

# FLR and AFM Foam Makers

## Features

- Stainless steel construction for corrosive environments
- Cylindrically-shaped air inlet screen helps prevent accidental damage or blockage
- Choice of two models with orifice plates sized for specific flow rate requirements
- Removable foam solution inlet screen for ease of inspection and cleaning (FLR-30 only)

## Application

ANSUL® Floating Roof Foam Makers (FLR) are air-aspirating foam discharge devices that are designed to protect floating roof, flammable liquid storage tanks. Specifically, the protected storage tanks must be of open-top construction with either double-deck or pontoon-type floating roofs. This type of construction eliminates the need for a vapor seal, allowing the use of foam makers rather than foam chambers. Additional applications include protection of diked flammable liquid storage and spill areas.

Floating roof foam makers are used with various types of proportioning systems such as bladder tanks, balanced pressure pump proportioning systems, or line proportioners. The foam makers can be used with appropriate ANSUL® low-expansion foam agents for the flammable liquid being protected.

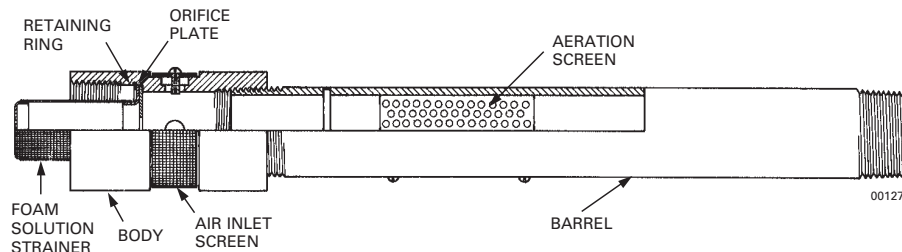
## Description

The ANSUL® floating roof foam maker is constructed of stainless steel components for corrosion-resistance.

A screened air inlet, conforming to the cylindrical body, allows uniform air distribution into the foam solution stream to generate expanded foam. This design also helps prevent damage and inhibits the entrance of foreign materials.

A removable orifice plate at the threaded inlet is sized to deliver foam solution over a range of flow rates depending on the inlet pressure (see Flow Range sections). The acceptable operating pressure range is 30 psi to 150 psi (2.1 bar to 10.3 bar).

### FLR-30



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A stainless steel foam solution strainer is provided at the inlet (FLR-30). The strainer is secured by a snap retaining ring to allow removal for inspection and cleaning. The solution inlet of the FLR-90 does not require a strainer.

## Approvals

The ANSUL® Floating Roof Foam Maker is UL Listed with various ANSUL® foam concentrates. Consult the UL Online Certifications Directory or contact Johnson Controls Technical Services for more information. Select models are USCG Approved, see Ordering Information.

## Specifications

The floating roof foam maker body (FLR), barrel, and sub-component parts shall be constructed of corrosion-resistant stainless steel. The foam maker shall be designed with a female NPT inlet and a male NPT outlet.

A machined brass metering orifice plate shall be provided at the inlet and sized to deliver the required flow rate of foam solution at a specified inlet pressure. The metering orifice and stainless steel foam solution inlet strainer, when applicable, shall be secured with a snap retaining ring to enable removal for inspection and cleaning. The foam maker orifice shall be stamped with the appropriate diameter.

The floating roof foam maker shall have a stainless steel air inlet screen that is cylindrically-shaped to fit the air inlet surface to ensure optimum performance and help prevent damage.

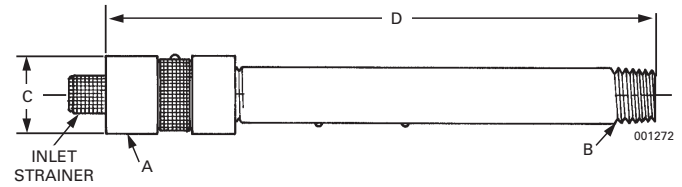
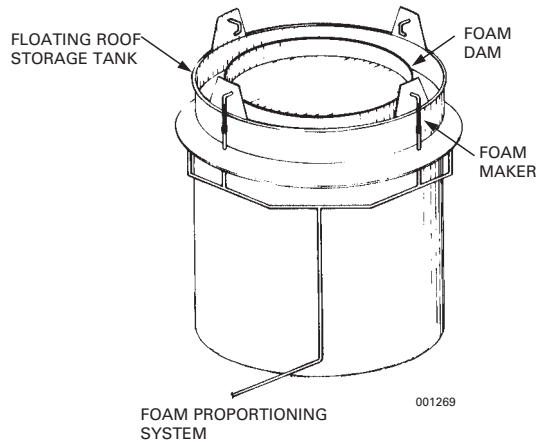
## Flow Range – Model FLR

The flow rate of the floating roof foam maker is determined by the orifice size and inlet pressure. The flow ranges listed in the following table are based on 30 psi (2.1 bar) using the smallest orifice for the minimum flow, and 150 psi (10.3 bar) using the largest orifice for the maximum flow.

Model	Flow Range	K-Factor Range
FLR-30	6.7 gpm to 79.6 gpm (25.4 Lpm to 301 Lpm)	1.2 to 6.5
FLR-90	31.1 gpm to 197.7 gpm (118 Lpm to 748 Lpm)	5.6 to 16.1

To determine flow rates for specific applications and proper orifice sizing, consult Johnson Controls Technical Services.

## Typical Storage Tank Protection

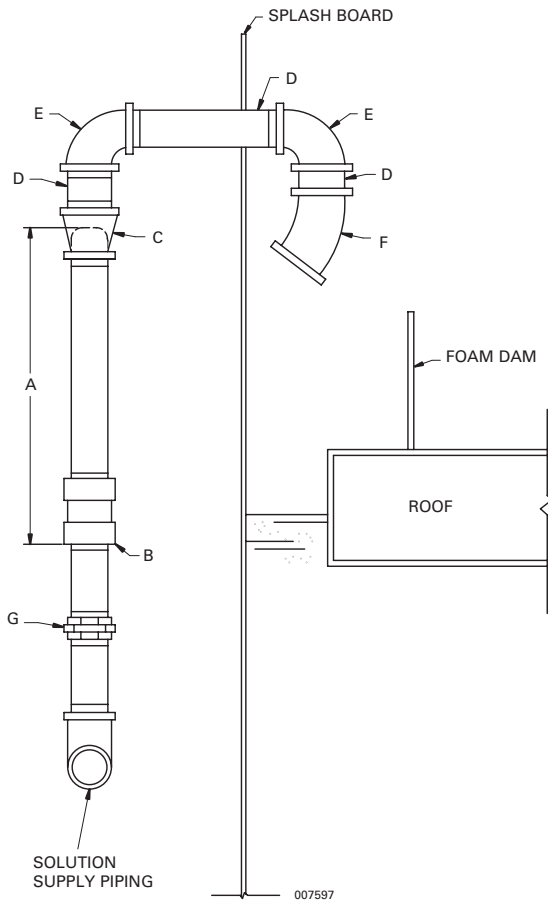


### Dimensions – Model FLR

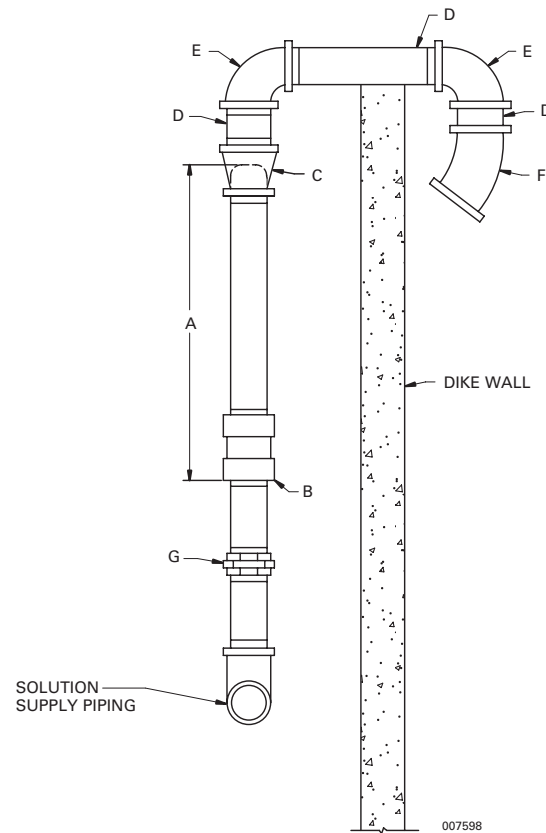
Model	Dim. A – in.	Dim. B – in.	Dim. C in. (mm)	Dim. D in. (mm)
FLR-30	1 1/2 NPT	1 1/4 NPT	2.25 (57)	16 (406)
FLR-90*	2 1/2 NPT	2 1/2 NPT	3.25 (83)	25 (635)

\*FLR-90 inlet strainer is not supplied or required.

## Typical Floating Roof Tank FLR Foam Maker Installation



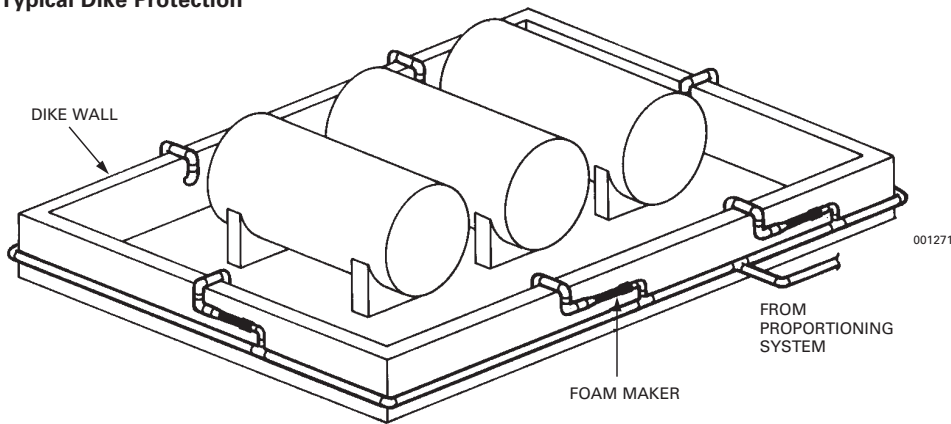
## Typical Diked Area FLR Foam Maker Installation



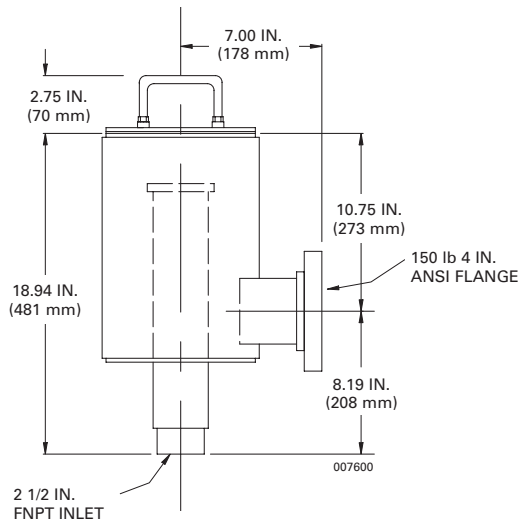
## Typical Material List

A	B	C	D	E	F	G
FLR-30	1 1/2 in. NPT	1 1/4 in. x 2 1/2 in. Red. Coup.	2 1/2 in. Nipple	2 1/2 in., 90° Elbow	2 1/2 in., 45° Elbow	1 1/2 in. Union
FLR-90	2 1/2 in. NPT	2 1/2 in. x 4 in. Red. Coup.	4 in. Nipple	4 in., 90° Elbow	4 in., 45° Elbow	2 1/2 in. Union

## Typical Dike Protection



## AFC-90 FLR Chamber Installation



**Note:** See Rim Seal Foam Pourer Data Sheet (F-200103) for other methods of mounting FLR Foam Makers.

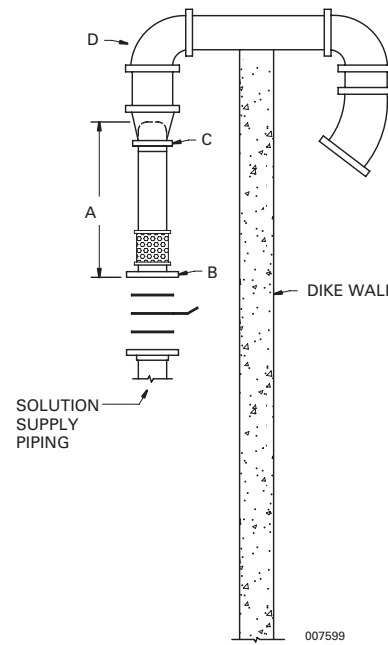
In some FLR installations, mounting may be easily accomplished using the "AFC-90 FLR Chamber" which is the chamber portion only from an ANSUL® Foam Chamber (AFC-90). This device is supplied with the cover, outlet gaskets, and a 2 1/2 in. NPT inlet. Use of this device with an FLR-30 will require a 2 1/2 in. x 1 1/4 in. reducing bushing not provided by Johnson Controls. The FLR Foam Makers and other normal AFC accessories such as a mounting pad or split deflector are sold separately.

**Note:** The "AFC-90 FLR Chamber" is not supplied with a vapor seal or vapor seal retaining ring and should not be used on hazards that require vapor seals.

## AFM Foam Makers

For some foam maker installations, particularly very large dikes or jetties, it may be required to have flow rates above those offered with the FLR Foam Makers. The ANSUL® Foam Maker "AFM" is the foam maker portion of an ANSUL® Foam Chamber without the Chamber. The AFM and AFC-90 FLR chamber are available as standard product constructed from mild steel with the "CR" Epoxy Red Paint System. The assemblies can be supplied in a primed only finish for field painting, or manufactured from 304 stainless steel for highly corrosive environments. Contact Technical Services for details.

## Typical Diked Area AFM Installation



**Note:** Pipe and fittings downstream from AFM will typically be threaded, welded, grooved, or flanged.

Model	Length A	Inlet Flange 150 lb ANSI B	Outlet Pipe Size NPT C	Minimum Pipe Size Downstream D
AFM-170	11 1/4 in. (286 mm)	3 in.	3 in.	6 in. (152 mm)
AFM-330	12 7/8 in. (327 mm)	4 in.	4 in.	8 in. (203 mm)
AFM-550	15 5/16 in. (389 mm)	6 in.	6 in.	10 in. (254 mm)

## Flow Range – Model AFM

The flow rate of the foam maker is determined by the orifice size and the inlet pressure. The flow ranges listed in the following table are based on 40 psi (2.76 bar) using the smallest orifice for the minimum flow and 100 psi (6.9 bar) using the largest orifice for the maximum flow.

Model	Flow Range	K-Factor Range
AFM-170	94 gpm to 279 gpm (356 Lpm to 1056 Lpm)	14.9 to 27.9
AFM-330	183 gpm to 610 gpm (693 Lpm to 2309 Lpm)	28.9 to 61.0
AFM-550	350 gpm to 980 gpm (1325 Lpm to 3709 Lpm)	55.3 to 98.0

To determine flow rates for specific applications and proper orifice sizing, consult Johnson Controls Technical Services.

## 3x3 AR-AFFF (A336 USCG) Fuel Specific Design Criteria

Description	Fuel	Orifice Diameter (In.)	Inlet Pressure (psi)
FLR-30	Hydrocarbons	0.251	50 - 150
FLR-30	Carboxylic Acids, Tert Butyl Alcohol (TBA), Gasoline/Mtbe (82.2%/17.8%)	0.251	100
FLR-30	Alcohols, Ethyl Alcohol, Methyl Alcohol, Ketones, Esters	0.251	100 - 150
FLR-30	Hydrocarbons	0.550	50 - 150
FLR-90	Methyl Ethyl Ketone (MEK)	0.547	120
FLR-90	Hydrocarbons	0.550	50 - 150
FLR-90	Methyl Alcohol	0.550	100
FLR-90	Ethyl Alcohol	0.550	100 - 150
FLR-90	Alcohols, Ketones, Carboxylic Acids, Tert Butyl Alcohol (TBA), Esters, Gasoline/Mtbe (82.2%/17.8%)	0.550	150
FLR-90	Hydrocarbons	0.900	100 - 150

## Ordering Information

Flow and pressure at the inlet of the device must be specified at the time of order.

Part No.	Description	Approximate Shipping Weight	
		lb	(kg)
75401	AFM-170, CR Epoxy Red	15	(7)
75402	AFM-330, CR Epoxy Red	25	(11)
75403	AFM-550, CR Epoxy Red	35	(16)
75615†	FLR-30 Foam Maker	5	(2)
75633†	FLR-90 Foam Maker	13	(6)
415829	AFC-90 FLR Chamber, CR Epoxy Red	40	(18)

† UL Listed and USCG Approved

**Note:** The converted metric values in this document are provided for dimensional reference only and do not reflect an actual measurement.

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