

Flameout Design and Fabrication LLC

1701 Brittmoore
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FTPS TYPE II FOAM CHAMBERS



Description

The Flameout FTPS Type B Foam Maker and Foam Chamber is designed to introduce expanded foam directly onto the surface of a flammable or combustible liquid for fire extinguishment and/or vapor suppression. Classified as a Type II discharge device in accordance with NFPA Standard 11, foam chambers deliver low expansion foam directly onto the fuel surface via a reverse action deflector plate causing tank cooling first and then spreads over fuel with little to no foam submergence or fuel agitation. Eliminating submergence and agitation increases the effectiveness of the foam blanket, resulting in more efficient operation, and superior extinguishing capabilities. FTPS foam chambers have the added advantage of directing all their flow directly onto the product surface and all components remain below the tank roof line, for the most effective utilization of foam resources. Foam chambers have a long history of timely and safe control of numerous incidents. Foam chambers are compatible with all types of foam concentrate; protein, fluoroprotein, FFFP, AR-FFFP, AFFF, and AR-AFFF. They are generally installed on the side wall of vertical storage tanks above the maximum product level. Piping coupled to the unit can be linked to a fixed foam proportioning system, or terminated a safe distance from the tank, where foam solution can be delivered via Flameouts Balanced Pressure mobile fire apparatus or portable foam proportioning equipment.

Features

- Four Sizes
- Superior Foam Quality
- Operates at 30 PSI (2.1 bar) minimum
- Tool Free Maintenance
- Corrosion Resistant Finish

Operation

FTPS Type B Foam Chambers produce foam by introducing air into the foam solution stream. Foam solution can be delivered to the foam chamber in a variety of ways as previously noted. The inlet of the foam maker is fitted with a factory installed high efficiency Venturi Jet which is designed to draw air into the foam solution stream. The high efficiency jet produces superior quality foam, and results in operating pressures 25% lower than previously possible, now as low as 30 PSI (2.1 bar). Air is drawn into the foam maker through a series of annular holes located around the integral foam maker. To prevent obstruction, the air inlet holes are protected by a stainless steel screen selected with a perforation size designed to exclude most known nesting birds and insects. The open area of the screen is designed to be no less than the total area of the foam maker air inlet

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holes. The aerated foam solution then passes through a series of precisely designed agitation mesh devices which maximize foam expansion, and enhance drainage time. The expanded foam then passes into the foam chamber body which is designed to further enhance expansion, and reduce the velocity of the foam stream prior to discharge onto the product tank wall and then the surface. The foam chamber is fitted with a vapor seal located at the inlet to the discharge pipe connected to the storage tank. The vapor seal prevents the escape of product vapors into the atmosphere and/or foam system piping. The easily accessible location of the vapor seal in the discharge piping, also prevents the escape of product into the foam chamber in the event of an overflow situation. The flow of expanded foam ruptures the vapor seal at a predetermined pressure, allowing the foam to enter the tank. As the foam exits the foam chamber, it impacts the deflector which is designed to direct the flow against the wall of the tank to reduce the amount of foam submergence into the product, as well as dispersing it to each side for more complete coverage.

Specifications

The entire assembly shall consist of the foam chamber body with integral foam maker; factory installed integral Venturi style jet, deflector, deflector mounting hardware, and gaskets. A lifting lug designed to support the weight of the assembly can be provided. The foam deflector shall be integral, and shall not require bolting. The foam chamber body shall contain a API rupture disc vapor seal positioned to prevent condensation and product vapors from entering the foam chamber body. The vapor seal shall be designed to rupture with a minimum inlet pressure of 30 PSI (2.1 bar) at the inlet to the foam chamber and shall withstand a maximum back pressure of 1.0 PSI (0.07 bar), or equal to 27 in. (686 mm) of water, as specified by API for welded storage tanks. The vapor seal is fabricated of graphite with a Teflon seal and is compatible with a wide range of corrosive chemicals. The vapor seal shall be a fully self-contained disc and shall not require adhesives, sealants, or loose gaskets to accomplish sealing. The vapor seal shall be held in place by a carbon steel holder. Access to the vapor seal shall be accomplished through a removable top cover, without the need to remove retaining nuts. All nuts shall be designed to be captive to prevent loss. All cover and vapor seal retaining hardware shall consist of stainless steel studs and nuts to seizing, and corrosion. All carbon steel parts shall be abrasive blasted and coated with a polyester powder finish. The foam maker and foam chamber shall meet U.L. Listed and ABS for operation as low as 30 PSI (2.1 bar). It shall be possible to test the foam maker and foam chamber assembly by removing the lid or back panel (special order). Testing shall be accomplished with the vapor seal installed, and without damaging the seal. During testing the vapor seal shall prevent test solution from entering the storage tank. No external sealing devices shall be necessary to accomplish testing. A drain shall be provided in the bottom of the foam chamber to allow for draining of the test solution. The drain shall be operable without tools.

Certification and Testing

All Flameout foam chambers are tested to UL 162 and are have 3rd party inspection and listing as defined by NFPA 11 (ABS, SWRL {ongoing})

Vapor Seal Ordering Information

Vapor Seal Kits are available with or without the holder.

Vapor Seal Kit Vapor Seal Kit Size without Holder with Holder

FTPS-50.....	FO-08-VS50.....	FO-08-VS50-1
FTPS-80.....	FO-08-VS80.....	FO-08-VS50-1
FTPS-100.....	FO-08-VS100.....	FO-08-VS50-1
FTPS-150.....	FO-08-VS150.....	FO-08-VS50-1

Selection

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FTPS type B Foam Makers and Foam Chambers are available in four sizes to suit most requirements. Consult Flameout, and the applicable design standards and local codes to determine the required flow rate for the application. The foam maker can be sized to provide any flow and pressure that falls within the operational limits of the foam maker. To select the correct size of foam maker, see the flow range charts on page 3, which show the operational limits of each foam maker. If the flow rate falls within the range of more than one unit, either size may be utilized. To determine the correct orifice, you must determine the design flow required and the available pressure at the foam maker inlet.

Generally, the higher the operating pressure, the better the quality of the foam produced. The better the foam quality, the more efficient the operation, therefore, it is beneficial to utilize the highest operating pressure economically feasible. After the flow and pressure have been determined, they can be plugged into the formula shown on page 3 to determine the actual orifice size required. Once the orifice size is determined, confirm that it falls within the orifice range shown for the selected size of foam maker. The required flow rate and inlet pressure must be specified when ordering. Deflectors are integral with the foam chamber design and can be specified to length.

The deflector is designed to accommodate most installations, and is automatically installed in the correct position from outside the tank when the chamber is attached. Shallow deflectors are intended for use when the tank is fitted with a floating roof which may pass over the deflector, minimizing possible damage to the roof seals.



FTPS-150 after chemical coating

Materials of Construction

Body.....	Carbon Steel
Jet/Receiver.....	Stainless Steel
Integral Deflector.....	Stainless Steel
Drain Assembly.....	Brass
Flange Gaskets.....	High Temp. Synthetic Fiber w/ Nitrile or EPDM Binders
Vapor Seal Disk.....	Teflon Coated Graphite
Vapor Seal Holder.....	Carbon Steel
Vapor Seal Gaskets.....	Teflon
Wing Nuts.....	Brass w/ SS Washer
Internal Studs and Nuts.....	Aluminum Bronze
Air Strainer.....	Stainless Steel

Finish:

Foam Chamber Body.....Abrasive blast to SSPC-SP6 and Deflector Chemical wash, rinse and seal. Powder Coat

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All Other Components.... Natural Finish

Ordering information

FTPS-50.....	FO-08-FTPS-50
FTPS-80.....	FO-08-FTPS-80
FTPS-100.....	FO-08-FTPS-80
FTPS-150.....	FO-08-FTPS-80

When ordering please supply the following information: tank identification, tank size and type, product being stored, flow and inlet pressure at each foam chamber, deflector length, foam concentrate type, and percentage of concentration.

The following are the maximum and minimum jet sizes for each foam maker size and the K factor for each jet.

FTPS-50 (C = 0.920) English Metric

Smallest Jet ---- 0.504" (12.8016 mm) Dia. 38.1 GPM.....@..... 30 PSI 144.4 LPM.....@..... 2.068 BAR

49.1 GPM.....@.....50 PSI 185.9 LPM.....@.....3.447 BAR
62.2 GPM.....@.....80 PSI 235.5 LPM.....@.....5.516 BAR
69.6 GPM.....@.....100 PSI 263.6 LPM.....@.....6.895 BAR

Largest Jet ----- 0.760" (19.3040 mm) Dia. 86.7 GPM.....@..... 30 PSI 328.3 LPM.....@..... 2.068 BAR

111.8 GPM.....@.....50 PSI 423.2 LPM.....@.....3.447 BAR
141.6 GPM.....@.....80 PSI 536.0 LPM.....@.....5.516 BAR
158.4 GPM.....@.....100 PSI 599.4 LPM.....@.....6.895 BAR

FTPS-80 (C = 0.870)

Smallest Jet ---- 0.721" (18.3134 mm) Dia. 73.8 GPM.....@..... 30 PSI 279.4 LPM.....@..... 2.068 BAR

95.2 GPM.....@.....50 PSI 360.4 LPM.....@.....3.447 BAR
120.5 GPM.....@.....80 PSI 456.1 LPM.....@.....5.516 BAR
134.8 GPM.....@.....100 PSI 510.2 LPM.....@.....6.895 BAR

Largest Jet ----- 1.051" (26.6954 mm) Dia..... 156.9 GPM.....@..... 30 PSI 593.8 LPM.....@..... 2.068 BAR

202.4 GPM.....@.....50 PSI 766.1 LPM.....@.....3.447 BAR
256.2 GPM.....@.....80 PSI 969.8 LPM.....@.....5.516 BAR
286.4 GPM.....@.....100 PSI 1084.1 LPM.....@.....6.895 BAR

FTPS-100 (C = 0.973)

Smallest Jet ---- 0.980" (24.8920 mm) Dia..... 152.5 GPM.....@..... 30 PSI 577.4 LPM.....@..... 2.068 BAR

196.8 GPM.....@.....50 PSI 745.0 LPM.....@.....3.447 BAR
249.0 GPM.....@.....80 PSI 942.6 LPM.....@.....5.516 BAR
278.5 GPM.....@.....100 PSI 1054.1 LPM.....@.....6.895 BAR

Largest Jet ----- 1.530" (39.8620 mm) Dia..... 371.8 GPM.....@..... 30 PSI 1407.3 LPM.....@..... 2.068 BAR

479.6 GPM.....@.....50 PSI 1815.5 LPM.....@.....3.447 BAR

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607.0 GPM.....@.....80 PSI 2297.7 LPM.....@.....5.516 BAR
678.8 GPM.....@...100 PSI 2569.4 LPM.....@.....6.895 BAR

FTPS-150 (C = 0.880)

Smallest Jet ----- 1.457" (37.0078 mm) Dia..... 304.9 GPM.....@..... 30 PSI 1154.2 LPM.....@.... 2.068 BAR

393.6 GPM.....@.....50 PSI 1489.9 LPM.....@.....3.447 BAR
497.9 GPM.....@.....80 PSI 1884.7 LPM.....@.....5.516 BAR
556.7 GPM.....@...100 PSI 2107.4 LPM.....@.....6.895 BAR

Largest Jet ----- 1.987" (50.4698 mm) Dia..... 567.1 GPM.....@..... 30 PSI 2146.7 LPM.....@.... 2.068 BAR

731.6 GPM.....@.....50 PSI 2769.4 LPM.....@.....3.447 BAR
926.0 GPM.....@.....80 PSI 3505.2 LPM.....@.....5.516 BAR
1035.4 GPM...@...100 PSI 3919.4 LPM.....@.....6.895 BAR