

Monday, May 15, 2017

# Medium and High Pressure Steam Vented Flash Tank Trim

Monday Morning Minutes | by Norm Hall, May 15, 2017

The last R. L. Deppmann Monday Morning Minutes (MMM) article described the difference between horizontal and vertical high-pressure condensate flash tanks. Once a decision is made between the horizontal and vertical orientation, the engineer must select the trim and show the installation detail. This week's MMM will help with the decisions for a vented flash tank.

## Horizontal vented Flash Tank Trim.

In the example below, a Celine model H80FST flash tank was selected by the online sizing program.

**SPECIFICATION OPTION 1:** The tank has a 150 PSIG working pressure and carries the ASME label, which is critical for pressure vessels within commercial and institutional buildings. This is listed as an option but may be required by most codes and is strongly recommended.

**SPECIFICATION OPTION 2:** Notice the drawing shows an inlet sparge tube. A sparge tube is a piece of pipe with multiple holes precisely drilled to allow the condensate to enter under the water across the length of the tank. This gives an even distribution of both the condensate and the flash steam within the tank. Be sure your specification includes this.

**SPECIFICATION OPTION 3:** The right side of the drawing shows a drop leg for the outlet of the cooled condensate. The condensate outlet is located above the inlet



to provide a water level, that insures that the condensate always enters below the water line. Without a drop leg, the water leaving the tank would be very hot, as it would trickle out at the flash steam to water barrier. The drop leg assures that the condensate leaving the tank is cooler. This protects the low-pressure return system from excessive flash steam that the return line may not be sized to handle.

SPECIFICATION OPTION 4: The drawing below also shows a handhole for inspection and clearing of debris. The handhole is not available on very small tanks. I rarely use this option since the tank is rarely inspected, if at all.

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### FST - Flash Tanks

**TECH INFO**

**SIZING**

**FST Sizing Data**

FST Input Data

FST Options

Drawing & Specification Viewer

BROCHURES

**Step 1:**  
Select Desired Configuration

Horizontal - Horizontal flash tanks are based on flashing from the surface of a pool of water. The surface flashing requires a larger tank.

Vertical - Vertical flash tanks use a cyclone effect to separate the flash from the condensate. These flash tanks require a smaller tank.

**Step 2:**  
Enter the #/Hr of Condensate

3700 (Range: 0 - 30000 #/Hr)

**Step 3:**  
Enter the Initial Pressure

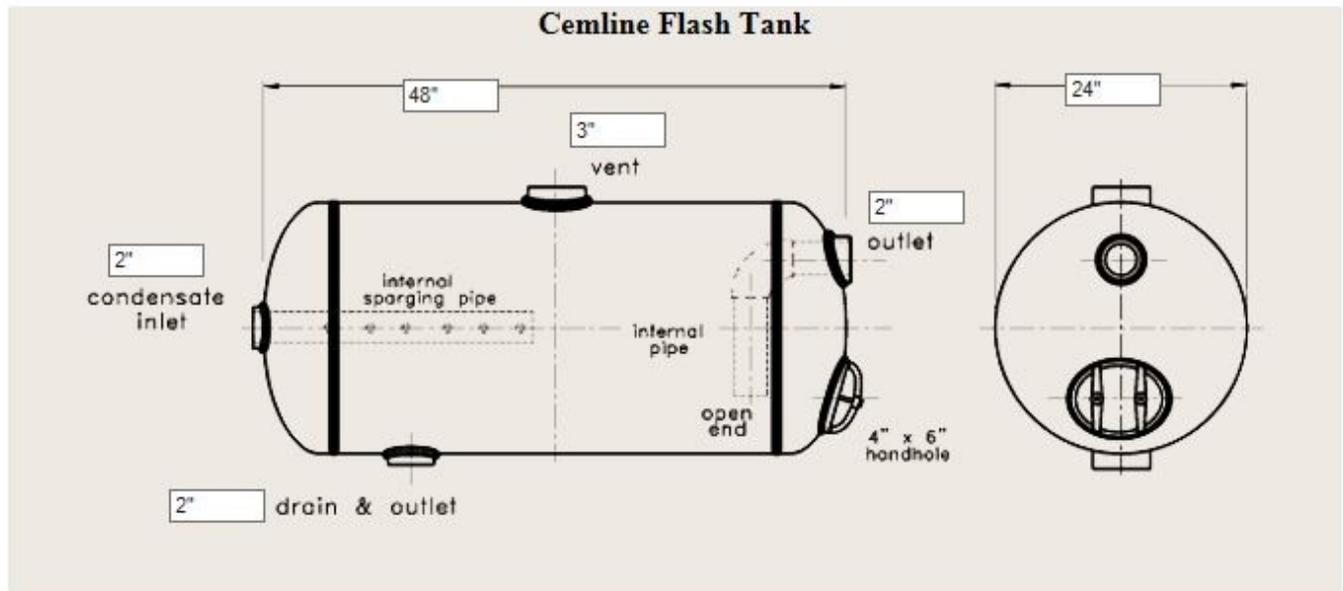
60 PSIG (Range: 0 - 160 PSIG)

**Step 4:**  
Enter the Flash Pressure

0 PSIG (Range: 0 - 100 PSIG)

Model Number: H80FST Percent Flash: 9.9

Model Number: H80FST Percent Flash: 9.9



## Vertical Vented Condensate Flash Tanks

The last MMM article described the difference in the principles of operation of vertical tanks when compared with horizontal tanks. Since they use a different principle, less optional trim is available.

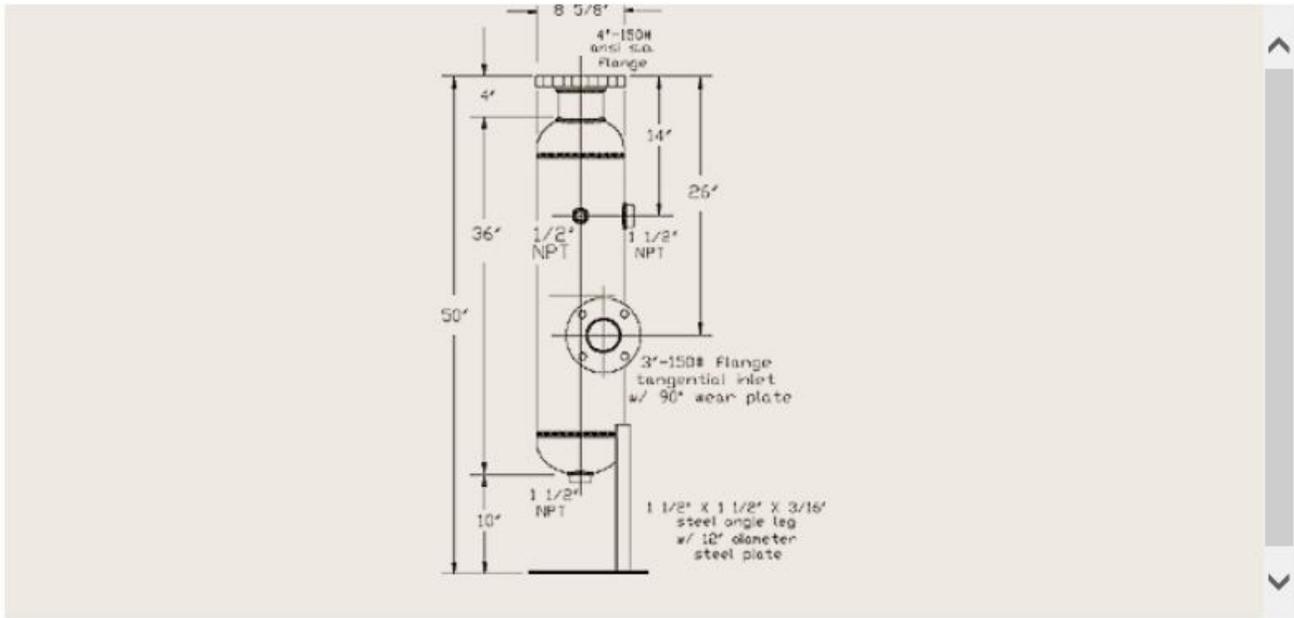
**SPECIFICATION OPTION 1:** These tanks should also carry the ASME label as mentioned above.

**SPECIFICATION OPTION 2:** Vertical tanks operate on the centrifugal action caused by the tangential inlet. This inlet is critical to the correct operation and separation of steam and condensate. As hard as it is to believe, some lower priced manufacturers will provide a vertical tank without this key option. Make sure you specify it and get it on your flash tanks.

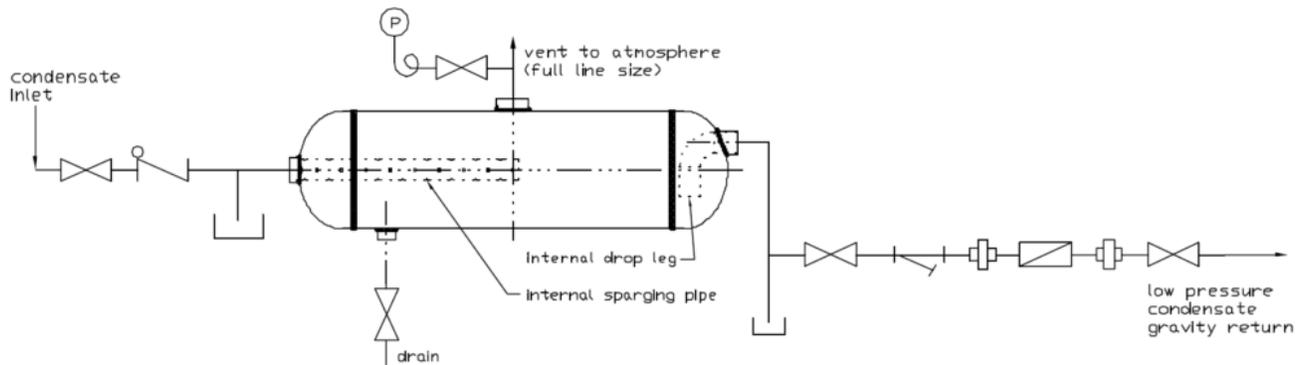
**SPECIFICATION OPTION 3:** The installation of these tanks requires some sort of structure to hold them. Since this is an ASME tank with a National Board number, the average welder cannot simply weld supports to the tank without voiding the ASME label and associated insurance. Support legs are provided when specified, so the engineer should make sure the drawings detail the legs. The height of the legs in this example is 10" and the steam float and thermostatic trap must be located below the outlet. If additional height is needed, the engineers can work with R.L. Deppmann or

their local representative to make sure the CAD drawing and specification align to these needs.

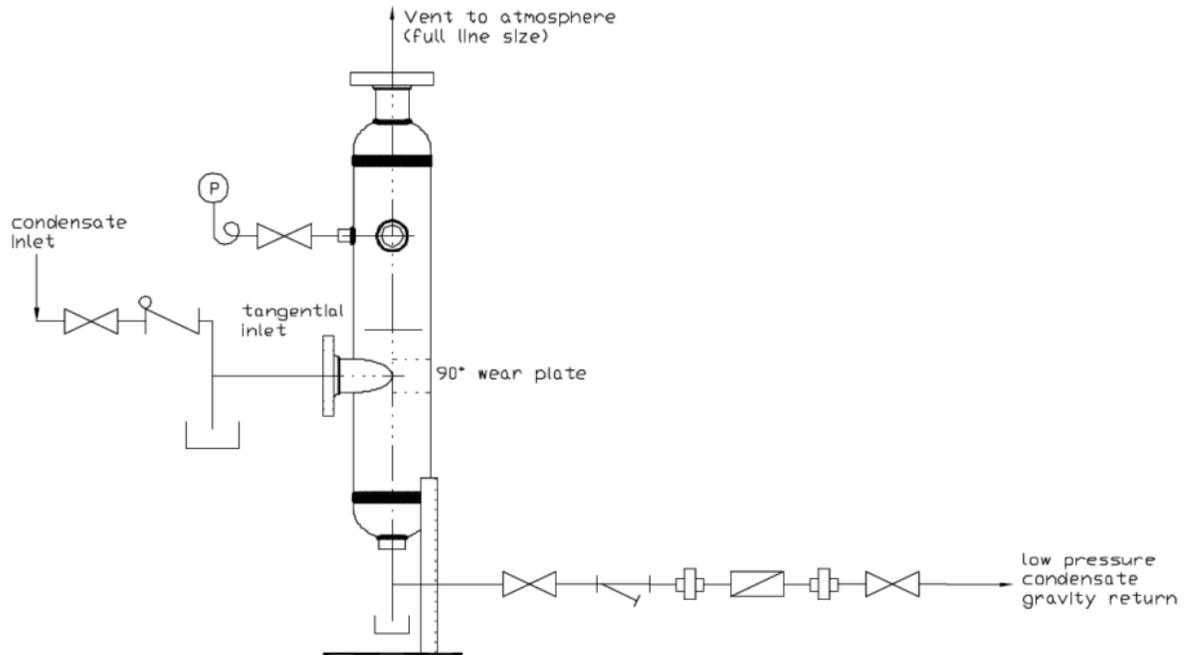
Model Number: V8FST Percent Flash: 9.9



## Vented Steam Flash Tank Installation



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The installation drawings for both tanks are shown above. The outlet float and thermostatic traps should refer to your standard details. There should be 14" of pipe below the outlet if your selections are based on ½ PSIG trap pressure drop. This can be adjusted as described in earlier blog articles. The vent size is critical; the vent should be sized for 4000 FPM velocity or less. Now, let's look at that pressure gauge.

## Pressure gauges for Steam Systems

The pressure gauge should have a pigtail syphon and a shutoff valve. The specification for installation should instruct the contractor to fill the pigtail with water before installing the gauge. Many low-priced pressure gauges are available in the market, but I prefer to spend a little more on steam gauges for longevity and safety. MILJOCO, a gauge manufacturer located in Mt. Clemens, Michigan, offers a great process gauge for steam—model P4520L. It's 4-1/2" with 426 stainless steel internals and ½% accuracy. It has a propylene case and a solid front with a blowout back for safety. **NEVER USE LIQUID FILLED GAUGES ON STEAM.**

The Cemline program automatically selects the correct tank size and opening sizes required AND provides you with a CAD-ready drawing. If you would like to sign up for the Cemline sizing program, just visit the product portion of our website for the link.

Next week, the R L Deppmann Monday Morning Minutes will examine the trim and installation of NON-VENTED flash tanks.