eNewsletter

November 2017

Fire Engineering Pty Limited

Over the past few months a lot of work has been put into the Fluorine Free Foam (F3) issues raised previously.

TOPA Testing Improvements

Early on Orion submitted samples for TOPA testing, with results identifying less than 1% of the known fluorosurfactant in a product. Since then, the latest TOPA test report now identifies 25% of the known fluorosurfactant.

In our testing we submitted 3 samples for TOPA testing, with post TOPA levels recorded as follows:

Foam Type	Levels Post TOPA (mg/L)	
	PFOS	PFOA
3M ATC	5,500*	121
Orion Hydrofilm AFFF 3%	0	52
Orion Hydrofilm AFFF C6 3%	0	1.2

*3M ATC PFOS levels pre-TOPA was in the order of 10,000 mg/L, for some reason this dropped to about 5,500 mg/L post TOPA which is odd.

An old Orion Hydrofilm AFFF 3% sample would just fail the Queensland requirements but is orders of magnitude better than 3M products. Our current C6 3% Hydrofilm AFFF probably passes the Queensland requirement but not all the fluorosurfactant is being identified, which continues to show that TOPA testing remains a problem.

We are continuing to work with the laboratories to try to improve the accuracy of the results as we're not sure current test methods are acceptable.

LASTFire Foam Conference

In October, David Meyer attended the LASTFire conference in Budapest. At the conference, F3 foams were a major focus along with a lot of information presented on the impact of fluorochemicals on our environment. The current research tells a frightening story and it is easy to see why environment protection agencies want to ban fluorine containing organic chemicals (PFAS).

From a fire protection perspective, the conference confirmed what we have already been saying, that we do not know how to design foam systems using F3 foams for many (most) applications.

The LASTFire group has been testing C6 and F3 concentrates for tank applications at small scales and has, since the conference, carried out some 11 meter tank testing. This is the first large scale testing for F3 foams.

Niall Ramsden, the coordinator of the LASTFire efforts, was quite firm in stating that F3 foams are unlikely to be effective through monitors using non-aspirated nozzles. Confirming what we have been saying regarding non-aspirated applications. Sub-surface application is also highly unlikely to work. Niall also emphasised that there is no such thing as a drop in F3 replacement for current foams.

LASTFire did some simulated monitor application to their 11 meter tank fire, which will provide some guidance about the effectiveness of F3 using aspirated nozzles from monitors. We are expecting them to be substantially less effective than AFFF products. Anecdotal reports suggest that this worked better than expected, at least for some foams. However, one problem with the LASTFire work is that they are not planning to publish their results.

There are at least seven basic fire scenarios that fire fighting foams need to be tested for, and any new foam technology needs to be proven for these.

1. Gentle (or semi gentle) application to tank and bund fires. Aspirated foam.
2. Aspirated sprinklers.
3. Non-aspirated sprinklers.
4. Aspirated monitors to deep fuel fires.
5. Non-aspirated monitors to deep fuel fires.
6. Subsurface application to tank fires.
7. Handline applications (aspirated and non-aspirated).

UL 162 testing can prove products for points 2, 3 & 7 (aspirated only) within the scope of existing standards. UL 162 does not certify foam products for monitor applications, whether aspirated or non-aspirated, for any type of foam.

Large scale fire test data is used to write foam system design standards, UL 165, EN 1568 and other small-scale tests are used for product certification. In order for foam technology to be ready for the real world, we need both large scale test data and product certification. Currently for F3 foams we only have some small-scale testing and limited product certification.

One other issue is that our current small-scale testing works reasonably well for fluorinated foams but may need modification for new foam technologies. One of the goals for the LASTFire test program is to check their small-scale test data against larger scale fire tests (the 11 meter tank fire). This is an essential step. Tests like UL 162 and EN 1568 etc may need modification to properly evaluate F3 products. The fact that EN 1568 testing identifies the problems F3 foams have with forceful application to fires indicates that it might be a more robust foam testing protocol than UL 162 for F3 foams.

There are some indications that F3 foams may have problems with specific fuels where AFFF type products did not. It may be necessary to expand the small-scale fire tests to include test with a variety of fuels, similar to testing for water miscible fuels.

A lot of work still needs to be done to commercialise F3 technologies. The LASTFire group should be applauded for the start they are making, though we really need them to publish their findings (without identifying specific products). At the very least, tens of millions of dollars will be needed to fund the testing that is needed to determine the design rules for F3 foam systems. The foam manufacturers can't fund this.

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

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