



DESIGN DATA

FOAM CHAMBER

1. PRODUCT NAME

Viking Foam Chamber
 Model VFC-2
 2" supply water way
 Model VFC-4
 2 1/2" supply water way
 Model VFC-8
 3" supply water way
 Model VFC-15
 4" supply water way

2. MANUFACTURER

The Viking Corporation
 210 N. Industrial Park Road
 Hastings, Michigan 49058 U.S.A.
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3. PRODUCT DESCRIPTION

The Viking Models VFC-2, VFC-4, VFC-8, VFC-15 Foam Chambers are fixed system end of line Type II foam application devices designed to be installed on the upper side of large flammable liquid storage tanks above the maximum liquid level to provide fixed system extinguishment of flammable liquid fires either on the interior of the tank (fixed cone roof tanks) or at the tank seal (floating roof tanks). Viking Foam Chambers can be installed with automatic system supplies or portable supply methods.

4. TECHNICAL DATA

Listings and Approvals

VFC-2
 UL Listed and FM Approved
 VFC-4
 UL Listed and FM Approved
 VFC-8
 UL Listed and FM Approved
 VFC-15
 UL and FM both Pending

Material Standards

Chamber: Carbon Steel
 Foam Maker: Carbon Steel
 Jet Receiver: Stainless Steel
 Air Strainer: Stainless Steel
 Deflector: Carbon Steel
 Vapor Seal: Aluminum Foil/Non-Asbestos

Fasteners: Stainless Steel/Brass
 Inlet Orifice: Stainless Steel

Finish

Foam Chamber Interior:
 Coal Tar Epoxy
 Foam Chamber Exterior:
 Abrasive Blast to SSPC-SP6
 Epoxy Primer
 Polyurethane Red Paint

All other components:
 Natural finish

Shipping Weights

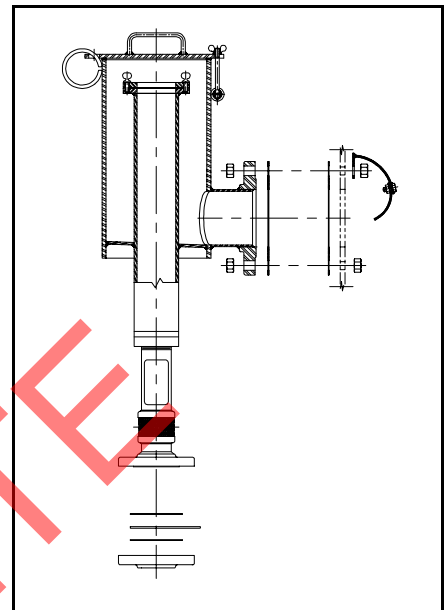
VFC-2:
 VFC-4:
 VFC-8:
 VFC-15:

5. FEATURES

- A. Self draining outlets to prevent accumulation of moisture and freezing.
- B. Swing away bolts and hangar lid to facilitate inspection and vapor seal replacement.
- C. Industrial grade replaceable gasketed foil vapor seal to prevent fuel vapor from entering fixed piping system. No sealant required.
- D. Split deflector assembly to aid in retro-fit tank installations.
- E. Mounting Companion flange for easy mounting of foam chamber to tank wall. (Optional)
- F. Steel foam chamber assembly with epoxy coated primer and polyurethane exterior finish.
- G. Integral foam maker at inlet side of foam chamber assembly.
- H. Stainless steel air strainer at base of foam chamber assembly for aeration of foam/water solution.
- I. Orifice plate sized for foam/water solution flow rate and pressure utilized. Includes tab and inside bolt alignment.

6. AVAILABILITY AND SERVICE

Viking foam chambers are available through a network of domestic and international distributors, see the Yellow Pages of the telephone directory for closest distributor (listed under "Sprinklers Automatic Fire") or write to The Viking Corporation, Hastings, Michigan USA 49058



7. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

8. INSTALLATION AND OPERATION

The foam/water solution is provided in a "pre-mix" condition through either an automatic or mobile proportioning system. **The foam chamber does not proportion foam concentrate into the water stream.** The Viking foam chamber discharges foam/water solution indirectly at a burning liquid by deflecting the foam/water solution at the interior tank wall. Foam/water solution then falls to the burning liquid through gravity and covers the surface of the liquid creating a vapor barrier to extinguish the fire. Foam/water solution applied to the interior tank wall provides cooling to the metal surface which helps prevent possible re-ignition of the fuel vapor.

- 1. The foam/water solution supply provided to Viking foam chambers must be continuous, clean, and obstruction free.
- 2. Viking foam chambers should be installed with adequate clearance and be protected from physical damage. Adequate space should



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be maintained for maintenance and inspection. Foam chambers are a deluge system device and should be provided with adequate shutoff capabilities while adjustment or maintenance is being performed.

3. The type of tank (fixed cone roof or floating roof top design) should be considered prior to installation of the foam chamber to the tank. Foam chamber backboards may be required on some floating roof top tanks, the tank erector or supplier should be consulted for installation considerations. Installation requirements of foam chambers are found in NFPA 11, The Standard for Low-Expansion Foam.
4. The foam chamber deflector is to be installed on the interior or storage side of the storage tank. The deflector is to be mounted on threaded through rods which are secured with hex nuts (provided by contractor) that extend through the tank wall from the mounting flange. Mounting flange is to be "two holed" so deflector and foam chamber will be mounted level and plumb.
5. The foam chamber is to be installed on the through rods (provided by contractor) that extend from the tank interior, through the tank, through the mounting flange, and are exposed to the exterior tank shell. The foam chamber is to be secured with hex nuts (provided by contractor) tightened to the back side of the discharge flange. Through rods and hex nuts are to be sized the same as the mounting flange bolt holes.
6. Foam chamber inlet is to be mounted to a compatible piping flange. Piping to monitor base should be self-supporting and installed in accordance with NFPA 11.
7. The foam chamber orifice plate is to be installed between the inlet flange and the supply piping flange. Orifice plate gaskets are to

be installed against the inlet flange and the supply piping flange. The orifice plate has a knife-edged or tapered edge orifice, the flat side of the orifice plate is to be installed facing the supply piping flange. Orifice plates are identified as to their size by numeric values indicated on the face of the orifice plate. Prior to installation of orifice plate, verify the size of the orifice plate for the specific range of flows and pressures of the orifice plate for a given size foam chamber. Also see specific sizing guidelines in NFPA 11.

9. TESTING AND MAINTENANCE

It is imperative that the system be inspected and tested on a regular basis. This is the owners' responsibility.

1. System piping is to be hydrostatically tested as prescribed in NFPA 11, The Standard for Low-Expansion Foam.
2. A vapor seal is provided with Viking Foam Chambers. Installation of this vapor seal is of utmost importance. The vapor seal is to be installed to prevent flammable or combustible vapors from traveling back through the fixed piping network. The vapor seal acts as a check valve or barrier between the flammable liquid vapor and system piping.
3. To replace or install the vapor seal, the foam chamber cover must be removed. Inside the foam chamber, a vapor seal assembly is centrally located. Remove the turn-down screws from the retaining ring of the vapor seal assembly. Place the industrial grade foil vapor seal with integral gaskets on the vapor seal base. Align the vapor seal retaining ring through holes with the threaded holes in the vapor seal assembly base. Secure assembly with thumb screw. Thumb-down screws should be tightened evenly and securely. After vapor seal is in place, replace

foam chamber cover with integral rubber gasket and fasten cover to foam chamber assembly.

4. Foam chamber supply piping is to be flushed in accordance with NFPA 11, The Standard for Low-Expansion Foam, after use.
5. The vapor seal is to be replaced after foam chamber has been flowed. Additional vapor seals can be purchased through a network of domestic and foreign distributors. Indicate the model of the foam chamber or the inlet flange size to order the correct foam chamber vapor seal.
6. Discharge outlet and deflector of foam chambers installed on floating roof tanks or where discharge outlet and deflector are exposed to atmospheric conditions, should be periodically inspected for nests, hives, and other non-man made obstructions. If any obstruction exists, remove obstruction and check that discharge path is clear.
7. The air screen is to be inspected for obstruction of air inlet holes. If any obstruction exists, remove obstruction and flush as necessary. The air strainer is oversized to prevent obstruction from nesting.

10. SELECTION

Viking Model VFC Foam Chambers are available in four (4) sizes. Refer to the Viking Foam Design Data Book and listed approval capacities per fuel being protected. Also refer to design standards and local code requirements for determination of required flow rates for application and quantity of chambers for tank diameters of surface. For each size chamber, orifice size is determined by flow and available inlet pressure. Also, listings determine minimum and maximum pressure at various orifice sizes for fuels other than hydrocarbon. See chart for foam chamber flow capacities and orifice "c" factors.



**VIKING FOAM CHAMBER PERFORMANCE
Foam Chamber Capacities**

Model	Orifice Diameter Min. / Max.	Minimum Flow GPM ³	Maximum Flow GPM ²	C Factor for Sizing
VFC-2	0.510 / 0.760	27	123	0.64
VFC-4	1.721 / 1.050	53	232	0.63
VFC-8	0.984 / 1.531	117	486	0.64
¹ VFC-15	1.491 / 1.803	228	682	0.63

¹UL & FM Listings and Approvals Pending

²Maximum flow based on largest orifice and maximum Listed pressure of 125PSIG.

³Minimum flow based on smallest orifice and minimum Listed pressure of 30 PSIG.

Sizing of Inlet orifice shall be done after determination of protected area Ft. Sq. and application density gpm/ft. sq. (see foam and fuel listings. Refer to standards for minimum quantity of chambers per tank diameter. Knowing the available pressure, required flow rate per each foam chamber, calculate the orifice diameter using the following formula:

$$D = (Q / (29.8) (C) (P \text{ exp } 1/2)) \text{ exp } 1/2$$

D = Orifice diameter inches

C = Orifice Plate C Factor

P = Available inlet pressure at foam chamber (take into account height to chamber inlet)

Q = Flow rate required GPM

Viking and 3M Foams Listed with Viking Foam Chambers

Viking Foam Concentrate	3M Foam Concentrate	Fuel	Minimum Application Rate GPM / sq. ft.
VF3AFF 3%	FC783F 3%	Hydrocarbon	0.10
VF3AFF-MS 3%	FC203CF 3%	Hydrocarbon	0.10
VF3ARC 3%	FC603F 3%	Hydrocarbon Alcohol	0.10 0.20
SUPREME-3 3%	ATC603 3%	Hydrocarbon Alcohol	0.10 0.13
-----	FC602 6%	Alcohol	0.20