



Dr. STHAMER HAMBURG

FOAM *FIGHTS* **FIRE**





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Innovation and tradition

A century's worth of research and development you can trust.

Challenges posed to fire protection, in the 21st century, are growing and ever changing. The focus is not only on performance and usability of fire extinguishing foams, but equally on the increased demand for environmentally friendly, socially acceptable and responsible solutions. The task of fire prevention and protection is of a complex nature and conceptual solutions require attention to all sensitive facts and areas. In the industrial sector in particular an efficient and long-term cost-effective solution is achievable only with a sophisticated range of well-engineered, differentiated products.

Whether in the early years of the company, founded by Dr. Richard Sthamer, or in the present fourth generation of Sthamer family management, the aim remains unchanged – to provide quality products of the highest standard whilst focusing on the diversity of customer needs. Ever since its founding in 1886, the company philosophy of delivering uncompromising service, excellent fire extinguishing foam agents and specialised products is diligently

pursued. Today, Dr. Sthamer is one of the world's leading manufacturers of fire extinguishing agents. The flexibility of being a medium-sized, family-run business guarantees commercial success and global customer satisfaction.

Our business policy is oriented towards sustainability, with an emphasis on close communication and cooperation with our customers. Solutions tailored to individual problems, flexible assistance and reliable service provide the basis for trusting long-term collaborations. We place emphasis on the most up-to-date technology and quality management systems for production, research and development, in order to ensure the excellent fire performance, longevity and reliability of our products.

The fact, that Dr. Sthamer's slogan 'Foam Fights Fire' is synonymous with the best in firefighting agents today, is our commitment and motivation for tomorrow.



Dr. Sthamer Timeline

1886

Our company's history dates back to the 19th century when local Hamburg chemist Dr. Richard Sthamer decided to set up his own business manufacturing chemical and pharmaceutical products. In January 1886 he founded Fabrik chemischer Präparate in Billwerder (now part of Hamburg) on the river Bille, the same site where our company is located to this day.

1920

In the 1920s, initial attempts were made exploring the use of saponin as a foam former in the firefighting sector. This resulted in the company entering a new market, a market in which we are recognised and held in high international esteem – the production of fire extinguishing foam concentrates.

1936

Only a few years later Erich Sthamer, son of the company's founder, began leading the development of protein based air foam concentrates. The respective patent dates back to 1936. In the following decades there would be many new developments protected by patents.

1950 – 1980

At the beginning of the 1950s Jürgen Sthamer joined the company, marking the third generation of the family business. A new era in foam concentrate manufacturing began with the first successful development of a synthetic, alcohol-resistant, gel film-forming foam concentrate. Further developments in synthetic and protein-based foam agents followed during the 60s, whilst the 70s revolved predominantly around combining fluorinated agents with protein foam concentrates, in order to create new, more effective products.

1980 – 2000

Oswald and Henning Sthamer joined the company in the 1980s, as the fourth family generation. This period was marked by the rapid growth in environmental awareness of society. Through new developments, modified methods of production and the use of new raw materials, the business succeeded in creating new, more environmentally friendly foam concentrates which, in 1995, led to ownership of a new patent.

2000 – 2015

A vast global customer base places their trust in and relies on our product quality and the competence and reliability of the company and our team. Intensive research and development continues to be a top priority at Dr. Sthamer. Our aim: High quality fire protection products, first-class customer service, exceptional responsibility toward our environment.

Foam is our job

Research and Development

All our products are designed and seen through to the production stage by our on-site Laboratory, where we employ the latest analytical methods and technologies. By closely monitoring the marketplace we are able to implement requests for new or altered products within the shortest possible time, whilst maintaining close contact with our customers, suppliers and research institutes. In order to sustain steady progress and to develop new and improved products, our scientists continue to research new raw materials and processing technologies.

Quality Management

All our products and services are subject to continuous innovation. Motivated and qualified staff are equally as important to us, as the use of high-quality raw materials and modern analysis and production technologies. Constant inspection ensures that only products in full compliance with legislative specifications and our strict internal standards are ever dispatched.

Approvals

Dr. STHAMER products meet the requirements of national and international standards and are acknowledged by numerous approval bodies.

Services

- Comprehensive technical advice before and after sale
 - Local technical support
 - Developing special fire extinguishing agents tailored to specific customer needs
 - Conducting fire tests, also according to individual user requirements
 - Product training courses
 - Annual quality testing of foam concentrate stocks
 - Sampling of foam concentrate stocks
 - Providing the latest technical info sheets
 - Information on new products or product developments
 - 24-hour emergency supplies
-



How foam fights fire

Combustion has four basic prerequisites: a flammable material, oxygen supply, the correct proportion of flammable material to oxygen, and the relevant ignition temperature. If any one of these prerequisites is missing, fire cannot break out. From a chemical point of view, combustion is the process in which a substance reacts rapidly with oxygen and gives off heat, induced by the ignition temperature. To extinguish fire, the burning material must be separated from the oxygen supply, or cooled down below the ignition temperature. Exactly this is achieved by fire extinguishing foam. The following extinguishing effects are utilised when applying foam:

Separation effect

The foam blanket covers the flame front, separating it from ambient air and preventing further oxygen supply to the flammable material.

Cooling effect

The water draining from the foam evaporates at the flame front, whereby heat is lost and the reaction rate between the flammable material and atmospheric oxygen is reduced significantly. The flammable material is cooled down by the water draining from the foam solution.

Covering effect

The foam blanket covers the flame front, preventing further gas emissions from burning materials, e.g. flammable gas from the incendiary matter can no longer reach the flame front. Simultaneous cooling of the burning material reduces vapour pressure,

avoiding gas breaches and therefore burn-back. Spilled vaporous fluids may be covered preventatively, in order to reduce environmentally hazardous emissions. This also significantly reduces the risk of fire.

Suppression effect

Flooding spaces, channels, facilities etc. with high or medium-expansion foam suppresses and separates atmospheric oxygen from and flammable gas necessary for the combustion process.

Insulation effect

Low thermal conductivity of the foam insulates not yet ignited, or extinguished, flammable material from thermal radiation and ignition sources.



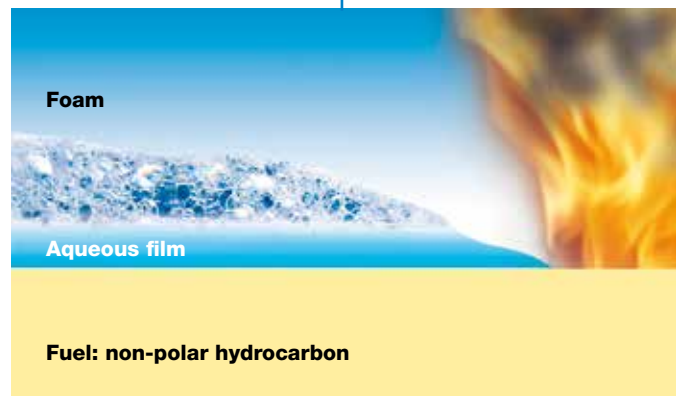


Film Formation



Polymer film

A polymer film is created when extinguishing polar (water miscible) solvents e.g. alcohol, ketone, ester. The film floats on the fuel, insulating the foam cover above from the foam-destroying liquid below. Only gentle foam application forms a stable, continuous polymer film resistant to foam-destroying liquids. For alcohol-resistant foams, gentle or indirect foam application is recommended.



Aqueous film (AFFF effect)

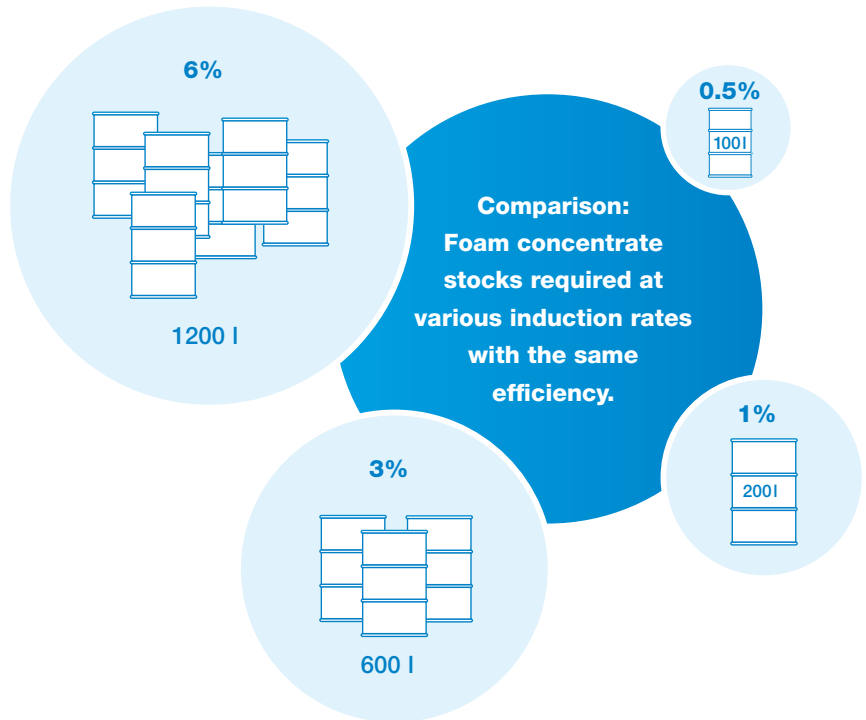
An aqueous film is created when extinguishing non-polar (water immiscible) hydrocarbons with fluorine-containing foam concentrates. A very thin film floats on the fuel, ahead of the foam, providing for the excellent flowing, extinguishing and burn-back preventing properties. The aqueous film also forms when using non-aspirated foam concentrate solutions, e.g. in sprinkler systems, water monitors, spray nozzles etc.

How foam is generated

A proportioning system mixes a fixed percentage of foam concentrate with the fire water. The resulting foam solution mixture is expanded with air in the foam generator. Lower proportions produce wet, heavy and flowable foam, whilst rigid foam with good adhesive and insulating properties is achieved at higher proportions. In any case, the volume of foam generated is many times that of the volume of the foam solution.

Induction rate

specifies the percentage ratio of foam concentrate added to water. At a 3% induction rate, for example, 3 parts foam concentrate are added to 97 parts water. The foam concentrate is added by means of a proportioner or pump premixer, either at the water pump, in the hose line, in the foam generator or in fixed installations in the central foam station. The induction rate is set at the proportioner or the pump premixer and usually varies (according to the type of foam concentrate, type of fire, flammable material and the application device used) between 0.5% and 6%. When using synthetic foam concentrates as wetting agents, up to 1 % is added.



Example of a 1% induction rate

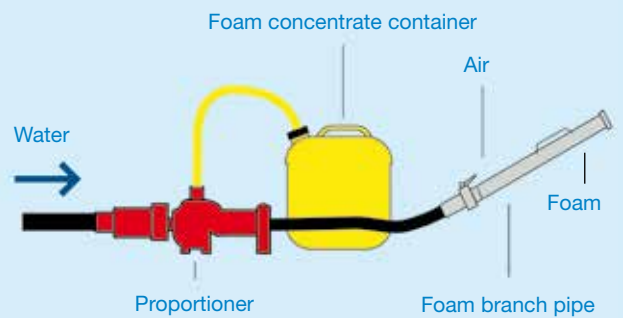
1 % foam solution	air	type of foam
<p>10 ml foam concentrate + 990 ml water = 1 l foam solution</p>	9 l =	10 l Low-expansion foam er* = 10
	199 l =	200 l Medium-expansion foam er* = 200
	999 l =	1000 l High-expansion foam er* = 1000

*er = expansion ratio



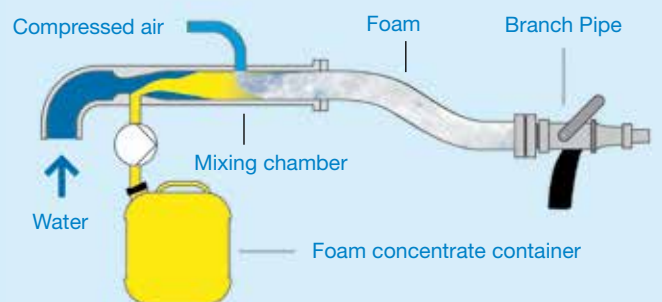
Conventional foam generation

The foam/water solution is expanded with an air-aspirating foam branch pipe.



CAFS foam generation

The compressed air foam system (CAFS) is a method of generating foam, where the premixed solution is expanded at the pump using compressed air. Foam consisting of very fine bubbles is produced. The proportioning rate is between 0.1% and 6% depending on the intended use.





Characteristics and application areas of the various fire extinguishing foam types

Low-expansion foam

expansion ratio <20

Characteristics

Low-expansion foam consisting of small bubbles with a relatively high weight and small volume. It has good flowability, is resistant to flames and thermal radiation, is gastight and prevents burn-back. Depending on the foam concentrate and induction rate, low-expansion foam has good adhesive properties to vertical objects. The extinguishing performance relies mainly on the separation and cooling effect. In addition, the separation effect of AFFF/-AR* and FFFP/-AR** is increased by the formation of an aqueous or polymer film.

Low-expansion foam is generated in low-expansion foam branch pipes, foam monitors or in fixed/mobile foam installations. Optionally fitted sieves, meshes, or baffles, e.g. goose necks, have the effect of expanding the foam solution even more effectively with the inducted air, creating a more rigid foam consisting of finer bubbles.

Application

Low-expansion foam is used for extinguishing both liquid and solid fires, due to its exceptionally good flowability. The foam rapidly spreads over the entire fire surface, creating a gastight seal. Its adhesive properties are particularly advantageous when

fighting solid fuel fires. Special foam-generating methods, e.g. CAFS, encourage this effect. If used as a preventative measure, low-expansion foam suppresses emission of flammable gas. Flammable materials remain covered by a gastight, insulating and cooling foam blanket for a longer period of time. As a result of its relatively high weight, a long projection range is achievable with low-expansion foam, allowing for firefighting operations from a safe distance.

Aqueous film-forming foam concentrates, e.g. STHAMEX® -AFFF, MOUSSOL® -APS, FOAMOUSSE® -FFFP, may be used as both expanded foam, or non-aspirated aqueous solution, e.g. at airports, fuel depots, in plastic and recycling industries, aboard ships, as well as in on- and off-shore sectors. These foam concentrates are also suitable for use with sprinkler and deluge systems. The foam's relatively short water drainage time enhances aqueous film formation and thereby improves flowability. The foam solution's low surface tension increases the wetting effect, when extinguishing solid material fires.

*AFFF/-AR:synthetic, aqueous film-forming, alcohol-resistant foam concentrate

**FFFP/-AR: aqueous film-forming, alcohol resistant protein-based foam concentrate



Medium-expansion foam

expansion ratio ≥ 20 to < 200

Characteristics

Depending on the expansion ratio, medium-expansion foam generates 'damp' foam consisting of fine bubbles, or 'dry' low-weight, high-volume foam consisting of large bubbles. The extinguishing performance relies mainly on the separation, cooling and reversion effects. Medium-expansion foam is generated in medium-expansion foam branch pipes. Together with the inducted air, the foam solution is pressurised and swirled around the branch pipe, where it passes through a mesh, causing additional expansion. This method produces a fairly large amount of foam, capable of relatively high build-up, in a short space of time.

Application

Thanks to its wide expansion range, medium-expansion foam may be used for a variety of applications: 50 to 100 times expansion foam is used for plastic, tyre and liquid fires, as well as for extinguishing smouldering fires; 100 to 200 times expansion is used to flood shallow areas, e.g. channels, pits, shafts etc., and wherever a successful firefighting operation depends on a fast build-up of large foam quantities. Medium-expansion foam achieves a projection range of approx. 12 m, enabling compara-

tively gentle foam application. It rapidly spreads over the entire fire surface, forming a sealed gastight foam blanket. MOUSSOL® -APS LV 1x1 achieves particularly rapid firefighting success when applied on polar liquids. Medium-expansion foam generators, designed especially for industrial fire protection, operate at expansion ratios ranging from 1:25 to 1:35, and are capable of reaching projection ranges of approx. 35 m.





High-expansion foam

expansion ratio ≥ 200

Characteristics

Extremely high foam volume and low weight. High-expansion foam contains a very high proportion of air and is, therefore, a particularly 'dry' foam consisting of large bubbles. It cannot be projected, due to its large volume and low weight. Extinguishing performance relies mainly on the separation, insulation and repression effects. These extinguishing effects are encouraged by a relatively high foam deterioration rate where minute water droplets are released, which, in turn, evaporate immediately due to the high combustion temperatures. The volume of water expands by a factor of 1700 when vaporised into steam, cooling the surrounding air accordingly. High-expansion foam is produced using high-expansion foam generators.

Application

High-expansion foam develops its full fire extinguishing potential in enclosed spaces. Due to the extremely high expansion rate, even large areas, such as aeroplane hangars or warehouses, may be completely flooded within a short time. The water content of the foam is so low that water damage is largely avoidable. When used preventatively, high-expansion foam displaces flammable gas, providing effective protection from flames and heat exposure.



Inside Air Foam System – high-expansion foam system for enclosed spaces

Inside air foam is created using specially designed foam concentrates and foam generators, in spaces such as warehouses or engine rooms. These systems generate foam using hot inside air loaded with combustion gas from a fire incident, which results in immediate gas absorption and cooling of the surrounding atmosphere. No fresh air supply or ventilation is required, whereby the construction of IAF systems has the potential to be far more cost-effective compared to conventional high-expansion foam systems.

Properties of different foam types

	Low-expansion foam					Medium-expansion foam		High-expansion foam
Type of foam concentrate	Protein			Synthetic		Synthetic		Synthetic
Product examples	FOAMOUSSE® 3% FLUOR-FOAMOUSSE® FOAMOUSSE®-FFFP FOAMOUSSE®-OMEGA			STHAMEX®-class A MOUSSOL®-FF STHAMEX®-AFFF MOUSSOL®-APS LV		STHAMEX®-K1% MOUSSOL®-FF STHAMEX®-AFFF MOUSSOL®-APS		MOUSSOL®-FF STHAMEX®-3% F-15 STHAMEX®-IAF 2%
Properties	P ¹⁾	FP ²⁾	FFFP ³⁾ FFFP/AR ⁴⁾	MBS ⁵⁾ S/AR ⁶⁾	AFFF ⁷⁾ AFFF/AR ⁸⁾	MBS ⁵⁾ S/AR ⁶⁾	AFFF ⁷⁾ AFFF/AR ⁸⁾	MBS ⁵⁾ S/AR ⁶⁾
Alcohol-resistance	-	-	- ++ ⁹⁾	- ++ ¹⁰⁾	- ++ ¹¹⁾	-	- + ¹¹⁾	-
Polymer film	-	-	- ++ ⁹⁾	- ++ ¹⁰⁾	- ++ ¹¹⁾	-	- + ¹¹⁾	-
Aqueous film	-	-	++	-	++	-	+	-
Flowability	o	+	++	+	++	o	+	-
Gas impermeable	+	++	++	+	++	o	+	-
Adhesion	++	+	o	++	o ¹²⁾ + ¹³⁾	+	-	-
Insulation effect	++	++	o	+	o	++	o	++
Cooling effect	+	+	++	++	++	o	+	-
Extinguishing time ¹⁴⁾	o	+	++	+	++	+	++	o
Wetting effect ¹⁵⁾	-	-	+	++	+	+	o	-
Oleophobic	-	+	++	-	++	-	++	-
Foam weight	++	++	++	++	++	o	o	-
Foam height	o	o	o	+	+	++	+	++
Foam stability	++	++	o	++	o ¹²⁾ ++ ¹³⁾	++	- ¹²⁾ o ¹³⁾	+
Drainage time	++	++	-	++	- ¹²⁾ + ¹³⁾	+	- ¹²⁾ o ¹³⁾	+
Projection range	+	+	++ ¹⁶⁾	+	++ ¹⁶⁾	o	o	-

Key:

++ very good / very high
+ good / high
o suitable / medium
- unsuitable / low

Foam concentrate

1) P: Standard protein foam concentrate
2) FP: Fluoroprotein foam concentrate
3) FFFP: Aqueous film-forming fluoroprotein foam concentrate
4) FFFP/AR: Aqueous film-forming, alcohol-resistant fluoroprotein foam concentrate
5) S: Synthetic foam concentrate
6) S/AR: Synthetic, fluorine-free, alcohol-resistant foam concentrate
7) AFFF: Synthetic aqueous-film forming foam concentrate
8) AFFF/AR: Synthetic aqueous film-forming, alcohol-resistant foam concentrate

9) only FFFP/AR
10) only S/AR
11) only AFFF/AR
12) AFFF
13) AFFF/AR
14) on liquids
15) on solids
16) To achieve a longer projection range, our AFFF, AFFF/AR and FFFP foam concentrates may be applied with non-aspirating equipment on petroleum products.



Dr. Sthamer product range



Foam agents

Our comprehensive product range incorporates all types of foam concentrates: From low-expansion protein foam concentrates, which are based on natural renewable resources and which mark the origin of air-foam firefighting, to a wide range of surfactant-based synthetic foam concentrates for various expansion types, with special properties for use in different application ranges, as well as on problematic fuel types.



Ready-to-use special extinguishing agents

We offer a wide range of liquid foam agents with different application ranges, which are usable as an undiluted solution in fire extinguishers and small fire extinguishing systems. Depending on the primary use, these products are designed for fire classes A, B and F. The advantage of this product range is the high performance, immediate availability in case of a fire, and a long shelf life. The demands on equipment, in order to effectively utilise these extinguishing agents, is low and re-establishing operational readiness of equipment and facilities post-operation is possible at short notice. Whether for protecting fryers and cooking equipment in large-scale catering facilities, in wind turbine extinguishing equipment, for protecting engine rooms, or for use in industrial plant extinguishing equipment, the operation spectrum is vast.



Wetting agents

Are used to increase the extinguishing intensity of fire water, especially for fighting solid fires and not easily wetted materials, as well as wildfires (fire class A). They reduce water surface tension substantially, thereby enabling excellent penetration and soaking of porous solids.



Training / Test foam agents

Our training and testing foam agents enable consumers to train for every type of foam operation and test installations and equipment. These foam agents are particularly environmentally friendly and completely biodegradable. Low foam stability facilitates swift removal of the foam following training / testing exercise. Training foam agents are not frost resistant and not suitable for fire extinguishing operations.



Dr. Sthamer foam concentrates at a glance

	Products	Type of foam			aqueous film forming	alcohol resistant	Viscosity	fluorine-free
		low	medium	high				
SYNTHETIC	MOUSSOL® – APS	●	●		●	●	P	
	MOUSSOL® – APS LV	●	●		●	●	N	
	MOUSSOL® – FF	●	●			●	P	●
	STHAMEX®	●	●	●			N	●
	STHAMEX® – AFFF	●	●		●		N	
	STHAMEX® – class A	●	●				N	●
PROTEIN	FOAMOUSSE®	●					N	●
	FLUOR-FOAMOUSSE®	●					N	
	FOAMOUSSE® – FFFP	●			●		N	
	FOAMOUSSE® – FFFP/AR	●			●	●	P	
	FOAMOUSSE® – OMEGA	●			●	●	N	

Key: N Newtonian / P pseudoplastic. All fluorine-containing foam agents comply with directive EU 757/2010.

Dr. Sthamer Foam concentrates

Customers worldwide rely on the quality, performance and longevity of Dr. Sthamer foam concentrates.



Municipal fire services

Municipal fire departments must be able to cover a large operational spectrum in their response area, depending on the respective risk of a situation. Regarding the use of foam this means, that it must be possible to fight both class A and B fires, to a certain extent. Therefore, fire extinguishing foams are an important part of the standard load of water-bearing fire engines. Municipal fire departments use mainly synthetic detergent, or class A foam concentrates. Due to the wide application range for class A and B (non-polar) fires, as well as the option of producing wetting agents and low, medium and high expansion foam, these fire extinguishing agents can be successfully applied to a majority of tasks faced by municipal fire departments.



Stationary fire extinguishing systems

Our FXS product line offers a variety of different foam concentrates specially designed for use in stationary fire extinguishing systems. This provides for powerful, needs-orientated, long-lasting products with a wide application range, where usability is maintained over many years. Prerequisites for the reliability and effectiveness of a stationary fire extinguishing system, besides meticulous facility design, are selecting reliable components and using high-quality fire extinguishing agents.



Wildfires

In most cases, wildfires develop following prolonged periods of drought and extreme heat in areas which are often inaccessible. They present a special challenge for fire-fighters, as water is regularly in short supply at such locations. Use of wetting agents increases the wetting properties of fire water significantly, contributing to fast, lasting extinguishing results.



Aviation

Foam concentrates used by airport fire services, or for use in extinguishing systems e.g. at commercial airports, in hangars or on helidecks, must comply with the requirements of the International Civil Aviation Organization (ICAO). Our products designed for the aviation sector satisfy these standards and offer excellent safety margins.



Maritime

Fire extinguishing foam concentrates for use aboard maritime vessels, tugboats and firefighting vessels must comply with the requirements of the Maritime Safety Committee (MSC) of the International Maritime Organisation (IMO). Compliance with these requirements is monitored by ship classification societies. Our foam concentrates for maritime use are type approved and certified according to MSC guidelines.



Industry

In industry, particularly high demands are placed on fire protection and associated equipment due to the risks involved. The foam extinguishing agents used here meet these strict requirements and offer excellent safety margins.



Synthetic detergent foam concentrates



STHAMEX®

comprises our range of synthetic detergent foam concentrates, which are designed for generating low, medium and high-expansion foam. Interface-active ingredients, foam stabilisers and antifreeze characterise the composition of these powerful, reliable and fluorine-free foam concentrates.

STHAMEX®-K 1%

is a highly concentrated synthetic detergent foam concentrate with a 1% induction rate to water. The low induction rate effectively triples the service time when compared with 3% induction rate foam concentrate.

STHAMEX® IAF

is designed for high-expansion inside-air foam systems. These systems generate foam using hot inside-air, loaded with combustion gas from a fire incident. STHAMEX® -IAF is a fluorine-free, synthetic foam concentrate based on a special surfactant combination and stabilisers.

MOUSSOL®-FF

is a fluorine-free, alcohol-resistant synthetic foam concentrate for generating low, medium and high-expansion foam for use on both polar* and non-polar** liquid hydrocarbons (fire class B), as well as ember forming solids (fire class A).

Primary use: Municipal fire services, power stations, industry, plastics industry, recycling plants, maritime, aviation

Main application: non-polar** hydrocarbons (fire class B) and solvents, plastics, recyclables, tyres, solid material fires (fire class A). In addition, MOUSSOL® -FF is suitable for extinguishing polar* solvents.

Installations and equipment: Hollow stram nozzles, low-expansion foam installations, low-expansion foam monitors, low-expansion foam branch pipes, medium-expansion foam branch pipes, high-expansion foam generators, CAFS

Environmental compatibility: All synthetic detergent foam concentrates are fluorine-free, physiologically safe when used as intended, and 100% biodegradable



STHAMEX® and MOUSSOL®-FF

PRODUCTS	STHAMEX®-K 1% F-15	STHAMEX® 3%	STHAMEX® IAF 2% F-10	MOUSSOL®-FF 3/6
Characteristics	Synthetic foam concentrates based on surfactants		Foam concentrate based on surfactants, stabilisers	Fluorine-free, alcohol-resistant, polymer film-forming foam concentrate
Properties	For use with all expansion types. Easily expandable, flowable, gastight, resistant to thermal radiation and burn back, has good fire performance and wetting effect.			Resistant to polar and non-polar foam-destroying hydrocarbons
			Suitable for inside-air foam systems	
Proportioning rate				
Low-expansion foam	1%	3%	-	non-polar: 3%, polar: 3 - 6%
Medium-expansion foam	1%	3%	-	non-polar: 3%, polar: 3 - 6%
High-expansion foam	1%	2 - 3%	2%	non-polar: 3%, polar: NA
as wetting agent	0.1% - 0.5%	0.1% - 0.5%	-	0.3% - 0.5%
Expansion				
Low-expansion foam	up to 20 times		-	up to 10 times
Medium-expansion foam	up to 200 times		-	up to 100 times
High-expansion foam	up to 1000 times		up to 1000 times	up to 800 times
25% / 50% drain time				
Low-expansion foam	up to 15 / 25 minutes	up to 10 / 15 minutes	-	up to 8 / 15 minutes
Medium-expansion foam	up to 20 / 30 minutes	up to 10 / 20 minutes	-	up to 5 / 10 minutes
High-expansion foam	up to 15 / 25 minutes	up to 10 / 25 minutes	up to 10 / 25 minutes	up to 4 / 6 minutes
Density kg/l (20°C)	1.03 ± 0.02	F-6: 1.01 ± 0.02; F-15: 1.03 ± 0.02; F-20/F-25: 1.04 ± 0.02	1.03 ± 0.02	1.04 ± 0.02
Frost-resistance	-15°C	-6 °C / -15 °C / -20 °C / -25 °C	-10 °C	-5 °C / -15 °C
Sediment	sediment-free			
Viscosity				
20 °C	≤ 20 mm ² /s	≤ 20 mm ² /s	≤ 20 mm ² /s	≤ 20 mm ² /s
0 °C	≤ 50 mm ² /s	≤ 30 mm ² /s	≤ 30 mm ² /s	≤ 30 mm ² /s
lowest use temp.	≤ 150 mm ² /s	≤ 110 mm ² /s	≤ 110 mm ² /s	≤ 110 mm ² /s
pH-value (20 °C)	6.5 to 8.5			
Storage	Stainless steel / plastic container			

According to EN 1566 Part 1-4

*polar = water miscible **non-polar = water immiscible

Class-A foam concentrates



STHAMEX®-class A

is a new, refined, highly concentrated foam agent based on foam-forming active ingredients, which are specially designed for extinguishing solid fuel fires (fire class A), as well as for use with compressed air foam system (CAFS). Upwards from 0.1% proportioning rate, STHAMEX® -class A is suitable for use as a wetting agent and, upwards from 0.3%, for CAFS applications. For extinguishing liquid fires (fire class B), the induction rate is 0.5%.

STHAMEX®-class A Classic

is a highly concentrated foam agent based on fully biodegradable surfactant compounds, developed especially for use on class A fires. STHAMEX® -class A classic is designed in particular for extinguishing ember forming solid material fires in combination with CAFS. The proportioning rate for extinguishing liquid fires (fire class B) is 1%.

Primary use: Municipal fire brigades, industry, recycling industry, waste treatment plants

Main application: Solid material fires, wildfires, non-polar* hydrocarbons and solvents, plastics, recyclables

Installations and equipment: CAFS, Hollow stream nozzles, medium-expansion foam branchpipes, low-expansion foam branchpipes, foam / water monitors, foam / water branchpipes

Environmental compatibility: All class-A foam concentrates are fluorine-free, physiologically safe when used as intended, and readily 100% biodegradable.



STHAMEX®-class A

PRODUCTS	STHAMEX®-class A Classic	STHAMEX®-class A
Characteristics	highly concentrated fire fighting foam concentrates based on surfactants, fluorine free	
Properties	short extinguishing time, great wetting properties, resistant to thermal radiation, good fire-resistance, fine bubbles and very good adhesiveness when used with CAFS	
Proportioning rate		
Class A fires	ab 0.5%	ab 0.3%
Class B fires	1%	0.5%
as wetting agent	0.1% - 0.3%	0.1% - 0.3%
Expansion		
Low-expansion foam	up to 20 times	
Medium-expansion foam	up to 200 times	
High-expansion foam	-	
25% / 50% drain time		
Low-expansion foam	up to 10 / 15 minutes	
Medium-expansion foam	up to 10 / 20 minutes	
High-expansion foam	-	
Density kg/l (20 °C)	1.04 ± 0.02	
Frost-resistance	-15°C	
Sediment	sediment-free	
Viscosity	20 °C	≤ 20 mm ² /s
	0 °C	≤ 50 mm ² /s
	lowest use temp.	≤ 150 mm ² /s
pH-value (20 °C)	6.5 to 8.5	
Storage	Stainless steel / plastic container	

According to EN 1568 Part 1-4

*non-polar = water immiscible

Aqueous film-forming foam concentrates (AFFF)

STHAMEX®-AFFF

comprises a range of synthetic, aqueous film-forming foam (AFFF) concentrates, which are designed for very fast and lasting fire extinguishing results with high burn-back resistance. These advantages are apparent particularly when extinguishing large-scale liquid fires. AFFF foams form a self-sealing duplex aqueous film on non-polar hydrocarbons, which also allows for application in non-aspirated form.

STHAMEX®-AFFF PREMIUM

are aqueous film-forming foam concentrates with exceptional fire performance and extremely high burn-back resistance.

Primary use: Chemical industry, petroleum and petrochemical industry, aviation, maritime, plastics industry, recycling industry

Main application: Non-polar* hydrocarbon and solvent fires, solid material fires, plastics, recyclables

Installations and equipment: Low-expansion foam installations, sub-surface installations, foam / water monitors, foam / water nozzles, medium-expansion foam branchpipes, low-expansion foam branchpipes, foam / water sprinkler or deluge systems, CAFS.

Environmental compatibility: STHAMEX® -AFFF foam concentrates are physiologically safe and 100% biodegradable when used as intended, with the exception of non-biodegradable C6 fluorinated components. Additional information can be found in the product and safety data sheets.



STHAMEX®-AFFF

PRODUCTS	STHAMEX®-AFFF 0.5%	STHAMEX®-AFFF 1%	STHAMEX®-AFFF 3%	STHAMEX®-AFFF 6%	
Characteristics	Fire extinguishing foam with surface active and aqueous film forming fluorinated components (C6) for fighting class A and B (non-polar) fires.				
Properties	high flowability, short extinguishing time, very good burn back resistance due to the aqueous film formation.				
Proportioning rate					
non-polar	0.5%	1%	3%	6%	
Expansion					
Low-expansion foam	up to 15 times				
Medium-expansion foam	up to 100 times				
25% / 50% drain time					
Low-expansion foam	up to 5 / 8 minutes.				
Medium-expansion foam	up to 4 / 6 minutes				
Density kg/l (20°C)	1.08 ± 0.02	1.05 ± 0.02		1.03 ± 0.02	
Frost-resistance	-15°C	0°C / -15°C / -25°C		0°C / -15°C	
Sediment	sediment-free				
Viscosity	20 °C	≤ 20 mm ² /s		≤ 10 mm ² /s	
	0 °C	≤ 40 mm ² /s		≤ 20 mm ² /s	
	lowest use temp.	≤ 120 mm ² /s		≤ 30 mm ² /s	
pH-value (20 °C)	6.5 to 8.5				
Storage	Stainless steel / plastic container				

According to EN 1568 Part 1-4

*non-polar = water immiscible



STHAMEX®-AFFP PREMIUM

	STHAMEX®-AFFP 1% PREMIUM	STHAMEX®-AFFP 3% PREMIUM
	surface active and aqueous film forming fire extinguishing foam concentrate based on the latest C6-Fluorocomponents for fighting class A and B fires.	
	high flowability, very short extinguishing time, very good burnback resistance due to aqueous film formation.	
	1%	3%
	5-10 times	
	—	
	up to 3 / 8 minutes.	
	—	
	1.05 ± 0.02	1.03 ± 0.02
	-25 °C	-15°C
	sediment-free	
	≤ 20 mm ² /s	≤ 5 mm ² /s
	≤ 40 mm ² /s	≤ 10 mm ² /s
	≤ 230 mm ² /s	≤ 20 mm ² /s
	6.5 to 8.5	
	Stainless steel / plastic container	

Alcohol-resistant foam concentrates

MOUSSOL®-APS

comprises a range of synthetic, alcohol-resistant, polymer and aqueous film-forming (AFFF) foam concentrates which are designed for safe, lasting extinguishing results and high burn-back resistance on polar* solvents, non polar** foam-destroying hydrocarbons and petroleum products.

MOUSSOL®-APS PREMIUM

are alcohol-resistant, polymer and aqueous-film forming AFFF foam concentrates with excellent fire performance and high burn-back resistance on polar* and non-polar** foam-destroying solvents and petrochemical hydrocarbons.

Primary use: Chemical industry, petroleum and petrochemical industry, aviation, maritime, plastics industry, recycling industry

Main application: Polar* and non-polar** foam-destroying hydrocarbons and solvents (fire class B), plastics, recyclables.

Installations and equipment: Hollow stream nozzles, low and medium-expansion foam installations, foam / water monitors, foam / water branchpipes, medium-expansion foam branchpipes, low-expansion foam branchpipes, foam / water sprinkler systems, CAFS

Environmental compatibility: MOUSSOL® -APS foam concentrates are physiologically safe when used as intended, and 100% biodegradable, with the exception of non-biodegradable C6 fluorinated components. Additional information can be found in the product and safety data sheets.



MOUSSOL®-APS

PRODUCTS	MOUSSOL®-APS 1/3	MOUSSOL®-APS 3/3	MOUSSOL®-APS 3/6	MOUSSOL®-APS 6/6
Characteristics	alcohol resistant, polymer and aqueous film forming foam (AFFF) concentrate with surface active polymer- and fluoro components			
Properties	high flowability, oleophobic, very short extinguishing time, high burn back resistance, resistant against polar and non-polar foam destroying hydrocarbons for generating low- and medium-expansion foam.			
Proportioning rate				
non-polar fuels	1%	3%	3%	6%
polar fuels	3%	3%	6%	6%
as wetting agent	—	—	—	—
Expansion				
Low-expansion foam	up to 15 times			
Medium-expansion foam	up to 100 times			
25% / 50% drain time				
Low-expansion foam	up to 10 / 15 minutes			
Medium-expansion foam	up to 7 / 10 minutes			
Density kg/l (20 °C)	1.05 ± 0.02			1.03 ± 0.02
Frost-resistance	0 °C / -15 °C	0 °C / -10 °C / -15 °C	0 °C / -15 °C	-10 °C
Sediment	sediment-free			
Viscosity	pseudoplastic, pump-assisted proportioning may be required			
pH-value (20 °C)	6.5 to 8.5			
Storage	Stainless steel / plastic container			

According to EN 1568 Part 1-4

*polar = water miscible **non-polar = water immiscible



MOUSSOL®-APS PREMIUM

MOUSSOL®-FF fluorine free

MOUSSOL®-APS 1/3 PREMIUM	MOUSSOL®-APS 3/3 PREMIUM	MOUSSOL®-APS 3/6 PREMIUM	MOUSSOL®-FF 3/6
alcohol resistant, polymer- and aqueous film forming fire extinguishing foam concentrate based on C6-Fluoro components			fluorine free, alcohol resistant, polymer film forming fire extinguishing foam concentrate
high flowability, oleophobic, very short extinguishing time, IA rating according to EN 1568, high burnback resistance, resistant against polar and non-polar foam destroying hydrocarbons			resistant against polar and non-polar foam destroying hydrocarbons
1% 3% —	3% 3% —	3% 5 - 6% —	3% 3 - 6% 0.3 - 0.5%
5-10 times			up to 10 times
—	—	—	up to 100 times
up to 10 / 15 minutes			up to 8 / 15 minutes
—	—	—	up to 5 / 10 minutes
1.05 ± 0.02	1.04 ± 0.02		1.04 ± 0.02
0°C	-15 °C		-5 °C / -15 °C
sediment-free			sediment-free
pseudoplastic, pump assisted proportioning may be required			pseudoplastic, pump assisted proportioning may be required
6.5 to 8.5			6.5 to 8.5
Stainless steel / plastic container			Stainless steel / plastic container

Low-viscosity, alcohol-resistant and aqueous film-forming foam concentrates (AFFF-AR)

MOUSSOL®-APS LV

comprises a product range of low-viscosity, alcohol-resistant, aqueous film-forming AFFF foam concentrates without polymer additives, which have a viscosity equivalent to that of a Newtonian fluid. Thanks to the low viscosity, these products may be used without adverse effects at the lowest nominal operating temperature in all commercially available proportioning systems. Storage and the logistical effort at the scene of a fire are minimised by the highly concentrated options, which have proportioning rates as low as 0.5% and 1%. They are excellent supplements for existing foam concepts of municipal fire services facing increased risk of large liquid fires in their response area.

MOUSSOL®-APS LV PREMIUM

are low-viscosity, alcohol-resistant, aqueous film-forming foam concentrates with excellent fire performance and comparatively high burn-back resistance on polar* and non-polar** foam-destroying hydrocarbons. Even at low temperatures these products are suitable for mobile and stationary application with conventional venturi proportioners.

Primary use: Chemical industry, petroleum and petrochemical industry, aviation, maritime, plastics industry, recycling industry, tank storage facilities.

Main application: polar* and non-polar** hydrocarbons and solvents, solid material fires, plastics, recyclables

Installations and equipment: Hollow stream nozzles, low-expansion foam installations, foam / water monitors, foam / water branchpipes, medium-expansion foam branchpipes, low-expansion foam branchpipes, foam / water sprinkler systems, CAFS

Environmental compatibility: MOUSSOL® -APS LV foam concentrates are physiologically safe and readily biodegradable when used as intended, with the exception of non-biodegradable C6 fluorinated components. Additional information can be found in the product and safety data sheets.



MOUSSOL®-APS LV

PRODUCTS	MOUSSOL®-APS LV 0.5/0.5	MOUSSOL®-APS LV 1/1	MOUSSOL®-APS LV 1/3	MOUSSOL®-APS LV 3/3
Characteristics	low-viscosity, alcohol resistant, aqueous film forming fire extinguishing foam concentrate based on C6-Fluoro components for fighting class B fires - newtonian fluid -			
Properties	high flowability, oleophobic, very short extinguishing time, high burnback resistance, resistant against polar and non-polar foam destroying hydrocarbons, for generating low- and medium expansion foam.			
Proportioning rate				
non-polar	0.5%	1%	1%	3%
polar	0.5%	1%	3%	3%
Expansion				
Low-expansion foam	up to 15 times			
Medium-expansion foam	up to 100 times			
25% / 50% drain time				
Low-expansion foam	up to 5 / 10 minutes			
Medium-expansion foam	up to 4 / 6 minutes			
Density kg/l (20°C)	1.09 ± 0.02	1.11 ± 0.02	1.03 ± 0.02	
Frost-resistance	-10 °C	-25 °C	-15 °C	
Sediment	sediment-free			
Viscosity	20 °C	≤ 50 mm ² /s	≤ 50 mm ² /s	≤ 20 mm ² /s
	0 °C	≤ 200 mm ² /s	≤ 150 mm ² /s	≤ 30 mm ² /s
	lowest use temp.	≤ 900 mm ² /s	≤ 900 mm ² /s	≤ 50 mm ² /s
pH-value (20 °C)	6.5 to 8.5			
Storage	Stainless steel / plastic container			

According to EN 1568 Part 1-4

*polar = water miscible **non-polar = water immiscible



MOUSSOL®-APS LV PREMIUM

MOUSSOL®-APS LV 1/1 PREMIUM	MOUSSOL®-APS LV 1/3 PREMIUM	MOUSSOL®-APS LV 3/3 PREMIUM
low-viscosity, alcohol resistant, aqueous film forming fire extinguishing foam concentrate based on C6-Fluoro components for fighting class B fires - newtonian fluid -		
high flowability, oleophobic, very short extinguishing time, IA rating according to EN 1568, very high burnback resistance, resistant against polar and non-polar foam destroying hydrocarbons, for generating low- and medium expansion foam.		
1%	1%	3%
1%	3%	3%
5 - 10 times		
—	—	—
up to 5 / 10 minutes		
—	—	—
1.06 ± 0.02		1.03 ± 0.02
-15 °C		
sediment-free		
≤ 30 mm ² /s	≤ 20 mm ² /s	
≤ 70 mm ² /s	≤ 30 mm ² /s	
≤ 220 mm ² /s	≤ 50 mm ² /s	
6.5 up to 8.5		
Stainless steel / plastic container		

Protein-based low-expansion foam concentrates

Fluorine-free

FOAMOUSSE®

comprises a product range of protein-based low-expansion foam concentrates, which are based on organic, renewable proteins, foam stabilisers and antifreeze and which constitute the origin of air-foam firefighting. A dense foam structure and particularly good foam stability characterise these reliable, fluorine-free foam concentrates.

Primary use:

Petroleum and petrochemical industry, tank storage facilities.

Main application:

Non-polar** hydrocarbon fires

Installations and equipment: Low-expansion foam installations, low-expansion foam branchpipes, Foam monitors.

Environmental compatibility: FOAMOUSSE® foam concentrates are fluorine-free, physiologically safe when used as intended, and readily biodegradable.



FLUOR-FOAMOUSSE®

are protein-based low-expansion foam concentrates combined with C6 fluorinated additives. The fluorinated components cause the foam to be oil-repellent (oleophobic), meaning the foam does not mix with the fuel, and increase flowability and fire performance significantly.

FOAMOUSSE®-FFFP

are aqueous film-forming, protein-based low-expansion foam concentrates combined with AFFF fluorinated components which form a duplex aqueous film which, in turn, leads to significantly increased fire performance and burn-back resistance.

Primary use: Chemical and petrochemical industry, refineries, aviation, maritime, tank storage facilities

Main application: non-polar** hydrocarbon fires, hydrocarbons with small proportions of polar* solvents.

Installations and equipment: Low-expansion foam installations, sub-surface installations, foam / water monitors, low-expansion foam branchpipes

Environmental compatibility: FLUOR-FOAMOUSSE® and FOAMOUSSE® -FFFP are physiologically safe when used as intended, and readily biodegradable, with the exception of non-biodegradable C6 fluorinated components. Additional information can be found in the product and safety data sheets.



FOAMOUSSE®

PRODUCTS	FOAMOUSSE® 3%	FOAMOUSSE® 6%	FLUOR-FOAMOUSSE® 3%	FLUOR-FOAMOUSSE® 6%
Characteristics	Protein based, low expansion fire extinguishing foam concentrate, fluorine free		Protein based, low expansion fire extinguishing foam concentrate with C6-Fluoro components.	
Properties	flowable, adhesive, heat resistant, stabil, gas tight		high flowability, oleophobic, gas tight, burn back resistant	
Proportioning rate				
non-polar	3%	6%	3%	6%
polar	–	–	–	–
Expansion	up to 8 times			
25% / 50% drain time	10 / 12 minutes.		up to 8 / 12 minutes	
Density kg/l (20°C)	1.18 ± 0.02	1.15 ± 0.02	1.18 ± 0.02	1.14 ± 0.02
Frost-resistance	-15 °C / -25 °C		-15°C	
Sediment	≤ 0.1% bei Lieferung			
Viscosity	20 °C	≤ 25 mm ² /s	≤ 30 mm ² /s	
	0 °C	≤ 40 mm ² /s	≤ 60 mm ² /s	
	lowest use temp.	≤ 100 mm ² /s	≤ 120 mm ² /s	
pH-value (20 °C)	6.5 to 8.5			
Storage	Steel / stainless steel / plastic container		Stainless steel / plastic container	

*According to EN 1568 Part 1-4

*polar = water miscible **non-polar = water immiscible

FOAMOUSSE®-FP/AR

is a fluoroprotein low-expansion foam concentrate combined with polymers which, when applied indirectly, build a homogeneous polymer layer between the foam-destroying effect of the polar* chemical and the foam above.

FOAMOUSSE®-FFFP/AR

is an alcohol-resistant, polymer and aqueous film-forming, protein-based low-expansion foam concentrate. It consists of organic proteins combined with polymer film-formers, anti-freeze and AFFF fluorinated components.

FOAMOUSSE-OMEGA® 3/3

is an alcohol-resistant, low-viscosity, aqueous film-forming, protein-based low-expansion foam concentrate. It consists of organic proteins combined with alcohol-resistant fluorinated components, stabilisers and antifreeze.

Primary use: Chemical industry, pharmaceutical industry, petroleum and petrochemical industry, aviation, maritime.

Main application: Foam-destroying polar* and non-polar** hydrocarbons

Installations and equipment: Low-expansion foam installations, foam/water monitors, low-expansion foam branch-pipes, semi-sub-surface installations

Environmental compatibility: FOAMOUSSE® -FP/AR, FOAMOUSSE® -FFFP/AR and FOAMOUSSE-OMEGA® 3/3 are physiologically safe and readily biodegradable when used as intended, with the exception of non-biodegradable C6 fluorinated components. Additional information can be found in the product and safety data sheets.



	FOAMOUSSE®-FFFP 3%	FOAMOUSSE®-FFFP 6%	FOAMOUSSE®-FP / AR	FOAMOUSSE®-FFFP / AR	FOAMOUSSE®-OMEGA
	aqueous film-forming foam concentrate combined with surface active agents, based on a special formulation of renewable organic protein, stabilisers, antifreeze and fluorinated compounds.		low viscosity fluoroprotein foam concentrate. It is based on a special formulation of organic protein, stabilisers, antifreeze, alcohol resistant- and fluorinated compounds.	Alcohol resistant fluoroprotein foam concentrate. It is based on a special formulation of organic protein, stabilisers, antifreeze, polymers and fluorinated compounds.	aqueous film-forming and alcohol-resistant protein-based low-expansion foam concentrate. It is based on a special formulation of organic protein, combined with alcohol resistant and fluorinated compounds.
	high flowability, aqueous film formation, oleophobic, gas tight, very fast extinguishing and excellent cooling properties, extremely resistant to burn back		high flowability, aqueous film formation, oleophobic, gas tight, very fast extinguishing and excellent cooling properties, extremely resistant to burn back, resistant against polar and non-polar hydrocarbons.		
	3%	6%	3%	3%	3%
	-	-	6%	6%	3%
	up to 8 times		up to 8 times		
	up to 6 / 10 minutes		up to 8 / 15 minutes	up to 8 / 12 minutes	up to 5 / 8 minutes
	1.15 ± 0.02		1.17 ± 0.02	1.06 ± 0.02	1.17 ± 0.02
	-15°C		-15°C	-15°C	-15°C
	≤ 0.1% at delivery				
	≤ 15 mm ² /s		≤ 40 mm ² /s	pseudoplastic, pump assisted proportioning may be required	≤ 40 mm ² /s
	≤ 30 mm ² /s		≤ 80 mm ² /s		≤ 80 mm ² /s
	≤ 40 mm ² /s		≤ 160 mm ² /s		≤ 160 mm ² /s
	6.5 to 8.5				
	Stainless steel / plastic container				

*polar = water miscible **non-polar = water immiscible



Ready to use speciality extinguishing agents

are ready-made liquid fire extinguishing agents for use with fire extinguishers and extinguishing systems for fighting class A, B and F fires.

FETTEX®

Fluorine-free

is used for extinguishing cooking oil and chip pan fires, fryers (fire class F), as well as associated filter and extractor units in kitchens, canteens, restaurants and the food industry as a whole.

FETTEX® is distributed finely on burning cooking oil/fat where it builds a gastight foam cover, due to a chemical reaction, which instantly suffocates the fire. Due to excellent cooling properties

heat is extracted from oil/fat, as well as the surrounding facilities. The risk of is thereby greatly reduced.

PRODUCT	FETTEX®
Density kg/l (20°C)	1.40 ± 0.02
pH-value (20°C)	8.5
Frost-resistance	-25°C
Sediment	≤ 0.1%
Viscosity 20 °C 0 °C	at +20°C ≤ 5 ± 0,5 mm ² /s at -15°C ≤ 29 ± 0,5 mm ² /s
Storage	Stainless steel / plastic container acc. to manufacturer

Primary use:

Kitchens, canteens, restaurants, industrial cookers

Main application:

cooking oil/fat fires

Installations and equipment:

Small fire extinguishing systems, fire extinguishers

Environmental compatibility: FETTEX® is physiologically safe and 100% biodegradable when used as intended.

MOUSSEAL®

comprises a product range of ready to use foam liquids, which cover a wide range of different requirement criteria when used for filling fire extinguishers and extinguishing systems.

MOUSSEAL®-C

is a ready-to-use foam agent containing a special combination of salts and surfactants. It has excellent wetting and permeating properties on solid material surfaces, whereby fire-resistance of the burning material is increased. An aqueous film is formed on flammable non-polar** hydrocarbons, e.g. petroleum products, creating a lasting, gastight cover. The lowest operating temperature is 0°C.

MOUSSEAL®-CF

the product composition is equivalent to MOUSSEAL® -C with frost resistance. The lowest operating temperature is -30°C.

MOUSSEAL®-ATC

is an alcohol-resistant ready-to-use foam agent containing a special combination of surfactants and polymers, which have excellent wetting properties on the solid material surfaces. An aqueous film is formed on flammable, non-polar** hydrocarbons, e.g. petroleum products, creating a lasting, gastight cover. A polymer film is formed on polar* foam-destroying liquids, e.g. alcohol or solvents, preventing further foam destruction.

Primary use:

Chemical industry, pharmaceutical industry, petroleum and petrochemical industry, aviation, helidecks, maritime, commerce, warehouses/rehandling operations, laboratories

Main application:

Class A and B (non-polar*) fires

Installations and equipment:

Fire extinguishers, fire extinguishing systems

Environmental compatibility: MOUSSEAL® -C/-CF is physiologically safe when used as intended, and 100% biodegradable, with the exception of non-biodegradable C6 fluorinated components. Additional information can be found in the product and safety data sheets.

Primary use:

Chemical industry, pharmaceutical industry, petroleum and petrochemical industry, aviation, maritime, commerce, warehouses / rehandling operations, laboratories

Main application: Solid material fires and polar* foam-destroying hydrocarbons (fire class A and B)

Installations and equipment:

Fire extinguishers, extinguishing systems

Environmental compatibility: MOUSSEAL® -ATC is physiologically safe when used as intended, and 100% biodegradable, with the exception of non-biodegradable C6 fluorinated components. Additional information can be found in the product and safety data sheets.

PRODUCTS	MOUSSEAL®-C	MOUSSEAL®-CF
Besonderheit		antifreeze
Density kg/l (20°C)	1.09 ± 0.02	
pH-value (20°C)	ca. 7.2	7.5 - 8.5
Frost-resistance	0°C	-20°C / -30°C
Sediment	sediment-free	
Viscosity 20 °C 0 °C		≤ 10 mm ² /s ≤ 30 mm ² /s ≤ 80 mm ² /s
lowest use temp.		
Storage	Stainless steel / plastic container acc. to manufacturer	

PRODUCT	MOUSSEAL®-ATC
Density kg/l (20°C)	1.01 ± 0.02
pH-value (20°C)	ca. 8.5
Frost-resistance	0°C
Sediment	sediment-free
Viscosity 20 °C 0 °C	≤ 40 mm ² /s ≤ 60 mm ² /s ≤ 200 mm ² /s
lowest use temp.	
Storage	Stainless steel / plastic container acc. to manufacturer

*polar = water miscible **non-polar = water immiscible



Wetting agents

are fire water additives which lower the surface tension of water and reduce the interface tension between water and solids.

UltraWet®

is a fire water additive which lowers the surface tension of water and reduces interface tension between water and solid material surfaces. UltraWet® wetting agent does not form water droplets, due to the low surface tension; instead it forms a thin aqueous film on solid materials, which spreads evenly across

their surfaces, displacing air bubbles. This enables extinguishing water to penetrate burning materials, e.g. wood, paper, textiles etc. (fire class A), or not easily wetted surfaces, increasing its cooling properties.

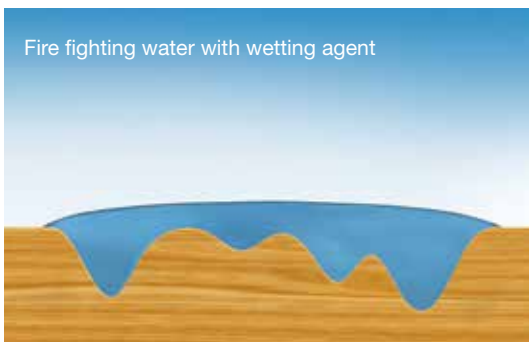
Primary use: Municipal fire services, wood/paper industry, recycling industry

Main application: Ember forming materials (fire class A), wildfires

Installations and equipment: Hollow spray nozzles, jet pipes, spray nozzles, water sprinkler or deluge systems, water monitors



Product	UltraWet®
Induction rate	from 0.1%
Frost resistance	- 25°C
Viscosity	20 °C ≤ 25 mm ² /s 0 °C ≤ 50 mm ² /s
min. use temperature	≤ 200 mm ² /s
Application	Fire water additive for solid materials, e.g. textiles, cotton, paper, wood shavings, straw etc.
Environmental compatibility	UltraWet® is fluorine-free, physiologically harmless and fully biodegradable.



The wetting effect

Wetting agents, such as UltraWet® or STHAMEX® -class A, reduce water surface tension allowing for easily wetted surfaces for all class A flammable materials. Thermal energy dissipates via the increased surface area, triggering a faster, longer- lasting successful fire extinguishing operation.



Foams for training and testing of installations and equipment.

Fluorine-free

Training foam concentrates are designed for training with foam equipment and fire extinguishing foam systems. The specific recipes limit the environmental impact to a minimum. The surfactants used are easily and 100% biodegradable. Training foam concentrates may be used with all commercially available low, medium and high-expansion foam installations and equipment. They are not suitable for firefighting operations.

Training Foam-N

is used for training with foam and testing of foam equipment. It is very easily expandable and has reduced foam stability, in order for the foam cover to collapse more quickly. Depending on the desired foam quality, the proportioning rate is 3%-6%.

Training Foam-N 1%

is used for training with foam and testing of foam equipment of highly concentrated foam agents at 1% proportioning rate. It is very easily expandable and has reduced foam stability, in order for the foam cover to collapse more quickly. Depending on the desired foam quality, the proportioning rate is 0.5%-1%.

Training Foam-U

is used for training with foam and testing of foam equipment with polymer film-forming (pseudoplastic), alcohol-resistant foam agents. It is very easily expandable and has reduced foam stability, in order for the foam cover to collapse more quickly. Depending on the desired foam quality, the proportioning rate is 3%-6%.

Test Foam

is a pseudoplastic foam agent for testing or inspecting foam extinguishing systems, induction rates during initial operation, or functionality tests. The viscosity of the test foam is adjustable according to that of the foam concentrate in use. Post use, test foam solution may be flushed into the sewage system, if consultation with sewage plant operators and local authorities has taken place prior to the operation.

Environmental compatibility:

Training and test foams are fluorine-free and 100% biodegradable. Nonetheless, entry into the environment must be avoided. For details please refer to information sheet DWA-M 718 (see page 34).



TRAINING- AND TESTING FOAM

Products	TRAINING FOAM - U	TRAINING FOAM - N	TRAINING FOAM - N 1%	TEST FOAM	
Characteristics	Training foam based on very easily and 100% biodegradable surfactants, fluorine-free	Training foam based on 100% biodegradable surfactants, fluorine-free		Training foam based on 100% biodegradable surfactants, fluorine-free	
Properties	to mimic low-, medium- and high-expansion foam for training purpose, pseudoplastic	to mimic low-, medium- and high-expansion foam for training purpose, pseudoplastic		for testing proportioning systems and fire fighting installations/concepts	
Proportioning rate	3% to 6% depending on needed foam stability		1%	3%	
Expansion					
Low-expansion foam	up to 10 times				
Medium-expansion foam	up to 200 times				
High-expansion foam	up to 500 times				
25% / 50% drain time					
Low-expansion foam	up to 10 minutes				
Medium-expansion foam	up to 5 minutes				
High-expansion foam	≥ 3 minutes				
Density kg/l (20 °C)	1.02 ± 0.02		1.05 ± 0.02	1.02 ± 0.02	
Frost-resistance	0 °C				
Sediment	sediment-free				
Viscosity	20 °C	≤ 70 mm ² /s	≤ 5 mm ² /s	≤ 20 mm ² /s	Will be adjusted to required viscosity
	0 °C	≤ 120 mm ² /s	≤ 10 mm ² /s	≤ 50 mm ² /s	
pH-value (20 °C)	6.5 to 7.5				
Storage	Stainless steel / plastic container				

According to EN 1568 Part 1-4

Quality criteria

Foam

Adhesion

Adhesion is required for foam to apply its cooling, insulating and wetting properties, even on vertical surfaces and bulky incendiary matter.

Ageing behaviour

This is gauged on how long the foam solution contained in the foam is retained, or how slowly/quickly the foam dehydrates. The unit of measurement is the water drainage time.

Combustion resistance

Combustion resistance refers to the foam's ability to withstand flames and thermal radiation.

Compatibility of foams for immediate use

Foams generated from different concentrates are compatible with all other expanded fire extinguishing foams. Different foam concentrates must not be mixed.

Film formation (see page 7)

Film formation is differentiated by:

- Polymer film
- Aqueous film

Fire performance

Fire performance largely depends on the criteria contained in this section. To determine this, fire tests are carried out using calibrated testing equipment in accordance with recognised standards, e.g. DIN EN 1568 part 1-4.

Flowability

Flowability is the capacity of the foam to rapidly spread across a fire surface. Good flowability ensures a fast, successful firefighting operation.

Gastight

The gastight foam cover seals and suppresses flammable gas on extinguished or preventatively covered flammable liquids. Gastight foam prevents burn-back and reduces fire risk.

Powder compatibility

STHAMER fire extinguishing foams are suitable for combined use with foam compatible dry chemical powders.

Seawater resistance

This is a requirement for foams used on maritime vessels, at ports, or in the off-shore sector. The excellent extinguishing properties of these foam agents are unaffected by use of salt, brackish, or treated industrial water.

Water drainage time

Water drainage time specifies the time in which e.g. 25% or 50% of foam solution contained in the foam is drained.

Foam concentrates

Environmental properties

These are particularly important, as foam is often used on unpaved surfaces, from which it can enter the environment. Our fluorine-free products are 100% biodegradable. Our fluorine-containing products are easily biodegrade, with the exception of the fluorinated components.

Frost resistance

Frost resistance is required where freezing temperatures are expected during longer operations or storage.

pH-value

The pH-value may indicate a change in quality, e.g. if there is a sharp drop, premature ageing and a loss of fire extinguishing efficiency may occur.

Physiological properties

Dr. STHAMER foam concentrates are physiologically safe. Adverse health effects are not expected, when used as intended. For further details see the safety data sheets.

Storage

Dr. STHAMER products may be stored over a long period of time in the sealed original containers and in compliance with the storage recommendations. Storage temperatures range from the indicated lowest temperature for use to +50°C. Temporary freezing at temperatures below the specified frost resistance limit will not affect the quality.

Training/Practicing

Local authorities are to be consulted for information on foam disposal. Foam solution runoff into groundwater must be avoided.

Viscosity

Viscosity is important for ensuring a constant proportioning rate at low temperatures and for specifying foam concentrate pumps in fixed fire extinguishing installations. Depending on the application temperature, pump-supported induction may be necessary for highly viscous foam concentrates.

*available at: DWA - Deutsche Vereinigung für Wasserwirtschaft, Abwasser u. Abfall e.V., Theodor-Heuss-Allee 17, 53773 Hennef



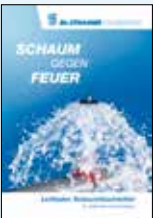
Additional information

Classification of flammable substances into fire classes in accordance with DIN EN 2:

- A** = Ember-forming fires involving predominantly organic, solid substances.
- B** = Fires involving liquids or liquid-forming
- C** = Gas fires
- D** = Metal fires
- F** = Cooking oil/fat fires in fryers, kitchen equipment etc.



Guideline Foam concepts for municipal fire departments



Guideline Foam concept for fixed fire fighting installations (only available in German)



YouTube Training Videos





**24-hour emergency
service!**

Our 24-hour emergency service for swift deliveries during major fire incidents is available at any time under the phone number

+49 (0)40 / 73 61 68-0

Subject to alterations. 12/2015



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