



Fire Protection Training

Procedures Handbook 4300

WILDLAND FIREFIGHTING

TOPIC: Foam For Class A Fires

LEVEL OF INSTRUCTION: Level II

TIME FRAME: 30 Minutes

BEHAVIORAL OBJECTIVE:

Condition: A written quiz

Behavior: The student will describe the characteristics of foam used on wildland fires as well as methods for applying it.

Standard: With a minimum of 70% accuracy, according to the information contained in this Lesson Plan

MATERIALS NEEDED:

- Example of Class A Foam & Proportioner

REFERENCES:

- Foam Vs Fire, Class A Foam For Wildland Fires, NWCG June 1992
- Private Fire Protection & Detection, IFSTA Edition 1 & 2

PREPARATION: Use of foam in wildland firefighting is becoming increasingly common. Originally designed for suppressing flammable liquid fires, it has evolved into an affordable and viable means of increasing the effectiveness of water on wildland fires. Firefighters should possess a basic understanding of the characteristics and applications of foam for wildland use.



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PRESENTATION	APPLICATION
<p>I. WILDLAND FIREFIGHTING FOAM</p> <ul style="list-style-type: none">A. Synthetic Detergent FoamB. Class A CombustiblesC. Considered A Wetting Agent <p>II. EXTINGUISHING ACTION</p> <ul style="list-style-type: none">A. Four Components Of Foam Tetrahedron<ul style="list-style-type: none">1. Foam concentrate2. Air3. Water4. Mechanical agitationB. Four Extinguishing Actions<ul style="list-style-type: none">1. Smothering prevents air and fuel from combining2. Cools the temperature of fuel and adjacent surfaces3. Separates the fuel from the fire4. Suppresses the release of flammable vapors <p>III. CHARACTERISTICS OF SYNTHETIC DETERGENT FOAM</p> <ul style="list-style-type: none">A. Mix Ratio<ul style="list-style-type: none">1. Normally the mix ratio of concentrate to water is from 0.1% - 1.0% and is adjusted to meet specific needsB. Expansion	<p>Information Sheet #1</p>



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<p>1. A 1% solution creates a foam that is 90% air, 9.9% water and only 0.1% concentrate</p> <p>2. Considered a high yield foam</p> <p>C. Use</p> <p>1. Use on all Class A fires</p> <p>2. Not recommended for Class B (flammable liquid) fires</p> <p>a) Less stable than other foams</p> <p>b) Prone to rapid breakdown</p> <p>c) Breaks down other foams that may be used later on</p> <p>d) Gives firefighters a false sense of security</p> <p>IV. ADVANTAGES OF CLASS A FOAM</p> <p>A. Increases The Effectiveness Of Water</p> <p>B. Extends The Useful Life Of Water</p> <p>C. Provides Short-Term Fire Barrier</p> <p>D. Effective On All Types Of Class A Fires</p> <p>E. Relatively Easy To Use</p> <p>F. Visible From Ground Or Air</p>	<p>Why would you not want to use a Class A foam on a Class B fire?</p> <p>What are some advantages of Class A foam?</p>



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<p>V. DISADVANTAGES OF FOAM</p> <ul style="list-style-type: none">A. Can Be Irritating To Skin And EyesB. Corrosive To Some Metals And Other Materials In Concentrated Form<ul style="list-style-type: none">1. Paint on fire engines2. Plumbing on fire engines3. Firefighter footwear and glovesC. CostD. May Harm Environment <p>VI. FOAM VARIATIONS</p> <ul style="list-style-type: none">A. Matching Foam With The Firefighting Needs Increases The Effectiveness Of The Water Being Applied, And Decreases The Effort To Complete The Job<ul style="list-style-type: none">1. Dry Foam<ul style="list-style-type: none">a) Produced by increasing the mix ratiob) Holds its shape, adheres well and releases the contained water slowly, creating a better insulating blanket than a wet foamc) Used best for pre-treatment of aerial fuels and structures owing to its ability to adhere to vertical surfaces and remain rigid2. Wet Foam	<p>What are some disadvantages of Class A foam?</p>



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<p>a) Produced by decreasing the mix ratio</p> <p>b) More fluid than dry foam. Releases its contained water more rapidly allowing for faster cooling and wetting</p> <p>c) Used best for ground fuels and penetration of deep seated fire</p> <p>VII. APPLICATION OF FOAM</p> <p>A. Direct Attack</p> <ol style="list-style-type: none">1. The ability of foam to continue wetting and cooling fuels long after the application is completed is a key to foam use strategy2. Greatest efficiency is achieved with continuous, rapid application<ol style="list-style-type: none">a) Knocking out the flaming fire frontb) Blanketing smoldering stumpsc) Allowing the foam to work where it is applied3. Make adjustments to the mix ratio to produce a wet foam solution4. When penetration into the burning material is necessary, increase the application or impact from a shorter distance<ol style="list-style-type: none">a) Since foam is highly visible, over-application can be minimized. As soon as steam is visible, move on. Leave a foam blanket over the hot fuel to smother it <p>B. Indirect Attack</p>	



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<ol style="list-style-type: none">1. Make adjustments to the mix ratio to produce a dry foam solution2. Apply foam as a wet line at least two and a half times as wide as the expected flame lengths adjacent to a backfire3. Apply foam directly at close range and attempt to coat all sides of fuel to the ground to add insulating barrier<ol style="list-style-type: none">a) Foam can also be lofted onto brush, tree trunks and canopiesb) For structures, apply blanket to roof and siding <p>C. Mop-Up</p> <ol style="list-style-type: none">1. Foam extinguishing, penetrating, and discharge distance capabilities allow mop-up operations to begin earlier and take less time to complete2. The smothering action of the foam and the penetration of the solution can be used soon after flames subside3. For surface fires, a wet foam can penetrate the fuel quickly to cool and smother the fire and create an oxygen barrier around any remaining smoldering fuel<ol style="list-style-type: none">a) This strategy works extremely well on pitchy and punky material, duff and litter material4. Avoid applying dry foam during mop-up<ol style="list-style-type: none">a) This slow-draining foam forms a lid over deep-seated fires, trapping heat	



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<p>5. Pockets of low-level combustion may show up as steam plumes or as patches with no foam remaining</p> <p>a) These places should be treated again</p> <p>VIII. SAFETY</p> <p>A. All personnel involved in handling, mixing, and applying foam concentrates of solutions should be trained in proper procedures to protect both their health and safety as well as that of the environment</p> <p>B. Foam concentrates are similar to household detergents and have similar health effects</p> <p>1. There is no evidence that suggests that the ingredients have any</p> <p>a) Carcinogenic</p> <p>b) Reproductive</p> <p>c) Or mutagenic effects</p> <p>C. All containers of foam solutions should be labeled to alert personnel not to drink the contents</p> <p>1. Ingestion of foam concentrates or, to a lesser degree, the solution can be harmful</p> <p>2. If foam concentrates are ingested</p> <p>a) The individual should seek medical attention as soon as possible</p> <p>D. When handling foam concentrates, personal protective equipment such as, goggles, waterproof gloves, and disposable coveralls are recommended</p> <p>E. Clothing soaked with foam concentrates should be removed and thoroughly rinsed with water</p>	



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<p>F. Eyes splashed with foam concentrates or foam solutions should be flushed as soon as possible with large amounts of clean water for at least fifteen minutes</p> <p>G. Inhalation of foam vapors can be irritating to the upper respiratory tract and should be avoided</p> <p>H. If Skin Contact Occurs</p> <ol style="list-style-type: none">1. Wash off with water, and remove contaminated clothing <p>I. Spills of concentrate can create slipping hazards and should be clean up with an absorbent material immediately</p> <ol style="list-style-type: none">1. Do not apply water directly to the spill area<ol style="list-style-type: none">a) Foaming and possible contamination of the surrounding area may result <p>J. Do not flush or clean equipment near natural or domestic water supplies, creeks or rivers</p> <ol style="list-style-type: none">1. If a spill does occur in a water way, contact the proper authorities and be prepared to provide them with the appropriate manufacturer's information<ol style="list-style-type: none">a) M.S.D.S.	



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SUMMARY:

Foam is now proving to be a valuable tool in fighting wildland fires. The ability of foam to penetrate living and dead fuels quickly, to form an insulating blanket, to cling to vertical surfaces, and to reach great distances from the nozzle are all characteristics that will enhance firefighting. Foam can prevent fire spread. It can protect stands of timber, structures in the path of fire, and other resource values. Foam accomplishes extinguishment with less application time, with less manpower, and less water than conventional water applications.

EVALUATION:

A written examination.

ASSIGNMENT:

None.