



Hazard Control Technologies, Inc.



Suggested Operating Guidelines

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #001

For the use of F-500 Encapsulator Agent in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Storage and Handling of F-500 Encapsulator Agent

Responsibility: As Directed by Department Policy

Procedure:

Application:

F-500 EA liquid concentrate is a noncorrosive, nonhazardous, synthetic concentrate for use by dilution with water in firefighting equipment, fixed or mobile systems. Protective equipment is recommended, as with any chemical, such as eye protection, gloves, etc. As with all concentrates, rinse thoroughly with water if spilled on your person.

Storage:

Recommended storage temperatures are 35°F - 120°F (1.7°C - 48.9°C), if stored in the manufacturer's shipping containers. When pre-mixed with water at .25%, .5%, 1% or 3%, the F-500 EA should be protected from freezing, the same as you would for plain water.

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Sample Operating Guidelines #2

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 - Filling On-Board Agent Tank

Responsibility: As Directed by Department Policy

Procedure:

Due to the potential for incompatibility of agents or products, NFPA recommends not mixing any two agents. HCT recommends that the agent tank is drained of any foam or wetting agent prior to filling with F-500. F-500 will NOT create a violent or hazardous situation if it comes in contact with other water additives or foams; however, it is always a good practice to drain and thoroughly rinse the tank with fresh water before filling with F-500.

To fill the tank with F-500, simply pour from the 5 gallon container directly into the agent tank while assuring all valves to the tank are closed prior to filling. 55 gallon drums and 250 gallon totes can be pumped off into the truck/tank directly by use of a suction pump, or by using a drain valve to fill smaller containers that will be used to service the tank.

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Sample Operating Guidelines #3

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 for Pre-Mixing the Booster Tank

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 to pre-mix the booster tank. The quantity of F-500 will be determined by the ratio of F-500 to the amount of water in the tank.

$$\text{F-500 (gallons)} = \frac{\text{Desired Proportion (\%)}}{100} \times \text{Tank Size (gallons)}$$

For example, to achieve a 1% solution in a 500 gallon booster tank, you must add 5 gallons of F-500.

Mixing Procedure for Booster Tanks

Pour the calculated amount of F-500 into the tank water to achieve the desired concentration of water and F-500. If this is done at the station, **no mixing or agitation is necessary**. The agitation of the water during transportation to the scene is sufficient to form a stable F-500/water solution with no separation occurring. If re-servicing the tank water at the scene, follow the “Re-Servicing Tank Water at the Scene” instruction on the next page.

Measuring Percentage of F-500 Concentrate After Booster Tank Usage

After the pre-mixed booster tank is used and the engine is to be re-serviced, we recommend that a measurement be made that indicates the remaining level of water and F-500. Once you determine the amount of water used from the booster tank, the crew will know how much F-500 and water are required to refill the booster tank.

Example: If you have 250 gallons remaining from a 500 gallon booster tank that had a 1% finished mix, you will need to add 2.5 gallons of F-500 to the newly added 250 gallons of water to be in full service again. You will now have 500 gallons of water with a 1% mixture of F-500.

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Re-Servicing Tank Water at the Scene

For this example, a 500 gallon water (booster) tank is used.

While operating at a fire where the F-500/booster tank water (500 gallons) has been used for the attack line and is now depleted, the following procedure can be used to quickly re-service at the scene from the hydrant, and again pre-mix the booster tank with F-500 to achieve your desired concentration.

Once the initial attack is made on the fire using the pre-mixed F-500/ water from the booster tank:

- 1) While hooked up to the hydrant supply line, continue feeding the attack lines with water.
- 2) Open ($\frac{1}{2}$ gate opening) the tank fill valve and fill the tank with water.
- 3) Close tank fill valve.
- 4) Open circulator valve.
- 5) With the tank now filled with 500 gallons of water and the circulator valve open, add **5 gallons of F-500** directly into the water tank to achieve the desired 1% pre-mixed solution.
- 6) **Optional:** Depending upon departmental policy, circulator valve may remain open or be closed 5 to 15 seconds after F-500 is added to the booster tank.
- 7) The tank solution is now ready for use through all the attack lines. Open the tank to pump valve to supply the 1% F-500/water solution to the handlines.

Note:

There is no cause for alarm if some bubbles appear from the top of the tank water. **Remember, F-500 is non-corrosive, non-toxic, non-hazardous, and 100% biodegradable.** Those bubbles will almost instantly go away without any additional wash-down needed.

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F-500 Booster Tank Premix Table

Tank Size (Gallons)	F-500 Premix Rate (Gallons)		
	0.25%	0.5%	1.0%
300	.75	1.50	3.00
500	1.25	2.50	5.00
750	1.875	3.75	7.50
1000	2.50	5.00	10.00
1250	3.125	6.25	12.50
1500	3.75	7.50	15.00
2000	5.00	10.00	20.00
2500	6.25	12.50	25.00
2500	6.25	12.50	25.00
3000	7.50	15.00	30.00
3500	8.75	17.50	35.00

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Sample Operating Guidelines #4

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 on Fuel Spills

Responsibility: As Directed by Department Policy

Procedure:

When responding to reports of fuel spills, upon arrival it is necessary to size-up the incident, determine the conditions, and establish command. Once an evaluation is made that the fuel is approachable and can be mitigated with a water-based agent, F-500 can be used as a vapor control/mitigation agent.

Application From a 2½ Gallon Extinguisher

A) Mix 10 ounces of F-500 into 2.5 gallons of water to achieve a 3% application rate for small fuel spills and small spill fires up to 1 gallon of gasoline or E-85. Using the HCT spray mist wand, treat the spill or extinguish the spill fire by sweeping over the spill and spill fire quickly cooling and encapsulating the hydrocarbon portion of the spill.

Hand-line Operation on a Fuel Spill

A) Dike/block drains and entrances to waterways before applying F-500 or water to the spill area.

B) Agitate a 3% F-500 and water mix through a 1", 2.5" or 1.75" handline into or over the fuel spill making sure you have used the LEL (Lower Explosive Limits) Meter first to determine the percent of vapor concentration of the spilled fuel. In most cases the alarm will sound and the reading will go to 100% indicating that there is an explosive level present that will support combustion. Taking the handline with a 3% setting of F-500, sweep over the surface of the fuel spill covering the entire area which now will render the spilled fuel and vapors non-flammable and non-combustible making for a safe area to operate in. Re-check the area with LEL meter to verify that vapors have been mitigated. If LEL meter alarms, reapply additional solution to the area.

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Clean-Up of Spill After F-500 Use

- A) Utilize department policy in accordance with government environmental regulations. (It is never recommended to wash any substance into the drainage system.)
- B) History has shown that when a spill is mitigated with F-500, and the liquid on the ground is allowed to evaporate the spill is not detectable.

Pooled Spills

When confronted with a spill (not involving fire) resulting in a large quantity of pooled fuel, a determination is to be made by the Incident Commander (IC) whether to completely neutralize the fuel or to secure the scene and call for a hazardous materials removal company to vacuum off the spill. Most often, the latter procedure is used when the fuel is not creating an imminent danger to the public. **Always follow established Environmental Procedures as dictated by your Local, State, and Federal Regulations, as well as established Department SOGs.**

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Sample Operating Guidelines #005

For the use of F-500 Encapsulator Agent in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 Encapsulator Agent to Neutralize and Suppress Flammability of Hydrocarbon Liquid Vapors

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 EA to render Class B hydrocarbon liquids nonflammable.

Application Rate and Procedure to Neutralize and Suppress Flammability of Class B Hydrocarbon Liquids:

- A) When total neutralization is desired, it is imperative to apply 1 pint (16 ounces) of F-500 EA for every 1 gallon of Class B hydrocarbon liquid and agitate with a minimum of 5 gallons of water (1:8:40 ratio).

F-500 EA and Water Required to Totally Neutralize Hydrocarbon Liquids			
	Ratio	Example 1	Example 2
F-500 EA	1	1-gallon F-500 EA	5-gallons F-500 EA
Hydrocarbon	8	8-gallons gasoline	40-gallons benzene
Water	40	40-gallons water	200-gallons water

- B) When this procedure is followed, it has been consistently proven that the fuel becomes nonflammable and unable to support combustion. The vapor levels are reduced significantly and now, the hydrocarbon molecules are in a chemical cocoon, surrounded by F-500 EA molecules. Verification of vapor suppression should be confirmed by use of a field Lower Explosive Limit (LEL) meter.

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Sample Operating Guidelines #6

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 on Vehicle Fires

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 to extinguish vehicle fires. The size and type of vehicle, as well as the cargo on board, will determine the firefighting appliances used [e.g. booster lines, handlines (1.5 1.75), deck guns, etc.].

Automobile Fire (Typical Scenario) Pre-Mixed in Booster Tank at 1%

Depending upon your current SOG for automobile fires, some departments are still using a booster line to attack a car fire, others are using a 1.5, 1.75 jump, or trash lines, some are using a pre-connect cross lay etc. When F-500 is pre-mixed in the booster tank, and the engine company is on the scene, the tank valve is opened and the attack line valve is opened and charged. The line supplies a 1% solution through the handline to attack the vehicle fire.

Note:

It has been found, on a consistent basis, that the attack line crew can extinguish a fully involved vehicle from a safe distance. It has also been noted that a fully involved vehicle is extinguished in a matter of a few seconds with minimal use of water and F-500 (Less Than 100 gallons for complete extinguishment and overhaul has been the standard).

Automobile Fire (Typical Scenario) Using In-Line F-500 Tank with Pump Panel Proportioners and Valve Control

When the attack line is the dedicated F-500 in-tank proportioned line, the proportioner at the pump is set at 1% and the valves are opened to provide that flow of F-500. The pump operator is familiar with the sequencing of the in-tank, pump proportioning system. Manufacturer's recommendations and manual for that system should be followed in order to achieve proper rates and flows.

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Automobile Fires (Typical Scenarios) - Use of In-Hose Line Eductors **95gpm/125gpm/250gpm**

A mechanical eductor can be used to introduce the F-500 into a handline for fighting vehicle fires. In most cases, the eductor is placed at the discharge line outlet that will be supplying the attack line.

A) It is imperative that the GPM rating of the eductor match the GPM setting of the nozzle being used. Example: If you are using a 125 GPM eductor, the nozzle must be set to 125 GPM. If the nozzle selection is 95 GPM, you will not achieve education of the product from the container. This is the #1 reason for failure to educt product through a handline.

B) It is also imperative that the gate on the nozzle or the nozzle itself be completely open in order to achieve proper education and flow of product through the handline. Pressure of 200 psi at the pump is a standard recommended by most eductor manufacturers. Sufficient pressure at the eductor is required for the F-500 to be picked up through the tube and displaced through the handline.

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Sample Operating Guidelines #7

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 on Large Scale Class B Transport Vehicles

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 to extinguish and control a large scale, large quantity Class B liquid fire in a transport vessel (truck, rail car, etc.).

Attack and Appliance Procedure

In a Class B tank truck (i.e., 8,500 gallon) fire, a recommended procedure for initial attack and extinguishment would be as follows:

A) Deck gun or master stream with a 2½" supply line of F-500 at 3% concentrate. Deck guns can be used from their mounted position on the engine company or in a portable operation on the ground. For a portable operation, a 2½" eductor is required to supply the feeder line to the deck gun. For a mounted operation an F-500 in-truck tank in conjunction with a large supply nozzle with a proportioner/pick up tube must be used. **Tank water can be used to make the initial attack followed by a supply line to the attack engine.**

B) A straight stream application on the side of the tank structure will achieve the following:

- 1) Heat reduction of the tank metal.
- 2) Initial knock down of the bulk of the fire.
- 3) Safer atmosphere in which handline operations can take place with a 3% concentrate of F-500 to complete extinguishment.

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Sample Operating Guidelines #8

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 on Structure Fires

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 to extinguish structure fires. We will consider all buildings (small, medium, and large) to be structures. The quantities and types of attack lines and appliances used will be determined by the size and type of structure.

Attack Line and F-500

1) Departments using F-500 in truck tanks that are proportioned at the pump panel usually dedicate that line as the initial fire attack line. This way, the FAO/Engineer can dial in the desired percentage (%) of F-500 (usually 1%). That line is used as the initial attack line. It can be a 1½", 1¾", or a 2½" handline. Important: The eductor GPM must match the nozzle GPM to achieve the proper finished product. Also, pump pressure must be per the recommendation of the eductor manufacturer (usually 200 psi at the pump).

2) Mechanical eductors can be placed at the discharge outlet at the pump panel with the attack line attached to the eductor as the attack line. This procedure will allow for the eduction of F-500 from a 5 gallon container using the pick-up tube procedure. Matching GPM rates and pump pressures are required here as if you are running off the in-truck proportioning system.

3) Mechanical eductors can be placed in between two handline sections to achieve F-500 introduction to that handline. It is important to note that 200 feet of hose is the maximum length that can be used without losing some of the flow concentrate. (e.g., You can place a 125 gpm eductor after the first, second, or third section of hose line to conserve product usage; however, NFPA and IFSTA recommend that when using a mechanical in line eductor, 100 feet is the maximum distance between the nozzle and the eductor to achieve maximum performance.)

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Sample Operating Guidelines #9

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 to Supply Fixed Extinguishing Systems (e.g., Sprinkler, Deluge Systems)

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 to supply fixed extinguishing systems. As an example, we will use a warehouse with a fixed sprinkler system that has fire department connections on the outside of the building.

APPLICATION PROCEDURE

Pumper Hook Up and Supply

- 1) The Incident Commander (IC) can instruct an arriving engine company to connect into the fire department connection to feed the sprinkler system. If the pumper has an in-truck F-500 tank, a 2½" supply line can be connected to the sprinkler system connection. Then the proportioner and valve controls are set to flow F-500 from the tank through the hoseline that is supplying the sprinkler system. The percent concentrate would be determined by the type of materials burning, quantity, etc.
- 2) For those pumpers without an in-truck F-500 tank, a mechanical eductor can be placed at the discharge outlet at the pump panel. Using a pick-up tube and F-500 containers, the F-500 can be introduced into the handline currently supplying the sprinkler system with F-500 and water.
- 3) Pre-mixed booster tanks on engine companies or pre-mixed tankers containing large quantities of water and F-500 can be used to supply the sprinkler system from the outside.

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Pre-Mixed and Attached F-500 Tanks Supplied to Sprinkler Systems

- 1) F-500 can be pre-mixed in above or below ground water supply/distribution tank systems and used for the water supply of the fixed system.
- 2) F-500 concentrate tanks can be installed adjacent to the sprinkler system utilizing an eductor system for proportioning. The water supply passes by the eductor/proportioner thus introducing F-500 into the sprinkler piping system and discharging at the sprinkler heads.

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Sample Operating Guidelines #10

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 with Aerial and Master Stream Appliances

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 through Aerial and Master Stream appliances. Aerial equipment and master streams can be used to introduce F-500 for large scale offensive and defensive attacks. **Example: Consider a commercial strip mall with a collapsed tar and gravel roof. Assume the contents of the mall, and the roof material is burning.**

Aerial Attack and Application Procedure Using Master Stream / Monitor and F-500

1) F-500 can be educted from the inlet of the waterway via a 2½" eductor. A 2½" or 3" hose line can be used as the feeder line to the aerial monitor. It may be necessary at times to use more than one water supply line to achieve the total flow rate of the monitor. Depending on the size of the fire and building(s), additional aerial units may be needed to achieve extinguishment. A stubborn tar/roof fire or a burning flammable liquids storage facility can be brought under control with F-500 through a safer, defensive mode attack. As long as F-500 is applied with water to the surface of the burning material, extinguishment can be achieved.

2) F-500 can be introduced through Master streams such as deck guns and large diameter handlines. F-500 is educted through mechanical or truck proportioning systems at rates to achieve desired percent concentrate. Good results can be achieved from a defensive attack while providing for a safer extinguishment environment.

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Sample Operating Guidelines #11

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 on Class A and Class B Fires

Responsibility: As Directed by Department Policy

Procedure:

This guideline gives an overview on the use of F-500 on Class A and Class B fires.

F-500 Use on Class A Fires

Generally speaking, F-500 is recommended for use at 1% on all Class A fires (e.g., wildland, automobiles, structures, tires, wood, paper, hay, straw, cotton, fiberglass, trash compactors, dumpsters, etc.).

F-500 Use on Class B Fires

F-500 has been found to be effective (as recommended in the F-500 brochure) at 3% on Class B Polar and Non-polar liquids. As a general rule, liquids such as gasoline, jet fuel, and heptane can be extinguished using a 3% concentrate application. There is no evidence that using a higher proportioning rate on polar or non-polar solvents improves firefighting performance.

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Sample Operating Guidelines #12

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – on E-85, E-90, Ethanol & Bio-Flex Fuels

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when firefighters are using F-500 to fight E-85, E-90 Ethanol & Bio-flex flex Class B Fuel.

Application:

Since we know that E-85 ethanol fuel is 85% ethanol, (a polar solvent) it will be burning hotter and cleaner than typical hydrocarbon fuels such as traditional gasoline, however, we know by field firefighting experience now with E-85 that we have to apply a minimum of 3% F-500 and cover as much of the surface area burning in a bulk container as possible.

Encapsulation & Neutralization:

Field tests have proven that applying a 1:8:40 ratio to the E-85 Ethanol fuel source will encapsulate the fuel and render it non flammable and non combustible just like gasoline.

Flat Spill & Flat Spill E-85 Fires:

Using a handline or monitor, a 3% F-500 application with the nozzle at a 35 to 40 degree pattern moving the nozzle over the surface spill or spill fire will cool and encapsulate the hydrocarbons present. The E-85 vapors will be encapsulated and the fire will be extinguished. The LEL meter is always used to measure the explosive limits to ensure scene safety.

E-85 Tank or Volume Fires:

Apply F-500 at 3% using handlines or monitors making sure to open the nozzle at 35 to 40 degrees to cover as much surface contact area as possible to encapsulate the vapor molecules and cool. If burning in a tank structure, it is imperative that exterior lines and or monitors are being used to cool all external tank metal surfaces which will help reduce ignition sources and help with a timely extinguishment.

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Sample Operating Guidelines #13

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 on Rolled Bales of Hay, Paper, and Other Class A Materials

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 to extinguish rolled bales of hay, paper, and other Class A materials. The quantities and types of attack lines and appliances used will be determined by the number of bales and their location.

APPLICATION PROCEDURE

Departments using F-500 through mechanical eduction equipment (i.e., inline eductors, onboard proportioners, round-the-pump proportioners, etc.) must follow guidelines set forth in the "Operation of Liquid Concentrate Delivery Equipment," page 35 of this manual.

Departments using F-500 pre-mixed in their booster tank should follow SOG #9, page 53 of this manual.

Note:

Piercing nozzles are an effective way of delivering F-500 solution into the core of the bail.

Bailed Material Located Outside a Structure

Using ½% of F-500, extinguish and cool the surface of the bailed materials. This is accomplished using a fog pattern of 30°-60°. Then shut down the nozzle, find the seated fires, and then work to direct the F-500 straight stream into the center of tightly compacted materials to cool and extinguish the coals or embers that have become "deep seated." Use caution during this procedure to prevent the dispersion of burning embers.

Note: Experience has shown that unrolling the bailed material is the most effective way to confirm that the fire is completely extinguished. F-500's cooling properties have proven to speed up this process as compared with plain water and Class A foams.

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Bailed Material Located Inside a Structure

When bailed material is located inside a structure, you are using both structural and bailed material firefighting techniques. Always use departmental SOG's in fighting structural fires. The method below is strictly for extinguishing bailed materials.

Using 1% of F-500, extinguish and cool the surface of the fire. You must work to direct the F-500 straight stream into the center of tightly compacted materials to cool and extinguish the coals or embers that have become "deep seated."

Note:

Experience has shown that use of F-500 inside a structure fire will reduce the heat six times faster than plain water or Class A foams, which allows a quicker removal of bailed materials. Upon removal of bailed materials, follow procedure as written above.

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Sample Operating Guidelines #14

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 - Decontamination of Personal Protective Clothing

Responsibility: As Directed by Department Policy

Procedure:

Turnout gear, gloves, boots, etc., when soiled with hydrocarbon-based chemicals (including soot), should be cleaned promptly to decontaminate and enhance the health and safety of the firefighter. This will also preserve the length of time required before replacing the equipment.

Decontamination of Gear on the Scene

A booster, 1½" or 1¾" handline set at 3% can be used to neutralize the hydrocarbon-based materials, as well as soot and dirt, from the complete set of personal protective gear. The F-500 will not harm hardware such as PASS devices, SCBA masks or packs, flashlights, etc. that will be carried and worn by the firefighter. Once the F-500 solution is used to decontaminate the gear, rinsing with fresh water is recommended to complete the process. (Remember: F-500 is **NON-CORROSIVE AND NON-HAZARDOUS**; therefore, minimizing any threat of injury or health risk to the firefighter.

F-500 Used in Turnout Gear Extractors

Place 4 ounces of F-500 in the extractor with the turnout gear. This process will remove the contaminants that reduce wear life while enhancing the firefighter's personal health and safety.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #15

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for Use of F-500 on Wildland Firefighting

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when using F-500 to extinguish wildland fires. The quantities and types of attack lines and appliances used will be determined by the size of the incident.

Wildland Firefighting

A) Departments using F-500 in truck tanks that are proportioned at the pump panel usually dedicate that line as the initial fire attack line. This way, the FAO/Engineer can dial in the desired percentage (%) of F-500 (usually ½% - 1%). That line is used as the initial attack line. It can be a 1", 1½", or a 1¾" handline. Important: The eductor GPM must match the nozzle GPM to achieve the proper finished product. Also, pump pressure must be per the recommendation of the eductor manufacturer (usually 200 psi at the pump).

B) Mechanical eductors can be placed at the discharge outlet at the pump panel with the attack line attached to the eductor as the attack line. This procedure will allow for the eduction of F-500 from a 5 gallon container using the pick-up tube procedure. Matching GPM rates and pump pressures are required here as if you are running off the in-truck proportioning system.

C) Pre-mixing the F-500 for wildland firefighting is recommended by Hazard Control Technologies at ½%. For information regarding premixing F-500 in booster tanks, please refer to HCT SOG #3.

NOTE: HCT recommends applying F-500 to deep-seated fires (i.e., muck or peat fires) and then making a second application of the F-500 to allow for greater penetration to the substrate material.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #16

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for Use of F-500 on Wildland Firefighting using Air Drop Apparatus

Responsibility: As Directed by Department Policy

Procedure:

Filling the Aircraft on-board agent tank:

Place the required amount of F-500 in the agent holding tank sufficient enough to premix the total water capacity of the aircraft for a ½ % finish mixture ready for deployment.

Deployment of F-500/mixture:

- a) The pilot of the aircraft will determine the spot or location in which to drop the F-500 water onto the fire.
- b) Wildland firefighters on the ground will communicate with the pilot to advise the suppression effect the drop has had and give direction for the next drop.

Re-servicing of the Aircraft:

- a) The pilot and crew will re-service the quantity of F-500 needed to make subsequent drops until the fire is under control and extinguished.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #17

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – on Class “C” Electrically Charged Equipment.

Responsibility: As Directed by Department Policy

Procedure:

In accordance with industry standards best practices, never use a direct stream of F-500/water mixture at electrically charged equipment or appliances. Conductivity tests conducted using F-500 at the Philadelphia Electric Company Fire Training Grounds proved that with a minimum of a 10 degree fog application on the nozzle flowing at 3%, F-500 will produce 0.03 mili-amps back to the nozzle, which is below human feeling and is not sufficient to cause harm to firefighters.

It is strongly suggested that power is cut to all facilities before firefighting operations begin to ensure the safety of all personnel.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #018, V4

For the use of F-500 Encapsulator Agent in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 Encapsulator Agent on Class D metal fires.

Responsibility: As Directed by Department Policy

Procedure:

Application:

F-500 Encapsulator Agent (EA) has been proven in the field and tested to extinguish Class D combustible metals such as magnesium, titanium and zirconium in powder, shavings, chips and solid forms.

F-500 EA solution is applied utilizing a 1% to 3% F-500 EA to water solution. While 1% is effective, 3% has proven to provide better knockdown, more rapid cooling and better fire control characteristics.

Regardless of the delivery device, the line should always be pre-charged with a solution of F-500 EA in order to prevent plain water from coming into contact with burning Class D metals which will cause metal flash and explosions. The initial attack with an F-500 EA pre-charged line should be with a 20-30⁰ degree fog pattern and an indirect application (i.e., raining down application) on the burning Class D metal, allowing the Encapsulator Agent to absorb the heat of the burning Class D Metal. After initial cooling, as the surface of the metal cools down, the fog pattern can be tightened and the application modified to a more direct application to accomplish some penetration into the burning pile. If the firefighter experiences any major flash popping, loosen up the spray pattern back to a 20-30⁰ degree fog pattern and adjust the application back to an indirect application, if needed.

Appliances Used:

Firefighters can use hand lines with structural firefighting nozzles (No Smooth Bore), or larger monitors to apply the F-500 EA to a Class D fire to achieve extinguishment. F-500 EA can also be fed into the Fire Department Connection to feed F-500 EA Solution to a fixed sprinkler system in a warehouse application.

Keep personnel upwind, whenever possible, and always wear complete PPE and breathing apparatus when fighting this type of fire.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #19

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – on Three Dimensional Pressure Class B Fuel Fires.

Responsibility: As Directed by Department Policy

Procedure:

Three Dimensional pressurized or running Class B fuel fires:

F-500 applied at 3% will encapsulate and cool a 3D running or pressure fuel fire significantly enough to cause extinguishment. Isolated flange valves, or pump seal fires are extinguished by directing a straight stream of 3% F-500 at equal to, or greater than, the pressure in which the fire is burning under pressure. Be sure to cool the heat source at the same time you are encapsulating the hydrocarbons in liquid or vapor state.

For large area pressure fuel fires originating from many outlets or sources may not necessarily be extinguished, however F-500 at 3% through the appropriate number of hose lines, nozzles or monitors using a fog pattern will protect the firefighter while personnel turn off the fuel flow valve, creating a safer environment for emergency response personnel fighting the fire. Once the fire is extinguished, personnel must take steps to contain the runoff.

Appliances used:

Firefighters can use hand-lines or larger monitors to apply the F-500 to a 3 Dimensional running pressurized Class "B" fire to achieve extinguishment. It is strongly recommended to shut off the flow of fuel to the fire if possible.

Caution: Complete PPE and breathing apparatus is required when fighting this type of fire, ALWAYS!

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #20

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – on Three Dimensional Pressure Class “C” Gas Fuel Fires. (European)

Responsibility: As Directed by Department Policy

Procedure:

Class “C” Fires – (European) Pressure Gasses

Under critical rescue situations when a pressurized combustible and flammable gas is burning, F-500 has been proven in the field to extinguish that gas fire by removing the heat and breaking the thermal column. F-500 has extinguished a pressure gas fire using a 1% F-500 mixture through a 1.5” hand line and a 95 GPM nozzle. The line and nozzle size is at the discretion of the officer in charge and firefighting personnel. All efforts should be made to shut off the flow of fuel to stop the propagation of flame. Only extinguish a running pressurized gas fire if human life is threatened and rescue is required.

Appliances used:

Firefighters can use hand lines or larger monitors to apply the F-500 to a three dimensional running pressurized Class “C” gaseous fire to achieve extinguishment. It is strongly recommended to shut off the flow of fuel to the fire if possible.

Caution: Complete PPE and breathing apparatus are required when fighting this type of fire, ALWAYS!

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #21

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – with a CAF (Compressed Air Foam) system.

Responsibility: As Directed by Department Policy

Procedure:

CAF System Operation with F-500:

F-500 has been used effectively through Department's Compressed Air Foam Systems (CAF) on Class A & B type fires.

At 0.3% (3/10's) of a percent setting of F-500, with 100 pounds of air and 40 gallons of water, F-500 forms a rich lather and extinguishes a Class A or Class B fire quickly and effectively without burnback. The F-500 will form a lather or blanket that is stable when applied and stays stable for long periods of time.

Personnel can add more air and less water to the handline which will provide for a drier finished product if you want it to stick to vertical and horizontal surfaces such as the exterior of a structure, trees, etc. for protection.

The wetter the solution through the handline the better the cooling capabilities of the F-500 coming through the handline.

NOTE: Flushing of the system is not required since F-500 is non corrosive and will not damage any CAF components.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #022

For the use of F-500 Encapsulator Agent in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for Re-servicing a 2.5-Gallon PW Extinguisher with F-500 Encapsulator Agent

Responsibility: As Directed by Department Policy

Procedure:

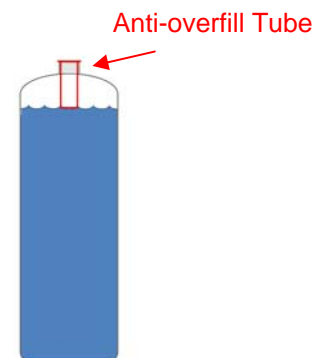
Servicing:

To refill an F-500 Encapsulator Agent 2.5-Gallon Fire Extinguisher with F-500 EA, turn the extinguisher upside down and release all of the pressure. Remove the head assembly by hand. Fill the extinguisher halfway with clean water. Slowly pour the ten-ounce bottle of F-500 Encapsulator Agent into the extinguisher. Pouring slowly will help prevent bubbles from forming, which make it difficult to see when the extinguisher is full.



Continue adding clean water until the F-500 EA/water solution reaches the bottom of the anti-overfill tube. The only purpose of the anti-overfill tube is for use as an indicator to tell when the extinguisher is full. Although you can remove it during filling, it remains securely seated in the neck of the fire extinguisher, so it is ready for the next fill.

The F-500 EA is water miscible and will mix perfectly in the solution without shaking or stirring. Replace head assembly. Replace lock pin and wire. Pressurize to 100 psig with a standard air chuck used for automobile tires.



HCT Extinguisher Recharge Kits are available with instructions and a 10-ounce bottle of F-500 EA.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #23

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – for Class B fuel Vapor mitigation in confined spaces.

Responsibility: As Directed by Department Policy

Procedure:

Confined Spaces: As defined by Webster's - an area with a small opening that is large enough for someone to enter and work.

F-500 can be used to remove or reduce significantly fuel or gas vapors found in confined spaces of all types; engine rooms, shipboard compartments and cargo holds, sewer drains, above ground storage tanks, rail cars and tank trucks.

Application:

Apply 3% F-500 through hand-lines or in combination with larger monitors or deck-guns with a 20 to 30 degree fog application. Moving the nozzle aggressively inside the space will provide for the encapsulation of airborne vaporized hydrocarbons, interrupting the free radical chain reaction providing for a safe operating area with a "0" LEL present.

Equipment needed:

The LEL Meter is a required piece of equipment anytime you have hydrocarbon vapor or liquid in any environment. You must mitigate the vapor below the explosive limits before you can consider it a safe operating non explosive environment.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #24

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – as exposure protection to flame impinged barrels, tanks, and railcars.

Responsibility: As Directed by Department Policy

Procedure:

This guideline is recommended when firefighters are using F-500 to provide cooling and exposure protection on barrels, tanks, and railcars impinged by fire.

Exposure Protection:

F-500 is applied through various appliances to include hand-lines, deck guns, monitors, aerial apparatus or any other methods at 0.25% to 0.5%. While firefighters are extinguishing the source of the fire, personnel can set up appliances to flow F-500 as a cooling line on tanks that are being exposed by the fire.

It is recommended to flow with the nozzles set at a pattern sufficient to cover the greatest amount of surface contact area so as to achieve the greatest amount of cooling and heat absorption.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #25

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the use of F-500 – on Tire Fires & Tire Recycling & Chipping Plants.

Responsibility: As Directed by Department Policy

Procedure:

Tire Fires outdoors or on vehicles:

Field firefighting experience has shown us that applying 0.5 to 1.0% of F-500 and water by means of a 2½ gallon PW extinguisher or a handline operation will extinguish tire fires of any size. For larger tractor trailer tires or heavy excavating equipment tires, a handline operation is recommended. Apply the F-500 by directing a straight stream to the burning tire surface, moving the nozzle to cover the total area. Once the bulk of the fire is knocked down, you can adjust your nozzle pattern to about a 30 degree pattern and moving it all over the tires to remove all the heat. The penetration and cooling effect of F-500 will allow for quick and complete extinguishment without the chance of burn back.

Tire Recycling or Chipping Plant fires:

F-500 has been used on numerous occasions to extinguish large outside tire recycling or chipping plant fires. F-500 should be applied at 1.0% using aerial apparatus, deck monitors, and handlines in conjunction with bulldozer or trackhoe excavating equipment. If the piles (large in nature) have been burning for a period of time, it will be necessary to move the bulk burning of the piles while F-500 is applied from the top down which will take using aerial monitors and deck monitors from pumpers, along with ground handlines to get the runoff hot spots when the trackhoe or bulldozer moves through a pile. Continued application and movement of the burning piles will result in suppression bring the smoke from toxic black to grey and white with total extinguishment as the end result. The F-500 can be educted, or batch mixed into the apparatus water holding tanks.

Considerations:

Department Incident Commanders should always assure that there is a task force in place to deal with the capture of now, liquid tire runoff. This runoff is considered an environmental hazard and should not be allowed to enter the storm drain or leach to any drinking water sources.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #26

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – LAST Fires – (Large Above Ground Storage Tank)

Responsibility: As Directed by Department Policy

Procedure:

Application:

Since F-500 does not create a foam blanket and does not work on the principles of foam spreading coefficients and blanketing, F-500 is applied at 3% on Class B fuels, through large diameter application monitors from aerial positions to cover all of the surface contact area, to encapsulate the hydrocarbon vapor molecule and cooling the surface as quickly as possible.

At the same time, fixed and portable monitors are applying F-500 at 3% on the exterior of the tank to help in the removal of surface heat of the metal tank itself which will aid in the suppression of the surface fire. It is a proven fact that reducing the temperature of the burning container assists in reducing the continued combustion progress. F-500 being applied to the surface of the fuel fire will encapsulate the hydrocarbon vapor and cool the surface at the same time, while external monitors are cooling the surface of the tank metal helping to reduce the overall heat.

Aerial apparatus will be needed to direct large monitors in a 30 to 50 degree fog pattern over the surface of the burning liquid. It is recommended to cover the complete surface area of the tank to achieve suppression.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #27

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – on Standpipe Operations for High-rise Firefighting.

Responsibility: As Directed by Department Policy

Procedure:

Standpipe Operations:

F-500 can be used during standpipe operations in low or high rise firefighting. F-500 can be supplied through handline standpipe connections from fire pumpers using 2-1/2 & 3" handlines. F-500 needs to be added to the water either through batch mixing the water booster tanks of pumpers feeding the standpipe connection, or through a 2-1/2" eductor at the pump panel where F-500 can be educted into the large supply line connected to the standpipe connection.

F-500 can be pumped at normal operating pressures that plain water would be supplied at for Standpipe, low and high rise operations. The advantage is now you will have .5 or 1%

F-500 in the water that will be used at each floor level for smaller (1.5 or 1.75") handlines to fight room or area fires at each level. The handline is connected to the standpipe connection in the staircase (usually) and used for firefighting in that area.

There are no special considerations or precautions that need to be taken when pumping F-500 water into the standpipe system since F-500 is not toxic, non-hazardous, non-corrosive, and 100% bio-degradable.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.



Sample Operating Guidelines #28

For the use of F-500 in Fire Department Operations

To: All Personnel

Objective: To Establish a Manner for the Use of F-500 – on Sprinkler Connections for Firefighting purposes.

Responsibility: As Directed by Department Policy

Procedure:

Standpipe Operations:

F-500 can be used during sprinkler operations. F-500 can be supplied through handline standpipe connections from fire pumpers using 2-1/2 & 3” handlines. F-500 needs to be added to the water either through batch mixing the water booster tanks of pumpers feeding the sprinkler connection, or through a 2-1/2” eductor at the pump panel where F-500 can be educted into the large supply line connected to the sprinkler connection.

F-500 can be pumped at normal operating pressures that plain water would be supplied at for Sprinkler operations. The advantage is now you will have .5 or 1% F-500 in the water that will be discharged through the sprinkler head used for firefighting in that activated area. The F-500 will assist in enhancing the visibility and reducing heavy toxic black smoke during fire suppression operations.

There are no special considerations or precautions that need to be taken when pumping F-500 water into the standpipe system since F-500 is non toxic, non-hazardous, non-corrosive, and 100% bio-degradable.

Note: This information is submitted as a suggested guide to establish a Departmental SOG when using F-500 as part of your emergency response procedures, and should in no way be considered a replacement for existing, established protocol. Hazard Control Technologies, Inc. is responsible for the quality of the product F-500 only, and will not assume responsibility for any other problem areas encountered when the product is being used.