

A fire hose (or firehose), by definition, is a high-pressure hose that carries water or other fire retardant (such as foam) from a source to the scene of the fire. Outdoors, it attaches to either a fire engine or a fire hydrant. It is one of the most important tools used in fighting fires. This document is meant to give your department key information about fire hose used in the fire service.

FIRE HOSE TYPES AND USES

Fire hoses are commonly cut and coupled in sections of 50 or 100 feet. The size of the hose refers to its inside diameter. The three standard sizes of hose lines are 1½, 1¾, and 2½ inches. Depending on the size and severity of the fire, hose line requirements vary in order to get the job done efficiently. Selecting the incorrect size from the start can cause delays in fire suppression and exhaustion.

The hose coupling diameter of a 1½-inch and a 1¾-inch are the same, they only differ with the diameter of the hose jacket. When there is water flowing through a 1¾-inch hose line, it still has to travel through a 1½-inch coupling at every 50 or 100 feet. This small reduction in the hose coupling diameter adds some friction loss overall; however, the amount is inconsequential in comparison to the amount of water that can be delivered at a lower operation pressure, with a 1¾-inch hose line.

TYPES OF FIRE HOSE

- **Booster Line** – size: ¾ to 1 inch. It is rubber-covered, rubber-lined, fabric-reinforced. These are used on small fires, and provide fire protection for the pumper.
- **Woven Jacket Hose** – size: 1 to 6 inches. It has one or two woven jackets, and is rubber-lined. It is used for a supply line or attach line.
- **Impregnated Single Jacket Hose** – size: 1½ to 5 inches. It is covered with a polymer and is also polymer-lined. It is a main supply line.
- **Non-Collapsible Intake Hose** – size: 2 to 6 inches. It is rubber-covered, rubber-lined, and reinforced with fabric or helix (a patented fire hose amplifier that achieves greater spraying distance by reducing hose hydrodynamic resistance. This allows fire fighters to keep a safer distance from the fire. It can also allow greater control and less operating fatigue while increasing the amount of water on target.) It is used as a supply line for drafting water from a static water source.



Double Lined 1½"



1" Booster Line



2½" Line



Pumper Outlet or Steamer Connection Hose 4½"

WHAT SIZE HOSE FITS A FIRE HYDRANT?

A standard fire hydrant has two 2½-inch hose connection nozzles with 7.5 threads per inch, and one 4½-inch pumper connection nozzle with four threads per inch, called a steam connection or pumper outlet.

CHARACTERISTICS OF THE FIRE HOSE

The main characteristics essential for a good firefighting hose are:

- **Flexibility** – Hose must be sufficiently flexible to be handled with ease, able to roll into a smooth and tight roll. The edges should be uniform and regular so that the hose does not bulge on one side after wobbling repeatedly.
- **Durability** – Hose must be strong enough for it to be reliable for use at fire scenes. The materials used in its construction must have high resistance to abrasion and should be able to withstand the rough usage found in firefighting.
- **Resistance to rot** – Hoses made of natural fibers are prone to be affected by rot or fungi. These must be treated with rot proofing agents such as zinc chloride.

FIRE HOSE CARE AND MAINTENANCE

- Store in a cool, dry and well-ventilated place.
- Clean and dry hose after each use.
- Clean rubber-lined hoses by passing water through them every 90 days and dry on towers, periodically. These should not be exposed to hot dry air or sun rays for long periods of time.
- Clean and dry hoses contaminated with acids/alkalis or oils before storing.
- Change the folds periodically.
- Avoid laying or pulling hose over sharp or rough corners.
- Prevent vehicles from running over hose.
- Slowly open and close nozzles, valves and hydrants to prevent water hammer.
- Avoid excessive pump pressure.
- Protect from excessive heat when possible.
- Keep away from vehicle exhaust.
- Remove wet hose from the apparatus after a fire and replace it with dry hose.
- Clean hose by brushing it and, if necessary, rinsing with water and mild detergent.
- Roll and store hose in suitable racks when not in use.

DRYING PROCEDURE

- **Natural** – In sheds constructed in such a way as to permit the entry of air as much as possible if you do not have a hose tower. However, you should protect the hose from the elements such as rain or snow. It is preferred to have the hose hung from towers at the roof with Pulleys.
- **Mechanical** – In chambers of brick construction. Provision is made to accommodate 20 lengths of

hoses. All of the hoses are coupled to allow warm air to be blown through and over the hose. There is also a manifold through which warm air is blown. An exhaust fan is fitted to the chamber so that air is circulated constantly.

- **Repairs** – After use, inspect the hose carefully to detect any damage and if needed, repair for future use. All damage such as pin holes should be marked and the defective hoses should be rolled with the male coupling inside for the sake of identification. Check with the department and manufacturer's policy for repairs or replacement.

FIRE HOSE COUPLING TYPES

- **Shank** – Portion of the coupling that attaches to the hose.
- **Threaded Couplings** – Have a male and female end. The male coupling is fixed and does not swivel, and the female coupling swivels on a fixed shank.
- **Lugs** – Aid in tightening or loosening the couplings. The three types are pin, rocker and recessed. The male coupling has lugs on its shank and the female coupling has lugs on its swivel.
- **Higbee Cut** – A special thread design in which the beginning of the thread is cut to help the coupling thread and eliminate cross-threading.
- **Higbee Indicator** – An indentation on the lugs marking where the Higbee cut begins.
- **Storz-Type Couplings** – Non-threaded couplings that are identical and are usually found on a large-diameter hose.

COUPLING A FIRE HOSE

Foot Tilt Method



One Member Standing Method



Two Firefighter Method



HOSE APPLIANCES

Appliances allow water to flow through the hose.

- **Gated Wye Appliances** – Divide one hose into two or more, with ball valves to control the flow
- **Siamese Appliances** – Used to combine two or more hoses into one hose line or appliance
- **Reducers** – Used to reduce an outlet to a smaller size
- **Valves** – Control the flow of water



Gated Wye Appliance



Siamese Appliance



Reducer



Pressure Reducing Valve

HOSE TOOLS

- **Hose Clamp** – Used to stop the flow of water in a hose line
- **Spanner, Hydrant Wrench, Rubber Mallet** – Used to tighten and loosen hose fittings
- **Hose Strap** – Used to carry, pull, and secure a charged hose

HOSE ROLLS

- **Straight Roll** – Hose is rolled straight from one end (usually the male) to the other end. Used for hose storage, carrying hose, or loading hose on an apparatus
- **Donut Roll** – For situations when hose is going to be deployed from the roll for use. Both couplings are on the outside of the roll within 12 inches of each other. This allows the hose to be unrolled quickly and makes the roll less likely to spiral or kink when unrolled
- **Twin Donut Roll** – A hose roll in which both ends of the hose are available. This is a compact roll that is transportable for special applications, such as high-rise situations



Straight Roll



Donut/Twin Roll

COMMON HOSE LOADS

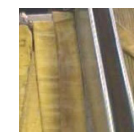
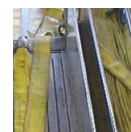
Accordion Load – Hose is laid on its edge in folds adjacent to each other

- All flakes (rows) are the same length
- Easy to load and advance
- Easy to unload for a shoulder-carry



Flat Load – Hose is laid so that its folds lie flat instead of on-edge

- Easy to load
- Is the necessary way to load large diameter hose, but can be used for all hose sizes



Pre-Connected Hose Load – Hose lines primarily used for fire attack that are connected to a discharge valve on the apparatus. Usually found in an area other than the main hose-bed.



HOSE LOADING CONSIDERATIONS

- Check gaskets and swivel before connecting a coupling.
- Keep flat sides in the same plane.
- Hand tighten couplings.
- Do not use spanner wrenches to tighten couplings.
- Remove wrinkles from inside of bends.
- Use “dutchmen” where necessary. A dutchman is an extra short fold placed on a loaded hose to ensure that the coupling faces the correct way.
- Do not pack hose too tightly.

CONCLUSION

One of the basic missions of a fire organization is to save lives and protect property. The application of water on a fire is a direct action that allows your firefighters to meet those goals and produce a successful outcome for those in danger during a fire. Therefore, knowledge of fire hose, its use, deployment and care are extremely important to your success in firefighting.

REFERENCES

Fire Engineering

American Fire Hose Supply

International Association of Fire Chiefs

National Fire Protection Association (NFPA)

- 1961 – Standard on fire hose
- 1962 – Standard for the care, use, and inspection of fire hose
- 1965 – Standard for fire hose appliances
- 1963 – Standard for fire hose connections