

# Firefighting Foam Concentrates 2016

Protecting what matters



Protecting lives, the environment and critical assets

## New Range of Foam Concentrates

Angus Fire has dedicated a large amount of research and development into a new range of foams to meet the requirements and expectations of today's firefighters. The Angus team worked hard to reformulate products, maintain approvals for them, and create a comprehensive new range of modern foam concentrates, which cover a wide spectrum of applications around the world.

Every fluorinated foam within this range is based on very pure C6 (short-chain) telomer chemistry and does not contain long-chain (C8) chemistry in accordance with the US EPA's Stewardship Programme. By working with regulators, customers and test facilities, each of these concentrates are now fully approved and suitable for use across a range of sectors on a wide variety of risks but still offering the high performance that has become synonymous with any Angus Fire product.

## The Stewardship Programme

In 2006 the United States of America's, Environmental Protection Agency (USEPA) initiated a voluntary programme. The eight major global manufacturers of fluorosurfactants were all tasked with the challenge of reducing bi-product content and emissions from their facilities on a global basis of

- PFOA
- precursor chemicals that can break down into PFOA
- related higher homologue chemicals.

All these chemicals are considered to be based on long-chain chemistry, or C8. These have eight carbon atoms in a line, hence the name C8.



The two main aims of the Stewardship Programme were;

- by the end of 2010, each signatory should have achieved a minimum reduction of 95% , and
- by the end of 2015, each company should be working towards eliminating emissions and product content of these chemicals.



In 2015 the US-EPA released the most recent reports on the progress of each company directly involved, and their progress in reaching the program's phase-out goals. Results showed that the companies are on track to reach the program's goal of phasing out these chemicals by the end of 2015.

These companies also worked closely with US-EPA to establish credible analytical standards and laboratory methods to ensure comparability of reporting.

## Angus Fire's Involvement

Even though the Stewardship Program's scope does not include firefighting foam concentrate manufacturers, Angus Fire has been working to transform its entire foam range to ensure that it could broadly follow the program as a responsible foam manufacturer and move away from the legacy C8 technologies. Their new range of Integrity foams contain only C6 fluorosurfactants, meet the same approvals and combine improved firefighting performance with reduced environmental impact.

## What's in a name?

All C6 foam concentrates have been re-certified and can be identified on product literature, including drum labels by the superscript "C6" after the product name, for example Niagara<sup>C6</sup> 3-3. Procurement specialists and firefighters, should look out for the C6 symbol to ensure they have foam concentrates containing the very pure C6 chemistries. Look out for old approvals or names which do not include the C6 notation, these could still be C8 formulations.

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## Petro-chemical Processing

High-risk facilities such as refineries, pharmaceutical plants, process areas, warehouses and rail/loading racks require very specific solutions depending on the chemicals on site. As UL and EN1568 are the most applicable standards in this sector, Angus Fire's Alcoséal<sup>CS</sup> (AR-FFFFP) or Tridol<sup>CS</sup> ATF (AR-AFFF) are often the preferred choice to protect these critical areas. For a specific chemical risk, Angus Fire's staff can advise on the most applicable foam type.



## Oil Storage & Tank Farms

Crude oil contains every oil derived product from bitumen to butane and as a result any fire is a very complex scenario. Open top floating roof tanks can reach diameters in excess of 110m (360ft) and require significant fixed protection systems (as supplied by the Angus Fire Engineering division) as well as high capacity mobile firefighting solutions. Lightning strikes within a tank farm which contains processed or blended products such as petrol or gasoline, can result in catastrophic consequences. Boil-overs in a crude oil storage tank can develop rapidly into multi-tank fires. The protection of bunds is especially important as their capacity is much larger than that of the tank. Medium expansion foam systems to protect the bund will provide both vapour suppression and firefighting without the need for firefighters to put themselves at risk. EN, LASTFIRE and UL162 approved foams and devices deliver the best protection for this type of risk (not just fire, but also vapour suppression). Tridol<sup>CS</sup> Ultra 1-3%, FP70<sup>CS</sup> and Tankmaster<sup>CS</sup> are used world-wide in these high risk environments.



## Municipal Fire and Rescue & Civil Defence

Local fire and rescue services face a broad range of risks such as road traffic collisions involving small amounts of petrol and diesel as well as tanker loads of highly flammable chemicals in transit. Complex and unpredictable structural firefighting in schools, hospitals, shopping centres, stadia, farms and high-rise residential blocks present a diverse range of challenges. Therefore there is a need for a high performance foam, that not only rapidly extinguishes a fire but also prevents re-ignition to enable firefighters to rescue lives or secure the scene. Angus Fire's Integrity foam concentrates offer firefighters reliable performance each time they are deployed. Angus Fire recommends the use of Tridol<sup>CS</sup> ATF for a varied risk or Niagara<sup>CS</sup> which is Newtonian, EN1568 and UL162 approved to -18°C (OOF) and is widely used by UK Fire and Rescue Services for these reasons. Training is an important part of any municipal fire service's role to ensure firefighters possess the essential skills required to tackle a wide range of complex emergencies. Angus Fire's Trainol foams (synthetic) and TF (protein based) are ideal for live fire training scenarios.



## Off-shore & FPSO

Many off-shore installations are found in hostile environments where equipment must operate at extremely low temperatures, foam concentrates must be able to perform under these conditions as well. In addition space and weight are always at a premium on off-shore facilities which makes the need for a foam concentrate that induces at a low induction rate essential to minimise storage space. Angus Fire offers Tridol<sup>CS</sup> S1 for use on helidecks and Niagara 3-3 for all the other risks on board.



- Firefighter safety – putting the fire out, and keeping it out.
- Lowering the environmental impact, whilst maximising firefighting capability.
- Committed partnership with firefighting professionals.

|   |                  | Power & Industrial | Aviation | Off-shore & FPSO | LNG & Gas Handling | Petro-Chemical | Oil Storage | Municipal | Forestry |
|---|------------------|--------------------|----------|------------------|--------------------|----------------|-------------|-----------|----------|
| <b>FP - Fluoroprotein</b>   |                  |                    |          |                  |                    |                |             |           |          |
| Specially developed to extinguish large hydrocarbon storage tank fires at oil refineries and fuel storage depots.           | Tankmaster       | ✓                  | -        | -                | -                  | ✓              | ✓           | -         | -        |
|   | FP70             | ✓                  | -        | -                | -                  | ✓              | ✓           | -         | -        |
|   | FP350            | ✓                  | -        | -                | -                  | ✓              | ✓           | -         | -        |
|   | FP600            | ✓                  | -        | -                | -                  | ✓              | ✓           | -         | -        |
| <b>FFFP - Film Forming Fluoroprotein</b>  |                  |                    |          |                  |                    |                |             |           |          |
| The world's leading foam for airport fire services, combining the speed of AFFF with the post-fire security of FP.          | Petroseal        | ✓                  | ✓        | ✓                | -                  | ✓              | -           | -         | -        |
| <b>AR-FFFP - Alcohol Resistant Film Forming Fluoroprotein</b>   |                  |                    |          |                  |                    |                |             |           |          |
| Highly versatile Alcohol-Resistant foams that are suitable for use on hydrocarbon and polar solvent flammable liquids.      | Niagara          | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | -        |
|   | Alcoseal         | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | -        |
| <b>AFFF - Aqueous Film Forming Foam</b>   |                  |                    |          |                  |                    |                |             |           |          |
| Rapid flame knockdown on hydrocarbon spill fires.   | Tridol M         | -                  | ✓        | -                | -                  | -              | -           | -         | -        |
|   | Tridol S         | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | -        |
|   | Tridol C         | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | -        |
| <b>AR-AFFF - Alcohol Resistant Aqueous Film Forming Foam</b>  |                  |                    |          |                  |                    |                |             |           |          |
| Fast flame knockdown and extinguishment with superior burnback resistance and post-fire security.                           | Tridol ATF Ultra | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | -        |
|   | Tridol ATF S     | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | -        |
|   | Tridol ATF C     | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | -        |
| <b>FF &amp; AR-FF - Fluorine Free (for Class A &amp; B fires)</b>   |                  |                    |          |                  |                    |                |             |           |          |
| Where the environmental considerations are paramount fluorine free foams are the first choice.                              | JetFoam          | -                  | ✓        | -                | -                  | -              | -           | -         | -        |
|   | Syndura          | -                  | ✓        | -                | -                  | -              | -           | ✓         | ✓        |
|   | Respondol        | ✓                  | -        | -                | -                  | -              | -           | ✓         | ✓        |
| <b>Class A</b>  |                  |                    |          |                  |                    |                |             |           |          |
| Specially formulated for applications such as forestry and wildland fire control, structural fires and tyre and paper fires | Forexpan         | -                  | -        | -                | -                  | -              | -           | ✓         | ✓        |
|   | Hi-Combat A      | -                  | -        | -                | -                  | -              | -           | ✓         | ✓        |
| <b>Hi-Ex - High Expansion</b>   |                  |                    |          |                  |                    |                |             |           |          |
| Ideal for total flooding and LNG applications.  | Expandol         | ✓                  | -        | ✓                | ✓                  | -              | -           | ✓         | ✓        |
| <b>TF - Training Foam</b>   |                  |                    |          |                  |                    |                |             |           |          |
| The latest FF technology ideal for training exercises and fire vehicle testing with minimal environmental impact.           | Trainol          | ✓                  | ✓        | ✓                | ✓                  | ✓              | ✓           | ✓         | ✓        |
|   | TF               | ✓                  | ✓        | ✓                | -                  | ✓              | ✓           | ✓         | ✓        |



## Power Generation & Industrial

Industrial process and the production of power have developed in recent years, so too have the risks in and around these facilities. Angus Fire recommends foam concentrates with EN approval and UL listings such as Tridol<sup>CE</sup> Ultra for mixed risks, or FP70<sup>CE</sup> for hydrocarbon only situations. High expansion generators are often used in industrial applications for the total flooding of warehouses and other enclosed spaces. Angus Fire would recommend its high expansion foam Expandol for these risks.



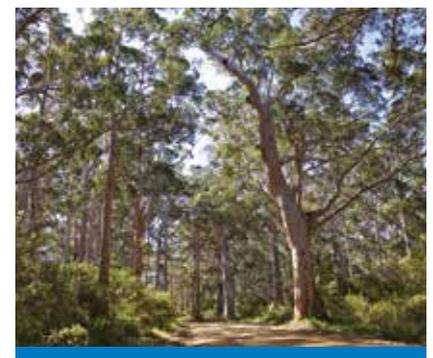
## Aviation

The preservation of life is paramount at any aviation emergency, considering the likelihood of rapid escalation into a major incident. So much so that aerodrome firefighters are tasked with creating a survivable environment within, or around, any aircraft to enable self evacuation or rescue of passengers. Fuels used in this industry are highly combustible and release tremendous amounts of heat when they are burnt (due to their high calorific value). Jet-A and Jet-A1 aviation fuel is stored in large quantities in tanks, tankers and aeroplanes themselves at various locations around the airport. Film forming foams such as Angus Fire's Petroseal<sup>CE</sup> and Tridol<sup>CE</sup> are ideally suited for this application achieving Level B or C passes against the ICAO (International Civil Aviation Organisation) performance test criteria. (ICAO sets three levels of performance, A, B and C with C being the most demanding). When fluorinated performance cannot be utilised due to environmental considerations, Angus Fire's Jetfoam is a fluorine free alternative with ICAO level B certification. For training purposes Angus Fire recommends Trainol or TF foams.



## Liquefied Natural Gas (LNG)

With the production of LNG expected to reach 10% of the global crude production by 2020, storage and processing facilities are growing in their size and complexity. With most processed LNG being transported by sea, these large storage tanks are most commonly located next to loading jetties which require specialised equipment to protect them. Accidental release into collecting ponds presents a serious risk of violent ignition as LNG expands 620 times moving from the liquid to vapour phase. As LNG has a boiling point of  $-161^{\circ}\text{C}$  operating temperatures can range from  $-161$  to  $+1300^{\circ}\text{C}$ . Angus Fire's slow draining Hi-Expansion foam, Expandol is the preferred choice by many installations to control a fire should ignition occur. Angus Fire's series of LNG Turbex foam generators ensures the most economical amount of water is used, to reduce the rate of LNG evaporation. This combination of foam and generator has been installed at many LNG facilities around the world.



## Forestry & Class A

Class A fires (wood, paper, timber, etc) are extinguished by wetting the combustible material. This also prevents re-ignition. Foams that reduce the surface tension of water to increase penetrating power are best suited for Class A fires. Angus Fire recommends Forexpan and Hi-Combat A. Hi-Combat A is certified to USDA forestry specification for use with helicopter and fixed wing aircraft, also ground appliances for wildfires. Forexpan and Hi-Combat A can be used through CAFS systems.

# Services from Angus Fire

Supporting firefighting professionals every day

## Firefighting Foam School

Angus Fire organises the hands on, theory packed Firefighting Foam and Emergency Planning School in Centro Jovellanos, Asturias, Spain. The school is run in partnership with CFB Risk Management.

The 5 day training covers a blend of theory and practice and is heavily focussed on the overall implications of tank firefighting. It includes an in-depth understanding of the risk and its manifestation, the importance of foam selection, designing and specifying foam fire systems, including tank systems. The practical training includes real fires with real fuels, across a number of training modules. To find out more about the school visit our website, [www.angusfire.co.uk](http://www.angusfire.co.uk)



## Foam Testing Service

Angus Fire's independent foam testing service includes a suite of tests and delivers a comprehensive, unbiased and reliable test result. For many flammable liquid risks, fire fighting foam is the preferred extinguishing medium; therefore it is vital that it performs when called upon during any stage of its operational life. Regardless of how thoroughly they were developed and tested, foam concentrates can be subjected to harsh climatic conditions outside their intended design criteria or be accidentally spoiled due to contamination or by dilution with water. That is why annual testing is vital and is recommended by many international standards. To find out more about testing service visit our website, [www.angusfire.co.uk](http://www.angusfire.co.uk)

## Emergency Foam Service

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Angus Fire has a long-standing history of providing a global emergency service for the dispatch of firefighting foam concentrates. The emergency foam service provides exceptional support in the event of an emergency. The service operates 24 hours a day, every day. When an emergency call is received, Angus Fire directs its complete foam plant at the incident – foam stocks, orders awaiting dispatch and work in progress are assessed. At the same time, the logistics to deliver the foam are actioned. This may involve a fleet of road tankers and/or aircraft depending on the severity and location of the fire. Angus Fire can mobilise foam from 7 countries, and 4 factories.



## Angus Fire Profile

Angus Fire is a global leader in firefighting technology. In more than 100 countries Angus Fire supplies fire safety products and services to customers operating in a wide range of industries such as oil companies, international airports, harbours, ports, to military bases, power stations, and of course to fire and rescue services. Angus is a global name with an impressive history of over 220 years in the firefighting industry. It is this rich heritage and associated expertise, which put Angus Fire at the forefront of the fire industry and makes the company the preferred partner with firefighters worldwide.

