

Foam Disposal Guide

Managing Firewater Runoff and Accidental Spills



Angus Fire foam concentrates are formulated to give maximum fire extinguishing and protection qualities, whilst reducing their environmental impact as far as possible. However, if allowed to escape into the environment, there can be adverse effects, and measures should be taken to dispose of foam and foam concentrates responsibly, complying with local waste disposal regulations.

Foam concentrates typically contain a mixture of fluorocarbon surfactants, synthetic or protein based hydrocarbon surfactants, solvents and polymers. Metal salts may also be present. Some of these components can be harmful to aquatic species such as fish, algae and daphnia. Fluorine-free foams contain hydrocarbon surfactants and other additives, and are also toxic to aquatic organisms.

Modern foams based on C6 fluorocarbons have low toxicity and do not bioaccumulate, but are persistent in the environment. (Bioaccumulation refers to the accumulation of substances, such as pesticides, or other organic chemicals in an organism. Persistence in this context means organic compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes, and therefore have the potential to cause pollution). Fluorine-free foams are generally more toxic to aquatic species, but do not bioaccumulate or persist. Under the Ground Water (England and Wales) Regulations 2009 it is illegal to

cause or knowingly permit the discharge of any hazardous substance or non-hazardous pollutant (for example, foam concentrates) into ground water unless the Environment Agency has granted a permit. This means that both fluorine-containing and fluorine-free foams should not generally (other than in an emergency when being used for the protection of life and property) be discharged onto grass, soil, waste land, or into rainwater drains, lakes, rivers, streams or other outdoor sites. Roads and car parks can be used as temporary storage areas with suitable containment measures.

Some waste water treatment sites have activated carbon filters that are able to remove fluorocarbon surfactants from incoming water. It would be acceptable to discharge a sufficiently diluted foam solution into a site with this equipment. However, most sites do not have carbon filters, and the fluorocarbon chain that forms part of the surfactant will end up in either the effluent water or sludge. Where foam is discharged to waste water treatment plants in large volumes, it can cause problems with excessive frothing which plays havoc with the float switches and level indicators. The waste water treatment plant should therefore be notified in advance, and the foam diluted with water sufficiently to prevent problems.

It is recommended that, where possible, foam, foaming solution or concentrate should be contained, converted into a solid form and incinerated.

The Environment Agency has produced helpful guidance to which customers are referred (PPG18: Managing fire water and major spillages).

Controlled conditions

Controlled conditions include training exercises, commissioning, maintenance and cleaning of equipment. Angus Fire provides a range of training foams that simulate the properties of real fire-fighting foams, but do not contain fluorine. Foams of this type should be used for all training exercises.

When testing or flushing systems with fluorine foams, the minimum quantity of foam should be used. All waste water generated should be contained in a suitable tank or bund. If the climate allows, waste water should be allowed to evaporate to dryness and the solid residue should be sent for incineration. Its evaporation is not practical, saving the liquid for re-use, or as fire water might be suitable.

Uncontrolled conditions

During an emergency fire-fighting, containment may not be possible. In these cases, temporary containment systems or the use of pollution control systems should be considered. **Water runoff must not be directed to drains, soil or vegetation.** If, during an emergency, run off inadvertently escapes then the local environment agency should be notified.

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Examples of emergency containment measures include:

- Blocking drains to prevent large quantities of contaminated foam solution from reaching the sewage treatment system.
- A sacrificial area consisting of a layer of porous soil, sand or proprietary absorbent media contained within an impermeable lining.
- Hard standing areas converted to temporary lagoons using sandbags or soil to form a perimeter bund.
- Pits or trenches, again preferably with an impermeable liner.
- Portable storage tanks or drums.
- Portable floating booms for marine-based operations.

Where foaming solution is contaminated with fuel, holding the liquid for a few hours or days may allow the fuel to separate from the foam solution and to be skimmed off for separate disposal. After use of a temporary measure, the porous material plus absorbed foam solution should be removed for disposal as soon as possible.

Spillages of foam concentrates

When rinsing out equipment, in the event of a spillage or leakage from a damaged container, the recommended approach to dealing with foam concentrate residues is to physically absorb them onto a suitable solid particulate material. Absorbents are available as granules, powder, sheets or pillows. This material can then be disposed of by incineration or landfill, in accordance with local regulations.

Disposal of foam concentrates

Foam concentrates require disposal when they are unsuitable for use, perhaps as a result of their age, or accidental dilution or contamination. They should be taken to an approved waste disposal site for safe incineration. Anyone sending foam for incineration should get a certificate of disposal from the contractor

References for further information

Environment Agency Guidance note PPG18 "Managing fire water and major spillages"

NFPA 11 Annex F Foam Environmental Issues

FFFC Fire Fighting Foam Coalition Environmental Issues Fact Sheet.

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