Foam Extinguishing Systems

Foam extinguishing systems are special protection systems designed to limit fire damage in an ignitable liquid use occupancy, or as an alternate to providing an emergency drainage system. A foam extinguishing system's basic components consist of (1) foam concentrate (2) foam concentrate storage tank (3) proportioner and (4) discharge device(s) which are compatible with each other and identified as part of the manufacturers FM Approval listing. The discharge device may be of either aspirating or non-aspirating type as identified in the listing. Ensure the foam extinguishing system will perform as intended by:

- Consulting FM Global Property Loss Prevention Data Sheets 4-3, 4-7 and 4-12, on foam extinguishing systems and the occupancy-specific property loss prevention data sheets listed in Appendix C.4 of FM Global Property Loss Prevention Data Sheet 4-0, Special Protection Systems, prior to design, installation and use of these systems.
- Insureds of FM Global contacting their local FM Global office to discuss proposed use and installation of foam extinguishing systems for protection of any enclosure or equipment.
- Verifying the required design criteria, as it may vary for each application type and depending upon maximum design parameters, may vary among foam extinguishing system manufacturers.
- Designing these special protection systems to provide protection for a specific duration within the limitations described in the manufacturer's design and installation manual identified in the Approval Guide listing.
- Consulting the FM Global occupancy-specific property loss prevention data sheet for discharge duration recommendations.
- Using compatible FM Approved controls and detection, as necessary. (**See AUTOMATIC RELEASES FOR EXTINGUISHING SYSTEMS AND OTHER FIRE PROTECTION EQUIPMENT under ELECTRICAL SIGNALING**).
- Using automatic sprinkler protection in conjunction with the foam extinguishing system when recommended by the occupancy-specific FM Global Property Loss Prevention Data Sheet.
- Applying this equipment by FM Global insureds to the limitations specified above and FM Global's acceptance of plans prior to installation.

Compressed Air Foam Systems

A Compressed Air Foam (CAF) System is a foam generation and delivery system that consist of a pressurized air or inert gas source, a source of foam solution (pre-mix solution or water pump and proportioner), and a means to apply the foam. CAF systems use low expansion foam concentrates to produce foam of higher expansion ratios than for a low expansion foam system; which reduces the water and foam concentrate required to extinguish flammable liquid fires. In a CAF System, the distribution piping carries already expanded foam and the discharge device distributes the foam without further expansion. CAF systems have unique hydraulic considerations which must be addressed by the manufacturer to ensure delivery of effective foam to the discharge device. The CAF System piping is independent and an overlay to the automatic sprinkler system.

In general CAF Systems can be used where ignitable liquids are stored, handled or processed. CAF applications may include, but are not limited to, exposed or shielded Class B pool or spill fires and are applicable for the protection of specific hazards and equipment. Systems are typically pre-engineered and 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

Integrated Compressed Air Foam System (ICAF) can initiate discharge either automatically, electrically, electrically in a failsafe mode, pneumatically, or emergency manually. The system requires a reliable water supply pressure between 50 and 175 psi (3.5 and 12.1 bar) at the required system flow. For proper performance, the temperature required to maintain the system is between 40° F (4.4° C) and 110° F (43.3° C).

FPO (Foam Powered Oscillating) nozzles are available for use where ignitable 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 in the table below.

Systems shall be designed in accordance with the manufacturer's Design, Installation, Operation, and Maintenance manuals; FM-090M-0-1D May 2007 ICAF Design Manual, FM-080P-0-4C November 2009 ICAF User's Manual, and FM-0723-0-02A ICAF Failsafe Relief Operations & Maintenance Manual.

Listings below contain "Maximum Sprinkler Density" meaning that the foam has been Approved to prevent re-ignition when exposed to the specified water discharge for 5 minutes.

Fuel	*Concentrate*	*Discharge Device Description*	*Nozzle Height*		*Maximum nozzles per system (If applicable per above system description)*	*Spacing or maximum area of coverage per nozzle*	*System Capacity*		*Minimum Design Application Rate*	*Maximum Sprinkler Density*
			Min	*Max*		*ft²*	*Gallons*	*Minutes*	*Gal/min/ft²*	*Gal/min/ft²*
			ft (m)	*ft (m)*		*(m²)*	*(liters)*		*(mm/min)*	*(mm/min)*
Hydrocarbon	ANSULITE 3x3 Low Viscosity at 6% concentration	TAR 225C Nozzle	8 (2.44)	35 (10.67)	Use as directed by spacing requirement, system can support 2 to 32 nozzles	100 (9.3)		10	0.06 (2.45)	0.25
IPA and Acetone	ANSULITE 3x3 Low Viscosity at	TAR 225C Nozzle	8 (2.44)	35 (10.67)	Use as directed by spacing requirement,	100 (9.3)		10	0.06 (2.45)	Not Applicable to Polar Solvent

	6% concentration				system can support 2 to 32 nozzles					Fuel Hazards
	ANSULITE 3x3 Low Viscosity at 6% concentration	**Foam Powered Oscillating, Floor Located Nozzle**					Determined by FireFlex Software	5	0.06 (2.45)	Not Applicable to Polar Solvent Fuel Hazards
IPA and Acetone		FPO-4-090-P8-2	2 (0.61)	N/A	Nozzle installation shall have a minimum of 5 times the diameter of straight pipe before entering the nozzle, and shall be positioned to distribute CAF on equipment being protected	90° Arc to 30 ft (9.1 m)				
		FPO-2-090-P8-D	2 (0.61)			90° Arc to 30 ft (9.1 m)				
		FPO-4-090-P16-U	2 (0.61)			90° Arc to 45 ft (13.7 m)				

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New/Updated Product Listing:	No
Listing Country:	Canada
Certification Type:	FM Approved