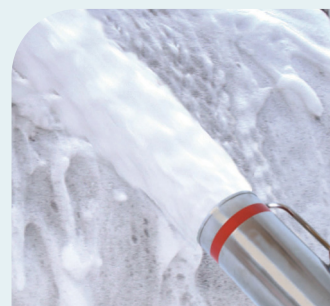
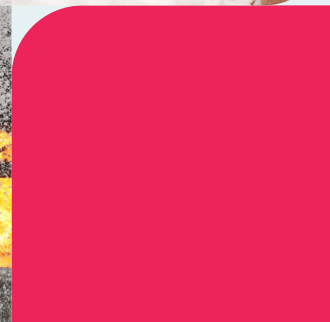


# Fluorine Free Foam Concentrates

Protecting lives, the environment and critical assets



**ANGUS  
FIRE**





### 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. UL and EN 1568 are the most applicable standards in this sector.

Best suited foams:

■ **Respondol ATF (AR-FF)**



### Storage Tank Farms

Lightning strikes within a tank farm can result in catastrophic consequences. Also boil-overs in crude oil storage tanks can develop rapidly into multi-tank fires. EN, LASTFIRE and UL approved foams and devices offer the best protection.

Best suited foams:

■ **Respondol ATF (AR-FF)**



### Off-shore & FPSO

Many off-shore installations are found in hostile environments dominated by extreme temperatures. In addition, space and weight are always at a premium on off-shore facilities. That is why a high performance foam concentrate is essential to ensure best use of storage space.

Best suited foams:

■ **Respondol ATF (AR-FF)**  
■ **JetFoam (FF)** – for helideck protection.



### Municipal Fire & Rescue and Civil Defence

Local fire and rescue services face a broad range of risks and therefore require high performance foams, that not only rapidly extinguish fires, but also prevent reignition. For municipal fires, UL and EN 1568 approved foams are recommended.

Best suited foams:

■ **Respondol ATF (AR-FF)**  
■ **Forexpan (Class A)**  
■ **Trainol (FF)**



### Aviation

Airport fires can rapidly escalate into major incidents as jet fuels are highly combustible and release tremendous amounts of heat. To create a survivable environment, firefighters need high performance foams that are also film-forming.

Angus Fire's **JetFoam ICAO-C (FF)** is the world's first film-forming, fluorine free, 100% biodegradable ICAO Level C foam. Others with ICAO Level B or C listing are:  
**JetFoam (FF)**



### Liquefied Natural Gas (LNG)

The production of LNG is on the rise and with that the storage and processing facilities of LNG are growing in their size and complexity. Accidental release into collecting ponds presents a serious risk of violent ignition. The operating temperatures can range from -161 to +1300°C. For this highly challenging risk use a slow draining, high expansion foam in total flooding applications.

Best suited foams:

■ **Expandol (FF)**

# Fluorine Free Firefighting Foam Concentrates



## Respondol ATF

- Highest performing fluorine free foam for use on hydrocarbon & polar solvent risks
- Lower viscosity than other fluorine free foams to ensure easy induction
- Ideal for use in fire trucks, mobile equipment and engineered systems
- 3% induction on both hydrocarbon and polar solvent risks



EN1568:2008  
Parts 3 & 4



## JetFoam ICAO Level B

- World's first film-forming, fluorine free foam for extinguishing JetA and JetA1 fuels
- ICAO Level B Certified
- Fast knock-down and extinguishment
- True Newtonian, flows like water to ensure accurate, easy induction and airport crash vehicle compatibility
- 100% biodegradable



## JetFoam ICAO Level C

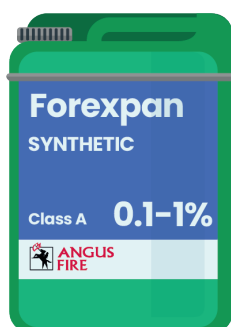
- World's first film-forming, fluorine free foam for extinguishing JetA and JetA1 fuels
- ICAO Level C Certified
- Fast knock-down and extinguishment
- True Newtonian, flows like water to ensure accurate, easy induction and airport crash vehicle compatibility
- 100% biodegradable



## Expandol

- Superior quality high expansion foam for extinguishing flammable hydrocarbon liquid fires
- Produces large volumes of foam, which totally seals off and extinguishes any remaining fires
- The high water content of medium expansion foam produces a valuable cooling effect
- Especially suited for marine and LNG applications

EN1568:2008  
Parts 1 & 2



## Forexpan

- A synthetic firefighting foam concentrate specially formulated for Class A applications
- Economical – 0.1% to 1% proportioning rate depending on application
- Long shelf life
- Suitable for use with fresh and sea water
- Use at 1% for small Class B hydrocarbon spill fires



## Trainol

- A fluorosurfactant free training foam which mimics the application and physical properties of Angus Tridol<sup>®</sup> S AFFF 6% fire fighting foam.
- Low toxicity foam developed to permit front line fire fighters to receive continuous training
- Complies with Civil Aviation and Environment Agency regulatory requirements for vehicle and equipment testing
- Readily Biodegradable

## Fluorine Free Foam Concentrates

	Induction rate %	Core Chemistry	Hydrocarbon and/or polar solvents HC & PS
FF & AR-FF - Fluorine Free (for Class A & B fires)			
Respondol ATF 3/3	3 x 3	Synthetic	HC & PS
Respondol ATF 3/6	3 x 6	Synthetic	HC & PS
JetFoam ICAO-C	3 or 6	Synthetic	HC
JetFoam ICAO-B	1 or 3 or 6	Synthetic	HC
Class A			
Forexpan	0.1 - 3	Synthetic	Class A
Hi-Ex - High Expansion			
Expandol	1 - 6	Synthetic	Hi-Ex
Expandol LT	1 - 6	Synthetic	Hi-Ex
TF - Training Foam			
Trainol	1 or 3 or 6	Synthetic	Training foam

## Approvals and Listings

	ENI558 pt3		ENI568 pt 4 (Acetone)		ENI568 pt 4 (IPA)		Lastfire (semi-asp)		Lastfire (asp)		Lastfire (system)		ICAO		UL162		ULC		Other
	FW	SW	FW	SW	FW	SW	FW	SW	FW	SW	FW	SW	B	C	FW	SW	FW	SW	
FF & AR-FF - Fluorine Free (for Class A & B fires)																			
Respondol ATF 3/3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	IMO
Respondol ATF 3/6	✓	✓	✓	✓	✓	✓													
JetFoam ICAO-C														✓					
JetFoam ICAO-B													✓						
Class A																			
Forexpan	✓	✓																	
Hi-Ex - High Expansion																			
Expandol																			ENSI 1568 1 & 2
Expandol LT																			
TF - Training Foam																			
Trainol																			



## HI-COMBAT Low Expansion Foam Branchpipe

- Long performance branchpipes for fighting spill fires from a safe distance
- Available in three models with flow rates of 225, 450 and 900 l/min at 7bar g
- Self-inducing versions of F225/SI and F450/SI models supplied with foam pick-up tube and piercer
- All models produce finished foam at nominal expansion of 10:1 with a throw of up to 24 metres



## HI-COMBAT Turbex Foam Generator

- High expansion foam generator for fast flooding of inaccessible spaces, producing up to 200m<sup>3</sup> of expanded foam per minute
- Water by-pass system allows performance to be maintained while working against high back pressures
- 30m of expandable polythene ducting
- Self-inducing facility
- Can also be used for smoke extraction and positive pressure ventilation



## Top Pourer Sets – TPS MK4 & MK5

- Used with fixed roof storage tanks for the protection of flammable liquids
- Calibrated with the available pressure to match the specific flow demanded by the individual tank
- Two types available with flow rates from 75lpm up to 3,300lpm at operating pressures between 3 bar and 10 bar
- MK5 is used in tanks with internal pressure below 1.5psi
- MK4 is used in tanks, having nitrogen or other inert gas blankets



## Bipod & Titan Foam Monitors

- Self-inducing, portable, low expansion foam monitors for small tank farms
- Available in three models with flows of 1800l, 2700l and 4500l /min at 7 bar inlet pressure respectively
- Each inlet has a integral non return valve to ensure continuous operation in the event of a hose failure



## HI-COMBAT AF120 Mobile Foam Unit

- Self-contained mobile foam unit, developed for fast response by a single person
- Standard unit comprises a 120 litre foam tank, UNI-225 inductor, F225/ HU low expansion foam branchpipe and two lengths of Duraline firehose
- GRP foam tank suitable to contain all foam types



## Foam Water Nozzles

- Open, air aspirating discharge heads made from stainless steel designed for installation as part of an engineered fire protection system
- Used in high risk situations where mixed risk flammable liquids are stored
- Suitable for low expansion foam applications as well as water cooling application

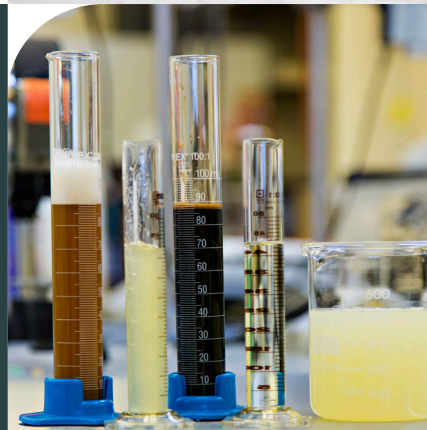
# Firefighting Foams You Can Rely On

Firefighting foam is an incredibly complex mixture of chemicals. It is tasked with being stored for many years, then instantly proportioned and diluted with water at up to 99 times, and still required to create 'the perfect bubble'. This bubble then needs to cope with high temperatures, fuel contamination and vapours trying to push their way through to the surface.

The environmental impact of fire-water runoff has made headlines throughout the world. Firefighting operations, training and testing continue to be the focus of intense scrutiny throughout Europe, the USA and Canada as well as Australia and New Zealand. Responsible manufacturers are going further to consider the environmental impact of their products, as much as their performance and reliability.

As the responsible foam manufacturer, Angus Fire is committed to meeting our customers' varied requirements and exceeding the latest test standards. We continue to develop the highest performing foam concentrates with a wide range of approvals whilst considering increased environmental demands.

Our fluorine free foams are composed of 100% biodegradable materials and will not persist in the environment. Angus Fire's technology-leading foams and our wealth of experience in the firefighting industry, ensure our customers have the best selection, when choosing their foam concentrate. Whatever the application rate, the expansion required (low, medium or high) Angus Fire has the solution for you.



# Services from Angus Fire

Supporting firefighting professionals every day

## Monnex™

Monnex™ is the world's most trusted high performance dry chemical powder for Class B, C and E flammable materials. It is used in high risk situations where flammable liquids are stored, processed or transported. Monnex™ is particularly effective against fires involving LNG, alcohols, ketones and esters, which are more difficult for conventional firefighting agents. That is why petrochemical facilities prefer to use Monnex™. The aviation industry requires rapid knockdown of the critical area, where passengers and fire crews are present. Monnex™ is especially effective on aviation fuel and achieves a very rapid knockdown. Monnex™ can be used in hand-held fire extinguishers, in trolley units or on fire trucks.



## 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 more about testing service visit our website [www.angusfire.co.uk](http://www.angusfire.co.uk)

## Emergency Foam Service

Angus Fire has a long-standing history of providing a global emergency service for the dispatch of firefighting foam concentrates. The emergency foam 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.



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## Angus Fire

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 & gas, international airports, harbours, ports, military bases, power stations and fire & rescue services.

Angus Fire 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 makes Angus Fire the preferred partner with firefighters worldwide.



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