

Proper care, maintenance, and testing of fire hose can make all the difference in a fire emergency.

Fire hose, while tough, is far from invulnerable to mildew, abrasion, UV rays, and a host of other forces that can weaken fire hose leading to catastrophic failures that injure firefighters or hinder firefighting efforts. In this document, we will look at how you can reduce these incidents and maximize the working life of your fire hose with a broad overview of proper fire hose washing, use, storage, inspection, and testing.

Many jurisdictions follow guidelines from the National Fire Protection Association (NFPA). In *NFPA 1962 Standard for the Care, Use, Inspection, Testing and Replacement of Hose, Couplings, Nozzles, and Appliances (NFPA 1062)*, the NFPA provides best practices for hose washing and drying.

Proper care begins with proper use.

Avoid dragging hose over sharp objects or abrasive surfaces. Rather than dragging fire hose on a folded edge, let a flat section of it make contact with concrete or pavement. This spreads the abrasion over a larger surface area to reduce wear.

Reducing contact with abrasive surfaces can prolong the usable life of a fire hose.

All fire hose should be used at or below its rated working pressure. Avoid surges in water pressure. When the need to raise the inside pressure of the fire hose arises it should be done at a slow but steady pace whenever possible.

Inspection and cleaning of fire hose, couplings and nozzles after use.

Simple cleaning techniques employed regularly can greatly extend a fire hose's usable life. The NFPA 1962 provides best practices for hose washing and drying. The following are a few of those standards.

HOSE

Fire hose should be removed from the engine after it has been charged and cleaned whenever it becomes soiled. Mild soap or detergent may be used for hose that has been in contact with oils, tars, or chemicals. Hose that has been used to pump salt water shall be thoroughly washed and flushed with water before drying. Before flushing, the couplings should be left loosened with the gaskets removed to allow for complete flushing. Any hose not used for thirty days shall be rotated. Complete instructions



for the testing of fire hose and appliances should be in your department policy. If during use, the hose has been exposed to hazardous materials, it shall (per the NFPA), be decontaminated by the method approved for the contaminant.

DAMAGE PREVENTION OF FIRE HOSE

- Hose, while in use, shall be positioned to minimize mechanical damage and heat exposure.
- Care shall be taken to prevent the hose from chafing.
- 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.
- 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.
- Avoid dragging large-diameter fire hose, but if the hose must be dragged, it shall be dragged when flat.
- When hose is in use during subfreezing weather, care should be taken to prevent water from freezing inside the hose. To help prevent freezing once the water is turned on some water shall be always be flowing through the hose.
- When the hose line is no longer needed, it should be uncoupled and drained before the water freezes.
- Hose that has frozen during use should be thawed and service tested as specified in Section 4.8 of the NFPA 1962.

WASHING FIRE HOSE

- Before washing a fire hose, unroll it on a clean surface. Stretch it out in its entirety on a clean, level surface. Carefully removing any kinks. Care must be taken not to damage the coupling threads.
- If several hose sections are being cleaned at the same time, lay them side to side but be sure to separate them enough to allow for proper draining.
- Always use a clean, dry brush. Soft to medium bristles remove dirt and debris without unnecessary wear. Don't use a power washer or solvent, which can damage the outer jacket.
- Repeat this process for both sides of the hose. Then, begin washing the fire hose with a garden hose or other low-pressure water source.
- Fire hose covered with rubber, nitrile, or another protective exterior, wipe the hose dry. Other hose types can dry on a tower or rack. If using a commercial hose dryer, ensure that the inside of the hose drains completely.
- Avoid drying hose in direct sunlight or on hot pavement.

PROPERLY STORE FIRE HOSE AFTER WASHING

After gently washing and drying fire hose, carefully store it in accordance with NFPA 1962. The following are some suggestions to consider:

- When preparing hose for storage, avoid damaging the couplings. Protect the exposed male coupling threads by rolling them inside the hose (or cover them with protective caps). Also, allow the fire hose to breathe. Trapped moisture inside the hose can result in mold or mildew growth.
- Before hose is stored, make sure it is drained, cleaned, dried, and inspected as specified in Sections 54.5 and 4.6 of NFPA 1962.
- Hose should be kept out of direct sunlight and in a well-ventilated location
- Hose should only be stored after it has been inspected in accordance with NFPA 1962 Section 4.5 and has been cleaned and dried.
- Hose that is out of service for repair shall be tagged and kept separated from any hose in storage that is ready for service.

HOSE INSPECTIONS

Give each hose a thorough visual inspection before placing it in storage. A visual fire hose inspection can reveal loose covers, kinks, soft spots, cuts, tears, bulges, or other troublesome variations in the exterior or liner.

- 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.

- During the inspection, a check shall be made to determine if the service test of the hose is current.
- The interior of the hose at each end should be visually inspected for any physical signs of liner delamination. If the hose shows signs of delamination (mode of failure where a material fractures into layers), the hose shall be condemned.
- If the hose fails the physical inspection it should be removed from service and either repaired as necessary and service tested as specified in NFPA 1962 Section 4.8, Section 4.9 or Section 4.10 as appropriate or condemned.

FIRE HOSE TESTING

NOTE: HOSE MANUFACTURED PRIOR TO JULY 1987 SHOULD BE REMOVED FROM SERVICE PER THE NFPA 1962.

WARNING: Due to the potential for catastrophic failure during the service testing of fire hose, it is imperative that safety precautions be taken to prevent exposure of anyone to this danger.

All fire hoses require periodic testing per NFPA 1962 to verify that the hose can still safely operate under the pressure that it was designed for. Service testing requirements for fire hose vary with hose type.

The following information hit key points of NFPA 1962. It is important to note that your department should follow NFPA 1962 for more fire hose testing information.

- NFPA 1962 requires annual fire hose testing for hoses still in service. Hoses stored for longer than one year also require testing before their return to service.
- Each length of hose should be assigned an ID number for the use in recording the testing history throughout the service life of the hose.
- Hose should be laid out 300 feet or less on a horizontal surface.
- A physical inspection shall be completed on each section to determine if the hose and couplings have been damaged, are free of debris, and exhibit no signs of mildew, rot, or damage by chemicals, burns, cuts, abrasion, and vermin.
- During these tests, hoses are laid straight and filled with pressurized water.
- The pressure used varies with hose type:
 - Attack fire hose shall be service tested to a minimum of 300 psi or a pressure not to exceed the service test pressure marked on the hose.
 - Supply fire hose shall be service tested to a minimum of 200 psi or a pressure not to exceed

the service test pressure marked on the hose.

- Forestry fire hose shall be service tested to a minimum of 300 psi a pressure not to exceed the service test pressure marked on the hose.
- Occupant-use hose shall be tested to the service test pressure marked on the hose.

This required service pressure must be maintained for three minutes. During this time, inspect the fire hose for leaks and other damage. Each hose undergoing testing should also undergo a visual inspection of the couplings, liners, and jackets described in prior sections.

From NFPA 1962 any hose that fails the inspection, bursts or leaks during the service test, or has couplings that leak or are otherwise found defective as defined in NFPA 1962 should be tagged and removed from service.

RECORD THE TEST RESULTS.

Record the test results on a form maintained in a centralized location for all hose. There is a sample attached to this document.

REPAIRED HOSE

Personnel responsible for the repair and maintenance of fire hose should ensure that a report of the work performed to repair each length is recorded on the permanent hose record. **Hose that has been repaired should be tested one length at a time.**

COUPLINGS

The female hose couplings should be checked for gaskets after each use and before loading on the engine. Examples of inspection after each use:

- Inspect for wear, rust, and other defects
- Damaged threads
- Corrosion
- Slippage on the hose
- Out-of-round
- Connections not rotating freely
- Missing lugs
- Loose external collar
- Internal gasket not in place
- Any locking device operating improperly

NOZZLES

Nozzles should be visually inspected after each use and at least annually. The nozzle inspection shall verify the following:

- There is no damage to the tip.
- The waterway is clear of obstructions.
- All controls and adjustments operate as designed.
- The shutoff valve, if so equipped, operates as

designed and closes off the flow completely.

- There are no missing or broken parts.
- The thread gasket is in good condition per NFPA 1962 section 7.2.
- Ensure that the molded rubber fog teeth are undamaged.
- The coupling gasket is undamaged and present.
- Each nozzle should be tested at least as frequently as the hose with which it is used.
- Hydrostatic testing of each nozzle with a shutoff mechanism should be done per NFPA 1962.

If the nozzle fails the inspection for any reason, it should be removed from service, repaired and service tested, or replaced.

Conclusion

Each department has standard operation guidelines or procedures for cleaning, storing, and testing hose. With the guidelines in place, each department should keep up with the requirements that have been set forth. Not only will it help its overall budget in the end by having to replace less hose each year, it can also help save lives and property. Your policy should reflect NFPA 1962 fire hose testing requirements,

References

NFPA 1962 Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances, 2018 Edition.

ANNUAL HOSE TEST

FIRE DEPARTMENT: _____

TEST DATE: _____

TEST SUPERVISOR: _____

| Hose ID | Hose Location | Hose Size | Hose Condition | Purchase Date | Last Test Date | Made By | Remarks |
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Legend

- Hose ID:** This is the identification number provided by the fire department for each section of hose.
- Hose Location:** Define location of the hose; pre-connected, hose bed, storage, etc.
- Hose Size:** List the size of the hose by diameter.
- Hose Condition:** Use poor, fair, good, replace, etc.

- Purchase Date:** Write in the date of purchase.
- Last Test Date:** Write in the last known test date.
- Made By:** Who manufactured the hose.
- Remarks:** Remarks pertaining to the section of hose, e.g., stained, abrasion, coupling damaged, etc.