

## COMPRESSED AIR FOAM SYSTEMS

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**Purpose:** *Compressed Air Foam Systems (“CAFS”) are recent developments in fire suppression. CAFS have shown to reduce fire knockdown times, and with less fatigue to firefighters due to reduced weight of charged fire hose. CAFS is a mixture of water, foam concentrate and compressed air bubbles.*

**Procedure:**

### FOAM CONCENTRATE AND STORAGE

1. Units 8032, 8033 and 8051 are the units which have CAFS capabilities, which consists of a foam proportioner for Class A type foam concentrate, foam cell and air compressor.
2. Only Class A foam concentrate shall be used in the foam cell. Class B foam concentrate shall NOT be placed in the foam cell for any reason as severe damage can result.
3. Class A foam concentrate shall be purchased in drum quantities to reduce the chances of inadvertently introducing Class B foam. The drum shall be placed reasonably close to CAFS equipped apparatus to avoid having to carry foam concentrate any farther than necessary.
4. Class A foam concentrate has a material safety data sheet (“MSDS”). Firefighters shall familiarize themselves with the information on the MSDS. Care shall be taken to follow all safeguards recommended by the foam concentrate manufacturer.
5. The level of Class A foam in the cell shall be checked as part of the daily apparatus check. Foam concentrate shall be added when necessary to bring the level up to full, but not overfull.
6. Class A foam concentrate tanks shall be topped-off when the level is 3/4 or less. Otherwise, adding foam concentrate following an incident will not be necessary.

### USE OF CAFS

7. The proper sequence of establishing CAFS flow is:
  - A. Engage pump
  - B. Establish water supply to pump and prime if needed
  - C. Turn on foam proportioner
  - D. Turn on the air compressor
  - E. Set discharge pressure: 100 PSI<sup>1</sup>
  - F. Open the desired discharge line(s)<sup>2</sup>
  - G. Switch on air discharge to selected discharge line(s)
  - H. Set Pressure Governor/Controller
  - I. The initial percentage of foam concentrate shall be 0.3%

<sup>1</sup> *PIERCE* recommends setting the pump pressure at 80 -100 PSI when using a smooth bore nozzle, and 100 – 120 PSI when using a fog nozzle. (CAFS will operate correctly between 80 – 160 PSI; the air compressor shuts off at 161 PSI)

<sup>2</sup> *Water discharge valves need not be fully opened with CAFS, which allows for “drier” or “wetter” foam. Experience will guide the operator on the degree to which water discharge valves are opened.*

*Standard Operating Procedures are meant only to be guidelines. Actual conditions may warrant alternative actions.*

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8. During morning apparatus inspections the air compressor should run for a time period of no less than 20 minutes. Excess moisture can be produced within the system, causing corrosion in the lines and components of the CAFS system. The system will achieve operating temperature within this time frame; thereby eliminating the excess moisture, preventing the corrosion problems.
9. When operating CAFS, some hydrants may need to be gated back to prevent pressures greater than 100 psi. This procedure should be performed only on hydrants, which produce intake pressures in excess of the operating pressures of CAFS. (Gating the hydrate should be performed at the pump panel not at the hydrant; the hydrant shall be in the full open position.) 8033 and 8051 are the only apparatus capable of gating back the front intake.
10. Pump manifold drains should be opened momentarily to relieve pressures within the pump. This will prevent foam from seeping back into the water tank.
11. Unlike in-line foam eductors the length of a CAFS line is not restricted.
12. Firefighters at the end of the nozzle should be prepared for a greater nozzle reaction when nozzle is first opened, due to air pressure. This greater reaction only occurs when the nozzle is first opened.
13. The initial foam percentage shall be 0.3% (one third of one percent). When the fire fighting has progressed to overhaul, this percentage should be reduced to 0.1%. When the apparatus operator has reduced the foam percentage, he shall advise the apparatus officer.
14. The “dryness” or “wetness” of the finished foam can be controlled by closing the appropriate discharge control valve. A fully opened valve adds more water, thus the foam is wetter. A partially opened valve results in dryer foam because there is less water. Dry foam has the consistency of shaving cream. Dry foam can be produced by removing the nozzle of a hose line.
15. CAFS may be used on small flammable/combustible liquid fires and spills where there are no puddles of product.
16. When finished with using CAFS, the hose-line shall be flushed with plain water. After flushing the line with plain water, the water valve may be closed and the air switch activated to use compressed air to blow out the line, eliminating the need to disconnect each section for draining.
17. The amount of foam concentrate used may be determined by examining the foam proportioner gauge. The amount of foam concentrate used shall be noted on the Engineer Check List. Noting this information shall assist those re-filling the foam cell.
18. CAFS shall be used on all fires, regardless of nature, unless otherwise directed by the Incident Commander.
19. The nozzles for CAFS lines are as follows: Booster – combination of smooth bore, straight stream and fog; 1-3/4” – combination of smooth bore, straight stream and fog; 2-1/2” – combination nozzle. When available, nozzles designed for foam application have been purchased.

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20. Dry foam may be used to place a layer of foam on exposures to fire, such as adjacent structures.
21. Before re-loading or disconnecting hose lines that have been used for CAFS application, these lines shall be flushed with clean water.
22. The foam strainers shall be checked at least once per week.
23. The brands of foam concentrate shall not be inter-mixed. If there is a change in foam brands, a thorough flushing of the entire foam system shall be done before introducing the new concentrate.

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