on fire apparatus for fire fighting purposes.

5-1.3* After determining the correct service test pressure for each length of hose to be tested, the service test shall be conducted as specified in Section 5-2 of this chapter.

5-2 Service Test Procedure.

5-2.1* *Warning*: When conducting the service pressure test, care shall be taken to remove all air from the hose before the nozzle or test cap valve is closed and the pressure allowed to rise. It shall be recognized that development of test pressures introduces a serious accident potential and this specified test procedure must be followed.

5-2.2 The following test procedure shall be followed:

5-2.2.1 Each length of hose to be service tested shall be inspected as specified in Section 2-5 of this standard. Any length of hose that fails the inspection shall be removed from the service test area and repaired as necessary or condemned.

5-2.2.2 A hose testing machine, a stationary pump, or a fire department pumper all equipped with a hose test gate valve shall be used. The gage used to read the test pressure shall be certified at least annually.

5-2.2.2.1* The hose test gate valve shall be a fire department gate valve with a ¼-in. (6.4-mm) opening drilled through the gate that permits the pressure to be

raised to the test pressure after the hose has been filled, the air completely removed, and the hose gate valve closed.

5-2.2.2.2 All 3½-in. (89-mm) and larger hose shall be service tested while lying flat. A short length of smaller diameter hose with the same or higher proof pressure shall be used to connect the test valve to the hose being tested.

5-2.2.3 A location shall be selected that will allow connection of the hydrostatic equipment to an adequate water source.

5-2.2.4* Each length of hose to be tested simultaneously shall be of the same service test pressure, and collectively shall be considered the hose test layout. The total length of any hose line in the hose test layout to be service tested shall not exceed 300 ft (92 m). The hose test layout shall be straight without kinks or twists.

EXCEPTION: HOSE THAT HAS BEEN REPAIRED OR RECOUPLED SHALL BE TESTED ONE LENGTH AT A TIME.

5-2.2.5 The test layout shall be connected to the hose test gate valve of the pump. The hose test gate valve shall be used to prevent the reaction of discharging a large volume of water in the event of a hose bursting during the test. If a fire department pumper is used, the hose test gate valve shall not be attached to any discharge outlet at or adjacent to the pump operator's position. The hose test gate valve end of the hose line shall be secured with a belt tie-in or rope hose tool at a point 10-15 in. (250-400 mm) from the coupling. Shut-off nozzles or test caps shall be attached to the far end of the line.

5-2.2.6 With the hose test gate valve open and the nozzle or test cap valve open, the pressure shall be gradually raised to 45 ± 5 psi (310 kPa). After the hose test layout is full of water, all air in each hose line shall be exhausted by raising the discharge end of each hose line above the highest point in the system. The nozzle or test cap valve shall be closed slowly, then the hose test gate valve shall be closed.

5-2.2.7* The shutoff device or the hose directly in back of the shutoff device shall be secured to avoid possible whipping or other uncontrolled reaction in the event of a hose burst.

5-2.2.8* After filling to 45 ± 5 psi (310 kPa), the hose shall be checked for leakage at the coupling and tightened with a spanner wrench where necessary. Each hose shall then be marked at the end or back of each coupling to determine, after the hose has been drained, if the coupling has slipped during the test.

5-2.2.9 All personnel shall clear the area other than those persons required to perform the remainder of the procedure.

5-2.2.10 The pressure shall be raised slowly at a rate not greater than 1000 psi (6900 kPa) per minute to the service test pressure, and held for five minutes.

5-2.2.11 While the test layout is at the service test pressure, the hose shall be inspected for leaks. If the inspecting personnel walk the test layout to inspect for leaks, they shall be at least 15 ft (4.5 m) to the left side of the nearest hose line in the test layout. The left side of the hose line shall be defined as that side which is to the left when facing the free end from the pressure source. Personnel shall never stand in front of the free end of the hose, on the right side of the hose, closer than 15 ft (4.5 m) on the left side of the hose, or straddle a hose in the test layout during the test.

5-2.2.12 If during the test a section of hose is leaking or a section bursts, the service test shall be terminated and that length of hose shall have failed the test. The test layout shall be drained, and the defective hose removed from the test layout. The service test shall be restarted beginning with Section 5-2 of this chapter.

5-2.2.13 After five minutes at the service test pressure, the pump shall be shut down, the hose test gate valve opened, the pressure allowed to equalize with the source, the pump discharge gates closed, and each nozzle or test cap valve opened to drain the test layout.

5-2.2.14* The marks placed on the hose at the back of the couplings shall be observed for coupling slippage. If the coupling has slipped the hose shall have failed the test.

5-2.2.15 Hose records specified in Chapter 3 of this standard shall be updated to indicate the results of the service test for each length of hose tested.

5-2.2.16 All hose failing the physical examination, bursting, leaking, or having couplings that fail because of slippage or leaking shall be tagged as required in 3-1.6 of this standard, removed from service and sent for repair. For leaking hose or for hose jackets failing the physical examination, a distinguishing mark noting the location of the defects shall be placed on the hose. For defective couplings, the couplings shall be cut from the hose.

5-2.2.17 After testing or retesting, all hose shall be thoroughly cleaned, drained, and dried before being placed in service or storage as described in Sections 2-6 and 2-7 of this standard.

5-3 Unlined Hose.

5-3.1 All service testing of unlined hose shall be performed in accordance with procedures specified in 5-1.1 and Section 5-2 of this chapter.

Exception: Unlined linen hose shall have a 10-minute wet-soak at 50 psi (345 kPa) to condition the linen yarn prior to applying the service test pressure.

5-3.2 If the service test pressure cannot be obtained at a maximum flow rate of 20 gpm (75 L/m), the hose shall be removed from service and condemned.

5-3.3 Linen hose shall be thoroughly dried immediately after testing to avoid mildew.

5-4 Nonwoven Rubber Hose.

5-4.1 Braided hose shall be service tested annually to 150 percent of its rated working pressure when tested in accordance with ASTM D380, *Standard Method of Testing Rubber Hose.*

5-4.2 Hard suction hose shall be service tested annually to 150 percent of the rated working pressure when tested in accordance with ASTM D380, *Standard Method of Testing Rubber Hose.*

5-4.3* Hard suction hose shall also be dry vacuum tested annually as follows:

(a) The hose shall be attached to a suction source.

(b) The free end shall be sealed with a transparent disk and connected to an accurate vacuum measuring instrument.

(c) A 22-in. (50-mm) mercury vacuum shall be developed. While holding the vacuum, the lining of the hose shall be inspected through the transparent disk. There shall be no collapsing of the lining into the waterway.

Chapter 6 Referenced Publications

6-1 The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

6-1.1 NFPA Publications. National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NFPA 24-1987, *Standard for the Installation of Fire Service Mains and Their Appurtenances*

NFPA 1961-1987, *Standard for Fire Hose*

6-1.2 Other Publications.

American Society for Testing and Materials, ASTM D380-77, *Standard Method of Testing Rubber Hose*, 1977, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103

Appendix A

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

A-1-3 The formula for water hammer is:

$$\text{delta } p = c \times d \times \text{delta } v$$

where:

delta p = change in pressure, [lbs/ft² (Kg/m²)]

c = velocity of pressure wave traveling back toward the water sources, [ft/sec(m/sec)]

d = mass density of water, [1.9 slugs/cu ft (Kg/m³)]

delta v = change in water velocity, [ft/sec (m/sec)]

NOTE: c for 2½ in. (65 mm) double jacket rubber lined hose is approximately 800 to 1,000 ft/sec.

(See Purington, R.G., *Fire Fighting Hydraulics,* New York, NY, McGraw-Hill Book Company, 1974, 1st ed., pages 371-373.)

A-1-4.1 See ASTM E380, *Standard for Metric Practice*, for additional information.

A-2-1.2 If at all possible, the apparatus should be loaded with previously tested and dried hose and returned to service.

The use of 100 percent polyester hose has increased very rapidly. However, this hose should be thoroughly drained and dried before reloading on the apparatus. Damp or wet hose loaded on the apparatus hose bed will still cause mildew to form. Although this will not affect the hose itself, it does cause undue rusting of the apparatus body and increases the potential of dry-rot in the wood flooring under the hose.

The use of a protective hose bed cover is recommended to protect the hose load from weather damage and other physical damage. Where covers are provided, care must be taken to permit free circulation of air under the cover to reduce the danger of mildew. Covers should be made from flame resistant materials and secured to the apparatus in a manner to prevent them from blowing off while the apparatus is in motion.

When the humidity is 70 percent or greater or when hose is for municipal use, jackets with cotton yarns should be treated with water repellents and against mildew.

A-2-1.3 It has been discovered that when 100 percent polyester hose is loaded on the apparatus in the conventional manner (horseshoe U-load, accordion, or skid loads) excessive edge wear is noted on this 100 percent polyester hose. As a result of this edge wear, hose manufacturers recommend that where 100 percent polyester hose is used, it be loaded on the apparatus in the FLAT LOAD manner.

Best fire department and forestry practice is to remove the hose from the apparatus at least once a month. Water should be run through the hose once quarterly and the hose thoroughly dried before being replaced on the apparatus.

A-2-1.4 Failures in short lengths of large-diameter pumper supply hose, also called soft suction, generally are caused when this hose is carried on the apparatus folded and either tied down or placed in a small compartment. Where folds are always placed at the same points, they place considerable stress on the warp threads. If limitations of space prevent folding the hose so that the folds occur in different places, it should be carried in a roll on a step or running board. Many fire departments keep one end of this hose preconnected to the suction side of the pump which decreases the time for hydrant hookup.

A-2-1.6.1 Pressure and volume relief device shall have adequate capacity, to relieve sufficient flow to effectively reduce the pressure in large-diameter hose to the desired setting. Relief valves normally installed on fire department pumpers are not adequate to perform this function.

A-2-1.8 When hoisting attack hose, damage can be avoided and the task made easier by use of hose rollers. Synthetic hose is more susceptible than cotton hose to damage from hot embers and radiant heat. Where it is necessary for vehicles to cross attack hose lines, hose bridges should be used. More damage to the hose is likely to occur on uncharged hose than on charged hose. To control water hammer when opening a water supply controlled by a quick-acting valve, such as a ball valve, crack the valve and allow water to fill the system before opening the valve completely.

A-2-1.10 During freezing weather, it is common practice to place the nozzle out of a window and by "cracking" the valve, keep water moving through the hose while overhaul is in process. Avoid sharply bending hose in or on which ice has formed as frozen hose can easily be damaged by a sharp bend. Use care in removing hose from ice after a fire. Steam is useful in removing ice from hose.

A-2-1.11 At structural fires, fire hose is exposed not only to heat from fires but burning embers, broken glass, nails and other sharp objects.

A-2-2.1 General recommendations for care and use of lightweight large-diameter relay-supply hose.

(a) Hose should be loaded flat in the hose bed and layered across the bed. All couplings should be loaded so as to pull off the load without flipping over.

(b) Before reloading into apparatus bed, remove all grit and foreign materials from hose. For hose of the type described in 2-1.4, drying after washing is not a requirement; however, hose should be rinsed off and dried with a clean rag or towel and then reloaded. Wet and dirty hose should not be reloaded for in-service use until thoroughly cleaned and dried.

(c) Couplings should be lubricated occasionally with a liquid silicone or light silicone base lubricant, or a dry graphite power.

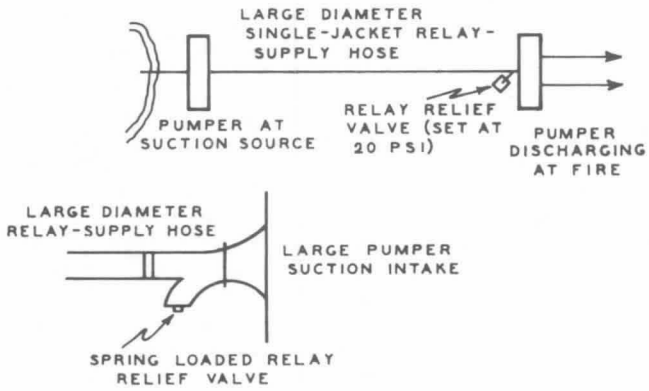


Figure A-2-2.9 Schematic Showing Relay Relief Valve.

A-2-2.9 The automatic pressure governor or the discharge relief valve on the pumper does not provide protection to the suction side of the pump. The lower the setting of the relay relief valve, the greater the protection to the hose. The relay relief valve should be designed to control the buildup of air pressure.

When shutting down the relay operation always disengage the pump nearest the fire first and allow the water to run free, then shut down the relay from the water source. This will avoid the pumper nearest the fire from pumping dry.

A-2-2.11 Large-diameter relay-supply hose should not be run over. If hose must be crossed, hose bridges should be used and vehicles should have sufficient clearance to cross without contact with hose.

A-2-3 Class II Standpipe System. Note size of standpipe and 1½-in. (38-mm) hose for building occupant use.

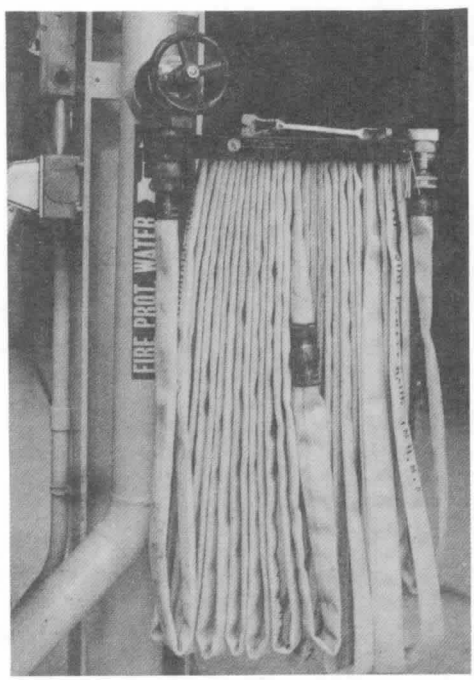


Figure A-2-3. *(Courtesy of National Aeronautics and Space Administration)*

A-2-3.1 When the humidity is 70 percent or greater, jackets with cotton yarns should be treated with water repellents and against mildew.

A-2-3.4 Typical Hose Houses.

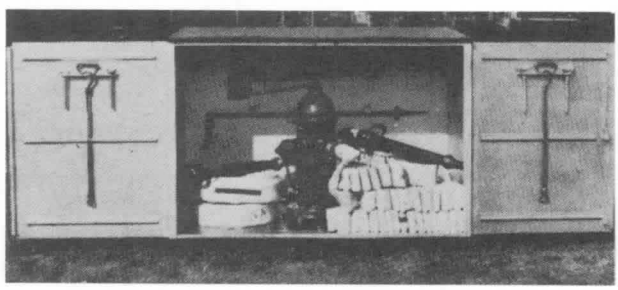


Figure A-2-3.4(a) Hose house of compact dimensions for installation over a yard hydrant. Construction may be steel or aluminum.

Figure A-2-3-4(b) Steel house of compact dimensions for installation over a yard hydrant.
House is shown closed. Top lifts up and doors on front side open for complete accessibility.

A-2-4.1 For best life, hose should be stored in a ventilated area at temperatures between 32°F (0°C) and 100°F (38°C).

A-2-6.1 For washing, use a scrub brush and mild soap or detergent and water. A mechanical washer can be used where hose is used frequently or the quantity to wash is great. Avoid constant washing of cotton jacket hose treated for mildew resistance as the washing will wash out the treatment. There are several commercial hose washers available, although many fire departments have constructed their own.

A-2-6.3 Tower drying has proved successful [*See Figures A-2-7.1(a) through (e)*]. However, care should be taken to properly ventilate and control the temperature of the tower so the hose will not be damaged by excessive heat. It is poor practice to suspend hose from couplings.

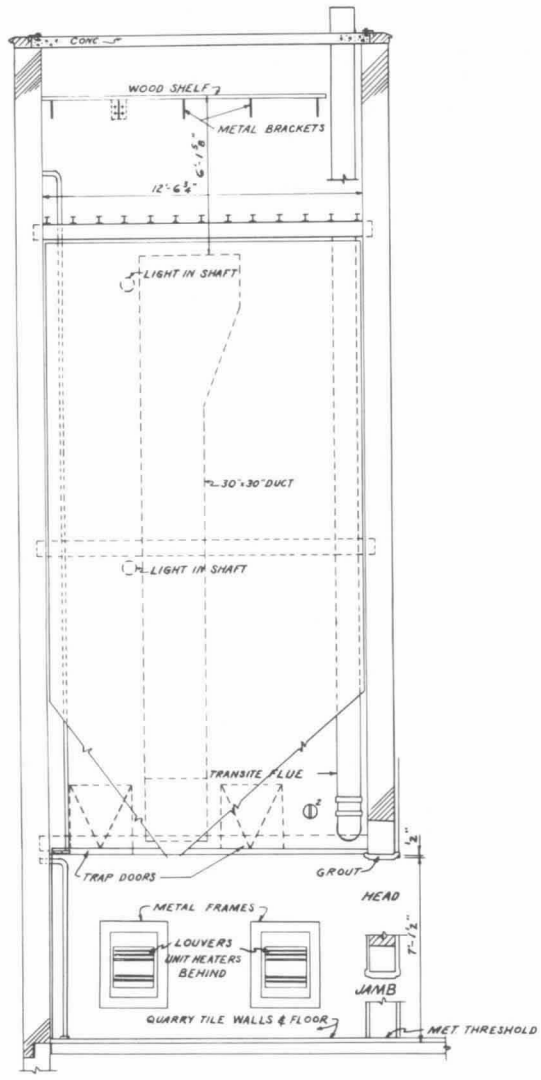


Figure A-2-7.1(a) Section through hose drying tower.

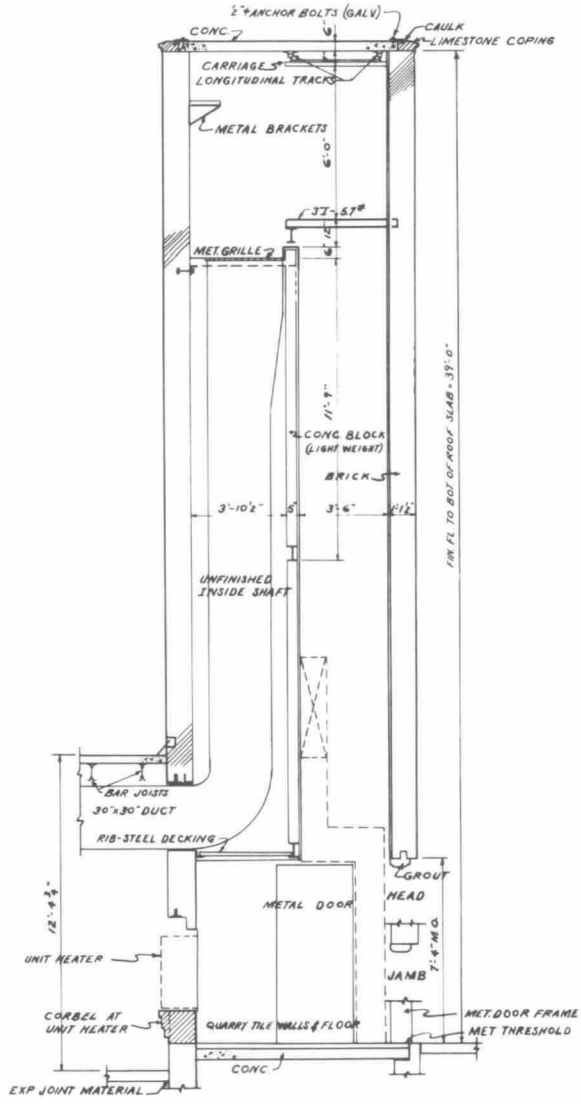
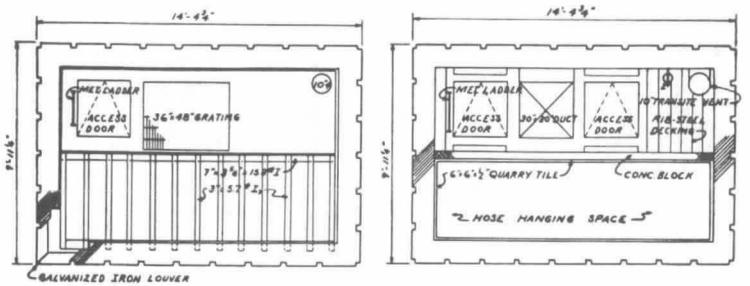
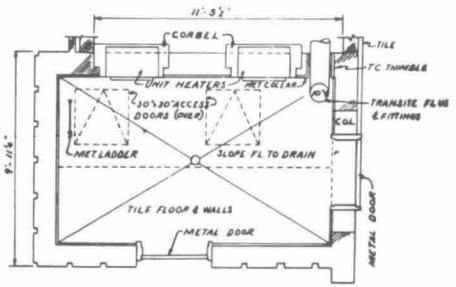


Figure A-2-7.1(b) Section through hose drying tower.

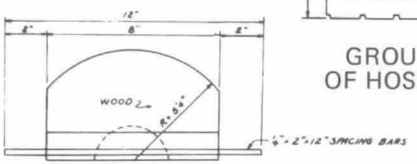


PLAN AT HOSE TOWER LOFT

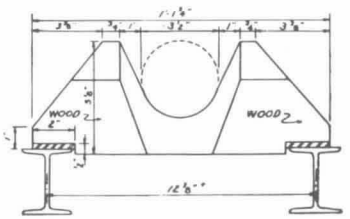
MID-FLOOR PLAN



GROUND FLOOR PLAN
OF HOSE DRYING TOWER



END ELEVATION



SIDE ELEVATION

DETAIL OF HOSE HANGING BLOCKS
50 Required

Figure A-2-7.1(c) Features of hose drying tower.

Figure A-2-7.1(d) Hose drying tower for forestry hose.

(Courtesy of United States Forest Service)

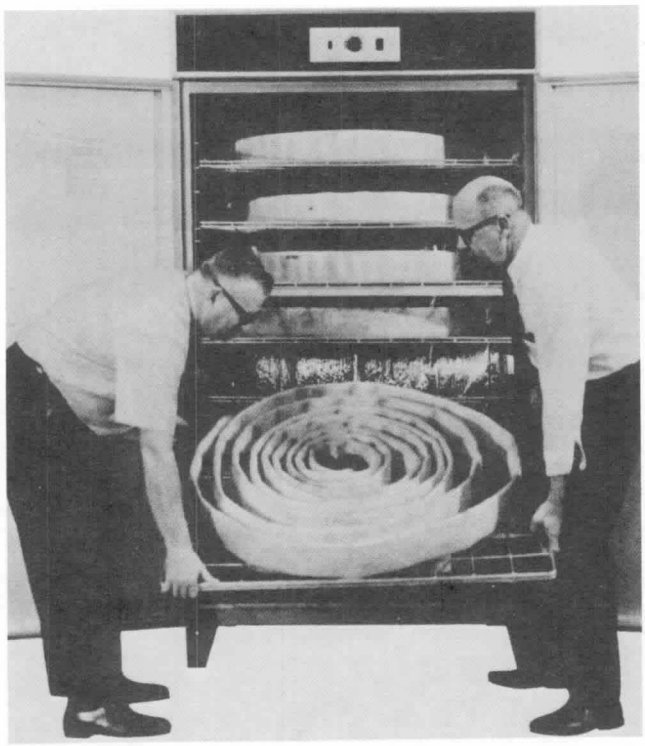


Figure A-2-7.1(e) Typical commercial hose dryer. *(Courtesy of Circul-Air Corp.)*

To dry linen hose, the following suggestions should be considered:

1. At least 24 hrs in a hose drier - loosely coiled.

2. Regardless of drying method the hose should be limp and flexible and retain no degree of stiffness beyond what it was originally.

3. Do not be misled by the fact that hose is dry on the outside.

A-2-7.1 Commercial storage racks are available but many users have built their own to fit their particular need.

A-3-1.1 Records are essential and necessary data to determine hose performance and assure safe use in fire fighting. Cost effectiveness can also be determined. This recorded information should be used for effective hose management.

A-3-1.2 Where hose repairs are frequent, however, couplings and hose lengths may become intermingled so that either stenciling the hose or changing the couplings should be employed. In stamping couplings, the proper procedure is to insert a special steel plug with round edges into the end of the expansion ring. One sharp blow from a steel numbering die will then clearly stamp the coupling. Coupling bowls may be damaged by improper number or letter stamping. Aluminum couplings should be stamped before they are hardcoated. Some fire departments color code couplings as well as various tools to identify the company to which the equipment is assigned. This enables each company to readily identify and pick up its own hose and equipment used at a fire. Where mutual aid operations are frequent, each length of hose should be appropriately stenciled or marked with identification of the fire department owning same. A water-base latex paint is not harmful to the hose. Paints with a petroleum solvent base may cause the bond between the liner and jacket to fail.

A-3-1.3 As the safe use of hose requires continuous, accurate, up-to-date records, the records should be maintained and kept at the company level in addition to a central file. Conditions, repairs, changes, problems, etc., should be recorded immediately for each length of hose.

A-3-1.5 Other information recorded might include: coupling threads, manufacturers of coupling and part number, length of guarantee, label number, and cost.

HOSE RECORD CARD

ID NO. _____ CITY _____ ENGINE CO. _____

SIZE (DIA.) _____ LENGTH _____ TYPE HOSE _____ CONST. _____ COST _____

MFG. _____ PART NO. _____ DATE RCD. _____ DATE IN SERVICE _____

VENDOR _____ CPLG. MFG. _____ TYPE CPLGS. _____

REPAIRS

DATE	KIND	COST	NEW LENGTH	NEW ID NO.

REMARKS: _____

SERVICE TEST TO _____ PSI **TEST RECORD**

DATE	SERVICE TEST PRES. PSI	TEST OK	REASON FAILED	DATE	SERVICE TEST PRES. PSI	TEST OK	REASON FAILED

DATE	EXPOSED TO POSSIBLE DAMAGE		DATE	REASON
		REMOVED FROM SERVICE		
		CONDEMNED		
		SOLD		
		WRNTY. FAILURE		

Figure A-3-1.3 Example showing front and back of a hose record card. *(Courtesy of Scandia Industries, Inc.)*

A-3-1.6

HOSE REPAIR TAG

HOSE TO BE REPAIRED MUST BE TAGGED

ID NUMBER ◇	COMPANY NUMBER
PICKED UP BY: ◇	DATE PICKED UP
DELIVERED BY: ◇	DATE DELIVERED

REPAIRS NEEDED:

REPAIRS MADE:

REPAIRED BY. ◇	DATE REPAIRED
SERVICE TESTED PSI	DATE TESTED

☐ HOSE IS NOT REPAIRABLE.
ID NO. OF REPLACEMENT HOSE →

NOTE: THIS TAG MUST BE FILLED OUT AND RETURNED WITH HOSE. ENTER REPAIRS ON HOSE RECORD CARD.

(Courtesy of Memphis Fire Dept.)

A-3-2.1 Forestry hose is often moved from one location to another in large quantities. Many times forestry fire apparatus leaves the scene of a fire with a different complement of hose than that at arrival. Because of the relocation of hose following fire activity, maintaining individual records of each length of hose may be impracticable. As a minimum, records should be kept on stored hose at stations and fire warehouses to ensure proper inventory rotation.

A-4-1.2 It should never be necessary to hammer a shutoff valve to make it operate.

A-4-1.7 Nozzles should be washed in a solution of soap and warm water. The nozzle should be submerged and the adjustable controls operated until a free movement is obtained, and then rinsed in water. The nozzle should be lubricated in accordance with the manufacturer's instructions. Cracked rubber-covered handles on nozzles can be the source of accidents and should be replaced.

A-4-2.1 In most cases a machine shop with the proper facilities can repair damaged threads. One way to detect any slippage of the coupling on the hose is to inspect the area where the expansion ring is located for any appreciable gap between the expansion ring and the coupling waterway. Ordinarily the swivels can be freed satisfactorily by immersion in warm soapy water.

A-4-2.2 On some couplings such abuse can cause the hose bowl and swivel to go "out-of-round" and, as a result, the swivel will not turn.

A-4-2.5 Usually a misfit over $\pm$ $\frac{1}{32}$ in. (0.79 mm) will require special techniques and should be avoided.

A-4-2.6 A degree of skill and experience is required to properly attach couplings to hose. You should have good equipment and a mechanic skilled and experienced in attaching couplings. If not, this work should be done by the manufacturer of the hose.

A-4-2.7 Damaged fire hose should not be patched unless such repair is recommended by the manufacturer of the hose and it is performed by properly trained and equipped personnel.

A-4-2.8 A high quality synthetic gasket, i.e., Buna N., with antioxidants or neoprene should be used, as natural rubber gaskets may deteriorate with age and will harden and break away from the gasket seat.

A thread gasket with a smaller diameter than that of the recess can cause a leaky connection when pressure is applied. See NFPA 1963, *Standard for Screw Threads and Gaskets for Fire Hose Connections.*

A-4-2.9 The tail gasket is the gasket placed in the coupling at the end of the hose to prevent leakage and to keep the fabric of the hose jacket dry. (*See Figure A-4-2.8.*)

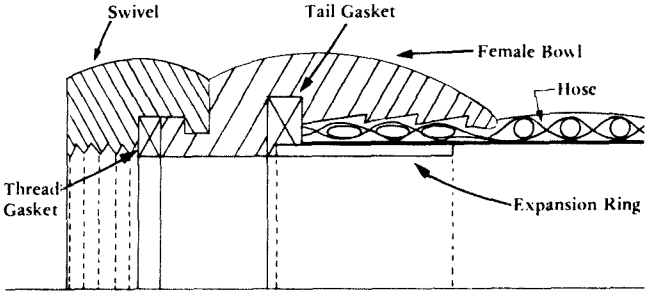


Figure A-4-2.9 Female coupling assembly.

A-4-2.10 If the gasket protrudes at the nozzle connection it can cause a ragged stream, thus reducing the effective reach of the nozzle, and at a coupling it can cause increased friction loss.

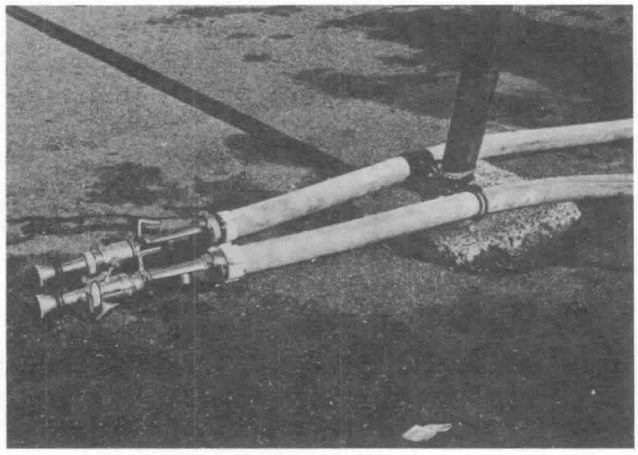
A-5-1.3 Hose meeting the requirements of NFPA 1961, *Standard on Fire Hose*, 1987 edition, and hose meeting the requirements of NFPA 1961, *Standard on Fire Hose*, 1979 edition and prior editions will probably have different service test pressures.

A-5-2.1 Air under pressure becomes greatly compressed, and the hose can whip violently if the pressure is suddenly released by a hose burst; also a blown-off coupling propelled by the compressed air will act like a high velocity missile (*see 5-2.2.5*).

A-5-2.2.2.1 If the hose bursts during the test the hose-test gate valve will not permit a volume surge from the pump. The closed-hose test gate valve will allow just enough water to enter the hose during the test to compensate for dilation and not allow a volume surge from the pump if a hose bursts.

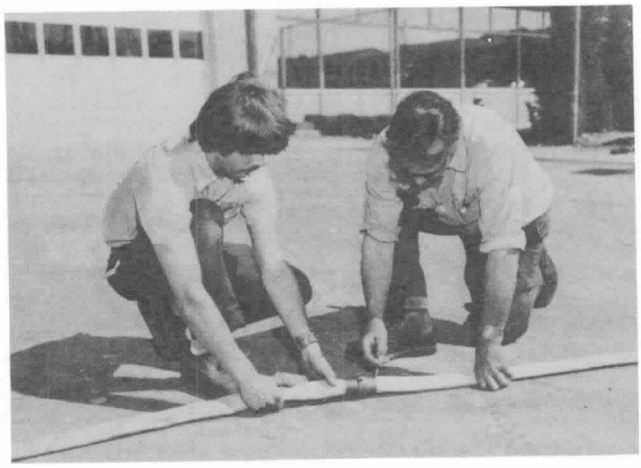
A-5-2.2.4 The surface on which the hose is laid out should be as smooth as possible. Rough surfaces will accelerate abrasion and hinder proper movement of the hose line.

A-5-2.2.7



Secured test hoses. *(Courtesy of Chelsea, Mass. Fire Department)*

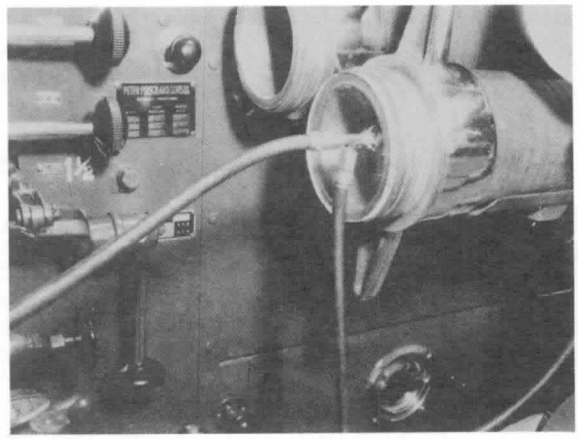
A-5-2.2.8



Marking for coupling slippage.

A-5-2.2.14 Rate of increase specified in 5-2.2.10 should not exceed 250 psi (1720 kPa) in 15 sec, or 500 psi (3450 kPa) in 30 sec.

A-5-4.3 The suction hose vacuum test may be run in conjunction with the annual pumper suction test.



Plastic test disk for pumper suction hose. One line goes to the pumper vacuum and the other to a test gage. A clear plastic disk at the other end used with a light makes it possible to observe if the internal lining is drawn into the waterway. *(Courtesy of San Diego Fire Department)*

Appendix B Referenced Publications

B-1 The following documents or portions thereof are referenced within this standard for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

B-1.1 NFPA Publications. National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

NFPA 1901-1985, *Standard for Automative Fire Apparatus*

NFPA 1963-1985, *Standard for Screw Threads and Gaskets for Fire Hose Connections.*

B-2 Other Publications.

American Society for Testing and Materials, ASTM E380-78, *Standard for Metric Practice*, 1979, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

Fire Hose Practices, 7th Edition, 1987, Fire Protection Publications, Stillwater, OK.

Purington, R. G., *Fire Fighting Hydraulics*, 1974, 1st edition, pp. 371-373, McGraw-Hill Book Co., New York, NY.

United States Department of Agriculture Fire Service Specification 5700-183f, "1-and 1½-in. Linen Hose," August, 1975, United States Department of Agriculture Fire Service Specifications, Superintendent of Documents, United States Government Printing Office, Washington, DC 20402.

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SUBMITTING PROPOSALS ON NFPA TECHNICAL COMMITTEE DOCUMENTS

Contact NFPA Standards Administration for final date for receipt of proposals on a specific document.

INSTRUCTIONS

Please use the forms which follow for submitting proposed amendments. Use a separate form for each proposal.

1. For each document on which you are proposing amendment indicate:
   (a) The number and title of the document
   (b) The specific section or paragraph.

2. Check the box indicating whether or not this proposal recommends new text, revised text, or to delete text.

3. In the space identified as "Proposal" include the wording you propose as new or revised text, or indicate if you wish to delete text.

4. In the space titled "Statement of Problem and Substantiation for Proposal" state the problem which will be resolved by your recommendation and give the specific reason for your proposal including copies of tests, research papers, fire experience, etc. If a statement is more than 200 words in length, the technical committee is authorized to abstract it for the Technical Committee Report.

5. Check the box indicating whether or not this proposal is original material, and if it is not, indicate source.

6. If supplementary material (photographs, diagrams, reports, etc.) is included, you may be required to submit sufficient copies for all members and alternates of the technical committee.

NOTE: The NFPA Regulations Governing Committee Projects in Paragraph 10-10 state: Each proposal shall be submitted to the Council Secretary and shall include:

(a) identification of the submitter and his affiliation (Committee, organization, company) where appropriate, and

(b) identification of the document, paragraph of the document to which the proposal is directed, and

(c) a statement of the problem and substantiation for the proposal, and

(d) proposed text of proposal, including the wording to be added, revised (and how revised), or deleted.