

BENEFITS OF FLUORINE AND SOLVENT FREE FOAM

Since the 1970s, synthetic firefighting foams have been used around the world to rapidly suppress and extinguish fires. Aqueous Film Forming Foams (AFFF) are water-based firefighting foam products that address flammable liquid fires by cooling the fire and coating the fuel, preventing its contact with oxygen. However, in recent years firefighting foams containing fluorine (such as some AFFF's) have been identified as having adverse impacts on the environment. The cause of this is fluorinated compounds; per- and poly-fluoroalkyl substances (PFAS).

Issues with PFAS

PFAS is a group of chemicals that are persistent, bio-accumulative and toxic (PBT). PFAS, and in particular PFOS and PFOA, are known to enter ecosystems and move up food chains, accumulating in animal and human tissue such as the liver and blood. PFAS have been linked to bladder and liver cancer, endocrine disruption, and developmental and reproductive toxicity. The use of PFAS containing fire-fighting foams is now banned in South Australia and restricted in QLD. As Australia is a signatory to the Stockholm Convention for the reduction of Persistent Organic Pollutants, it is expected the other states and territories will follow in due course.

Problems with Solvents

Solvents could be considered a forgotten environmental concern for foam manufacturers. Most solvents in foams are glycols and their derivatives but there are also some alcohols. They are used for foam stabilizing, antifreeze protection, and solubilizers. The use of solvents in foams represents risks to health and the environment.

Whether by direct or indirect discharge, foams are often released into the environment after use. Foams are made of a mixture of chemical compounds such as foaming agents and water-soluble solvents to balance its extinguishing properties. Foaming agents are essential, but they expand sharply during use and disrupt the operation of wastewater treatment plants. Foams are very visible if directly discharged to a watercourse, they degrade faster or slower depending on the nature of the agents selected in the formulation.

Health Hazards:

Solvents are absorbed into the body by inhalation and through the skin. They are then metabolized and can result in side effects due to high doses in the liver, kidneys and central nervous system. Many glycols are prohibited in household products used by the public. In water-based paints, they can be gradually released into the air we breathe and can lead to long-term consequences. They are also listed as Volatile Organic Compounds (VOC) and are subject to restrictions in industry.

Environmental Hazards:

Solvents have a significant organic load. Therefore, their Chemical Oxygen Demand (COD) can overload water treatment plants or if released into a river or lake, they contribute to the phenomenon of asphyxiation resulting in oxygen consumption.

3F's FREEDOL SF, a fluorine and solvent free foam agent exclusive to Wormald Australia has a significantly lower COD compared to typical AFFF's. For example, a standard 6% AFFF has a COD of **400 g/l**. Our FREEDOL SF which is fluorine and solvent free has a COD of **100 g/l**. The lower COD results in less environmental impact.

Existing AFFF systems, either pre-engineered vehicle systems or fixed suppression systems, can be easily upgraded to use Fluorine Free and Solvent Free Foam using 3F product exclusive to Wormald Australia. Minor modifications include changes to proportioners or increase in vehicle system cylinder pressure. These new fluorine foam concentrates are essentially 'drop in' replacements for the existing Wormald AFFF concentrate solutions containing fluorine.

For further information contact Wormald on 133 166 or sales@wormald.com.au