

Heliport Fire Protection Oscillating Monitor/Nozzle Model HFPOM

NFPA Standard 418



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PURPOSE

In the event of a helicopter accident and fire at a rooftop heliport, the heliport fire protection oscillating monitor/nozzle generates foam and applies it to the landing pad in accordance with NFPA 418 *Standard for Heliports*. Chapter 5 recommends low expansion AFFF (Aqueous Film Forming Foam) be applied to the helideck from either 1) a Hose Line at the rate of 89 GPM for a duration of 2 minutes, **or** 2) either Fixed Nozzles or an Oscillating Nozzle aimed at the landing pad, at the rate of .10 GPM per square foot for a duration of 5 minutes.

A hose line – when operated by a trained person - has the advantage of applying foam onto a helicopter fire, even if a crash occurs off the landing pad. The disadvantage is the prohibitive cost of having a trained person/fire fighter at the heliport for every landing and takeoff. Fixed nozzles and an Oscillating Nozzle have the advantage of being activated by anyone by simply pushing a button; trained/professional fire fighters need not be present. The disadvantage of fixed nozzles is that if the helicopter crashes off the helideck, fixed nozzles cannot be aimed away from the landing pad. An oscillating nozzle, however, due to its oscillating mechanism - not only sweeps foam across the landing pad automatically - but also permits manual control when fire fighters arrive, permitting foam to be applied to the fire anywhere on the rooftop.

PRINCIPLE OF OPERATION

Because NFPA 14 recommends most buildings have a wet standpipe/sprinkler system, heliport foam fire protection can utilize that water supply by inserting a tee in the standpipe, attaching a 4” electric deluge valve to control the flow of water, and extending a 4” line from that valve to the foam producing equipment outside near the heliport.

While there are many methods of proportioning AFFF foam concentrate with water to generate foam, the unit utilizes a nozzle with a venturi that draws foam concentrate from the nearby foam concentrate storage tank up into the nozzle, proportions it with the water, and discharges high quality foam onto the landing pad. To ensure foam is applied to the entire landing pad from one oscillating monitor/nozzle, a small portion of the water to the unit is used to power the oscillating mechanism that sweeps the nozzle back and forth across the landing pad automatically. Because the mechanism is water-powered, it is extremely reliable.

The 25 gallon tank of concentrate produces 2500 gallons of high quality foam, 1 ½ to 3 times the minimum amount of foam recommended by NFPA, depending upon size of landing pad. If even more foam is desired, a significant feature of the unit is that foam concentrate can be added while the unit is operating. When foam is finally exhausted, the unit will flow plain water.

OPERATION

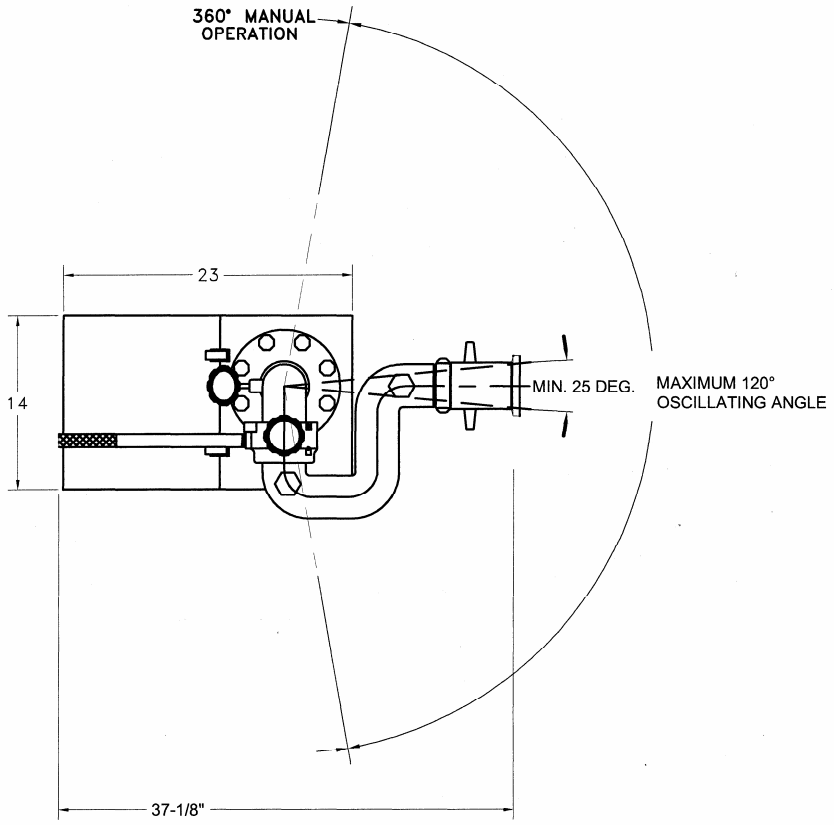
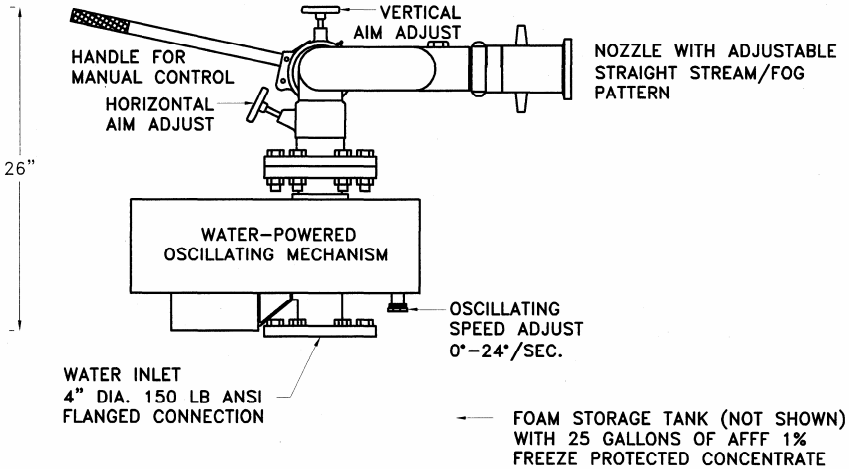
To operate, one need only pull a handle on the wall mounted Pull Station labeled “Heliport Fire Suppression” (furnished with the equipment), usually located in the lobby serving the heliport where people must wait during landings or located in a remote, supervised area such as a security office. This switch opens an electric deluge valve described above, sending water through a 4” pipe outside to the oscillating monitor/nozzle. **No other action is required.** Within five seconds the nozzle will produce foam, oscillate back and forth, and cover the entire landing pad with foam automatically.

If the monitor can be located a safe distance, 40’-50’, from the edge of the landing pad, a fire fighter can take manual control by loosening two brass knobs which disconnect the oscillating mechanism and aim the nozzle at the fire anywhere on the rooftop using the handle provided.

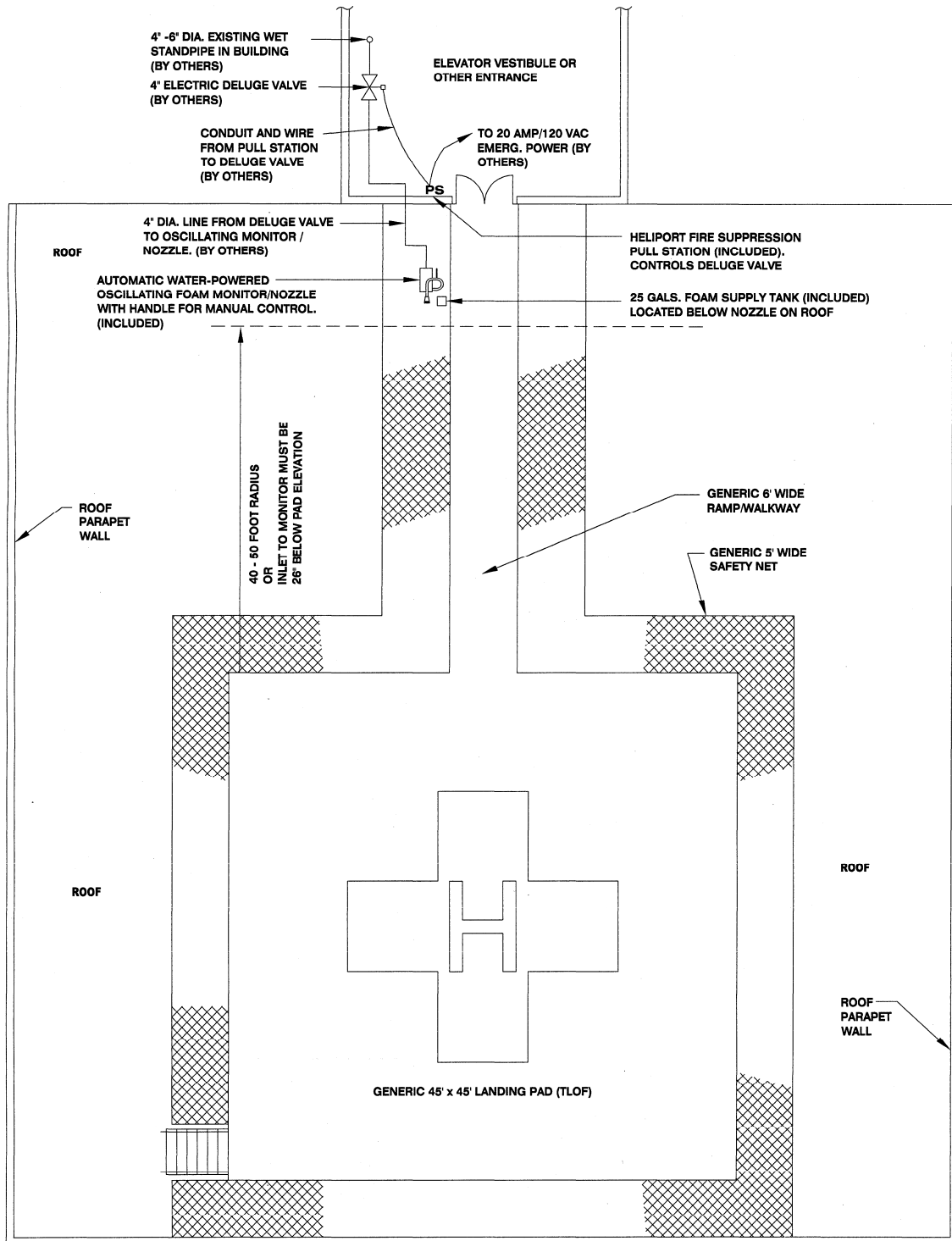
AFFF CONCENTRATIONS

The unit is intended for use with 1% AFFF concentrate. AFFF is sold in 1%, 3%, and 6% concentrated solutions. A common misconception is that 6% is more concentrated than 3%, and 3% is more concentrated than 1%. Actually, the reverse is correct. One gallon of 1% AFFF concentrate mixed with 99 gallons of plain water produces 100 gallons of properly proportioned foam. Three gallons of 3% AFFF concentrate mixed with 97 gallons of plain water produces 100 gallons of properly proportioned foam, etc. After proportioned with water, all three foams are of equal quality. 1% concentrate costs more per gallon than 3%, and 3% costs more than 6%. The advantage of 1% concentrate is that storage and pumping requirements are *one third* those of 3%, just as 3% requirements are *half* those of 6%. The 25 gallon storage tank when filled with 25 gallons of 1% AFFF concentrate, produces 2500 gallons of properly proportioned, high quality, foam.

MODEL HFPOM HELIPORT FIRE PROTECTION OSCILLATING MONITOR/NOZZLE



SCHEMATIC / GENERIC LAYOUT



INSTALLATION - Sprinkler Contractor:

If possible, locate the Model HFPOM oscillating monitor/nozzle and foam supply tank a safe distance (for manual operation purposes), 40' to 60' from the edge of the landing pad. See SCHEMATIC LAYOUT. If the landing pad takes up most of the roof and it cannot be located 40'-60' from the edge, it can be mounted at the edge of the landing pad, but with the 4" flanged inlet connection 26" **below** the top of the landing pad, so the nozzle cannot be struck by arriving/departing helicopters. In both cases, the monitor is supported by the steel pipe that supplies water to the 4" flanged connection. Support and brace the 4" piping near the monitor so the line supports the monitor both vertically for a 200 lbs load and laterally for a 200 lbs load. Do not attempt to support the monitor from the stainless steel box containing the water-powered mechanism.

At the building's nearest 4" or larger standpipe, typically in a stair tower serving the roof, install a 4" electric deluge valve with all trim (valve normally not furnished with this equipment) to control the flow of water and to ensure the 4" piping from the valve to the oscillating monitor is normally dry so it will not freeze in cold climates. Slope the 4" piping so it can be drained after each use. Install a 4" 150 lbs ANSI flange on the end of the 4" line to match the 4" 150 lbs ANSI flange connection at the monitor.

The 25 gallon foam supply tank must be located within 6' of the oscillating monitor/nozzle. Often this tank can be located directly below the nozzle and placed directly on the roof without special attachment due to its 200 lbs weight when full. Connect the supplied stainless steel braided hose from the nozzle to the foam supply tank's ¼ turn ball valve. Make sure the ball valve is closed until foam flow is desired. Fill the 25 gallon foam tank with AFFF 1% concentrate from the five 5 gallon containers furnished with the equipment.

Install a pressure switch downstream of the valve to send an alarm to the building's annunciator panel.

Prior to attaching nozzle, make sure all alarms are off, open the electric deluge valve, and flow plain water to ensure the piping is free of all foreign objects. Run water until all black and rusty water turns clear.

If the building is equipped with a fire pump, verify the pump turns on automatically and pressure is maintained.

Close the deluge valve. Attach the nozzle. Verify the ball valve at the foam tank is closed. Trip the Pull Station to test wiring to the deluge valve and flow plain water. Adjust the nozzle so the stream reaches the farthest point of the landing pad. Adjust the oscillating range so the stream covers the landing pad. Open the ball valve at the foam tank for a few seconds to verify foam flows out the nozzle onto the landing pad. Close the ball valve. Close/reset the deluge valve. Tighten the brass knobs. Using a black magic marker or paint marker, mark the positions of the 1) nozzle, 2) horizontal aim, and 3) vertical aim with arrows that align with each other.

TESTING:

For a formal flow test to be witnessed by all interested parties, open the ball valve at the foam tank. After all parties have arrived and all alarms are turned off, pull the handle of the Pull Station to simulate an actual foam system release and to verify all components work. Observe that foam covers the landing pad; this typically takes 2-3 minutes. If satisfactory to the Authority Having Jurisdiction, close the deluge valve. Close the ball valve at the foam tank. Flow plain water to flush and to remove foam residue from the landing pad. Refill foam tank and open ball valve.

INSTALLATION - Electrical Contractor:

1. Mount the Heliport Fire Suppression Pull Station furnished with the equipment on the wall in the rooftop heliport lobby near the door facing the heliport, or where indicated on the drawings.
2. Provide a 20 amp, 120 VAC, emergency power line with lock on breaker to the Pull Station above. Wire from Pull Station to the electric deluge valve. The Pull Station has two sets of dry contacts rated for 120 VAC.

INSTALLATION - Fire Alarm Contractor:

1. Provide fire alarm wiring from the pressure switch to the building's annunciator panel labeled "Heliport".

PERIODIC MAINTENANCE

Date of Installation _____ / _____ / _____
Month Day Year

MONTHLY:

1. Check foam supply by looking at tank. Level must be near the top, at the 25 gallon mark.
2. Check that the adjustment of the oscillating monitor has not changed by looking at the three pairs of arrows on the unit. The arrows must be aligned with each other.

ANNUAL:

NFPA recommends foam systems be tested annually. To test:

Flow test the unit until satisfied with operation or until the concentrate is depleted (1/2" remaining in bottom of tank). Caution: A long foam test can result in foam coming up storm sewer grates in the street below; check with local authorities before conducting a long flow test.

Following the Flow Test:

1. Run plain water through the oscillating monitor/nozzle.
2. Loosen the two brass knobs on the monitor and aim the nozzle to wash foam from the landing pad.
3. Realign the arrows and tighten the brass knobs.
4. Remove the stainless steel braided hose, flush with plain water; then reconnect.
5. Refill foam tank with proper foam.

Freezing climates: Use 1% AFFF, freeze protected, 5 gal containers. Ansul Corp. PN 415301

Non-freezing climates: Use 1% AFFF, 5 gal. containers, Ansul Corp. PN 55804.



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Specification for Model HFPOM Heliport Fire Protection Oscillating Monitor

Equipment shall consist of oscillating foam monitor, nozzle, foam supply tank, foam, and pull station located where indicated in the drawings.

The monitor shall be completely self-contained requiring no outside electrical connections or hydraulic controls for operation. The oscillating mechanism shall be driven by the water supply to the unit. Unit shall have an arc of oscillation adjustable from 0-120 degrees, anywhere within a 360 degree field of operation. Speed of oscillation shall be adjustable from 0-30 degrees per second. Unit shall have an elevation adjustable from a range of +80 and -40 degrees. Unit shall have a handle for manual override capability for full 360 degree operation in the event a helicopter crashes off the heliport. The monitor and body of the oscillating unit shall be manufactured of brass. The water drive wheel shall be bronze with bronze supply gate valve. Unit shall have a 4" dia. 150 lbs. ANSI flanged inlet. Unit shall be UL Listed.

Nozzle shall be designed for use with AFFF, and shall have pattern adjustable from straight stream to fog. Nozzle shall be constructed entirely of brass.

Foam supply tank shall provide a quantity of foam 1.5 times the 5 minute minimum recommended in NFPA 418 for a heliport with a fixed foam system. Tank shall be suitable for use with AFFF and shall be suitable for outdoor locations.

Foam shall be AFFF (Aqueous Film Forming Foam), 1% concentrate, UL Listed. At locations subject to freezing, AFFF shall be freeze protected to -20 deg. F, Ansul Corp. PN 415301 for 5 gal. containers. At locations not subject to freezing, 5 gal. containers Ansul Corp. PN 55804.

Above equipment shall meet all recommendations of NFPA 418 for Heliport Categories H-2 and H-3. Equipment shall be Model HFPOM as manufactured by Heliport Systems Inc., Morristown, NJ 07960. 800-540-0011.

**EXTINGUISHING
AGENT DATA
SHEET****ANSULITE®
1% FREEZE
PROTECTED AFFF
CONCENTRATE
-20 °F (-29 °C)****DESCRIPTION**

ANSULITE 1% Freeze Protected Aqueous Film-Forming Foam (AFFF) Concentrate is formulated from specialty fluorochemical and hydrocarbon surfactants along with solvents. It is transported and stored as a concentrate to provide ease of use and considerable savings in weight and volume.

It is intended for use as a 1% proportioned solution in fresh, salt or hard water. It may also be used and stored as a 1% premixed solution in fresh or potable water only. The correct proportioning or mixture ratio is 1 part concentrate to 99 parts of water.

Three fire extinguishment mechanisms are in effect when using ANSULITE 1% Freeze Protected AFFF Concentrate. First, an aqueous film is formed which works to help prevent the release of fuel vapor. Second, the foam blanket from which the film-forming liquid drains effectively excludes oxygen from the fuel surface. Third, the water content of the foam provides a cooling effect.

**Typical Physicochemical Properties
at 77 °F (25 °C)**

Appearance	Clear Pale Yellow Liquid
Density	1.05 g/ml
pH	7.3
Refractive Index	1.3940
Viscosity	14.1 centistokes
Spreading Coefficient	5.2

APPLICATION

ANSULITE 1% Freeze Protected AFFF Concentrate is intended for use on Class B hydrocarbon fuel fires having low water solubility such as various crude oils, gasolines, diesel fuels, aviation fuels, etc. **It is not suitable for use on fuels having appreciable water solubility (polar solvents), i.e., methyl and ethyl alcohol, acetone, and methyl ethyl ketone.** It can be used with both aspirating and non-aspirating discharge devices because of the low energy required to make it foam.

Its excellent wetting characteristics make it useful in combating Class A fires as well. It can be used with dry chemical extinguishing agents without regard to the order of application to provide even greater fire protection capability.

PERFORMANCE

Fire Performance – The fire performance of ANSULITE 1% Freeze Protected AFFF Concentrate is measured primarily against Underwriters Laboratories Standard UL 162 (Latest Revision).

Foaming Properties – When used with fresh or salt water or water of any hardness, at the correct dilution with most conventional foam making equipment, the expansion will vary depending on the performance characteristics of the equipment. Aspirating discharge devices produce expansion ratios of from 6:1 to 10:1 depending primarily on type of aspirating device and flow rate. Subsurface injection is a special case where generally expansion ratios of 2:1 to 3:1 are preferred but up to 4:1 is allowed. Non-aspirating devices such as handline water fog/stream nozzles or standard sprinkler heads give expansion ratios of 2:1 to 4:1.

Proportioning – ANSULITE 1% Freeze Protected AFFF Concentrate can be easily proportioned (at the correct dilution) using most conventional proportioning equipment such as:

1. Balanced pressure and in-line balanced pressure pumped proportioning equipment
2. Balanced pressure bladder tank proportioner
3. Around the pump type proportioners
4. Fixed or portable (in-line) venturi type proportioners
5. Handline nozzles with fixed induction/pickup tubes

The minimum and maximum usable temperature for ANSULITE 1% Freeze Protected AFFF Concentrate in this equipment is -20 °F (-29 °C) to 120 °F (49 °C) respectively.

Storage/Shelf Life – When stored in the packaging supplied (polyethylene drums or pails) or in equipment recommended by the manufacturer as part of the foam system and within the temperature limits specified, the shelf life of ANSULITE 1% Freeze Protected AFFF Concentrate is about 20-25 years. The factors affecting shelf life and stability for ANSULITE AFFF concentrates are discussed in detail in Ansul Technical Bulletin No. 54. If the product is frozen during storage or transportation, thawing will render the product completely usable. Mixing after freeze thaw cycle is recommended.

Compatibility – Ansul has conducted testing with admixtures of different manufacturers' AFFF products in varying proportions and is satisfied that the ANSULITE 1% Freeze Protected AFFF Concentrate is compatible with these products. Refer to Ansul Technical Bulletin No. 48 for a more detailed discussion of compatibility.

Different types of foam concentrates, i.e., AFFF, protein base, etc., should not be mixed under any circumstances.

Materials of Construction Compatibility – Tests have been performed with ANSULITE AFFF concentrates verifying compatibility with standard carbon steel "black" pipe and pipe manufactured from various stainless steel or brass compounds. Alternative pipe, fittings, and valves may be used in some cases if acceptable to the customer and/or the authority having jurisdiction. Refer to Ansul Technical Bulletin No. 59 addressing acceptable materials of construction for use with Ansul foam concentrates.

Galvanized pipe and fittings must not be used in areas where undiluted concentrate will contact them since corrosion will result.

Please **first** consult Ansul Fire Protection for specific guidelines concerning materials of constructions.

Inspection – As with any fire extinguishing agent, ANSULITE AFFF concentrates, whether in the concentrate or pre-mixed form, should be inspected periodically. NFPA 11 "Standard for Low Expansion Foam and Combined Agent Systems" requires that foam concentrate samples be submitted to the manufacturer or other qualified laboratory for quality condition testing at least annually. Contact Ansul for further information on annual inspection.

APPROVALS AND LISTINGS

ANSULITE 1% Freeze Protected AFFF Concentrate is approved, qualified under, listed or meets the requirements of the following specifications and standards:

Underwriters Laboratories Inc. – UL Standard 162 EX 3125 (Latest Revision)

1. Foam Quality Tests
2. Class B Hydrocarbon Fuel Fire Tests
3. Foam Identification Tests
4. Tests of Shipping Containers

It is impractical for Ansul to list its ANSULITE 1% Freeze Protected AFFF Concentrate with every piece of UL listed hardware. Moreover, there are numerous foam hardware components without UL listings that cannot be listed for use with any AFFF concentrate.

Many unlisted pieces of foam hardware should be similar to those listed. However, on installations where ANSULITE 1% Freeze Protected AFFF Concentrate may be used with hardware components of significantly different types than those tested, contact Ansul for recommendations.

ORDERING INFORMATION

ANSULITE 1% Freeze Protected AFFF Concentrate is available in pails, drums, or bulk shipment.

Part No. 415301	5 gallon pail
Part No. 415303	55 gallon drum
Part No. 415305	Bulk

Shipping Weight:

5 gal. (19 L) pail – 45 lbs. (20.4 kg)
55 gal. (208.1 L) drum – 495 lbs.
(224.5 kg)

Cube:

5 gal. (19 L) pail – 1.25 cu. ft.
(.0353 m³)
55 gal. (208.1 L) drum – 11.83 cu. ft.
(.3350 m³)

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ANSULITE® 1% AQUEOUS FILM-FORMING FOAM (AFFF) CONCENTRATE

Data/Specifications

ANSUL

DESCRIPTION

ANSULITE® 1% Aqueous Film-Forming Foam (AFFF) Concentrate is formulated from specialty fluorochemical and hydrocarbon surfactants along with solvents. It is transported and stored as a concentrate to provide ease of use and considerable savings in weight and volume.

It is intended for use as a 1% proportioned solution in fresh, salt or hard water. It may also be used and stored as a 1% premixed solution in fresh or potable water only. The correct proportioning or mixture ratio is 1 part concentrate to 99 parts of water.

Three fire extinguishment mechanisms are in effect when using ANSULITE 1% Aqueous Film-Forming Foam (AFFF) Concentrate. First, an aqueous film is formed which works to help prevent the release of fuel vapor. Second, the foam blanket from which the film-forming liquid drains effectively excludes oxygen from the fuel surface. Third, the water content of the foam provides a cooling effect.

TYPICAL PHYSIOCHEMICAL PROPERTIES AT 77 °F (25 °C)

Appearance	Clear Pale Yellow Liquid
► Density	1.03 ± 0.01 gm/ml
pH	7.5 ± 0.5
► Refractive Index	1.3880 ± 0.0015
► Spreading Coefficient	3.0 – 6.0

APPLICATION

ANSULITE 1% Aqueous Film-Forming Foam (AFFF) concentrate is intended for use on Class B hydrocarbon fuel fires having low water solubility such as various crude oils, gasolines, diesel fuels, aviation fuels, etc. **It is not suitable for use on fuels having appreciable water solubility (polar solvents), i.e., methyl and ethyl alcohol, acetone, and methyl ethyl ketone.** It can be used with both aspirating and non-aspirating discharge devices because of the low energy required to make it foam.

Its excellent wetting characteristics make it useful in combating Class A fires as well. It can be used with dry chemical extinguishing agents without regard to the order of application to provide even greater fire protection capability.

FIRE PERFORMANCE

The fire performance of ANSULITE 1% Aqueous Film-Forming Foam (AFFF) Concentrate is measured against specifications and standards such as U.S. Military Specification MIL-F-24385B and Underwriters Laboratories Standard UL 162 – 5th Edition. Reports covering this fire performance are available on request since standards and specifications such as those cited are continuously being upgraded and changed.

FOAMING PROPERTIES

When used with fresh or salt water or water of any hardness, at the correct dilution with most conventional foam making equipment, the expansion will vary depending on the performance characteristics of the equipment. Aspirating discharge devices produce expansion ratios of from 6:1 to 10:1 depending primarily on type of aspirating device and flow rate. Subsurface injection generally produces expansion ratios of 2:1 to 3:1. Non-aspirating devices such as handline water fog/stream nozzles or standard sprinkler heads give expansion ratios of 2:1 to 4:1.

PROPORTIONING

ANSULITE 1% Aqueous Film-Forming Foam (AFFF) Concentrate can be proportioned (at the correct dilution) using most conventional proportioning equipment such as:

1. Balanced pressure and in-line balanced pressure pumped proportioning equipment
2. Balanced pressure bladder tank proportioner
3. Fixed or portable (in-line) venturi type proportioners
4. Handline nozzles with fixed induction/pickup tubes

The minimum and maximum usable temperature for ANSULITE 1% Aqueous Film-Forming Foam (AFFF) Concentrate in this equipment is 35 °F (2 °C) to 120 °F (49 °C) respectively.

STORAGE/SHELF LIFE

When stored in the packaging supplied (polyethylene drums or pails) or in equipment recommended by the manufacturer as part of the foam system and within the temperature limits specified, the shelf life of ANSULITE AFFF 1% Aqueous Film-Forming Foam (AFFF) Concentrate is about 20-25 years. The factors affecting shelf life and stability for ANSULITE AFFF Agents are discussed in detail in Ansul Technical Bulletin No. 54. If the product is frozen during storage or transportation, thawing will render the product completely usable.

COMPATIBILITY

ANSUL has conducted testing with admixtures of different manufacturers' AFFF products in varying proportions and is satisfied that the ANSULITE 1% AFFF is compatible with these products. Refer to Ansul Technical Bulletin No. 48 for a more detailed discussion of compatibility.

Different types of foam concentrates, i.e., AFFF, protein base, etc., should not be mixed under any circumstances.

MATERIALS OF CONSTRUCTION COMPATIBILITY

Tests have been performed with ANSULITE 1% AFFF Concentrate verifying its compatibility with standard carbon steel "black" pipe and pipe manufactured from various stainless steel or brass compounds. Alternative pipe, fittings, and valves may be used in some cases if acceptable to the customer and/or the authority having jurisdiction.

Galvanized pipe and fittings must not be used in areas where undiluted concentrate will contact them since corrosion will result.

Please **first** consult ANSUL for specific guidelines concerning materials of constructions.

INSPECTION

As with any fire extinguishing agent, ANSULITE 1% Aqueous Film-Form Foam (AFFF) Concentrate, whether in the concentrate or pre-mixed form should be inspected periodically. Please refer to the Field Inspection Manual, Ansul Part No. 31274, for the detailed procedures to perform this inspection. An annual inspection is recommended unless unusual conditions of exposure occur such as are described in Ansul Technical Bulletin No. 54. In such cases, ANSUL's recommendation should be sought.

APPROVALS AND LISTINGS

ANSULITE 1% Aqueous Film-Forming Foam (AFFF) Concentrate is approved, qualified under, listed or meets the requirements of the following specifications and standards:

Underwriters Laboratories Inc. –

U.L. Standard 162 EX 3933 (7th Ed.)

1. Foam Quality Tests
2. Class B Hydrocarbon Fuel Fire Tests
3. Foam Identification Tests
4. Tests of Shipping Containers
5. Class B Hydrocarbon Fuel Sprinkler Tests (Foam water and standard type both upright and pendent approvals)
6. Subsurface Injection at 1% Proportioning

It is impractical for ANSUL to list its ANSULITE 1% agents with every piece of U.L. listed hardware. Moreover, there are numerous foam hardware components without U.L. listings that cannot be listed for use with any AFFF agent.

Many unlisted pieces of foam hardware should be similar to those listed. However, on installations where ANSULITE 1% may be used with hardware components of significantly different types than those tested, contact ANSUL for recommendations.

ORDERING INFORMATION

ANSULITE 1% Aqueous Film-Forming Foam (AFFF) Concentrate is available in pails, drums, or bulk shipment.

Part No. 55804	5 gallon pail
Part No. 55811	55 gallon drum
▶ Part No. 432160	265 gallon tote
Part No. 56083	Bulk

Shipping Weight:

- 5 gal. (19 L) pail – 45 lbs. (20.4 kg)
- 55 gal. (208.1 L) drum – 495 lbs. (224.5 kg)
- ▶ 265 gal. (1000 L) tote – 2465 lb. (1118 kg)

Cube:

- 5 gal. (19 L) pail – 1.25 cu. ft. (.0353 m³)
- 55 gal. (208.1 L) drum – 11.83 cu. ft. (.3350 m³)
- ▶ 265 gal. (1000 L) tote – 31.50 cu. ft. (.8920 m³)

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