

## FIRE FIGHTER I

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<b>TOPIC:</b>	CHARACTERISTICS AND FUNCTIONS OF FIRE HOSE AND COUPLINGS
<b>TIME FRAME:</b>	1:30
<b>LEVEL OF INSTRUCTION:</b>	Level II
<b>AUTHORITY:</b>	1997 NFPA 1001 3-3.6(a), 3-3.7(a), 3-3.9(a), and 3-3.10(a)
<b>BEHAVIORAL OBJECTIVE:</b>	
<b>Condition:</b>	A written test
<b>Behavior:</b>	The student will confirm a knowledge of the characteristics and functions of fire hose and couplings by completing the written test
<b>Standard:</b>	With a minimum 80% accuracy according to the information contained in <u>Essentials of Fire Fighting</u> , IFSTA, Fourth Edition, Chapter 12 and <u>Hose Practices</u> , IFSTA, Seventh Edition, Chapter 1
<b>MATERIALS NEEDED:</b>	<ul style="list-style-type: none"><li>• Writing board with markers/erasers</li><li>• Appropriate audiovisual equipment</li><li>• Appropriate audiovisual materials</li><li>• Section of woven-jacket, lined hose</li><li>• Section of woven-jacket, unlined hose</li><li>• Section of nitrile rubber-covered hose</li><li>• Section of braided (booster) hose</li><li>• Section of wrapped, hard-suction hose</li></ul>
<b>REFERENCES:</b>	<ul style="list-style-type: none"><li>• <u>Essentials of Fire Fighting</u>, IFSTA, Fourth Edition</li><li>• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition</li><li>• <u>Hose Practices</u>, IFSTA, Seventh Edition</li></ul>
<b>PREPARATION:</b>	Fire hose is the most used item in the fire service. Because it is used for a number of functions during fire fighting operations, there are many different types of fire hose. It is manufactured in different lengths and sizes; it is made of natural or synthetic materials, lined or unlined, and has different types and sizes of couplings. Fire fighters must clearly comprehend the methods of hose construction, the



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types of hose, and the respective uses for each type, as well as the limitations of each type of hose. Every member of a fire suppression team has a part in repair and maintenance of equipment, including an understanding of hose coupling parts and components. With this knowledge, every fire fighter can become an active and reliable team member who can hold up his or her end of the duties that must be accomplished.

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PRESENTATION	APPLICATION
<p><b>I. <u>BASIC INFORMATION</u></b></p> <p>A. <u>Fire hose defined</u></p> <ol style="list-style-type: none"> <li>1. <u>Flexible tube used by fire fighters to carry water from the source of supply to a point where it is discharged</u></li> <li>2. <u>Should only be used for fire fighting</u></li> </ol> <p>B. Characteristics</p> <ol style="list-style-type: none"> <li>1. Flexible           <ol style="list-style-type: none"> <li>a) For loading into hose compartment</li> <li>b) To maneuver during interior and exterior fire attack</li> </ol> </li> <li>2. Watertight           <ol style="list-style-type: none"> <li>a) To withstand high pressure</li> </ol> </li> <li>3. Smooth inner lining           <ol style="list-style-type: none"> <li>a) To transport water with a minimum loss in pressure</li> </ol> </li> <li>4. Durable covering           <ol style="list-style-type: none"> <li>a) To withstand damage from fireground operations</li> </ol> </li> </ol> <p>C. <u>Function</u></p> <ol style="list-style-type: none"> <li>1. <u>Attack line</u></li> <li>2. <u>Supply (relay) line</u></li> <li>3. <u>Intake line</u></li> </ol>	<p><u>How would you define the term "fire hose?"</u></p> <p>Looking at this fire hose, what are some of its characteristics?</p> <p><u>What are the four broad use categories of fire hose?</u></p>

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PRESENTATION	APPLICATION
<p>4. <u>Extinguisher</u></p> <p><b>II. CONSTRUCTION</b></p> <p>A. Hose classification factors</p> <ol style="list-style-type: none"> <li>1. Material from which it is constructed</li> <li>2. Size</li> </ol> <p>B. Outer jacket materials</p> <ol style="list-style-type: none"> <li>1. Cotton</li> <li>2. Nylon</li> <li>3. Rayon</li> <li>4. Rubber blends               <ol style="list-style-type: none"> <li>a) Nitrile rubber</li> </ol> </li> <li>5. Polyester fibers</li> </ol> <p>C. <u>Sizes</u></p> <ol style="list-style-type: none"> <li>1. <u>Each size designed for a specific purpose</u></li> <li>2. <u>Dimensions</u> <ol style="list-style-type: none"> <li>a) <u>Inside diameter of the hose</u></li> <li>b) <u>Length of hose</u> <ol style="list-style-type: none"> <li>1) <u>Commonly cut and coupled into lengths of 50 or 100 feet</u></li> </ol> </li> </ol> </li> </ol>	<p>What are the two factors for classifying fire hose by construction?</p> <p>What materials are commonly used in the construction of the outer jacket?</p>

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PRESENTATION	APPLICATION
<p>2) Convenience of handling and replacement</p> <p>3) Other lengths of hose may be obtained</p> <p>4) Lengths are also referred to as sections</p> <p>5) Couple sections together to produce a continuous hoseline</p>	<p>Why is fire hose commonly cut in these lengths?</p> <p>What is the term most commonly used to identify these lengths of hose?</p> <p>What is meant by the term "attack line?"</p>
<p><b>III. <u>ATTACK LINE</u></b></p> <p>A. <u>Defined as any hoseline used to directly control and extinguish fire</u></p> <p>B. <u>Typical sizes for attack handlines</u></p> <ol style="list-style-type: none"> <li>1. <u>¾"-2½" fire hose</u></li> <li>2. Some agencies may use 3" hoseline for attack handlines</li> </ol> <p><b>NOTE:</b> List student responses on board or easel pad. Subcategorize responses into: 1) Fire Department Hose, (2) Wildland Hose, (3) Standpipe Hose, and (4) Noncollapsible Rubber Hose</p>	<p><u>What is range of fire hose sizes used for attack handlines?</u></p> <p>What are some common applications for attack lines?</p>

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PRESENTATION	APPLICATION
<p>C. Types of attack lines</p> <ol style="list-style-type: none"> <li>1. Fire department hose           <ol style="list-style-type: none"> <li>a) Heavy duty, lined hose</li>   <li>b) Variety of sizes               <ol style="list-style-type: none"> <li>1) Diameters of 1½", 1¾", 2", and 2½" are common</li> <li>2) 3" used by some agencies</li> </ol> </li>   <li>c) Construction               <ol style="list-style-type: none"> <li>1) Usually double-jacketed and lined for maximum durability</li> <li>2) Newer inner liners made from thermoplastic instead of rubber</li> <li>3) Woven fabric-jacket                   <ul style="list-style-type: none"> <li>• May be single or multiple-jacketed</li> </ul> </li> <li>4) Rubber-covered                   <ul style="list-style-type: none"> <li>• Jacket and lined</li> <li>• Rubber and fabric bonded into a single inseparable unit</li> </ul> </li> </ol> </li> </ol> </li>   <li>2. <u>Wildland hose</u> <ol style="list-style-type: none"> <li>a) <u>Characteristics</u></li> </ol> </li> </ol>	<p>What are some common sizes of fire department hose used for attack?</p> <p>Are fire department hoses usually single- or double-jacketed, and why?</p> <p><u>What is wildland hose used for?</u></p>

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PRESENTATION	APPLICATION
<ol style="list-style-type: none"> <li>1) <u>Used to suppress wildland and vegetation fires</u></li>   <li>2) <u>Differs from fire department hose</u> <ul style="list-style-type: none"> <li>• <u>Size</u></li> <li>• <u>Weight</u></li> <li>• <u>Optional rubber lining</u></li> </ul> </li>   <li>b) Variety of sizes           <ol style="list-style-type: none"> <li>1) 1"-1½" diameters common</li> </ol> </li> <li>c) Construction           <ol style="list-style-type: none"> <li>1) Single-jacket, small diameter hose</li> <li>2) May be lined or unlined</li> <li>3) Lightweight</li> </ol> </li>   <li>d) Need for wildland hose           <ol style="list-style-type: none"> <li>1) Carried long distances over uneven terrain, often uphill</li> <li>2) Can be used in a way that conserves water</li> <li>3) Can be backpacked or air-dropped to a remote scene</li> <li>4) Used with portable pump that drafts water from an open water source</li> </ol> </li> </ol>	<p><u>How does it differ from fire department hose?</u></p> <p>What are some common sizes of wildland hose?</p> <p>What logistical advantages will wildland hose provide over fire department hose?</p>

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PRESENTATION	APPLICATION
<p>3. Standpipe hose</p> <p>a) Used primarily by building occupants to mount a quick attack</p> <p>1) For use on incipient/ignition stage fires</p> <p>b) May also be used by private fire brigades that lack fire apparatus and a standard fire hose complement</p> <p>c) Characteristics</p> <p>1) Usually preconnected to a water source</p> <ul style="list-style-type: none"> <li>• Smaller diameter domestic standpipe</li> <li>• Yard hydrant</li> </ul> <p>2) Complete with a nozzle and stored</p> <ul style="list-style-type: none"> <li>• Suspended, accordion-like, from a rack within a cabinet</li> <li>• On a reel</li> </ul> <p>d) Size</p> <p>1) 1½" most common size</p>	<p>Who is the intended user of standpipe hose?</p> <p>What stage of fire development is standpipe hose intended for when used by building occupants?</p> <p>What are two ways that standpipe hose may be stored?</p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> <li>e) Construction               <ul style="list-style-type: none"> <li>1) Single-jacket</li> <li>2) Unlined, but may be lined</li> </ul> </li> <li>f) Disadvantages               <ul style="list-style-type: none"> <li>1) Unreliable with age, particularly with unlined type</li> <li>2) Ruptures typically occur at the folds</li> <li>3) Not designed to withstand higher pressures typically supplied by fire department pumping apparatus</li> </ul> </li> <li>g) Fire fighters only use fire department hose on standpipe systems</li> <li>4. Noncollapsible rubber hose               <ul style="list-style-type: none"> <li>a) Also known as booster hose or hard line</li> <li>b) Usually carried on a reel</li> </ul> </li> <li>c) Purpose               <ul style="list-style-type: none"> <li>1) Extinguish relatively small fires</li> <li>2) Overhaul work</li> </ul> </li> </ul>	<p>What are the disadvantages to using standpipe hose?</p> <p>Because of the unreliability of standpipe hose, what should fire fighters use?</p> <p>What are the more common names for this type of hose?</p> <p>What fireground applications are "booster" lines intended for?</p>

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PRESENTATION	APPLICATION
<p>d) Size</p> <ol style="list-style-type: none"> <li>1) ¾" and 1"</li> <li>2) Usually carried on reels</li> <li>3) Higher pressure needed to overcome friction loss for maximum water flow</li> </ol> <p>e) Construction</p> <ol style="list-style-type: none"> <li>1) Rubber-covered, made of several layers of braided, rubberized material</li> </ol>	<p>How does the diameter affect the pressure needed for maximum water flow?</p>
<p><b>IV. <u>SUPPLY (RELAY) LINE</u></b></p> <p>A. <u>Move large volumes of water at low pressure</u></p> <p>B. Two groups</p> <ol style="list-style-type: none"> <li>1. Medium diameter hose (MDH)</li> <li>2. Large diameter hose (LDH)</li> </ol> <p>C. MDH</p> <ol style="list-style-type: none"> <li>1. Attack line used for supply</li> <li>2. Best for relatively short distances and operations that do not routinely require large water volume</li> </ol>	<p><u>What is the purpose of a supply (relay) line?</u></p> <p>What are the two groups of supply lines?</p> <p>In what type of supply situations will MDH provide satisfactory service?</p>

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PRESENTATION	APPLICATION
<p>a) Pressure loss caused by water friction on inner lining of hose seriously depletes water flow in long-distance supply</p> <p>3. For large volumes</p> <p>a) Several parallel lines must be laid, or</p> <p>b) Pumpers must be placed at intervals along the hose lay to boost the pressure</p> <p>4. <u>Size</u></p> <p>a) <u>2½"-3" diameter</u></p> <p>D. LDH</p> <p>1. Developed to overcome the pressure loss problems of MDH</p> <p>2. Size</p> <p>a) 3½", 4", 4½", 5", and 6" sizes available</p> <p>3. Construction</p> <p>a) May be woven-jacket or rubber-covered</p> <p>4. Advantages</p>	<p>What is the problem with using attack lines for long-distance water supply?</p> <p>If MDH must be used for large volumes of water, how can this be achieved?</p> <p><u>What size hoseline would fall into this category?</u></p> <p>What are the advantages gained by using LDH for supply operations?</p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> <li>a) Flows large quantities of water without need for parallel supply lines</li> <li>b) Moves large volumes of water quickly with a minimum number of pumpers and personnel</li> <li>c) Virtually no loss of pressure with low volume flows</li> <li>d) Often eliminates the need for a second pumper at the hydrant to boost the pressure to the first pumper</li> </ul> <p>5. Disadvantages</p> <ul style="list-style-type: none"> <li>a) Heavy and not easy to move once charged</li> </ul>	<p>How is pressure loss affected when LDH is used to move smaller volumes of water?</p> <p>If a pumper used one of the larger sizes of LDH in a hose lay from the hydrant to the fire scene, how would this benefit the fireground operation?</p> <p>Once charged, what problem may LDH present if there is a need to move the hose?</p>

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PRESENTATION	APPLICATION
<p>b) Nitrile rubber LDH may not handle the higher pressures that woven-jacket hoses can</p> <p>c) Must pre-incident plan the hose lay so as not to block major response routes by other units</p> <p>6. Crossing nitrile rubber LDH</p> <p>a) NEVER cross LDH when dry or damage will occur at edges</p> <p>b) Most desirable method is to use hose bridges/ramps</p> <p>c) If no hose bridges/ramps available, cross when charged at an angle, one wheel at a time, slowly</p> <p>d) Do NOT attempt to cross charged LDH perpendicular or hose will roll in front of tires</p> <p>e) Do NOT cross hose at the couplings, or coupling could get stuck in dual rear tires</p>	<p>What limitation does nitrile rubber LDH present when used on the discharge side of the pump?</p> <p>What should the engine company keep in mind when laying LDH for a fireground operation?</p> <p>If nitrile rubber LDH must be crossed by fire apparatus, what precautions must be taken?</p>

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<p>f) Vehicles that do NOT have higher ground clearance must NOT cross LDH without a hose bridge/ramp, or the underside of the vehicle will damage the hose</p> <p><b>V. <u>INTAKE HOSE</u></b></p> <p>A. <u>Used to connect a fire department pumper or a portable pump to a nearby water source</u></p> <p>B. <u>Two groups within this category</u></p> <ol style="list-style-type: none"> <li>1. <u>Soft sleeve hose (soft suction)</u></li> <li>2. <u>Hard suction hose (hard sleeve)</u></li> </ol> <p>C. <u>Soft sleeve</u></p> <ol style="list-style-type: none"> <li>1. <u>Used to transfer water from a pressurized water source, such as a fire hydrant, to the pump intake</u></li> <li>2. Construction           <ol style="list-style-type: none"> <li>a) Multiple-jacket and lined</li> <li>b) Rubber covered</li> </ol> </li> <li>3. Sizes           <ol style="list-style-type: none"> <li>a) Range from 2½"-6"</li> </ol> </li> </ol> <p>D. <u>Hard suction</u></p> <ol style="list-style-type: none"> <li>1. <u>Used primarily to draft water from an open source</u></li> <li>2. Also used to siphon water from one portable tank to another           <ol style="list-style-type: none"> <li>a) Usually in connection with a tanker shuttle operation</li> </ol> </li> </ol>	<p>What is intake hose used for?</p> <p><u>What is soft sleeve hose used for?</u></p> <p><u>What is hard suction hose used for?</u></p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> <li>3. Constructed of a rubberized, reinforced material               <ul style="list-style-type: none"> <li>a) Noncollapsible</li> <li>b) To withstand the partial vacuum conditions created when drafting</li> </ul> </li> <li>4. Sizes               <ul style="list-style-type: none"> <li>a) Range from 2½"-6"</li> </ul> </li> </ul>	<p>Why must hard suction hose be designed in this way?</p> <p>Where is fire extinguisher hose used?</p>
<p><b>VI. <u>FIRE EXTINGUISHER HOSE</u></b></p> <ul style="list-style-type: none"> <li>A. <u>Used on large extinguisher units that may be stationary, wheeled, or vehicle mounted</u></li> <li>B. May be coiled or on reels</li> <li>C. Transports liquid, gaseous, or powder extinguishing agents from the extinguisher container to the nozzle</li> <li>D. Two groups of extinguisher hose           <ul style="list-style-type: none"> <li>1. Conventional               <ul style="list-style-type: none"> <li>a) Used with extinguishers that discharge at pressures no greater than 400 psi</li> </ul> </li> <li>2. High-pressure               <ul style="list-style-type: none"> <li>a) Withstands pressures of up to 1250 psi</li> </ul> </li> </ul> </li> <li>3. Constructed similar to noncollapsible rubber/booster hose</li> </ul>	<p>Both the conventional and high-pressure extinguisher hoses are made in essentially the same way as what other hose?</p>

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PRESENTATION	APPLICATION
<p><b>VII. CLASSIFICATION OF FIRE HOSE</b></p> <p>A. Four basic classifications</p> <ol style="list-style-type: none"> <li>1. Woven jacket</li> <li>2. Rubber-covered</li> <li>3. Braided</li> <li>4. Wrapped</li> </ol> <p><b>NOTE:</b> Display two woven jacket hose sections: one lined and one unlined.</p> <p>B. Woven jacket</p> <ol style="list-style-type: none"> <li>1. Uses           <ol style="list-style-type: none"> <li>a) Attack</li> <li>b) Medium and large diameter hose relay and supply</li> <li>c) Soft sleeve</li> </ol> </li> <li>2. General types           <ol style="list-style-type: none"> <li>a) Two types               <ol style="list-style-type: none"> <li>1) Unlined</li> <li>2) Lined</li> </ol> </li> <li>b) Unlined hose               <ol style="list-style-type: none"> <li>1) No inner tube or liner</li> </ol> </li> </ol> </li> </ol>	<p>What are the four basic classifications of fire hose?</p> <p>What are some common uses of woven jacket hose?</p> <p>What are the two general types of woven jacket fire hose?</p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> <li>• Standpipe hose</li> </ul> <p>2) Closely woven linen jacket serves same function as rubber tube in lined hose</p> <p>3) Seepage occurs when first charged until fabric becomes saturated and swells</p> <p>4) Advantages</p> <ul style="list-style-type: none"> <li>• Lightweight</li> <li>• Compactness</li> </ul> <p>5) Disadvantages</p> <ul style="list-style-type: none"> <li>• More vulnerable to abrasion damage</li> <li>• Higher friction loss compared to lined hose</li> <li>• Must be dried after use, if cotton jacketed</li> <li>• More difficult to clean</li> </ul> <p>c) Lined hose</p> <p>1) More widely used</p> <ul style="list-style-type: none"> <li>• Fire department hose</li> </ul>	<p>What type of attack hose is typically unlined?</p> <p>What are the advantages of unlined hose?</p> <p>What are the disadvantages?</p> <p>What category of attack hose is normally lined?</p>

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<ul style="list-style-type: none"> <li>• Wildland hose</li> </ul> <ol style="list-style-type: none"> <li>2) Consists of one or more woven-fabric seamless jackets</li> <li>3) Smooth-walled rubber tube inserted and vulcanized into jacket(s)               <ul style="list-style-type: none"> <li>• Makes the hose leak-proof</li> <li>• Reduces friction that occurs when water moves through hose at high velocity</li> </ul> </li> <li>4) Advantages               <ul style="list-style-type: none"> <li>• Withstands higher internal pressures than unlined hose</li> <li>• Greater abrasion resistance</li> <li>• High burn resistance</li> <li>• Resistance to cuts</li> </ul> </li> <li>5) Disadvantages               <ul style="list-style-type: none"> <li>• Must be dried after use if cotton jacketed</li> </ul> </li> </ol>	<p>How does the smooth-walled rubber tube contribute to the efficiency of water flow through the hose?</p> <p>How does the lined fire hose compare to the unlined fire hose with respect to internal pressure and abrasion resistance?</p> <p>What are the disadvantages of the woven jacket lined hose?</p>

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<ul style="list-style-type: none"> <li>• More difficult to clean</li> </ul> <p><b>NOTE:</b> Display a section of rubber-covered, nitrile hose.</p> <p>C. Rubber-covered</p> <ol style="list-style-type: none"> <li>1. Uses           <ol style="list-style-type: none"> <li>a) Attack</li> <li>b) Medium and large diameter hose relay and supply</li> <li>c) Soft sleeve</li> </ol> </li> <li>2. Construction methods           <ol style="list-style-type: none"> <li>a) Extrusion process               <ol style="list-style-type: none"> <li>1) Permeating and coating a circular woven fabric tube with nitrile rubber, inside and out</li> </ol> </li> <li>b) Three-ply vulcanized process               <ol style="list-style-type: none"> <li>1) Nitrile rubber vulcanized to interior surface of woven polyester tube</li> <li>2) Outside coated with layer of protective rubber</li> </ol> </li> </ol> </li> <li>3. Advantages           <ol style="list-style-type: none"> <li>a) Lightweight</li> <li>b) Durable</li> <li>c) Resists deterioration when wet (mildew)</li> <li>d) May be reloaded in fire apparatus without drying</li> <li>e) Resists deterioration when in contact with chemicals</li> <li>f) Does not kink as readily</li> <li>g) Won't rip or tear when punctured</li> </ol> </li> </ol>	<p>What are some common uses of rubber-covered hose?</p>



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<p>g) Easy to clean and put back in service</p> <p>h) Strong and durable</p> <p>i) Moisture cannot enter jacket, so no drying is required</p> <p>4. Disadvantages</p> <p>a) Requires high internal pressure to achieve maximum water flow</p> <p>b) Smaller diameter limits flow to a range of 10-30 gpm</p> <p>c) Heavier hose to maneuver and drag</p> <p><b>NOTE:</b> Display a section of wrapped hose.</p> <p>E. Wrapped</p> <p>1. Hard suction hose</p> <p>a) Also known as intake hose</p> <p>b) Use</p> <p>1) Drafting water from a static source</p> <p>2) Distance from hydrant to the pump intake connection is most critical</p> <ul style="list-style-type: none"> <li>• Usually only 20 feet of hard suction carried on pumping apparatus</li> </ul> <p>2. Construction</p>	<p>What type of hose is wrapped?</p> <p>What application is hard suction hose primarily used for?</p> <p>If hard suction hose is used to supply water from a hydrant to the pump intake, what factor is most critical?</p>

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PRESENTATION	APPLICATION
<p>a) Extruded rubber tube wrapped with several layers of fabric</p> <ol style="list-style-type: none"> <li>1) Rubber compound applied between layers</li> <li>2) Heavy gauge galvanized or copper wire coiled around the hose between layers</li> </ol> <p>b) Newer construction method</p> <ol style="list-style-type: none"> <li>1) Corrugated design</li> </ol> <p>3. Fabric-wrapped versus corrugated design</p> <p>a) Fabric wrapping</p> <ol style="list-style-type: none"> <li>1) Adds strength to hose</li> <li>2) Heavier hose           <ul style="list-style-type: none"> <li>• Requires two to three persons to couple and position for drafting</li> </ul> </li> <li>3) Slightly flexible</li> </ol> <p>b) Corrugated design</p> <ol style="list-style-type: none"> <li>1) More flexible</li> <li>2) Considerably lighter</li> </ol> <p><b>VIII. <u>INTRODUCTION TO COUPLINGS</u></b></p> <p>A. <u>Since the earliest use of leather and canvas hose, a means of coupling it together has been necessary</u></p> <p>B. <u>Many improvements have been made over the years</u></p>	<p>What prevents the hose from collapsing during drafting operations?</p> <p>How does the fabric wrapped and corrugated designs compare?</p>

# FIRE FIGHTER I

PRESENTATION	APPLICATION
<p>1. <u>First made of metal</u></p> <p>2. <u>Now manufactured from brass, aluminum, or an alloy called pyrolite which is lighter and stronger than brass</u></p> <p><b>IX. COMPONENTS</b></p> <p>A. <u>Three-piece coupling</u></p> <ol style="list-style-type: none"> <li>1. <u>Male threaded shank</u></li> <li>2. <u>Female threaded swivel</u></li> <li>3. <u>Nonthreaded shank</u> <ol style="list-style-type: none"> <li>a) <u>Female swivel attaches to</u></li> <li>b) <u>Usually does not have any lugs</u></li> </ol> </li> </ol> <p>B. Five-piece reducing coupling</p> <ol style="list-style-type: none"> <li>1. Male threaded shank</li> <li>2. Reducer</li> <li>3. Female threaded swivel</li> <li>4. Reducer</li> <li>5. Male threaded shank           <ol style="list-style-type: none"> <li>a) Fits into reducer</li> </ol> </li> </ol> <p>C. Other types of couplings</p> <ol style="list-style-type: none"> <li>1. Snap</li> <li>2. Quarter turn</li> <li>3. Storz</li> </ol> <p><b>X. COUPLING CONSTRUCTION</b></p> <p>A. Methods</p> <ol style="list-style-type: none"> <li>1. Cast</li> </ol>	<p>What are some other types of couplings?</p> <p>What are the methods of forming materials into couplings?</p>

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<ul style="list-style-type: none"> <li>a) Weakest</li> <li>b) Least resistance to internal and external forces</li> </ul> <p>2. Extended</p> <ul style="list-style-type: none"> <li>a) Somewhat stronger than cast</li> <li>b) Resistant to external forces</li> <li>c) Smoother surfaces and lock swivel protection</li> </ul> <p>3. Drop forged</p> <ul style="list-style-type: none"> <li>a) More desirable</li> <li>b) Strong</li> <li>c) Resistant to damage</li> <li>d) Embossed ridge on swivel shank               <ul style="list-style-type: none"> <li>1) Swivel protection</li> </ul> </li> </ul> <p>B. Materials</p> <p>1. Brass</p> <ul style="list-style-type: none"> <li>a) Doesn't lend self to recoupling because of permanent expansion</li> <li>b) Drop forged does not expand as readily</li> </ul> <p>2. <u>Aluminum alloy</u></p> <ul style="list-style-type: none"> <li>a) <u>Considerable merit with hard coating</u></li> <li>b) <u>About half the weight of brass</u></li> <li>c) <u>Can be reused without excessive stretching</u></li> <li>d) <u>Do not intermix brass and aluminum</u> <ul style="list-style-type: none"> <li>1) <u>Electrolysis</u></li> </ul> </li> </ul>	<p>What are the materials generally used?</p>





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<ul style="list-style-type: none"> <li>a) Common spanner may work</li> <li>E. Extended lug                             <ul style="list-style-type: none"> <li>1. Has large ears that extend out from the coupling</li> <li>2. May be easily tightened or loosened by grasping large lugs                                     <ul style="list-style-type: none"> <li>a) Rubber mallet may be used</li> </ul> </li> <li>3. Used on soft suction hose couplings for speed and ease of making connection</li> </ul> </li> <li>F. Storz coupling                             <ul style="list-style-type: none"> <li>1. Void of threads</li> <li>2. Requires only ¼ turn to couple or uncouple</li> </ul> </li> </ul>	



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<ul style="list-style-type: none"><li>3. All couplings are the same<ul style="list-style-type: none"><li>a) No male or female end</li><li>b) Eliminate adapter usage</li></ul></li><li>4. Range from 1-6 inches</li></ul>	



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## **SUMMARY:**

Fire hose is essential to the fire suppression effort, so a thorough knowledge of fire hose is necessary to select and use it properly. Understanding the different fireground applications of fire hose will aid the fire fighter in determining the correct hose to choose for a given operation. Realizing the strengths and limitations associated with different types of hose will also aid the fire fighter in selecting the most appropriate hose for deployment. A clear understanding of the methods and types of construction will provide the fire fighter with the foundation necessary to appreciate the procedures to be followed for proper care and maintenance of the fire hose after use.

Hose couplings are many and varied. They are made of brass, aluminum, and alloys of magnesium.

## **EVALUATION:**

The student will complete the written test at a time determined by the instructor.

## **ASSIGNMENT:**

Review your notes and read Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 12 and Hose Practices, IFSTA, Seventh Edition, Chapter 1 in order to prepare yourself for the upcoming test. Study for our next session.