

***Flammable
Liquid Fire
Solutions***

***Foam
Fire Protection
Systems
from
Ansul***

The background of the entire advertisement is a photograph of an industrial facility, likely a refinery or chemical plant, silhouetted against a dramatic sunset sky. The sky transitions from a deep orange near the horizon to a darker, purplish-red at the top. A bright sun is visible as a large white circle on the horizon. In the upper right quadrant, a large, bright orange and yellow flame or flare is visible, rising from a stack. The industrial structures consist of various pipes, scaffolding, and towers, all rendered in dark silhouette.

If your company...

**manufactures,
stores,
dispenses,
processes,
or
transports
flammable liquids...**

your risk of a *devastating fire* is very real.

ANSUL Fire Solutions

In 1939, Ansul entered the fire protection market with the introduction of the first cartridge-operated, dry chemical fire extinguishers. Ansul further applied that dry chemical technology by developing wheeled extinguishers, large hand-hose line skid units, fixed automatic suppression systems, and hazard specific systems to protect industrial hazards, restaurant kitchens, and off-road vehicles.

In the 1960's, Ansul teamed with the U.S. Navy to develop the first foam-compatible dry chemical and later introduced the twin-agent concept combining the fast knockdown capability of dry chemical with the securing power of aqueous film-forming foam (AFFF).

Ansul fully entered the foam systems market in the 1970's when we began to develop our own line of synthetic foam agents. Today, with over 20 years of experience in foam technology, Ansul provides a full line of quality foam concentrates, agent storage tanks, proportioning equipment and discharge devices. Ansul Germany provides additional foam products and services which further enhance our ability to serve our domestic, international, and multi-national customers.



The First Multifunction Foam

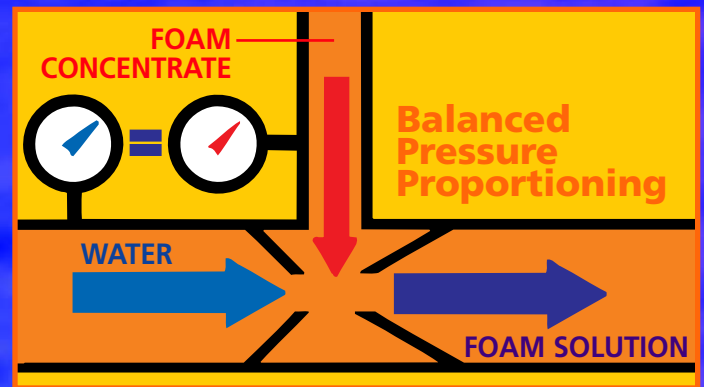
In 1988, Ansul chemists invented Ansulite® 3x3 Foam Concentrate, the first alcohol-resistant AFFF capable of being used at a 3% concentration on BOTH polar-solvent and hydrocarbon fuels. (Conventional agents required 3% for hydrocarbons and 6% for polar solvents.) And later, those same Ansul scientists developed Ansulite® 3x3 Foam Concentrate in an exclusive *low viscosity* formula. Today, Ansulite® 3x3 is still the only low viscosity, multifunction foam that can offer all of these benefits...

Ansulite® 3x3
LOW VISCOSITY

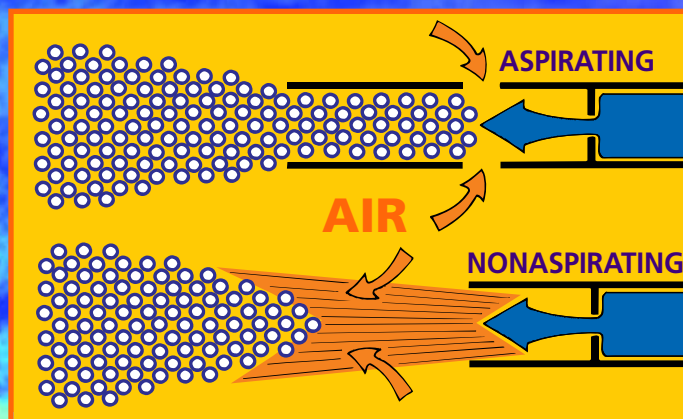
- ▶ Simple – One agent proportioned at 3% on both hydrocarbon and polar solvent (alcohol-resistant) fuels.
- ▶ Lower viscosity makes it suitable for use in all foam proportioning equipment including eductors, around-the-pump systems, bladder tanks, balanced pressure pump systems, and crash-fire-rescue vehicles.
- ▶ Superior firefighting performance and lower required application rates for various polar-solvents including oxygenated fuels like MTBE.
- ▶ UL-listed and FM-approved for a wide variety of hardware and applications.
- ▶ Creates a thick, durable foam blanket suitable for spilled fuel and fuming acid vapor suppression.
- ▶ Reduced system hardware and installation costs using smaller tank sizes, pipe diameters, pumps, and motors.
- ▶ Not subject to the reporting requirements of SARA Title III, Section 313.

What is firefighting foam?

Simply stated, firefighting foam is a stable mass of small, air-filled bubbles with a lower density than oil, gasoline, or water. Foam is made up of three ingredients...water, a foam concentrate, and air. Water is mixed with a foam concentrate (proportioned) to form a foam solution. This solution is then mixed with air (aspirated) to produce a foam which readily flows over fuel surfaces.

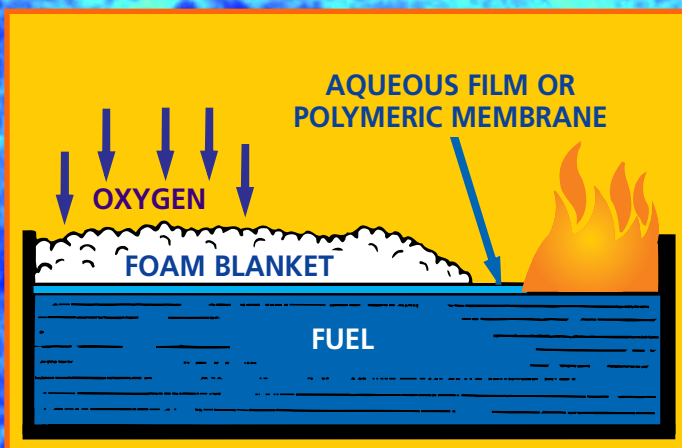


Balanced pressure proportioning is the most common method used for foam system applications. The foam concentrate pressure is balanced with the water pressure at the proportioner inlets allowing the proper amount of foam concentrate to be metered into the water stream.



With an aspirating discharge device, foam solution passes through an orifice, past air inlets, and into an expansion area to produce an expanded foam. With nonaspirating devices, foam solution passes through the orifice and discharge outlet where it mixes with air enroute to the fire.

How do foam agents work?



An AFFF agent forms an aqueous film on the surface of a hydrocarbon fuel. An alcohol-resistant concentrate (ARC) will form a polymeric membrane on a polar solvent fuel.

Firefighting foam agents suppress fire by separating the fuel from the air (oxygen). Depending upon the type of foam agent, this is done in several ways:

- ▶ Foam blankets the fuel surface, smothering the fire and separating the flames from the fuel surface.
- ▶ The fuel is cooled by the water content of the foam.
- ▶ The foam blanket suppresses the release of flammable vapors that can mix with air.

Types of 'Class B' Foams

Aqueous Film-Forming Foam (AFFF)

AFFFs are based on combinations of fluoro-chemical surfactants, hydrocarbon surfactants, and solvents. These agents require a very low energy input to produce a high quality foam. Consequently, they can be applied through a wide variety of foam delivery systems. This versatility makes AFFF an obvious choice for airports, refineries, manufacturing plants, municipal fire departments, and any other operation involving the transportation, processing, or handling of flammable liquids. *Ansulite® AFFF is available as 1%, 3%, and 6% concentrates or as 1% and 3% freeze-protected concentrates. Ansul Germany offers 1% and 3% AFFF concentrates – regular and freeze-protected.*

Alcohol-Resistant Concentrates (ARC)

Alcohol-resistant foams are based on AFFF chemistry to which a polymer has been added. ARCs are the most versatile of the foam agents in that they are effective on fires involving polar solvents like methanol as well as hydrocarbon fuels like gasoline. When used on a polar solvent type fuel, the ARC concentrate forms a polymeric membrane which prevents destruction of the foam blanket. When used on hydrocarbon fuels, the alcohol-resistant concentrate produces the same rugged aqueous film as a standard AFFF agent. Alcohol-resistant concentrates provide fast flame knockdown and good burnback resistance when used on both types of fuels. *Ansulite® 3x3 and 3%/6% alcohol-resistant AFFF concentrates are available. Ansul Germany offers various 3x3 and 3%/6% alcohol-resistant AFFF concentrates.*

Protein Foam Concentrates

Protein foams are recommended for the extinguishment of fires involving hydrocarbons. They are based on hydrolyzed protein, stabilizers, and preservatives. Protein foams produce a stable mechanical foam with good expansion properties and excellent burnback resistance characteristics. *Ansul and Ansul Germany offer protein foam as 3% and 6% concentrates.*

Fluoroprotein Foam Concentrates

Fluoroprotein foams are based on hydrolyzed protein, stabilizers, preservatives, and synthetic fluorocarbon surfactants. When compared to protein foams, fluoroproteins provide better control and extinguishment, greater fluidity, and superior resistance to fuel contamination. Fluoroprotein foams are useful for hydrocarbon vapor suppression and have been recognized as very effective fire suppressing agents for sub-surface injection into hydrocarbon fuel storage tanks. *Ansul and Ansul Germany offer fluoroprotein foam in a 3% concentrate. Ansul Germany also offers a film-forming fluoroprotein (FFFFP) concentrate.*

High Expansion Foam Concentrates

High expansion foams are based on combinations of hydrocarbon surfactants and solvents. They are used with foam generators for applying foam to large areas in total flooding and three-dimensional applications such as warehouses, ship cargo holds, and mine shafts. They are especially useful on fuels such as liquefied natural gas (cryogenic fuels) for vapor dispersion and control. In certain concentrations, high expansion foams are effective on hydrocarbon spill fires of most types and in confined areas. *Ansul offers Jet-X® high-expansion foam in a 2.75% concentrate. Ansul Germany also offers various high-expansion foam concentrates.*

Typical Foam-Water Sprinkler System Operation

1

Fire breaks out in the rack storage area of a flammable liquid warehouse.

2

Rising heat from the fire ruptures the quartzoid bulb(s) in the sprinkler head(s) which starts the flow of water.

3

Flowing water opens the alarm check valve which allows water to open the hydraulic foam concentrate valve and operate the water-motor gong.

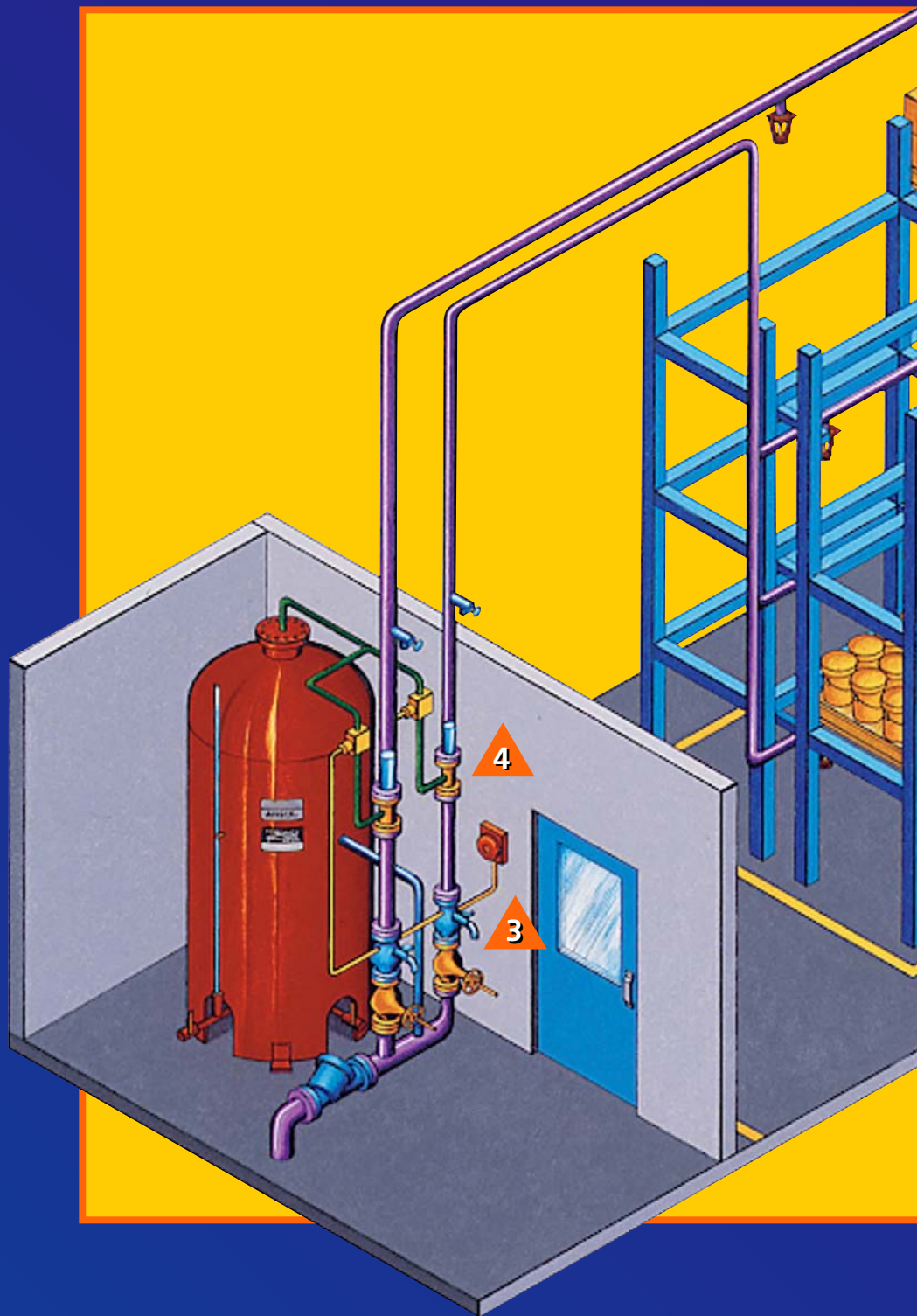
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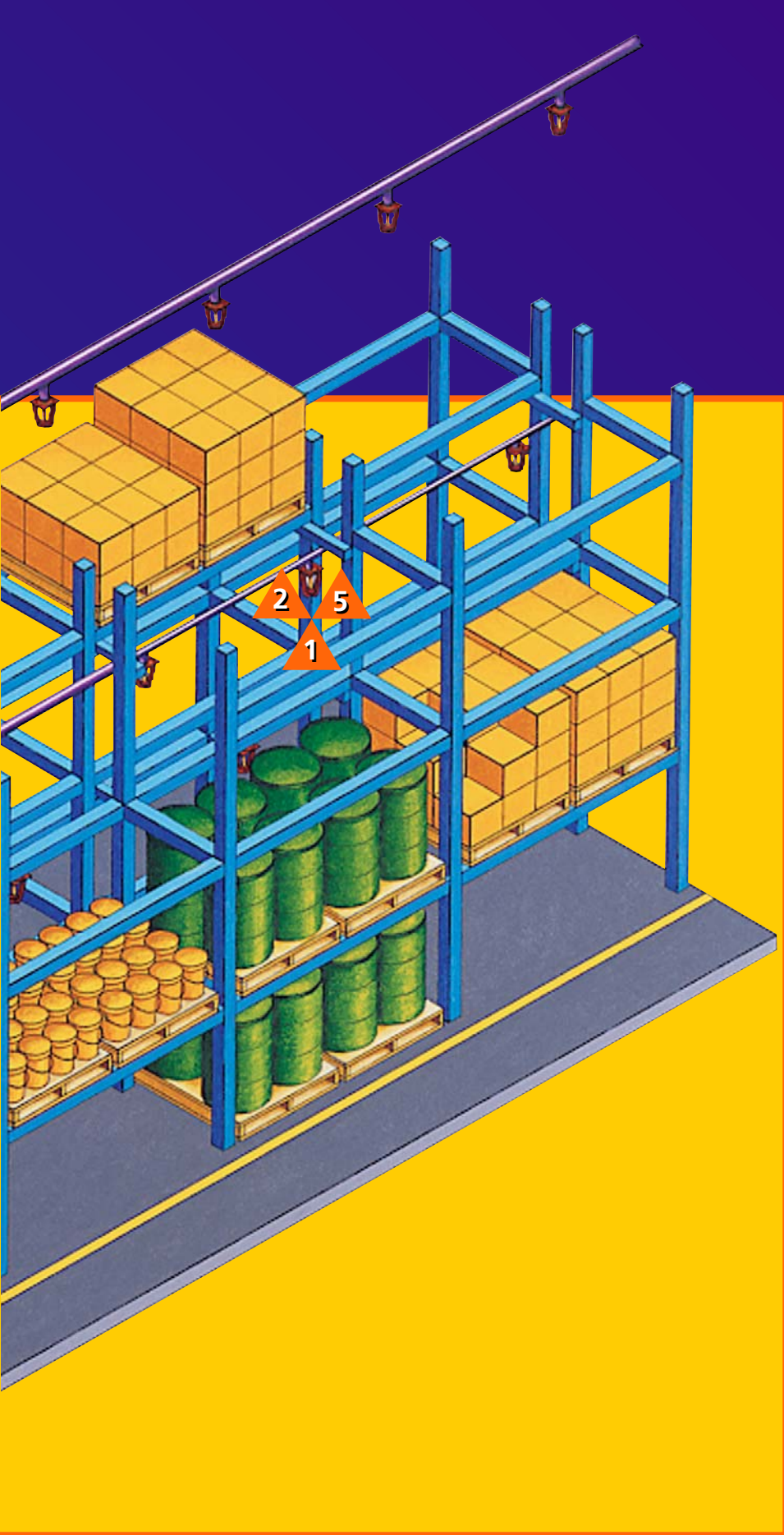
Foam concentrate flows from the bladder tank into the proportioner where it is mixed with the flowing water at the designed foam solution percentage.

5

Foam is generated as the foam solution discharges through the sprinkler head(s) onto the fire.

The above represents operation of a typical foam-water sprinkler system. Although many other types of systems are available; a basic foam system will always require foam agent storage, proportioning equipment, one or more discharge devices, and a manual and/or automatic means of detecting the fire and actuating the system.





Listings/Approvals

Ansul Incorporated (USA) and Ansul Germany hold foam agent and hardware approvals and listings from various independent approval/testing agencies and are in compliance with many standard-making organizations and authorities including...

- ▶ American Bureau of Shipping (ABS)
- ▶ Arabian American Oil Company (ARAMCO)
- ▶ Australian Dept. of Aviation
- ▶ Australian Dept. of Defense
- ▶ Boeing
- ▶ Canadian General Standards Board (CGSB)
- ▶ Det Norske Veritas (DNV)
- ▶ Deutsches Institut für Normung e.v. (DIN)
- ▶ Factory Mutual Research Corporation (FMRC)
- ▶ International Civil Aviation Organization (ICAO)
- ▶ Lloyds Registry of Shipping (LRS)
- ▶ National Fire Protection Association (NFPA)
- ▶ Petro-Brasil (PETROBRAS)
- ▶ Petro-Mexico (PEMEX)
- ▶ Statens Prouningsansålt (SP)
- ▶ UK Ministry of Defense
- ▶ Underwriters Laboratories, Inc. (UL)
- ▶ Underwriters Laboratories of Canada (ULC)
- ▶ United States Coast Guard (USCG)
- ▶ United States Military Specifications

Ansul Foam System Components

Along with the foam agent, three basic types of equipment make up a typical foam system: proportioning equipment, discharge devices, and detection/control components.

Proportioning Equipment

Proportioning is the introduction of foam concentrate into a flowing stream of water to produce a foam solution. Although there are several methods of proportioning, fixed foam systems typically use balanced pressure proportioning equipment.



Pump Skids

Pump skids (or balanced pressure pump proportioning systems) are used in combination with atmospheric storage tanks which are typically of polyethylene or fiberglass construction. While foam concentrate is pumped from the storage tank to the proportioner, an automatic pressure balancing valve regulates the foam concentrate pressure to match the water pressure.



Bladder Tank Systems

Bladder tank systems use a pressure-rated tank containing a nylon reinforced elastomeric bladder to store the foam concentrate. System water pressure is used to squeeze the bladder providing foam concentrate, at the same pressure, to the proportioner. With bladder tank systems, no external power source is required and little maintenance is needed.



In-Line Balanced Pressure Proportioners

In-line balanced pressure proportioners are similar to pump skids, except that the proportioning assembly, including the automatic balancing valve, is remote from the pump and storage tank. A pressure control valve is added to the foam concentrate return line to maintain a constant pressure to the proportioner. Multiple assemblies can be supplied from a single tank and pump to protect several hazard areas.





Foam Monitors

Foam monitors are designed to control the horizontal and vertical directions of large capacity discharge streams. Water-oscillating monitors will automatically move side-to-side using water pressure as the energy source. Remote controlled monitors use an electric joystick tied into a hydraulic system. Other monitors are operated manually using a tiller bar to control direction and elevation. Various aspirating and non-aspirating nozzles are also available for use with monitors and/or handlines.

Foam Chambers and Foam Makers

Foam chambers and foam makers are air-aspirating devices designed to protect flammable liquid storage tanks. Foam chambers apply expanded foam gently down the inside of the tank wall onto the liquid surface. High back-pressure foam makers inject expanded foam through the tank wall near the bottom of the tank allowing foam to gently rise to the surface. Other types of foam makers are installed in the foam distribution piping where expanded foam is directed to specific hazards such as dike areas or floating-roof tank seal areas.

Discharge Devices

Discharge devices produce expanded foam and direct the flow at the point of application. Some foam discharge devices are special air aspirating devices which mix air with the foam solution to form an expanded mass of bubbles. Non-aspirating devices may be used with certain low-expansion foam agents which do not rely on a thick blanket of foam to achieve extinguishment.

Sprinkler Heads

Sprinkler heads are available from various manufacturers in both nonaspirated and aspirated versions. Nonaspirated heads with AFFF agents are more economical and can be used in either open deluge or closed-head sprinkler systems. Aspirated sprinkler heads are required for protein and fluoroprotein foams in deluge systems.

Foam Generators

Foam generators deliver large quantities of foam by expanding foam solution in the range of 200:1 to 1000:1. The high-expansion generator operates by coating its screen with high-expansion foam solution while air is blown through the screen to produce expanded foam. Because of its high expansion ratio, little water is required to generate large quantities of foam thereby reducing the potential for hazardous run-off or water damage. Jet-X® foam generators are water-powered and require no other sources of power.

Detection and Control Equipment

In many applications, including aircraft hangars and loading racks, the fire protection requirements call for an automatic detection and control system. In these cases, thermal detectors or quick-response flame detectors are installed to provide input to an electronic control panel. The control panel provides vital output functions such as sounding alarms, shutting off fuel pumps, monitoring water flow, supervising valves, and actuating foam systems. A variety of Ansul detection and control equipment is available from the simplest alarm horn to a sophisticated analog-addressable control panel.



Foam System Applications

Ansul foam systems protect virtually any hazard where flammable liquids are present. These hazards are common to a multitude of industries including Petrochemical, Chemical, Oil and Gas, Aviation, Marine/Offshore, Manufacturing, Utilities, Military, and Transportation.



Flammable Liquid Storage



Loading Racks



Processing Areas



Refineries



Dike Areas



Aircraft Hangars



Heliports



LNG Storage/Manufacturing



Jet Engine Test Facilities



Marine Applications



Warehouses

We Deliver the Complete Foam Package.

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- ▶ **ANSULITE® AFFF Foam Concentrates**
- ▶ **ANSULITE® Alcohol-Resistant Foam Concentrates**
- ▶ **ANSUL® Protein & Fluoroprotein Foam Agents**
- ▶ **SILV-EX® Class A Foam Agent**
- ▶ **ANSUL® Foam Proportioning and Discharge Hardware**
- ▶ **ROCKWOOD® Nozzles, Valves and Proportioners**
- ▶ **JET-X™ High-Expansion Foam Agent**
- ▶ **JET-X™ High-Expansion Foam Generators**

For More Information...

About Ansul Foam Products
 or to request a quotation...
 Contact Ansul at:

1-800-TO-ANSUL (USA /CAN)
1-715-735-7411 (International)
 USA Fax: 1-715-732-3608
 INT'L Fax: 1-715-732-3477

For worldwide sales offices & manufacturing locations, or for a listing of authorized distributors, visit:

www.ansul.com

Other Ansul Foam Companies:



SABO foam

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