

This month we are featuring foam and foam proportioning systems, which is quite topical for many people.

### Foam Proportioning Systems

Recently we have had a lot of enquiries regarding the use of turbine proportioners in foam systems, so we feel it is worth reviewing foam proportioning systems and highlighting the benefits and drawbacks of each type of system.

There is a big trend toward the use of turbine proportioners as a single solution to all proportioning needs. We supply turbine proportioners, however while they may seem like a simple solution to all foam proportioning needs this is not the case and a proper engineering analysis is needed to work out the best option.

#### Proportioning System Summary

Proportioning Type	Advantages	Disadvantages
<b>Turbine Proportioner</b>	<ul style="list-style-type: none"> <li>- Compact design</li> <li>- No power requirements (e.g. foam pumps)</li> <li>- Often have wide flow range</li> </ul>	<ul style="list-style-type: none"> <li>- Single point of failure</li> <li>- Regular maintenance requirements</li> <li>- Sensitive to suction pipe design</li> </ul>
<b>Line Proportioner</b>	<ul style="list-style-type: none"> <li>- Proven technology when installed correctly</li> <li>- Very low system maintenance requirements</li> <li>- Low Cost</li> </ul>	<ul style="list-style-type: none"> <li>- Not suited for sprinkler deluge systems</li> <li>- Often incorrectly designed/installed</li> <li>- Single flow device</li> <li>- Higher pressure loss</li> </ul>
<b>Balanced Pressure – Pump Systems</b>	<ul style="list-style-type: none"> <li>- Most reliable foam system when dual pumps are used</li> <li>- Good flow range</li> </ul>	<ul style="list-style-type: none"> <li>- Higher space requirements</li> <li>- Higher cost</li> <li>- Higher maintenance costs</li> </ul>
<b>Balanced Pressure – Bladder Tanks</b>	<ul style="list-style-type: none"> <li>- No power requirements</li> <li>- Good flow range</li> </ul>	<ul style="list-style-type: none"> <li>- Difficult to refill</li> <li>- Can be high maintenance if not managed well</li> </ul>

#### Turbine Proportioners:

Turbine proportioners use a water turbine that is direct coupled to a positive displacement foam pump, with the foam pump being sized to provide the required foam concentrate mixing rate. They use the flow of water to drive the foam pump and therefore need no external power source.

There are a range of different types of turbine proportioners on the market utilising different technologies for the type of water turbine and foam pump. The choices for the turbine and the foam pump types can be very important for your application.

#### Line Proportioners:

The humble, simple and cheap line proportioner is the most abused and misused foam proportioning device. There are a few applications where they are a great option, but they must be designed and installed correctly. Sadly, we have a lot of photos of incorrectly installed line proportioners.

#### Balanced Pressure Proportioning:

Simply, if the water and foam concentrate are supplied to a venturi proportioner at the same pressure (hence balanced pressure system) then accurate proportioning is possible over a reasonably wide range of flows. There are two basic versions of this type of system; pump systems and bladder tanks.

#### Further Information

We have new technical articles on our website dealing with foam proportioning system design using Turbine Proportioners, Line Proportioners and Balanced pressure proportioning.

[https://www.orion-fire.com/technical\\_category/foam-proportioning-systems/](https://www.orion-fire.com/technical_category/foam-proportioning-systems/)

The articles are not complete design guides but are designed to give some basic appreciation of the design issues that need to be considered and some of the pitfalls. If required, we can assist with specific foam proportioning system design.

There are also articles on designing for high viscosity foam concentrates [here](#) and on pumping from multiple tanks [here](#) that are very important for foam proportioning system design.

### TOPA Testing Improvements

The general conclusion seems to be that the TOPA test is as good as it will get, despite identifying less than half the fluorosurfactant in samples we had tested.

Orion C6 premium AFFF and AF-AFFF products easily meet the requirements of the Queensland Department of Environment and Heritage Protection. These products have been sold since late 2011, making us possibly the 1<sup>st</sup> supplier of C6 based foams in Australia.

### Changes to AS 1940

Late in 2017 a new version of AS 1940 was published. There are very few substantial changes but there is one very significant change that relates to the use of fluorine free foam. Table 11.6 no longer specifies the foam types as AFFF, AR-AFFF and fluoroprotein foam. It now uses generic terms “non-alcohol resistant foam” and “alcohol resistant foam”. This opens the way for the use of fluorine free foams and complying with AS 1940.

Currently, the testing for fluorine free foams is not sufficient to determine design application rates for tank fires, yet AS 1940 now allows the use of fluorine free foams at the default rates used for AFFF and AR-AFFF. We are not sure how this can be justified. A risk review might be a good idea before relying on AS 1940.



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

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