



We make Compressed Air Foam... Simple!

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Compressed Air Foam Systems (C.A.F.S.) How and Why they Work

Foam is actually hollow spheres of water (bubbles) formed when water is mixed with air. Inherently, foam bubbles are unstable and collapse quickly. The addition of a fire fighting foam concentrate reduces the surface tension of water allowing the formation of small uniform bubbles. These bubbles are much more stable than the larger bubbles produced by other detergents such as dish soap. Compressed Air Foam systems (CAFS) produce the most stable foam structures, much more so than eductor systems.

Compressed air fire fighting foams expand water to between five and fifteen times it's original volume (i.e. one gallon of water turns into five to fifteen gallons of foam). A common mix ratio for compressed air foam is 0.2% concentrate by volume (compared to 0.5% for eductor generated foam). Assuming an average expansion of ten times it follows that the foam consists of 0.02% concentrate, 9.98% water and 90% air.

Through evaporation of the water it contains, compressed air foam cools the fire by removing its energy. As the foam collapses, water is released and increases in temperature by absorbing the heat and eventually turning into steam. The water is released from foam either through ruptures in the bubbles caused by the fire's heat expanding the entrapped air or through the effects of gravity distorting the bubble walls. As this is a gradual process the foam acts as a water reservoir, releasing the water at a rate that allows the fuel to absorb it, rather than running off and forming useless puddles.

An added benefit of foam concentrates is that they contain surfactants or wetting agents that reduce the surface tension of the water and allow for deeper penetration into hard woody fuels, deep forest litter, etc. This "Wet Water" effect allows the fire fighter to get the optimum use out of the available water. The deep penetration of the "Wet Water" into the fuels inhibits rekindling for prolonged periods of time.

Compressed air foams help control fire in other ways. They can have a cooling effect on the heat side of the fire triangle. The air entrapped in the foam bubbles acts as an insulating material and absorbs the heat given off by the fire and prevents it from igniting adjacent fuel. It can also act as a blanket, smothering the fire and removing the oxygen side of the fire triangle.

Because compressed air foam is easy to see it assists the fire fighter in guard construction, reducing the chance of missed areas or weak spots.

Compressed air foam is much more effective than straight water. When properly utilized, they can greatly reduce the time, effort and resources necessary to control and extinguish fires.

Because they are intended for use indoors and outdoors and fire fighters will be in direct contact with them, compressed air foams are formulated to have minimal environmental impact and be safe to handle. However, as with any chemical product, they should be used in strict accordance with the manufacturer's recommendations.



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Other benefits of compressed air foam are:

1. Compressed air foam clings to vertical and overhead fuel surfaces to protect and insulate structures, etc., from fire even at rates of 0.2% chemical.
2. It can be pumped over a much longer distance and greater height, at a given pressure, than plain water. Good casting distances are obtained with compressed air foam.
3. Clean up is much easier than with plain water systems because much less water is used. In addition, water damage is significantly reduced for the same reason.
4. It is environmentally safe and biodegradable.
5. Compressed air foam lines are much lighter than ones charged with only water and they will float. Fire fighter fatigue is dramatically reduced.
6. Manpower can be better utilized because only one person is required to operate the hose safely, since operating pressures do not exceed 125 psi (with THE SNUFFER).
7. Compressed air foam is the most effective and the lowest cost method of controlling, protecting and suppressing fire in structures, forests and wild lands.