

Best Practice Guidance for Fluorinated Firefighting Foams

Q & A

Q What are fluorinated firefighting foams?

A Fluorinated firefighting foams are the most effective agents currently available to fight flammable liquid fires. These foams contain fluorosurfactants that provide fuel repellency, heat stability and the required low surface tension and positive spreading coefficient that enables formation of an aqueous film on the surface of hydrocarbon fuels. Fluorinated foams provide rapid extinguishment, burn-back resistance, and protection against vapor release, which help to prevent re-ignition and protect firefighters working in the area as part of rescue and recovery operations.

Types of fluorinated Class B firefighting foams:

- Aqueous film-forming foam (AFFF)
- Alcohol resistant aqueous film-forming foam (AR-AFFF)
- Film-forming fluoroprotein foam (FFFP)
- Alcohol resistant film-forming fluoroprotein foam (AR-FFFP)
- Fluoroprotein foam (FP)
- Alcohol resistant fluoroprotein foam (AR-FP)

Q When should I be using fluorinated firefighting foams?

A Fluorinated firefighting foams should be used where there is a significant flammable liquid hazard, such as:

- Airport operations
- Storage tanks, terminals and petroleum/chemical processing
- Highway and rail transportation
- Marine and military applications
- Industrial facilities
- Some power generating facilities.

Q When should I not be using fluorinated firefighting foams?

- A**
- Forest fires
 - Residential and structural fires
 - Computer rooms and telecommunications facilities
 - Restaurants and commercial kitchens
 - General facilities protection
 - Class A (wood) or Class C (electrical) hazards where there is minimal or no flammable liquid threat
 - Small flammable liquid threats such as automobile fires without a significant fuel spill where a large water application rate or dry chemical extinguisher can be used

Q How can discharges of fluorinated foams to the environment be minimized?

- A** Users should be following industry best practice by:
- Using training foams that do not contain fluorosurfactants for training purposes.
 - Using surrogate liquid test methods that do not contain fluorosurfactants for testing fixed system and vehicle foam proportioning systems.
 - Providing for containment, treatment, and proper disposal of foam solution—do not release directly to the environment.
 - Following applicable industry standards for design, installation, maintenance, and testing of foam systems.
 - Minimizing foam releases from foam systems as a result of accidental discharges by using approved detection/control systems and proper maintenance of the system.
 - Using foam and equipment that will safely and successfully handle the incident in the most efficient way.
 - Developing mitigation plans for uncontrolled/unplanned releases of foam concentrate or foam solution so as to minimize the environmental impact.



Q How can emissions of foam and firewater be minimized during a live fire event?

A As firewater run-off may contain all range of toxic contaminants from the fire, even if foam has not been used, it is important to prevent it from entering the environment in an uncontrolled way. It is recommended that a firewater runoff collection plan be developed. This plan aims at listing and making available the required equipment (permanent or temporary) such as dikes, bunds, and holding tanks that will capture the runoff water and place this water in a contained area allowing later treatment. The goal of the plan is to minimize the volume of uncollected runoff firewater.

Q How should I dispose of collected firewater?

A Firewater runoff is a complex fluid to manage after its collection. It may contain burned or partially burned fuel from the fire, e.g. hydrocarbons or polar solvents, other combustion products, hydrocarbon and/or fluorocarbon surfactants, water-soluble polymers, hydrolyzed proteins, co-solvents, anti-freezing agents. This type of firewater runoff can also potentially foam. As such, it is recommended to contain all firewater runoff and disposed of it in an environmentally responsible process, e.g. thermal destruction (high temperature incineration) at a facility capable of handling this type of waste. Other techniques that have proven effective in removing contaminants, in particular fluorinated surfactants, from firewater runoff are commercially available around the world.

Q How should I dispose of spent or expired foam concentrate?

A As with firewater runoff, when disposal of a fluorinated foam concentrate is required (end of life), it is recommended that it be sent for thermal destruction (high temperature incineration) to an approved facility capable of dealing with halogenated waste.

Q What are manufacturers doing to address the environmental impact of fluorinated firefighting foams?

A Foam manufacturers are continually working to improve the fire fighting performance of their foam concentrates to protect lives, the environment and critical assets, while at the same time acting to minimize their environmental impact.

Foam manufacturers have reformulated their foam products to contain only short-chain (C6) fluorotelomer-based fluorosurfactants. These products are considered to be much lower in toxicity and not bioaccumulative based on current regulatory criteria. In addition, the foam industry is promoting best practices for the use and disposal of fluorinated firefighting foams with the goal of significantly reducing discharges to the environment.

FFFC has developed a best practice guidance document that provided the information for this flyer and is available online at <http://www.ffc.org/images/bestpracticeguidance2.pdf>



1001 19th Street North, Ste. 1200
Arlington, VA 22209
571.384.7915
cortinaec@comcast.net
www.ffc.org

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