

## Foam Extinguishing Systems

A foam installation consists of either (1) a foam generator attached to a permanently piped system which discharges through nozzles or (2) a very high-expansive type foam generator arranged to discharge directly into a protected space. Either operates automatically or manually.

Contracts for fixed-foam protection should be let subject to FM Global acceptance obtained by the manufacturer prior to installation. Drawings showing the installation details and a complete description of the hazard should be submitted to FM Global for review, as well as information regarding auxiliary features which may affect the operation of the system.

## Compressed Air Foam Systems

Compressed air foam (CAF) systems use low expansion foam concentrates to produce foam of substantially higher expansion ratios. The systems include a mixing and foam generating device which meters and combines the concentrate, water, and compressed air to produce CAF, which is then piped to proprietary nozzles for application to the hazard. Use of CAF reduces the water and concentrate required to extinguish flammable liquid fires, due to higher expansion and lower required application rates. CAF can both spread across horizontal surfaces and cling to vertical surfaces. Systems must be designed by the manufacturer for the specific application. The appropriate FM Global Property Loss Prevention Data Sheets for the occupancy being protected should be consulted prior to use of these systems.

## Integrated Compressed Air Foam System (ICAF)

Integrated Compressed Air Foam System (ICAF). Uses National Foam Concentrates Aer-O-Lite 3% and Aer-O-Water 3EM 3%, only, at a 2 percent concentration for hydrocarbon fuel applications. Uses Ansul, Incorporated Ansulite 3X3 LV alcohol resistant concentrate, only, at a 6 percent concentration for alcohol and ketone fuel applications. For use only with FireFlex ARC-1 or Notifier NFC-320/E/C release control panels. Discharge may be initiated either manually, electrically, electrically in a failsafe mode, or pneumatically. Requires a reliable water supply pressure between 50 and 175 psi (3.5 and 12.1 bar) at the required system flow. Compressed air is supplied by cylinders at 2400 psi (165.5 bar). Includes concentrate supply tank. Provides a minimum of 10 minutes of discharge with the option to provide a second 10 minute, to be either manually or automatically activated, if required.

Uses FireFlex TAR 225C nozzles at a maximum area of coverage of 150 ft<sup>2</sup> (13.9 m<sup>2</sup>) for hydrocarbon fuel applications and 100 ft<sup>2</sup> (9.3 m<sup>2</sup>) for alcohol and ketone fuel applications and TAR 225L nozzles for applications where a three dimensional fire requires horizontal discharge.

Minimum ceiling height is 8 ft (2.4 m) and maximum nozzle height is 46 ft (14 m) for hydrocarbon fuel applications and 35 ft (10.7 m) for alcohol and ketone fuel applications.

FPO (Foam Powered Oscillating) nozzles are available for use where flammable liquid spills occur on horizontal surfaces and may cause pool fires. They are designed to provide discharge over the specified angles and ranges of coverage shown from a 2 ft (0.6 m) minimum height above floor level.

Nozzle Part Number	Nominal Pipe Size in.	Concentrates	Application Rate gal/min/ft <sup>2</sup> (mm/min)	Flow Rate gal/min (L/min)	Angle of Sweep degrees of arc	Maximum Range ft (m)
FPO-2-090-H8-U	2	National Foam Aer-O-Lite 3%, Aer-O-Water 3EM 3%	0.025 (1.02) for hydrocarbon fuels	48 (180)	90	43 (13.1)
FPO-2-090-H8-D	2	National Foam Aer-O-Lite 3%, Aer-O-Water 3EM 3%	0.025 (1.02) for hydrocarbon fuels	48 (180)	90	45 (13.7)
FPO-4-090-H16-U	4	National Foam Aer-O-Lite 3%, Aer-O-Water 3EM 3%	0.025 (1.02) for hydrocarbon fuels	96 (340)	90	58 (17.7)

FPO-4-180-H16-U	4	National Foam Aer-O-Lite 3%, Aer-O-Water 3EM 3%	0.025 (1.02) for hydrocarbon fuels	96 (340)	180	45 (13.1)
FPO-4-090-H32-U	4	National Foam Aer-O-Lite 3%, Aer-O-Water 3EM 3%	0.025 (1.02) for hydrocarbon fuels	192 (725)	90	92 (28.0)
FPO-4-180-H32-U	4	National Foam Aer-O-Lite 3%, Aer-O-Water 3EM 3%	0.025 (1.02) for hydrocarbon fuels	192 (725)	180	63 (19.2)
FPO-2-090-P8-U	2	Ansulite 3X3 Low Viscosity at 6%	0.06 (2.3) for alcohol & ketone fuels	48 (180)	90	30 (9.1)
FPO-2-090-P8-D	2	Ansulite 3X3 Low Viscosity at 6%	0.06 (2.3) for alcohol & ketone fuels	48 (180)	90	30 (9.1)
FPO-4-090-P16-U	4	Ansulite 3X3 Low Viscosity at 6%	0.06 (2.3) for alcohol & ketone fuels	96 (340)	90	45 (13.7)

Systems are deluge type, engineered, balanced designs. The basic systems can be ganged to cover larger areas or multiple hazards. Systems shall be designed in accordance with Design Manual FM-090M-0-1, Revision E, dated November 2009. Design calculations shall be by the manufacturer using FireFlex HydroPneumatic Calculations Version 1.3 software dated November 2009 and its User's Manual FM-080P-0-04C.

Minimum design application rate is 0.04 gal/min/ft<sup>2</sup> (1.6 mm/min) for hydrocarbon fuel applications and 0.06 gal/min/ft<sup>2</sup> (2.3 mm/min) for alcohol and ketone fuel applications.

Mixer Nominal Size in.	Number of Nozzles	Maximum Area of Coverage ft <sup>2</sup> (m <sup>2</sup> )		Required Water Supply gal/min (L/min)
		Hydrocarbons	Alcohols and Ketones	
1	1	150 (13.9)	100 (9.3)	6 (23)
1	2	300 (27.9)	200 (18.6)	12 (45)
1 1/2	4	600 (55.7)	400 (37.2)	24 (90)
2	8	1200 (111.5)	800 (74.3)	48 (180)
3	16	2400 (223.0)	1600 (148.6)	96 (360)
3	32	4800 (445.9)	3200 (297.3)	192 (720)

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<b>Listing Country:</b>	Canada
<b>Certification Type:</b>	FM Approved