

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.

Low Expansion Foam Systems

Low expansion foam agents are an aggregate of gas-filled bubbles, made by mixing air into a water solution containing a foam concentrate. Foam agents are of lower density than flammable and combustible liquids, which allows the foam to float over a burning liquid surface and form a continuous blanket that seals volatile combustible vapors from access to air. Low expansion foam agents have expansion ratios up to 20:1.

Products identified with the **GREEN** symbol have attributes that are considered to be "sustainable" by certain outside organizations. FM Approvals verifies the presence of these attributes. Specific attributes for specific products are listed in the individual listings. To facilitate a search for these products in the Approval Guide, first search by the product type you desire and then refine your search to products with the **GREEN** symbol.

Low Expansion Foam Systems

Foam Concentrates. Used as a component of foam systems. Concentrates are only Approved for use with the specific proportioning, bladder tank, and discharge devices listed below and the sprinklers listed in the Foam Water Sprinkler section of the Approval Guide.

Use of a concentrate with other devices or outside the listed ranges may result in solutions too lean or rich or may produce foam unable to provide the required extinguishing or sealing performance. Concentrates below are compatible with both fresh water and sea water.

Product	Company	Listing Country	Type of Equipment	For Use With			
				Concentrate Name	Concentrate Percent in Water	Configurations	Approved Fuel Hazards
FILMPLUS NF3-C6 AFF 3%	NAFFCO	UAE	Concentrate	FILMPLUS NF3-C6	3%	For use with NAFFCO ratio controllers and bladder tanks specifically tested with this concentrate. Or Water Motor-Powered Positive Displacement Pumps within acceptable viscosity range only. May be used in a pre-mixed solution. For use with NAFFCO discharge devices evaluated with the specific concentrate only.	Hydrocarbons
FILMPLUS NF6-C6 AFF 6%	NAFFCO	UAE	Concentrate	FILMPLUS NF6-C6	6%	For use with NAFFCO ratio controllers and bladder tanks specifically tested with this concentrate. Or Water Motor-Powered Positive Displacement Pumps within acceptable viscosity range only. May be used in a pre-mixed solution. For use with NAFFCO discharge devices evaluated with the specific concentrate only.	Hydrocarbons
FILMPLUS AR(3X3)-C6 AR-AFF 3X3	NAFFCO	UAE	Concentrate	FILMPLUS AR(3X3)-C6	3%	For use with NAFFCO ratio controllers and bladder tanks specifically tested with this concentrate. Or Water Motor-Powered Positive Displacement Pumps within acceptable viscosity range only. May be used in a pre-mixed solution. For use with NAFFCO discharge devices evaluated with the specific concentrate only.	Hydrocarbons, IPA
FILMPLUS AR(3X6)-C6 AR-AFF 3X6	NAFFCO	UAE	Concentrate	FILMPLUS AR(3X6)-C6	3% (hydrocarbon) 6% (polar solvent)	For use with NAFFCO ratio controllers and bladder tanks specifically tested with this concentrate. Or Water Motor-Powered Positive Displacement Pumps within acceptable viscosity range only. May be used in a pre-mixed solution. For use with NAFFCO discharge devices evaluated with the specific concentrate only.	Hydrocarbons, IPA

GREEN - NAFFCO FILMPLUS NF3-C6, FILMPLUS NF6-C6, FILMPLUS AR(3X3)-C6, and FILMPLUS AR(3X6)-C6 foam concentrates do not contain or produce perfluorochemicals (PFOS, PFOA).

Bladder Tanks. For use with NAFFCO foam concentrates, proportioners, discharge devices, and foam water sprinklers within the specifications identified in the table below.

Type of Equipment	For Use With				Type	Maximum Operating Pressure	Sizes				
	Concentrate Name	Concentrate Percent in Water	Configurations	Approved Fuel Hazards				Hydraulic Concentrate Control Valves			
								Model Number	Size, inches (NB)	Minimum Actuator Operating Pressure	Maximum Operating Pressure
Bladder Tank	FILMPLUS NF3-C6	3%	Vertical	Hydrocarbon	Model NF-WPV	1 (25NB) 1.5(40NB) 2 (50NB)	30 PSI (2.1 Bar)	175 PSI (12.1 Bar)	ASME Section VIII, Division 1	50 - 3200 USG (190 - 12100 Liters)	
	FILMPLUS NF6-C6	6%	Vertical	Hydrocarbon							
	FILMPLUS AR(3 X 3)-C6	3%	Vertical	Hydrocarbon, IPA							

	FILMPLUS AR(3 X 6)-C6	3% hydrocarbon 6% (polar solvent)	Vertical	Hydrocarbon, IPA								
Bladder Tank	FILMPLUS NF3- C6	3%	Horizontal	Hydrocarbon	Model NF-WPV	1 (25NB) 1.5 (40NB) 2 (50NB)	30 PSI (2.1 Bar)	175 PSI (12.1 Bar)	ASME Section VIII, Division 1	175 PSI (12 Bar)	50 - 6000 USG (190 - 22700 Liters)	
	FILMPLUS NF6-C6	6%	Horizontal	Hydrocarbon								
	FILMPLUS AR(3 X 3)-C6	3%	Horizontal	Hydrocarbon, IPA								
	FILMPLUS AR(3 X 6)-C6	3% hydrocarbon 6% (polar solvent)	Horizontal	Hydrocarbon, IPA								

Proportioners. For use with NAFFCO foam concentrates and bladder tank proportioning systems (where applicable) within the specifications identified in the table below.

Product	Company	Listing Country	Type of Equipment	For Use With										Connection	Fi
				Concentrate Name	Concentrate Percent in Water	Configurations	Approved Fuel Hazards	Approved Flow Range		Approved Pressure Range					
								(gal/min)	(L/min)	(psi)	(bar)				
Model WRC-B65 & WRC-S65	NAFFCO	UAE	Ratio Controller	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and discharge devices as appear in the FM Approval Guide only.	Hydrocarbons	55-313	208-1185	44-100	3-7	Wafer	Broi Sta St		
				FILMPLUS NF6-C6	6%		Hydrocarbons	66-220	250-833	44-100	3-7				
				FILMPLUS AR(3 X 3)-C6	3%		Hydrocarbons, IPA	98-348	371-1317	29-100	2-7				
				FILMPLUS AR(3 X 6)-C6	3%		Hydrocarbons	93-324	352-1226	29-100	2-7				
				FILMPLUS AR(3 X 6)-C6	6%		IPA	101-322	382-1219	29-100	2-7				
Model WRC-B80 & WRC-S80	NAFFCO	UAE	Ratio Controller	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and discharge devices as appear in the FM Approval Guide only.	Hydrocarbons	237-614	897-2324	29-100	2-7	Wafer	Broi Sta St		
				FILMPLUS NF6-C6	6%		Hydrocarbons	241-619	912-2343						
				FILMPLUS AR(3 X 3)-C6	3%		Hydrocarbons, IPA	229-616	867-2332						
				FILMPLUS AR(3 X 6)-C6	3%		Hydrocarbons	232-632	878-2392						
				FILMPLUS AR(3 X 6)-C6	6%		IPA	251-646	950-2445						
Model WRC-B100 & WRC-S100	NAFFCO	UAE	Ratio Controller	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and discharge devices as appear in the FM Approval Guide only.	Hydrocarbons	455-1200	1722-4542	29-100	2-7	Wafer	Broi Sta St		
				FILMPLUS NF6-C6	6%		Hydrocarbons	445-1150	1685-4353						
				FILMPLUS AR(3 X 3)-C6	3%		Hydrocarbons, IPA	465-1032	1760-3907						
				FILMPLUS AR(3 X 6)-C6	3%		Hydrocarbons	455-1026	1722-3884						
				FILMPLUS AR(3X6)-C6	6%		IPA	460-1035	1741-3918						
Model WRC-B150 & WRC-S150	NAFFCO	UAE	Ratio Controller	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and discharge devices as appear in the FM Approval Guide only.	Hydrocarbons	780-2400	2953-9085	2-7	Wafer	Broi Sta St			
				FILMPLUS NF6-C6	6%		Hydrocarbons	725-2135	2744-8082						
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	758-2375	2869-8990						
				FILMPLUS AR(3 X 3)-C6	3%		Hydrocarbons	765-2270	2896-8593						

Finish	Sizes
nze(B) or inless eel(S)	2.5" (65 NB)
nze(B) or inless eel(S)	3" (80 NB)
nze(B) or inless eel(S)	4" (100 NB)
nze(B) or inless eel(S)	6" (150 NB)

				FILMPLUS AR(3 X 6)-C6	6%		IPA	775-2260	2934-8555				
Model WRC-B200 & WRC-S200	NAFFCO	UAE	Ratio Controller	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and discharge devices as appear in the FM Approval Guide only.	Hydrocarbons	845-2320	3199-8782	29-100	2-7	Wafer	Broi Sta St
				FILMPLUS NF6-C6	6%		Hydrocarbons	890-2305	3369-8725	44-100	3-7		
				FILMPLUS AR(3 X 3)-C6	3%		Hydrocarbons, IPA	853-2311	3229-8748	44-100	3-7		
				FILMPLUS AR(3 X 6)-C6	3%		Hydrocarbons	837-2360	3168-8934	44-100	3-7		
				FILMPLUS AR(3 X 6)-C6	6%		IPA	1103-2100	4175-7949	44-100	3-7		

Note: Maximum static pressure is 200 PSI (13.8 bar).

Topside discharge devices. For use with NAFFCO foam concentrates and bladder tank proportioning systems within the specifications identified in the table below.

Product	Company	Listing Country	Type of Equipment	For Use With										Connection
				Concentrate Name	Concentrate Percent in Water	Configurations	Approved Fuel Hazards	Approved Flow Range		Approved Pressure Range				
								(gal/min)	(L/min)	(psi)	(bar)			
Model NF-FC65 & NF-FCSS65	NAFFCO	UAE	Foam Chamber	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	52-156	197-591	40-100	2.75-7	Flanged		
				FILMPLUS NF6-C6	6%		Hydrocarbons	59-158	223-598	50-100	3.5-7			
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	57-167	216-632	50-100	3.5-7			
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	59-157	223-594	50-100	3.5-7			
				FILMPLUS AR(3X6)-C6	6%		IPA	58-157	220-594	50-100	3.5-7			
Model NF-FC80 & NF-FCSS80	NAFFCO	UAE	Foam Chamber	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	101-309	382-1170	50-100	3.5-7	Flanged		
				FILMPLUS NF6-C6	6%		Hydrocarbons	94-303	356-1147	50-100	3.5-7			
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	110-311	416-1177	58-100	4-7			
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	107-305	405-1155	58-100	4-7			
				FILMPLUS AR(3X6)-C6	6%		IPA	100-304	379-1151	50-100	3.5-7			
Model NF-FC100 & NF-FCSS100	NAFFCO	UAE	Foam Chamber	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	198-679	750-2570	50-100	3.5-7	Flanged		
				FILMPLUS NF6-C6	6%		Hydrocarbons	195-674	738-2551	50-100	3.5-7			
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	211-678	799-2567	58-100	4-7			
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	197-675	746-2555	50-100	3.5-7			
				FILMPLUS AR(3X6)-C6	6%		IPA	192-680	727-2574	50-100	3.5-7			
Model NF-FCR150 & NF-FCRSS150	NAFFCO	UAE	Foam Chamber	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	493-1048	1866-3967			Flanged		
				FILMPLUS NF6-C6	6%		Hydrocarbons	489-1042	1851-3944					
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	516-1086	1953-4111	50-100	3.5-7			
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	512-1073	1938-4062					

Size(B) or Inches (S)	8" (200 NB)
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Finish	Sizes
Carbon Steel or Stainless Steel (SS)	2.5" (65 NB)
Carbon Steel or Stainless Steel(SS)	3" (80 NB)
Carbon Steel or Stainless Steel(SS)	4" (100 NB)
Carbon Steel or Stainless Steel(SS)	6" (150 NB)

				FILMPLUS AR(3X6)-C6	6%		IPA	514-1072	1946-4058				
Model NF-FM50 & NF-FMSS50 w/ NF-FP55 & NF-FP-S-55	NAFFCO	UAE	Foam Chamber w/ Gooseneck Pourer	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	35-106	132-401	50-100	3.5-7	Flanged	
				FILMPLUS NF6-C6	6%		Hydrocarbons	36-106	136-401				
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	41-112	155-424				
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	42-119	159-450				
				FILMPLUS AR(3X6)-C6	6%		IPA	41-118	155-447				
Model NF-FM65 & NF-FMSS65 w/ NF-FP55 & NF-FP-S-55	NAFFCO	UAE	Foam Maker w/ Gooseneck Pourer	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	58-167	220-632	50-100	3.5-7	Flanged	
				FILMPLUS NF6-C6	6%		Hydrocarbons	57-168	216-636				
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	58-205	220-776				
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	56-203	212-768				
				FILMPLUS AR(3X6)-C6	6%		IPA	57-204	216-772				
Model NF-FM50 & NF-FMSS50 w/ NF-RSP80 & NF-RSPS80	NAFFCO	UAE	Foam Maker w/ Rim Seal Pourer	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	72-105	273-397	73-100	5-7	Flanged	
				FILMPLUS NF6-C6	6%		Hydrocarbons	73-105	276-397	73-100	5-7		
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	42-112	159-424	50-100	3.5-7		
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	41-112	155-424	50-100	3.5-7		
				FILMPLUS AR(3X6)-C6	6%		IPA	42-112	159-424	50-100	3.5-7		
Model NF-FM65 & NF-FMSS65 w/ NF-RSP100 & NF-RSPS100	NAFFCO	UAE	Foam Maker w/ Rim Seal Pourer	FILMPLUS NF3-C6	3%	For use with NAFFCO bladder tanks and ratio controllers as appear in the FM Approval Guide only.	Hydrocarbons	56-170	212-644	50-100	3.5-7	Flanged	
				FILMPLUS NF6-C6	6%		Hydrocarbons	90-167	341-632	73-100	5-7		
				FILMPLUS AR(3X3)-C6	3%		Hydrocarbons, IPA	57-207	216-784	50-100	3.5-7		
				FILMPLUS AR(3X6)-C6	3%		Hydrocarbons	58-204	220-772	50-100	3.5-7		
				FILMPLUS AR(3X6)-C6	6%		IPA	58-205	220-776	50-100	3.5-7		

Foam chambers are fitted with glass vapor seals designed to rupture upon system discharge. Maximum permissible back pressure is 1 psi.

Company Name:	National Fire Fighting Mfg. FZCO
Company Address:	P. O. Box 17014, Jebel Ali Free Zone, Dubai, United Arab Emirates
Company Website:	http://naffco.com
New/Updated Product Listing:	Yes
Green Product:	No
Listing Country:	United Arab Emirates
Certification Type:	FM Approved

Carbon Steel or Stainless Steel(SS)	2.0" (50 NB)
Carbon Steel or Stainless Steel(SS)	2.5" (65 NB)
Carbon Steel or Stainless Steel(SS)	2" (50 NB)
Carbon Steel or Stainless Steel(SS)	2.5" (65 NB)