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http://www.cheresources.com/cheplusstore/catalogue.php

Clicking the above link should activate your default browser and launch the site.

We recommend using our search feature to find the title.

If you haven't visited our site before, you can find the main page at:

http://www.cheresources.com

Thanks for visiting our site,

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Content Based
Chemical Engineering

FLASH TANK - volume determination; based on instantaneous flashing

BASIS: Enthalpy balance from the initial saturated condensate to the combined flash steam and remaining condensate. Assumes instantaneous flashing; 1 second.

REFERENCES: PERRY'S CHEMICAL ENGINEERS HANDBOOK; PSP-425 - Flashing Fluids in Vessels, ASHRAE 1989 Handbook-Fundamentals Chapter 33, figure 10.

NOTE: Always begin a new case by retrieving the original file. Direct entry of data in cells that originally contain table lookups could cause functions to be lost, or incorrect calculations. I format cells requiring entry colored **RED**; calculated values are black.

1.) Enter identification at [C3].
2.) Enter the condensate flow, at [E4].
3.) Enter the initial condensate pressure at [E5].
4.) Enter the flashing pressure at [E6].
The percent flash is calculated and shown at [E17].
The minimum flash tank volume is calculated and shown at [F22].
The required disengaging area is calculated and shown at [D25].
5.) Enter the selected upward velocity at [C30]. **NOTE: non-tangential entrances require velocities as low as 2 fps (0.6 mps); tangential designs can be upwards to 10 fps (3 mps) maximum.**
The minimum flash tank diameter is calculated and shown at [G31].

Print out using direct Excel commands. This application is provided by Chemical Engineers Resource Website, vis cheresources.com for additional selections.

Print out using direct EXCEL commands.

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4/17/2004

Flash Tank - Volume Determination; Instantaneous Flashing

Service: 15# CONDENSATE TO ATMOS. FLASH TANK

Condensate Rate: 45000 lbs/hr

P_1 = 100 psig

P_2 = 0 psig

$$x = \frac{Hg_2 - Hf_1}{Hg_2 - Hf_2} \quad \text{liquid fraction}$$

$$= \frac{(1150.5 - 309.1)}{(1150.5 - 180.2)}$$

= 86.7% condensate which equates to 39,021.8 lb/hr

(1-x) = 13.3% flash steam which equates to 5,978.2 lb/hr

- Flash tank volume determination ...

Condensate volume: 0.181 cubic feet

Flash steam volume: 44.503 cubic feet

Total Volume: 44.684 cubic feet, minimum

Req'd disengaging Area: 22.50 square feet minimum; (based on 0.5 sq.ft./1,000 lb/hr flow
(Assumes instantaneous flashing; 1 second.)

- Vessel diameter determination; based on a selected upward velocity.....

- Velocity = 10 fps inside diameter = $[(3.06 \cdot W \cdot v_1)/ \text{velocity}]^{0.5}$

inside diameter = 78.4 inches, minimum

4/17/2004

Flash Tank - Volume Determination; Instantaneous Flashing

Service: 15# CONDENSATE TO ATMOS. FLASH TANK

Condensate Rate: 5.6699 kg/sec

P_1 = 6.89476 bar ga

P_2 = 0 bar ga

$$x = \frac{Hg_2 - Hf_1}{Hg_2 - Hf_2} \quad \text{liquid fraction}$$

$$= \frac{(2675.5 - 718.6)}{(2675.5 - 417.5)}$$

= 86.7% condensate which equates to 4.914 kg/sec

(1-x) = 13.3% flash steam which equates to 0.756 kg/sec

- Flash tank volume determination ...

Condensate volume: 0.0051297 cubic meter

Flash steam volume: 1.3237617 cubic meter

Total Volume: 1.3288914 cubic meter, minimum

Req'd disengaging Area: 2.268 sq. meter min.; (based on 0.05 sq.m./0.125 kg/sec flow)
(Assumes instantaneous flashing; 1 second.)

- Vessel diameter determination; based on a selected upward velocity.....

- Velocity = 3.048 meter/sec inside diameter = $3/vel \cdot 141389^{0.5} \cdot (vel \cdot W \cdot V_1)^{0.5}$

inside diameter = 2,036 millimeter, minimum