SPRINGFIELD FIRE DEPARTMENT

Series 600

Title:	**Annual Inventory and Hose Testing**	**602**
Category:	**Maintenance**	**7/2017**

The purpose of this guideline is to explain the proper procedure for the testing of fire service hoses. This procedure outlines the **National Fire Protection Associations (NFPA) Standards 1962, "Standard for the Care, Use and Service Testing of Fire Hose Including Couplings and Nozzles."**

GENERAL OPERATING GUIDELINES

1. Hose shall be service tested one year after its date of manufacture or before it is placed in service for the first time. **4.1.3**

2. Hose that is in service shall be service tested at least annually. **4.1.2**

3. Hose held in storage for longer than one year shall be service tested before it is placed in service. **4.1.4**

4. All hose shall be inspected prior to service testing. **4.1.1**

5. Each hose will have an identification number assigned. If there is a numbering system in place, those numbers will be used accordingly. If there is no identification number assigned, each length of hose shall be given one.

HOSE INSPECTION **4.5**

1. Physical inspection shall determine if the hose and couplings have been vandalized, are free of debris, and exhibit no evidence of mildew, rot, or damage by chemicals, burns, cuts, abrasion, and vermin. **4.5.1**

2. During the inspection, a check shall be made to determine if the service test of the hose is current. **4.5.2**

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4. The interior of the hose at each end shall be visually inspected for any physical signs of liner delamination. If the liner shows signs of delamination, the hose shall be condemned. **4.5.3.1 & 4.5.3.2**

5. If the hose fails the physical inspection, it shall be removed from service and either repaired as necessary and service tested or condemned. **4.5.4**

SERVICE TEST USING A HOSE TESTING MACHINE **4.8.5**

The following procedures defined in this guideline shall be used when hose is service-tested using a hose testing machine.

WARNING: Because there is a potential for catastrophic failure during the service testing of fire hose, it is vital that safety precautions be taken to prevent exposure of anyone to this danger. Do not deviate from the procedures prescribed herein.

1. The condition of the hose tester shall be thoroughly checked before each testing session and before the machines is used. **4.8.5.1**

2. The hose testing machine shall be carefully examined for damaged components that might fail during the test. **4.8.5.1.1**

3. If any damage is discovered, the hose testing machine shall not be used until the damaged component(s) are repaired or replaced. **4.8.5.1.2**

4. A pressure leak integrity test shall be performed on the machine to determine whether the pressurized outlet side of the machine and its related components are leak free. **4.8.5.1.3**

5. The fire hose outlet connection(s) of the machine shall be capped or otherwise closed. **4.8.5.1.3.1**

6. Pressure shall be applied through the machine using integral pump to a level that is 10% higher than the highest service test pressure needed for the hose to be tested. **4.8.5.1.3.2**

7. The pressure shall be held for 3 minutes with the pump turned off. **4.8.5.1.3.3**

8. If leaks are detected, the testing machine shall not be used until leaking component(s) is repaired or replaced. **4.8.5.1.3.4**

9. The test gauge that is used to read the test pressure shall have been calibrated within the last 12 months. **4.8.5.1.4**

10. The test layout shall be connected to the outlet side of the water supply valve on the hose testing machine.

11. If the hose machine incorporates elevated outlets for water supply that are higher than the inflated diameter of the hose from the testing surface, a means to vent trapped air shall be provided between the hose and the valve. **4.8.5.1.5**

CONDUCTING THE TEST **4.8.5.2**

1. The test layout shall be connected to the outlet side of the water supply valve on the hose testing machine. **4.8.5.2.1**

2. A test cap with a bleeder valve shall be attached to the far end of each hose line in the test layout. If a test cap is not available, a nozzle with a non-twist shutoff shall be permitted to be used. **4.8.5.2.2**

3. With the test cap valve or the nozzle open, the pressure shall be raised gradually to 45 PSI ± 5 psi (3.1 bar ± 0.35 bar or 310 kPa ± 35kPa). **4.8.5.2.3**

4. After the hose test layout is full of water, all the air in each hose line shall be exhausted by raising the discharge end of each hose line above the highest point in the system. **4.8.5.2.4**

   Warning: Take care to remove all air from the hose before the valve in the test cap is closed and the pressure is raised. The development of test pressures introduces the potential for a serious accident potential if air remains in the system.

5. If the hose testing machine incorporates elevated outlets for water supply that are higher than the inflated diameter of the hose from the testing surface, air shall be vented next to the water input end. **4.8.5.2.5**

6. The nozzle or test cap valve shall be closed slowly, and then the outlet water supply valve shall be closed. **4.8.5.2.6**

7. The hose directly in the back of the test cap shall be secured to avoid possible whipping or other uncontrolled reactions in the event of a hose burst. **4.8.5.2.7**

8. With the hose at 45 PSI ± 5 PSI (3.1 bar ± 0.35 bar or 310 kPa ± 35 kPa), it shall be checked for leakage at each coupling and the couplings tightened with a spanner wrench where necessary. **4.8.5.2.8**

9. Each hose shall then be marked at the end of each coupling to determine, after the hose has been drained, if the coupling has slipped during the test. **4.8.5.2.9**

10. All personnel other than those persons required to perform the remainder of the test shall clear the area. An "ALL CLEAR" signal will be given. Safety cones will be placed 20 feet from test hose layout. This will mark a "SAFETY AREA." Only authorized personnel will be allowed into the "SAFETY AREA" during the testing phase. **4.8.5.2.10**

11. The pressure shall be raised slowly at a rate not greater than 15 PSI (1 bar or 103 kPa) per second until the service test pressure is attained and then maintained, by pressure boosts if necessary, for the duration of the stabilization period. **4.8.5.2.11**

12. The stabilization period shall be not less than 1 minute per 100 feet (30 m) of the hose in the test layout. **4.8.5.2.12**

13. After the stabilization period, the hose layout shall hold the service test pressure for 3 minutes without further pressure boosts. **4.8.5.2.13**

14. While the hose test layout is at the service test pressure, it shall be inspected for leaks. **4.8.5.2.14**

15. The inspecting personnel will 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 of the hose line shall be defined as that side that is to the left when facing the free end from the pressure source. **4.8.5.2.14.1**

16. Personnel shall never stand in front of the free end of the hose(s), on the right side of the hose, or closer than 15 ft (4.5m) on the left side of the hose, or straddle a hose in the test layout during the test. **4.8.5.2.14.2**

17. If the hose test layout does not hold the service test pressure for the three (3) minute duration. The service test shall be terminated. **4.8.5.2.15**

18. The length(s) of hose that leaked shall have failed the test. **4.8.5.2.15.1**

19. The test layout shall be drained and the defective hose removed from the test layout. **4.8.5.2.15.2**

20. The service test shall be restarted beginning with the above procedures. **4.8.5.2.15.3**

21. After the three (3) minutes at the service test pressure, each test cap shall be opened slowly to drain the test layout. **4.8.5.2.16**

COUPLING SLIPPAGE **4.8.5.2.17**

1. The hose and any marks placed on the hose at the back of the couplings or at external collars shall be observed for coupling slippage after completion of the serve test and after the hose has been drained. **4.8.5.2.17.1**

2. If the hose assembly shows any sign of coupling slippage, the hose shall have failed the test. **4.8.5.2.17.2**

HOSE TESTING RECORDS **4.11**

1. Accurate hose records shall be established and maintained. **4.11.1.1**

2. Each length of hose shall be assigned an identification number for the use in recording its history throughout its service life. **4.11.1.2**

3. The identification number shall be marked on the hose at the female end of all attack hose (1 ¾ in., 2 in., 2 ½ in.). All supply hose (3 in, 4 in, 5 in,) the identification number will be marked at the furthest end of the hose from the hose testing machine. A black magic marker shall be used to mark the ID number. **4.11.1.2.1 & 4.11.1.2.2**

4. Records of the hose used by the fire department shall be kept as part of the departments complete equipment inventory. **4.11.1.3**

CLEANING AND DRYING **4.6**

1. After each use, all hose shall be cleaned. **4.6.1**

2. If dirt cannot be thoroughly brushed from the hose or if the hose has come in contact with harmful materials, the hose shall be washed. **4.6.2**

3. Hose shall not be dried on hot pavements or under intense sunlight. **4.6.5**

STORAGE **4.7**

1. Hose shall be kept out of direct sunlight and in a well-ventilated location. **4.7.1**

2. All hose shall be drained and thoroughly dried before being placed in storage. **4.7.2**

3. Hose shall be stored only after it has been inspected and has been cleaned and dried. **4.7.3**

REPLACEMENT OF FIRE HOSE **4.1**

1. Only clean, dry hose shall be placed in service. **4.1.5**

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. **4.1.6**

3. Hose shall be removed from the fire apparatus and reloaded so that the folds occur at different positions with sufficient frequency to prevent damage and the setting of permanent folds in the rubber lining. **4.1.7**

DAMAGE PREVENTION **4.1.11**

1. Hose, while in use, shall be positioned to minimize mechanical damage and heat exposure. **4.1.11.1**

2. Vehicles shall not be driven over charged or uncharged fire hose unless the hose is bridged and the vehicle has sufficient ground clearance to cross the bridged hose. **4.1.11.2**

3. Nozzles and valves shall be opened and closed slowly to prevent pressure surges and water hammer that can burst the hose and in turn cause injury to people or damage to the pump. **4.1.11.3**

4. Care shall be taken to prevent the hose from chafing. **4.1.11.4**

5. Care shall be taken to avoid dragging large-diameter fire hose, but if the hose must be dragged, it shall be dragged when flat. **4.1.11.5**

6. When hose is in use during subfreezing weather, care shall be taken to prevent water from freezing inside the hose. Hose that has frozen during use shall be thawed and service tested before being put back in service or in storage. **4.1.11.6 & 4.1.12**