



The most common tech. support questions I get revolve around setting up for foam educator operations. This piece should help those having trouble making foam with the industry's default proportioning device.

First: Alcohol resistant (AR-AFFF) foam is supposed to be jell-like in appearance. The thicker it is the more alcohol resistant component it has. Educators will work fine with AR-AFFFs. Most UL listed, AR foams are listed using foam educators.

Let's bust another myth about shelf life: AFFF and AR-AFFF have no specific shelf life. Twenty-year old foam is fine as long as the foam has been stored in accordance with the storage instructions on its package. The secret is keeping containers airtight. Foam concentrate will evaporate if left open or with lids ajar.

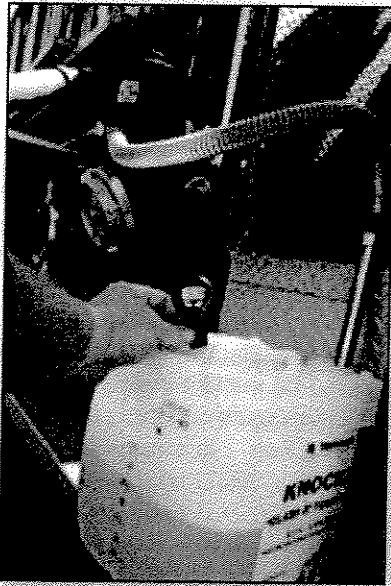
In-Line Educator This business of placing an educator somewhere in a hose-line is a

pain in the neck. Try to keep the educator attached to a pump discharge. The educator is much better off at the pump where the operator has light, communications, pressure gages and a ready foam supply. Inch-and three-quarter hose will allow you to operate at 3% or 6%, 200 ft. from the engine. Two-inch hose on a 95 gpm educator will allow you to operate four hundred feet from the engine. (See educator and hose distance table on the last page)

If your educator does not pull foam concentrate, try these steps.

1. Connect the subject educator to a pump outlet; use a reducer if necessary.
2. Be sure all pick-up hose connections are tight, no cracks in the hose, etc.
3. If using AR-AFFF foam, take the strainer out of your pick-up tube end.
4. Connect fifty feet of hose with no nozzle attached.
5. Place the pick-up tube in a pail of water.
6. Set the proportioning meter at 6%
7. Have someone hold the open hose butt so it doesn't flop around the ground.
8. Open the discharge (all the way) and throttle up until you reach 200 psi.

A 95 gpm educator, set at 6% will drain more than three, less than four gallons of water from the bucket in 30 seconds. A sixty gpm educator will drain almost two gallons in thirty seconds. If testing a 125 gpm educator, it will drain slightly more than 3.5 gallons in 30 seconds.

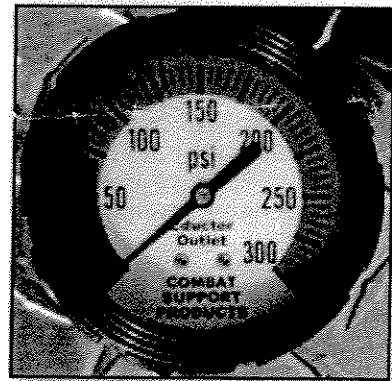


9. Add a nozzle and repeat the steps above. If OK, add 50 feet of hose and try again. Keep adding hose until the eductor stops drinking water.

10. Finally, substitute foam concentrate for the water in the bucket and repeat the test. After flowing foam for thirty seconds, put the pick-up tube back in the water bucket and flush for a minute. If using a push-button flush foam eductor, flush it by pressing the red button for a minute with pump pressure reduced to <50 psi. Throttle the discharge gate if necessary to get pressure low enough to press the button.

Another way of testing your foam eductor is to put an in-line pressure gauge on the outlet of the foam eductor. The one pictured was designed specifically for foam eductor outlets.

1. Attach your hose and nozzle system (95 gpm).
2. Open the discharge and slowly throttle up to 200 psi. (eductor inlet-pressure).
3. Open the nozzle.
4. If the gauge on the eductor's outlet reads higher than 130 psi, subtract hose, or increase nozzle flow (if possible) till gauge falls below 130 psi.
5. If you have one, put a dual pressure nozzle in the low-pressure setting before subtracting hose. Lowering nozzle pressure or subtracting hose will help in getting the back pressure problem under control.



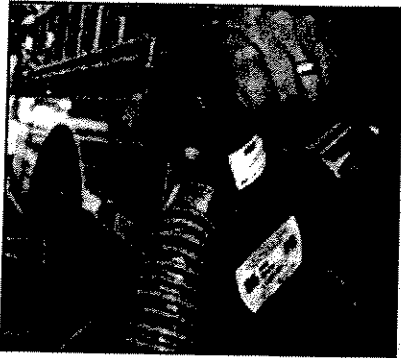
Rule: Sixty-five percent (65%) of inlet pressure is available for hose loss and nozzle pressure. If your hose requirements are short and you have a low-pressure nozzle that's a flow match for the eductor, you can operate at pressures less than 200 psi. See table below.

Inlet pressure	Outlet B.P. (hose + nozzle and elevation back pressure)
225 psi	145 psi max. - Proportions a little lean.
200 psi	130 max. - Just right.
175 psi	114 max. - A little rich.
150 psi	98 max. - A little richer.

Remember, nozzle flow rate must be the same or higher than the eductor's flow rate. A sixty gpm nozzle on a 95 gpm eductor will shut down the system because of excessive back pressure. Actually, automatics nozzles are much friendlier than most others because there are no flow settings to worry about. The nozzle is always in hydraulic balance with the eductor. Note eductors will operate fine with no nozzle. If you want to fill a water tank with foam solution, connect the male end of the hose to a tank fill or in a folding tank. Be sure to fill from the bottom up to minimize frothing.

Tips For Starting Up your Foam Eductor:

If using 3% foam concentrate, (or colored water) set the metering valve at 3%. At engine idle, put the pick-up tube in the foam pail before charging a DRY line. With an on board foam eductor system, open the eductor and foam tank valves before charging the hose. Immediately after opening the discharge (at 50 psi +) you will notice concentrate or colored water moving into the eductor. It happens at low pressure because the eductor feels no back pressure. The eductor will continue to pull foam up the tube until the 3% solution (97 parts water and 3 parts foam concentrate) has reached the closed nozzle. While the line is filling with solution, throttle up to 200 psi. When the nozzle opens, the operator gets foam immediately, although somewhat rich at first.



Transit Time

Transit time is the time it takes foam solution to get from eductor outlet to nozzle inlet. With 200 ft of 1.75" hose, at 95 gpm, it will take about 9 to 10 seconds per hundred feet of hose. A 60-gpm eductor can take as much as thirty seconds for the solution to get to a nozzle that's 200 ft away. The larger the hose, the longer it will take. This is true for all on-board foam system too. So, whatever setting changes you make at the eductor it will take about twenty or more seconds before you notice richer or leaner finished foam coming from the nozzle.

Proportioning Accuracy - A Major Safety Issue At Crash Scenes

Just because you re making bubbles does not mean the foam will hold down gasoline vapors on a hot road spill. Industry standards allow proportioning as much as one full percent rich, no lean. Lean proportioning means fires may not go out as fast as you want them to, or finished foam disappears (drains) way too fast while trying to maintain vapor security at crash scenes. Since foam concentrate viscosities vary from type to type it would be wise to test all your eductors for accuracy. AR-AFFF s (ATC s) are the most viscous. My experience with older foam eductors and AR-AFFF has not been good, they tend too be lean. Proportioning accuracy can be tested using water. Contact me about equivalency numbers for the brand foam you use.



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Note: NFPA now requires annual proportioning accuracy certification of all (A&B) on board foam systems.

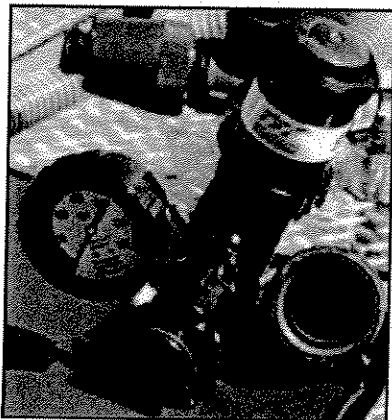
Foam Eductor Distance & Fire Fighting Table

Foam Eductor GPM	Fire Control size AFFF & AR-AFFF	Concentrate flow GPM	Nozzle or Hose outlet psi	Distance Hose I.D. 1.5"	Distance Hose I.D. 1.75	Distance Hose I.D. 2	Distance Hose I.D. 2.5	Distance Hose I.D. 3	Distance Hose I.D. 4	Distance Hose I.D. 5
60 gpm	Hydrocarbon 600 sq ft	1%= 0.6	100	300 ft	700 ft	850 ft				
	AFFF & AR-AFFF	3%= 1.8	75	600 ft	1250 ft	1550 ft				
	Polar Solvent 300 sq ft	6%= 3.6	50	850 ft	1850 ft	2200 ft				
			10	1300 ft	2800 ft	3400 ft				
95 gpm	Hydrocarbon 950 sq ft	1%= 1.0	100	100 ft	200 ft	350 ft	1200 ft			
	AFFF & AR-AFFF	3%= 3.0	75	250 ft	350 ft	650 ft	2200 ft			
	Polar Solvent 425 sq ft	6%= 6.0	50	350 ft	500 ft	1000 ft	3200 ft			
			10	550 ft	800 ft	1500 ft	4800 ft			
125 gpm	Hydrocarbon 1250 sq ft	1%= 1.25	100	50	100	250	800			
	AFFF & AR-AFFF	3%= 3.75	75	175	200	450	1450			
	Polar Solvent 625 sq ft	6%= 7.2	50	250	300	650	2100			
			10	400	500	1000	3200			
250 gpm	Hydrocarbon 2500 sq ft	1%= 2.5	100				200 ft	480 ft	3000 ft	
	AFFF & AR-AFFF	3%= 7.5	75				350 ft	880 ft	5500 ft	
	Polar Solvent 1250 sq ft	6%= 15	50				500 ft	1280 ft	8000 ft	
			10				800 ft	1920 ft	12000 ft	
300 gpm	Hydrocarbon 3000 sq ft	1%= 3.0	100				150 ft	300 ft	1666 ft	
	AFFF & AR-AFFF	3%= 9	75				250 ft	600 ft	3055 ft	
	Polar Solvent 1500 sq ft	6%= 18	50				400 ft	850 ft	4444 ft	
			10				600 ft	1300 ft	6666 ft	
500 gpm	Hydrocarbon 5000 sq ft	1%= 5	100				50 ft	100 ft	600 ft	2000 ft
	AFFF & AR-AFFF	3%= 15	75				100 ft	200 ft	1100 ft	3600 ft
	Polar Solvent 2500 sq ft	6%= 30	50				100 ft	300 ft	1600 ft	5300 ft
			10				200 ft	450 ft	2400 ft	8000 ft

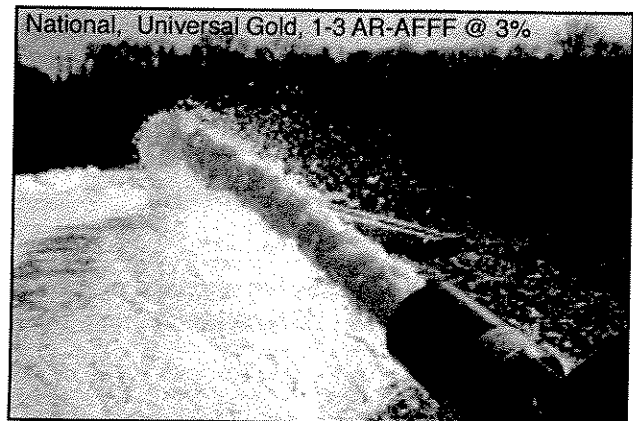
NFPA 11 requires a 15 minute foam concentrate supply for spill fires (one-inch or less)
 NFPA 11 requires a 55 minute foam concentrate supply for fires in depth (tank type fires)

Put a pressure gauge on eductor inlet and outlet. At 200 psi inlet pressure, do not exceed 130 psi back pressure on the outlet gauge.
 Distance to hose outlet is based on NFPA friction loss tables and or actual field experience.

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Aftermarket outlet gauge



How 3% AR-AFFF should look...