Installation & Maintenance

Foam Chambers

WHEN WORKING AT HIGH LEVELS, ENSURE THAT ALL FALL PROTECTION PROCEDURES HAVE BEEN IMPLEMENTED.

Please read through this manual before starting any installation. Any flow rates discussed are displayed in U.S. GPM.

In accordance with NFPA 11:

**TYPE I Discharge Outlet**: An approved discharge outlet that will conduct and deliver foam gently onto the liquid surface without submergence of the foam or agitation of the surface.

**TYPE II Discharge Outlet**: An approved discharge outlet that does not deliver foam gently onto the liquid surface but is designed to lessen submergence of the foam and agitation of the surface.

Chemguard Foam Chambers and Foam Makers are approved Type II discharge devices which are designed to lessen submergence of the foam and agitation of the flammable liquid surface. They are suitable for use with all low expansion foam concentrates, i.e. Protein, Fluoroprotein, FFFP, AFFF and AR-AFFF.

**FOAM CHAMBERS**

Foam Chambers are typically used as part of a fixed or a semi-fixed surface application fire protection system on exterior fixed cone roof or on internal floating roof storage tanks.

When correctly installed, the foam chamber has a foam deflector mounted on the inside of the tank wall. When the system is activated, the expanded foam mass discharges from the foam chamber and flows against the deflector, which diverts the expanded foam back against the inside wall of the tank.

There are two types of deflectors used in conjunction with foam chambers: the split deflector and the solid deflector.

The number of foam chambers required for any fixed or semi-fixed fire protection system is based on the diameter of the storage tank to be protected.

**Number of Foam Discharge Outlets required:**

<table>
<thead>
<tr>
<th>Tank Diameter</th>
<th>Minimum Number Of Discharge Outlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>Meters</td>
</tr>
<tr>
<td>Up to 80</td>
<td>24</td>
</tr>
<tr>
<td>Over 80 to 120</td>
<td>24 to 36</td>
</tr>
<tr>
<td>Over 120 to 140</td>
<td>36 to 42</td>
</tr>
<tr>
<td>Over 140 to 160</td>
<td>42 to 48</td>
</tr>
<tr>
<td>Over 160 to 180</td>
<td>48 to 54</td>
</tr>
<tr>
<td>Over 180 to 200</td>
<td>54 to 60</td>
</tr>
</tbody>
</table>

For tanks over 200' Diameter (60 m.) it is suggested that for each 5,000 sq. ft. (465 sq. m) of liquid surface, one additional discharge outlet is added.

PLEASE, review the Chemguard data sheet for FOAM CHAMBERS. This data sheet will supply the necessary information, to enable the size and flow rate of the chambers required to be selected.

The foam solution design application rate is to be at least .10 gpm/sq. ft. of flammable liquid surface area on tanks containing liquid hydrocarbons.

Storage tanks containing water-miscible/polar solvent type flammable or combustible liquids, which are normally destructive to regular foams, require the use of special AR-AFFF type foam solutions. In most cases, the recommended application rate will be higher than the .10 gpm/sq. ft. as used on tanks containing liquid hydrocarbons. Please check with the engineering department at Chemguard for the recommended application rate. The duration of discharge can vary from 30 minutes to 55 minutes. This is dependent on the type of flammable liquid being held in the storage tank.

**INSTALLATION**

The Foam Chamber is normally mounted vertically...
on the cone roof storage tank wall shell just below the roof joint or approximately between 8" to 12" down from the roof joint to the center point of the foam chamber outlet. The Chemguard Model FC2.50 is mounted approximately 8" down from the roof joint where as the model FC6.00 is mounted approximately 12" down from the roof joint.

When the Foam Chamber is mounted correctly, the internal glass seal of the chamber will be just slightly higher in elevation than the roof joint on the storage tank.

The Foam Chamber inlet and outlet are standard flat-faced flanges. Refer to the Foam Chamber data sheet for the correct size inlet and outlet flanges on the selected foam chamber.

If the storage tank is of new construction and the foam deflector can be installed from inside the tank, a solid deflector is normally used. This style deflector can either be bolted or welded to the inside wall of the storage tank so that the deflector covers the foam discharge port from the foam chamber. If bolted, the studs / bolts holding the solid deflector in place can be used for the mounting of the foam chamber onto the outside wall of the tank.

The split deflector is used where the installation of the foam chamber/deflector cannot be carried out from the inside of the storage tank. The split deflector allows for insertion of half of the deflector through the flange opening in the sidewall of the tank and mounted to existing studs or the studs from a mounting pad that protrude through the tank wall into the tank. When attached to the tank, the second half of the split deflector can then be passed through the flange opening in the tank wall and bolted to the other half of the deflector. Once the split deflector is correctly mounted, covering the foam discharge port, the foam chamber can then be bolted onto the studs on the other side of the mounting pad or to existing studs that go through the tank wall and hold the split deflector in place.

**IMPORTANT**

PLEASE ensure that after the installation of the foam chamber(s) and before placing in service, that the glass seal inside of the foam chamber is in place. This seal will prevent any vapors from escaping from inside the storage tank down through the foam chamber piping. In the event of an accidental overfill, the glass seal will prevent product from escaping down the foam chamber piping. When there are two or more foam chambers mounted on a storage tank, they are to be equally spaced around the tank periphery and each foam chamber outlet should be sized to deliver foam solution at approximately the same application rate.

Each individual foam chamber is to have its own individually valved lateral riser feed pipe that terminates at a safe distance from the tank and outside of any dike area.


At the inlet to the foam chamber, an orifice is sized to be able to pass the necessary required flow rate in gpm at the residual foam solution pressure that is available at the chamber inlet. A minimum of 40 psi to a maximum of 125 psi must be available at the inlet flange into the foam chamber for this discharge device to work correctly.

In accordance with NFPA 11, supplementary fire protection must also be supplied. This is in addition to any fixed system that is installed on the storage tank(s). The supplementary protection can either be portable monitors, towers or hand hose line devices. When handline application devices are used, they must have a minimum foam solution flow rate of 50 gpm. The number of handlines required is dependent on the diameter of the storage tank being protected.

<table>
<thead>
<tr>
<th>Diameter of Largest Tank</th>
<th>Number of Handlines Required</th>
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</thead>
<tbody>
<tr>
<td>Up to 65 ft.</td>
<td>1</td>
</tr>
<tr>
<td>65 ft. to 120 ft.</td>
<td>2</td>
</tr>
<tr>
<td>Over 120 ft.</td>
<td>3</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Duration of Discharge of Handline(s)</th>
<th>Diameter of Largest Tank</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 min.</td>
<td>Up to 35 ft.</td>
</tr>
<tr>
<td>20 min.</td>
<td>35 ft. to 95 ft.</td>
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<tr>
<td>30 min.</td>
<td>Over 95 ft.</td>
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**MAINTENANCE**

Chemguard designed and manufactured Foam Chambers are built to give many years of problem
free service. However, like any item of emergency equipment, it is recommended that the following maintenance procedures be carried out on an annual basis.

**FOAM CHAMBERS**

- Remove the foam chamber lid.
- Check that the glass seal is intact.
- Check the inside of the chamber foam expansion area for any debris, bird nests, etc. that could hinder performance.
- Remove the glass seal and look down the main inlet pipe of the chamber to make sure that the pipe is free from any foreign material.
- Check the screen around the air inlet ports and make sure that it is still in place and intact.

- Inspect the complete foam chamber to ensure no corrosion that could affect the performance of the chamber in an emergency.
- Check to see that the glass seal is correct and scored on one side to the correct depth. (Chemguard can supply spare glass seals.)
- If possible, block off the discharge from the chamber into the storage tank and flow test the chamber(s) to ensure the system will work as designed. After the foam solution has been discharged, flush the system with water.
- Replace the glass seal in the chamber with the scored side of the seal facing up.
- Replace the lid on top of the chamber.

![Foam Chamber Topside Application on Cone Roof Tank](image)