Identifying hazards

Performance vs environmental impact trade-offs exist for all types of foam, and finding that perfect balance between the two is key.

Several important issues need to be taken into account when choosing the right foam, emphasises Matt Boyle, Marketing Manager for Chemguard. Industry response teams need to consider the identity of the potential hazard they are most likely to come face to face with, and match it with the very best concentrate proven to combat that hazard.

Boyle stipulates that the proper listings and approvals are essential in making sure that the foam has the right performance and minimal environmental footprint. "Make sure the concentrate is listed and approved by an accredited association. This way you can be certain that it has proven itself against rigorous testing. "In addition, it is imperative to make sure that the foam is stored properly and at the right temperature. As with all foam concentrates, users need to make sure their foam is ready to go at a moment's notice. Proper storage in an environment that conforms to the manufacturer's recommendations is critical. There are speciality products on the market that are designed to operate at sub-zero (32°F, 0°C) temperatures, but even those have a freezing point. "

Chemguard offers a broad range of fluorosurfactants for use in aqueous film-forming foam agents.

Most of the AR-AFFF (alcohol resistant AFFF) concentrates on the market today are thicker and more viscous than an ordinary AFFF. Their consistencies can range anywhere from apple sauce to honey compared to the almost water-like consistency of typical AFFF. Users need to make sure their existing equipment can accurately proportion the AR-AFFF concentrate.

Boyle explains that compatibility with mutual aid reserves is another major issue when facing a major event ie compatibility in concentrate form only.

The majority of foam concentrates out there are compatible if, and only if, they are of the same type. It's not recommended to add a 1x3 on top of a half-filled tank of 3x6. Nor to mix an AFFF with an AR-AFFF in their concentrated form. AR-AFFF finished foam will retain all of it's effectiveness on the same fire that's being attacked from a different location by an AFFF. AR-AFFF and AFFF foams are only compatible in the finished foam state proportioned and discharged from different locations on the same fire.

Boyle recommends checking that any new foam is compatible with residual foam in existing foam systems "This might only be for convenience but it something to consider. Most fixed foam fire suppression systems have a reserve supply of concentrate. If you're planning to access this backup supply in the event of an emergency for transport to the fire scene, it's important for it to be compatible with your foam."

Consider the actual amount of foam concentrate available and compare that to the amount of foam needed to extinguish a potential hazard. Ten to 15 gallons of AR-AFFF concentrate

Chemguard performs all types of fire tests at its fire test facility, located in Mansfield, Texas, adjacent to the company's headquarters.

doesn't stand a chance against a 2,000-gallon Ethanol pool fire, he continues. "In that case it would be better to direct efforts to control the spread of the fire and protect structures outside the outer perimeter of the fire until a mutual aid supply arrives. Never take a knife to a gun fight."

Chemuard expects that the TSCA, the Toxic Substances Control Act, is likely to be overhauled in the coming years and perfluorosurfactants will have much greater scrutiny by the EPA.

In the mean time, the evolution of new fuels and blended fuels will continue to drive the demand for AR-AFFF concentrates. In addition, the expanding global population's requirement for fuel and other potentially hazardous chemicals increases the demand for AR-AFFF concentrates for protection, starting at the point of manufacture, through to transport, and on to distribution. And of course seeing that no one-to-one replacement has as yet been developed, the competition between foam manufacturers to develop a superior product, the increasingly growing education of the fire service and response teams continue to create a growing demand.

"If the potential hazard is unchanging then go with the very best extinguishment method for that specific fuel or hazard. Since high quality AR-AFFF foams are extremely effective on such a broad range of flammable liquid fuels, it is definitely the best choice when facing a variety of potential fires.

"Performance vs environmental impact trade-offs exist for all foam types and finding that perfect balance point between the two is key," concludes Boyle.

Solberg: what future for organohalogens?

"The priority in these current times is twofold. First, industry response teams must extinguish the fire, and secondly, they must not damage the environment. But which comes first is open to debate, considering that this does not just relate to AFFF or AFFF ATC but all foams," believes Steve Smith, area manager for Solberg.

Environmental legislation already exists in the UK, eg The Ground Water Regs 1998, but the EC's REACH (Registration, Evaluation, Authorisation and Restriction of Chemical substances) directive will impact further because it will highlight compounds that can at present be "omitted" from Safety Data Sheets. Furthermore, increased pressure on manufacturers of fluorosurfactants means that they will, voluntarily, be changing from molecules that are currently C8 to what is purported to be the "safer" C6. "This of course is unfounded as they are all organohalogens and therefore all banned from use. The C6 molecule is more expensive and less effective than the C8, resulting in poor performance foams costing much more than current agents."

According to Smith, history shows that AFFF ATC is very good at putting out fires. "It has a very long shelf life and therefore never degrades meaning there is no sludge or sediment. It also enables foam manufacturers to "concentrate" the liquids so that they can be accurately inducted at rates of 1% or even lower, unlike other types of foam. The logistics of having a 1% foam far outweigh those of a 3% and definitely of a 6%. The new technology organohalogen-free foams are very close to mimicking this performance."

A panacea would be one foam that fits all, but in today's world this is not practical, says Smith. An AR foam will handle all fires but it is more expensive than a standard AFFF so costs would be very important. Many industries have customs based around a particular type of foam and no amount of persuasion will get them to change (this is particularly evident in the aviation industry). Of course there are also "special" risks that need "special" foams like high-ex foams, and why would anyone use an expensive class B foam on a class A fire?

Smith sees a bleak future for foams containing fluorosurfactants. "In very blunt terms it will no longer exist. All foams AFFF, FFFP, FP and their alcohol derivatives damage our environment and will continue to do so for thousands of years, long after we stop using them, so the environmentalists will win. The only argument thus far against stopping the use of these foams has been that there are no safe alternatives. But this is no longer the case. There are at least four foam manufacturers that have organohalogen-free foams in their product range, all passing current fire performance standards. The argument is wearing very thin and eventually whether by legislation, legal precedent or just good practice foams that contain organohalogens will be stopped.

"Any environmentally responsible institution will embrace the new technology that is available today and work to ensure it progresses to a point where it is at least as effective as the AFFFs and FFFPs available today instead of trying to block its progress. It is much easier to leave things as they are than to embrace new technology and move forward," concludes Smith.