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NFPA Guidelines

Hose Tester



FLAMEFIGHTER
FH-1000

Safety First! Read This Section Before Using Your New Hose Tester

Even though firefighters have one of the world's most dangerous jobs, they always practice safety first. When testing fire hose, you should too.

Safety cannot be stressed enough when testing fire hose. **Do Not Skip This Section!** There may be some safety issues you have not thought of.

Safety First, Foremost, and Always!

Any time you are using this equipment you will be bringing water and electricity together which always presents potential danger. Additionally, the ultimate purpose of testing fire hose is to find out if a hose is defective to the point where it will begin to fail, fail, and/or burst at high pressure (catastrophic failure). In other words, testing fire hose is a dangerous activity.

Many safety features have been built into the testing apparatus and the instructions on its use. However, history shows that as humans, we can always find ways to overcome safety features and procedures. Therefore, the ultimate safety device on any piece of equipment is the operator. An informed operator who is constantly aware of the situation at hand can prevent more accidents than any manual, device, or warning label.

Because of this the ultimate responsibility for safe operation rests solely with the operator. In order to operate the equipment in the safest manner possible the test operator should:

- Read all instructions carefully,
- Never rush the procedure,
- Memorize all safety precautions,
- Read and obey all safety labels,
- Stay constantly aware of the entire testing area,
- Continuously monitor the hose being tested,
- Never leave the test equipment un-monitored.
- Use common sense.
- By following this advice hose testing can be done efficiently and safely for many years with your new hose testing equipment.

ADDITIONAL PRECAUTIONS – MUST READ!

Warning – Do not use the pump with anything other than water!

Warning – Do not use this unit in an explosive atmosphere!

Warning – Do not use this unit to pump water that is at or above 140 degrees Fahrenheit!

Warning – Risk of shock! All cords, outlets, or any form of power supply must be wired to meet the most recent National Electric Code requirements. Extension cords must be carefully inspected. If there is any doubt about the source, do not use it! Further, do not handle the hose testing unit in any manner when your hands are wet or when any part of your body is in contact with standing water.

Warning – Be sure that all fittings used when performing a test are rated for 500 PSI. Failure to do so may result in personal injury.

Warning – Do not alter the plumbing or wiring on the hose tester. Doing so may result in serious injury.

Danger – High voltage and moving parts around motors and motor driven equipment can cause serious or fatal injuries. Always disconnect power source before working on a motor or its connected load. Installation must conform to all OSHA requirements, and the National Electrical Code (NEC) in the United States, and all local codes.

Preparing to Test

A testing area that is properly chosen and well laid out will make the entire operation run faster and smoother.

The information provided in this section is intended to make testing fire hose easier and more efficient. These tips have been gathered from years of hose testing experience as well as from publications on the subject. Please take the time to read these helpful hints.

Location, Location, Location!

The most important aspect of testing hose with a portable tester is to pick a location that works to your advantage. The area must be large enough to lay out all of the hose that is being prepared for test, hose that has been tested, and the hose which is connected to the machine.

The test machine should be located near a water source and on reasonably level ground. Avoid placing the tester in an area where water might pool.

Attention should also be given to how well the entire area will drain since a lot of water is used in testing.

Hose Stretches

Fire hose is made from very flexible material and stretches easily. When choosing a location this must be taken into consideration. The pressures used in testing can increase a length of hose as much as 8%. So, if you are testing at full capacity (300 feet of hose on each discharge outlet) with this type of hose, as you reach pressure each hose will be fighting for additional space because the original 1200' of hose is now 1296' long.

This effect will impact your situation in two ways.

First, the hose will take up more room during the test than during setup. To offset this the operator has to plan in advance for the additional length.

Secondly, the additional length will require a larger volume of water to fill it. In the case above, if it is 5" hose the additional water required would be 97 gallons after the hose appears to be full. A good deal of this additional water will be supplied by the pressurized water source that is connected to the testing equipment. However, the 3 gallon per minute pump on the tester will have to make up the rest. This will take time so be patient. Take this time to make your initial visual inspection of the couplings to check for slippage and leaks. Do not, however, leave the testing area for any reason. If you must leave, turn the unit off first.

Air Compresses, Water Does Not

When draining air from the system, take your time to make sure you have as much of it out as possible. Since air will compress, any remaining air pockets will drastically increase the time needed to reach testing pressures. But, even worse, the stored air will expand rapidly should a hose fail and increase the amount of energy released thus increasing the chances of injury. So, take your time and get all of the air out of the system prior to starting each test sequence.

The More the Merrier

When testing hose, it is wise to test several sections at a time. The more hose that is connected to the machine, the safer it will be should a hose experience catastrophic failure. If only one or two sections are being tested the resulting force from a failure could possibly "whip" the machine. It is advisable to test at least 200 or more feet of hose at a time.

Preparing to Test (cont.)

End Caps

To cap the ends of the hoses being tested, the operator must assure that whatever is used is able to handle the pressures. Some older caps used to cover the discharges on fire pumps are not designed to handle the pressures that can be developed by the test equipment. Use of fire fighting nozzles is recommended as long as they are fabricated from either brass or aluminum. Under no circumstances should the common Lexan (plastic) nozzles found on rack type hose be used. Also, some caps might be able to handle the pressures in their regular form but when modified by drilling and tapping to add a bleeder are weakened.

The best advice for capping hose ends if fire grade nozzles are either not available or too expensive is to purchase vented caps that are specifically designed for this type of use.

Look Before You Test

A good visual inspection of hose to be tested can save the prevent a dangerous situation. It is not safe to test hose that the operator is certain will fail. A section of hose does not have to fail the pressure test in order to be removed from service. Visual imperfections are valid criteria for failure. Testing hose that is known to be defective creates a dangerous situation and should be avoided.

If it is obvious to the naked eye that a section of hose, testing that hose will also waste the operator's time. The failed hose will have to be removed from the setup and the test started from the beginning on all remaining hose. Such hose should be repaired first, if practical, and then tested to confirm the repairs were done in an acceptable manner thus saving time.

The operator should take the necessary time to do a thorough visual inspection of all hose to be tested and reject the obvious bad lengths.

Testing fire hose is dangerous enough without intentionally adding to the risk.

Hose Testing Procedure

Using the proper procedure will result in reliable and consistent results.

Following is a general guideline for testing fire hose. This guideline is not intended to replace your department or company standard operating procedures.

The Procedure

Fire hose should be tested as set forth in NFPA Pamphlet 1962, *Standard for the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles*, latest edition. Copies of this document can be obtained from NFPA by calling (617)770-3000 or by visiting their website at www.nfpa.org. It is strongly suggested that anyone testing fire hose obtain a copy and read it thoroughly. The standards have been produced and honed for years by manufacturers, firefighters, insuring agencies and other experts on the subject.

During pressurization and when the attained pressure is being held, all visual inspections should be performed from a distance of about 15 feet.

Do not move or drag fire hose once it has reached test pressure.

Never straddle hose that is being tested.

1. Attach fire hose to be tested (ensure all connected hose requires the same test pressure)
2. Per NFPA all hoses being tested need to be tied together. It is recommended to tie the hose at every coupling assembly.
3. Attach bleeder caps at free ends of hose,
4. Tighten all fittings leaving bleeders open,
5. Mark hose at each coupling,
6. Connect water source to inlet of tester,
7. Slowly open the main inlet valve on tester,
8. Slowly open the individual valve(s) to fill hose with water,
9. As each bleeder begins to pass air-free water, close it firmly,
10. Once all bleeders are closed, allow the unit to sit for one minute,
11. Crack each bleeder slightly to remove remaining air,
12. Close all bleeders,
13. Close the main inlet valve on the tester, leaving the individual hose supply valves open,
14. Attach hose tester line cord to 110 volt AC outlet,
15. Turn switch on,
16. Be patient,
17. When the desired pressure is achieved, adjust relief valve handle to maintain pressure,
18. Start timer,
19. At end of test time, switch pump off and disconnect from power source,
20. Slowly open bleed valve on manifold,
21. Open bleeders on hose ends,
22. Remove caps,
23. Disconnect all hose,
24. Inspect previous marks,
25. Record results.
26. Remember to thoroughly drain the hose tester before storing

Test Pressures

You need to be familiar with the way to determine what pressure to use.

Testing to the correct pressure is essential. Too much pressure on low rated hose will obviously result in problems but, not testing to high enough pressure can result in unexpected failures at the worst possible times. Please read this section carefully.

Under Pressure

Standards for marking fire hose changed in the 1980's and have caused some confusion. Rather than get into a long explanation of hose marking and test pressure standards, it is summed up below. Read this carefully.

If a length of fire hose was manufactured after July, 1987 it will be labeled with the pressure it must be tested to. The label will read, *Service Test ??? PSI*, (the question marks will be replaced with the correct test pressure) and the date of manufacture will be clearly identified. Note that the label clearly states Service Test. For this vintage of fire hose, it will be tested to what is clearly marked on the hose.

Hose manufactured prior to July, 1987 may be labeled with nearly anything. Most common, however, is an Acceptance Test pressure which is 2 or more times the Service Test pressure! Use of this pressure for service tests will dramatically increase the rate of hose failure and create unnecessary safety risks.

It is the operator's responsibility to ensure that the pressure applied during the test sequence be the proper pressure for the hose being tested.

The following chart can be used for fire hose manufactured prior to 1987. Simply find the correct acceptance test pressure on the hose and use the service test pressure in the correct column.

Hose Type	Hose Size	Jacket	Acceptance Test Pressure	Service Test Pressure
Lined Industrial, Standpipe, Fire Dept.	1-1/2" thru 2-1/2"	Single	300	150
Lined Industrial, Standpipe, Fire Dept.	1-1/2" thru 4-1/2"	Single	400	250
Lined Industrial, Standpipe, Fire Dept.	1-1/2" thru 2-1/2"	Single	500	250
Lined Industrial, Standpipe, Fire Dept.	1-1/2" thru 2-1/2"	Multiple	400	250
Lined Industrial, Standpipe, Fire Dept.	1-1/2" thru 2-1/2"	Multiple	600	250
Unlined Stand Pipe	1-1/2" thru 2-1/2"	Single		150
Lined Forestry	1" thru 1-1/2"	Single	450	250
Unlined Forestry	1" thru 1-1/2"	Single	450	250
Relay, Supply	3-1/2" thru 4-1/2"	Single	400	200
Relay, Supply	5" thru 6"	Single	300	150
Pumper Supply (Soft Suction)	4" thru 6"	Multiple	400	200

Maintenance

Even the best equipment will fail if not cared for properly.

Often neglected, maintenance should be a priority on all equipment used in testing fire hose. This section will explain how to properly care for your new hose tester. If you follow these suggestions, you will get many years of trouble free service from the unit.

Lubrication

None required, this is a grease less unit.

Visual Inspection

Before and after each use, do a close visual inspection of the unit. Check for loose nuts and bolts, loose fittings, cracked fittings, impact damage, etc. Pay especially close attention to the electrical cord. If any problems are found, they should be corrected prior to using the tester. Never use a tester that has known problems.

Draining

After each use it is important that the hose tester be drained as thoroughly as possible to prevent sediment and rust deposits. Open all valves and tip the unit from side to side and front to back until no more water comes out. Leave all valves open when the unit is in storage to allow for free evaporation of any remaining dampness.