

Queensland Foam Concentrate Policy

This newsletter is designed to give our comments on the policy that has been put in place by the Queensland Department of Environment and Heritage Protection (EHP), regarding the use of fire fighting foam concentrates and general guidance for people contemplating the move to fluorine free foams. The EHP Policy has a number of problems. There is an assumption that fluorine free foams are fully capable replacements for fluorine containing fire fighting foams. However, there is no engineering evidence to support such a position. In addition, the TOPA test for fluorine containing foams is new technology and results may change over time.

With the new regulations in Queensland, users of foam concentrates have been presented with some major challenges. Two possible options are presented by the regulations:

- 1) Use 'C6 Pure' AFFF type products and collect all foam system discharges for disposal.
- 2) Use fluorine free foams (F3).

Superficially the choice for customers may seem to be simple, move to F3 foams.



C6 Pure Fire Fighting Foams

The first option requires C6 pure fire fighting foam to be available. Orion can now confirm that two of our current products have been tested using the latest TOPA test method and comply with the C6 pure requirements. These are:

- Hydrofilm 3% AFFF C6 Premium
- Polarfilm 3x3 ARAFF C6 Premium

Both products tested easily comply with the C6 Pure requirement in the EHP policy. They have less than 2% of the allowable level of fluorosurfactant C7 and longer (>C6), and less than 0.02% of the allowed level of PFOS.

Based on these tests our 6% AFFF and 3/6 ARAFF would be expected to comply also.

We also tested our discontinued Hydrofilm 3% AFFF which was phased out about 6 years ago when the new C6 technology became available. Results showed that the PFOS level in this product was very low, and the total fluorosurfactant >C6 was close to the 50mg/L limit.

It is possible that some batches of our Hydrofilm 3% would comply with the current regulations, as well as some batches of our discontinued Polarfilm 3/6 ARAFF. We can assist with testing and provide advice as needed.

Fluorine Free Fire Fighting Foam

Orion has a well-tested and widely used Fluorine Free (F3) foam concentrate available – Orion Polarfilm FF 3/6 - which can be used on hydrocarbons and polar solvents. We would recommend this for some applications after a careful engineering analysis as F3 foams are not a drop in replacement for AFFF or fluoroprotein based foams.

The problem with Fluorine Free Foams (F3) is that there is no large-scale fire test data for them. Over the last 50 years, AFFF has been proven on many large scale fire tests as well as on real world fires, however F3 foams are a new foam technology (there maybe more than one technology as there may be different technologies used by various manufacturers) and they are yet to be proven in a properly engineered manner on large scale fires. We need large scale test data to determine design application rates.



Any questions about this email or other Orion products and services?

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The reason for proving foam technologies at large scale is quite simple. The processes involved in fire extinguishing large scale fires are potentially different to small scale fires. It should be obvious that scaling fire test data from a 1 square meter fire test to real world applications 100's or 1000's times larger is a very risky leap to take without some corroborative test data on larger fires.

Design application rates used in standards such as NFPA 11 and AS 1940 for AFFF and fluoroprotein foams were derived from large scale fire testing. The small scale approval testing that was available at the time - UL 162 (1st published in 1960, AFFF was patented in 1962) was not used to prove AFFF capabilities. Approval testing is mainly a quality assurance test and does not 'prove' a product for many applications. Some exceptions exist for specific applications such as sprinkler systems where there are very specific tests in UL 162. Consequently, there is no data that can be reliably used to determine the application rates that should be used when changing to F3 foams for many applications. It is almost certain that large scale testing would demonstrate that many F3 foams systems need to be designed at higher application rates than for fluorosurfactant foams.



F3 foams have a known problem when applied forcefully to fires (even on small scale fire tests), such as from monitors, even when using aspirated foam nozzles. F3 foams have little or no test data at small scale and none at large scale for non-aspirated monitor nozzle use (being applied by fog nozzles). AFFF was proven to work using fog nozzles by large scale testing and there is no listing process for this use. There were no small scale approval tests for this application until the LASTFIRE test was developed. Even so, any foam technology needs to be demonstrated at large scale to determine if the small scale testing is actually valid.

The history of fires in storage tanks indicates that even fixed systems using AFFF and fluoroprotein foams rarely managed to extinguish a full surface tank fire. There are moves to increase the design application rates for tank systems for fluorosurfactant containing foam, and good reasons for thinking F3 foams will be less effective than current fluorosurfactant based products.

More Information

More information on this can be found on our web site:

http://www.orion-fire.com/technical_category/fluorine-free/

Consider the history of AFFF development, where applications were 1st proven at large scale before the technology was used in practice. System designers, customers and regulators need to consider the possible risks involved in changing to F3 foams. They are mostly unproven technology as far as good fire engineering practice is concerned. Ideally, some large scale testing needs to be done as an industry wide (customers, suppliers and government) initiative, where the move to F3 foams is essentially being mandated.



Disclaimer and Conclusion

TOPA testing will evolve over time and result may vary in future. This is recognised in the EHP Policy. We will be monitoring the situation and will keep our customers informed of any changes.

In conclusion, Orion can help you with your changeover requirements to meet the new requirements from the EHP. Whether you are looking for quotes to replace or update foam/equipment, or just advice on what you need to do to ensure compliance, contact us for assistance. We also have many years' experience in testing foam systems with foam concentrates and foam simulants. We also understand how to interpret TOPA test data.



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