



# ALBEMARLE COUNTY FIRE RESCUE TRAINING DIVISION



# TRAINING BULLETIN

Subject/Topic: CAFS Operating Principles

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## INTRODUCTION

Compressed Air Foam Systems, or CAFS, has been integrated into newer Class A apparatus specifications for all new purchases. The intent of this document is to ensure commonality in operation amongst system operators.



## IMPORTANT!

- *Fire suppression utilizing CAFS is still dependent on sufficient volumes of water to overcome BTU's generated. In no instance shall an interior attack line be placed in service while flowing less than 95 gallons per minute(gpm) of water (NFPA 1403) This standard is inclusive of attack lines utilizing a CAFS mixture for suppression purposes.*

## DISCUSSION

The introduction of CAFS as a suppression technology requires operators to understand its functionalities and limitations. Our CAFS engines utilize an advanced design in the air compressor is interlocked to the fire pump, and the system is monitored by computer controls to ensure maximum product efficiency.

With this design, operators can establish a CAFS line capable of flowing multiple configurations. As a default, we recommend a 2:1 ratio (gpm / cfm), with a gpm flowing no less than 100 gpm and no more than 150 gpm, with an ideal configuration of 120 gpm / 60 cfm. The gpm / cfm ratio is monitored by observing the flowmeter in comparison to the cubic foot per minute (CFM) meter, ensuring a proper ratio.

In addition, we recommend utilization of a wet-foam mixture for structural firefighting, and a water-only application for overhaul purposes. In order to establish a wet-foam solution, it is necessary to gate the discharge to approximately 1/3 of a full opening. This is most easily obtained by fully opening the discharge, and gating the valve shut using the width of your hand as a stopping point.

As with water, the CAFS mixture's extinguishing ability is directly proportional to its volume. In other words,



larger fires require larger application of the CAFS mixture. This is accomplished in one of two ways: 1.) utilization of multiple handlines, or 2.) utilization of systems capable of delivering higher flows, as in large diameter attack lines and / or the use of portable or fixed master stream devices. However, as a point of interest, output will be limited by the CFM threshold (in the newer apparatus: 200 cfm), which equates into a maximum of 400 gpm flowing (a 2:1 ratio of gpm / cfm must be maintained, regardless of application).

Research into the ability of a CAFS engine to supply a non-CAFS engine varies in results. A common theme amongst the advocates is the utilization of the attack pumper as a glorified manifold, and allowing the supply pumper to pressurize the attack lines of the primary piece. In addition, a thorough flushing of the primary pumper is required to prevent degradation of pump seals by the foam solution. It is recommended that operators become familiar with this practice prior to implementation on an incident.

## **SUMMARY**

CAFS technology, when properly implemented, has the potential to increase our suppression efficiency. Commonality in approach is necessary to ensure that operators are not overwhelmed by the potential complexities. Operators must understand the functionality and limitations of CAFS-capable pumpers in order to take full advantage the technology offers.