

4123:1-21-06 **Fire hose, couplings, and nozzles.**

(A) Care and use of fire hose.

(1) Attack hose, supply hose, and forestry hose.

- (a) Large-diameter hose marked "Supply Hose" shall be used at operating pressures not to exceed one hundred eighty-five psi to supply pumpers from hydrants and in relay from pumper to pumper and to directly supply attack lines, master streams appliances, portable hydrants, manifolds, and standpipe and sprinkler systems.
 - (i) 6-inch supply hose shall not be used at operating pressures exceeding one hundred thirty-five psi.
- (b) 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 provided on the discharge side of the pump when large-diameter supply hose is being used to supply attack lines, manifolds, and standpipe and sprinkler systems. Rapid closing or opening valves shall not be used with large-diameter supply hose.
- (c) When hose marked "Supply Hose" is used in relay between pumpers, the suction of each receiving pumper shall be equipped with a relief valve.
- (d) Hose that has been frozen during use shall be thawed and service tested as specified in paragraph (D) of this rule before being put back in service or in storage.
- (e) After use and before being placed in storage or back in service, the hose shall be drained, cleaned, and inspected as specified in paragraph (A)(3) of this rule.

(2) Booster and hard suction hose.

- (a) Booster and hard suction hose shall be service tested at least annually as specified in paragraph (D)(5) of this rule.
- (b) Hose which has the braid exposed shall be removed from service and repaired or destroyed. The defective section may be cut out, and the length recoupled and service tested as specified in paragraph (D)(5) of this rule.

(3) Inspection.

- (a) Physical inspection shall determine that the hose couplings and nozzle, when required, have not been vandalized and are free of debris and that there is no evidence of mildew, rot, or damage by chemicals, burns, cuts, abrasion, and vermin.
- (b) If the hose fails the physical inspection, it shall be removed from service and not used until it can meet the service test requirements specified in paragraph (D) of this rule.
- (c) The couplings shall be inspected as specified in paragraph (C)(2)(a) of this rule.
- (d) When nozzles are required, they shall be inspected as specified in paragraphs (C)(1)(a) and (C)(1)(b) of this rule.

(4) Storage.

- (a) Hose shall be stored only after it is properly inspected, service tested, if required, brushed or washed, dried, and rolled.
- (b) Hose out of service for repair shall be properly tagged as specified in paragraph (B)(4) of this rule and, if temporarily stored, kept apart from any hose in storage ready for service.

(B) Hose records (attack and supply hose).

- (1) Accurate hose records shall be established and maintained.
- (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 with 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) 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) Date of each service test and service test pressure;
 - (j) Repairs and new length if shortened;
 - (k) Actual damage;
 - (l) Exposure to possible damage;
 - (m) Reason removed from service;
 - (n) Reason if condemned.
- (4) Out-of-service hose shall be properly tagged with the reason it has been removed from service noted on the tag.

(C) Nozzles and couplings.

- (1) Nozzles.
 - (a) All nozzles shall be inspected annually and after each use. The nozzle shall be inspected for the following:

- (i) Obstructions in waterway;
 - (ii) Damage to tip;
 - (iii) Full operation of adjustments such as pattern selection, etc.;
 - (iv) Proper operation of shutoff valve, if so equipped;
 - (v) Missing parts;
 - (vi) Internal gasket.
- (b) If the nozzle fails the inspection for any reason, it shall be removed from service, repaired and reinspected, or replaced.

(2) Couplings.

- (a) After each use and at each service test of the hose, couplings shall be visually inspected for the following:
- (i) Damaged threads;
 - (ii) Corrosion;
 - (iii) Slippage on the hose;
 - (iv) Out-of-round;
 - (v) Swivel not rotating freely;
 - (vi) Missing lugs;
 - (vii) Other defects that impair operation.
- (b) Couplings found defective shall be removed from service, repaired reinspected, or replaced.
- (c) 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.
- (d) The outside diameter of the hose shall fit snugly in the internal diameter of the bowl of the coupling. The expansion ring shall be of the proper size and length for the coupling used.
- (e) When couplings are attached or reattached to hose, the hose shall be service tested in accordance with paragraph (D) of this rule.
- (f) After repair or recoupling, the hose shall be retested to the service test pressure. 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 paragraph (B)(3) of this rule.
- (g) 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.
- (h) The tail gasket at the end of the hose shall be replaced when attaching a coupling.

(D) Service testing.

(1) In-service hose shall be service tested prior to being put into service for the first time and at least annually thereafter.

(2) Service test pressure.

(a) Hose manufactured prior to July 1987.

(i) 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 by finding the acceptance or proof test pressure by type of hose and corresponding service test pressure specified in table 1 of this rule.

Table 1 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 (1750)
1½ (38) thru 4 (102)	Multiple	600 (4140)	250 (1750)
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.

- (ii) 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.
- (iii) The new hose rated acceptance or proof test pressure tests shall be conducted only at the point of manufacture or at a facility properly equipped and staffed for these tests and shall not be conducted by the employer's employees.

(b) Hose manufactured July 1987 and after.

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."

- (c) After the correct service test pressure for each length of hose to be tested has been determined, the service test shall be conducted as specified in paragraph (D)(3) of this rule.

(d) Hard suction hose.

Suction hose manufactured in accordance with the 1992 Edition of NFPA 1961, Standard on Fire Hose, will be marked "for vacuum use only" if it is designed for use under vacuum only. If the suction hose is designed for use under positive pressure, it will be marked "service test to (the service test pressure) and twenty-two inch Hg. vacuum per NFPA 1962."

- (i) Hard suction hose shall be dry-vacuum tested annually. This test can be run in conjunction with the annual pumper suction test. The hose shall be attached to a suction source. The free-end shall be sealed with a transparent disk and connected to an accurate vacuum measuring instrument. A 22-inch mercury vacuum shall be developed. While holding the vacuum for ten minutes, the lining of the hose shall be inspected through the disk. There shall be no collapsing of the lining into the waterway.
- (ii) If hard suction is used under positive pressure, it shall be service-tested to the marking on the hose, or if not marked, to one hundred sixty-five psi using the procedures as specified in paragraph (D)(3) of this rule.

(e) Booster hose.

Booster hose shall be tested annually in accordance with paragraph (D)(3) of this rule to one hundred ten per cent of its maximum working pressure which may be marked on the hose. If it is not marked, it shall be tested to one hundred ten per cent of the normal highest working pressure as used in the system.

(3) Service test and hose testing machine procedure.

The following test procedure shall be followed:

- (a) Each length of hose to be service tested shall be inspected as specified in paragraph (A)(3) of this rule. Any length of hose that fails the inspection shall be removed from the service test area and repaired as necessary or destroyed.
- (b) A hose testing machine, a stationary pump, or a fire department pumper, each equipped with a hose test gate valve, shall be used for the test procedure.
 - (i) The hose testing machine shall be carefully examined for damaged components before commencing the service tests. This check shall be performed before each testing session. If any damage is discovered, the machine shall not be used until repairs are made.
 - (ii) Pressure leak integrity test shall be performed on the machine to determine if the pressurized outlet side and its components are leak free. The fire hose outlet connection(s) of the machine shall be capped or otherwise closed. Pressure shall be applied through the machine using the integral pump to a level that is ten percent higher than the highest service test pressure needed for the hose test. The pressure shall be held for three minutes with the pump turned off. If leaks are detected, the machine shall not be used until the leaking components are repaired.
- (c) The hose test gate valve may be a fire department gate valve with a one-fourth-inch 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.
- (d) All three and one-half-inch 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.
- (e) 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 three hundred feet. The hose layout shall be straight without kinks or twists. Exception: hose that has been repaired or recoupled shall be tested one length at a time.
- (f) 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 ten to fifteen inches from the coupling. Shut-off nozzles or test caps shall be attached to the far end of the line.
- (g) With the hose test gate valve open and the nozzle or test cap valve open, the pressure shall be gradually raised to forty-five PSI plus or minus five PSI. 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.

- (h) 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.
- (i) After being filled to forty-five psi plus or minus five psi, 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.
- (j) All personnel not required to perform the remainder of the test procedure shall clear the area.
- (k) The pressure shall be raised slowly at a rate not greater than fifteen psi per second until the service test pressure is attained and then maintained, by pressure boosts if necessary, for the duration of the stabilization period. The stabilization period shall be not less than one minute per one hundred feet of hose in the test layout. After the stabilization period, the hose layout shall hold the service test pressure for three minutes without further pressure boosts.
- (l) 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 fifteen feet to either side of the nearest hose line in the test layout. Personnel shall never stand in front of the free end of the hose or closer than fifteen feet to the hose and shall not straddle a hose in the test layout during the test.
- (m) If during the test a section of hose is leaking, or if 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 paragraph (D)(3)(a) of this rule.
- (n) 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.
- (o) 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.
- (p) The hose records specified in paragraph (B) of this rule shall be updated to indicate the results of the service test for each length of hose tested.
- (q) All hose failing the physical examination, bursting, leaking, or having couplings that fail because of slippage or leaking shall be tagged as required in paragraph (B)(4) of this rule, 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.

(4) Unlined hose.

Unlined fire hose shall be replaced with an approved lined fire hose when service testing is required.

(E) Application.

The requirements of this rule shall apply only to fire hose, couplings, and nozzles contracted for or bought on or after the effective date of this rule, except that the requirements of paragraph (D) of this rule shall also apply to all fire hose, couplings, and nozzles owned before the effective date.