FLASH STEAM TANK

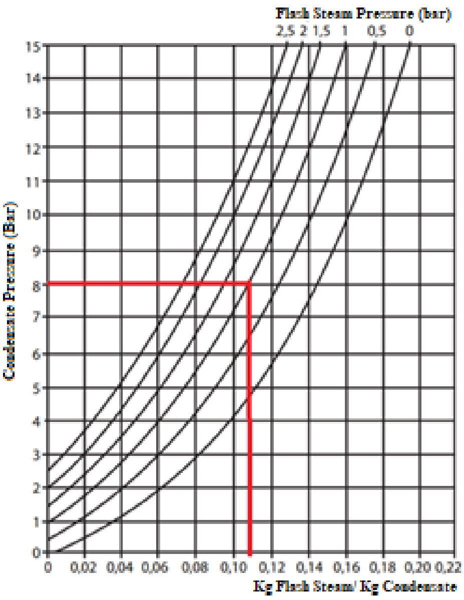
Saturated steam, which meets a surface lower than its own heat, turns into condensate at the same pressure by giving the heat of evaporation and includes saturated water enthalpy. The enthalpy of saturated water at a pressure of 1.5 bar is 536.3 kj / kg. If the condensate at 8 bar pressure is released to 1.5 bar pressure, 743,6- 536,3 = 207,3 kj / kg energy will be released. This energy evaporates some of the condensate. The resulting steam is called **flash steam**.

Flash steam can sometimes be seen as a very low value waste product compared to steam produced directly in the boiler. This thought can be an expensive mistake. Failure to use flash steam causes energy loss and inefficiency in the system. Flash steam is a highly efficient heat carrier and when it is not considered as waste, it significantly increases both system efficiency and energy efficiency.

How to calculate the amount of flash steam?

Let's consider a process that uses steam at 8 bar pressure. The enthalpy of the steam at this pressure, which gives the heat of evaporation at the end of 2775.8 kj / kg of heating, turns into condensate at the same pressure and containing 743.6 kj / kg enthalpy.

Let's assume the condensate after the steam trapis draining İnto the tank. The enthalpy of saturated water at 1 bar pressure in the steam table is 505.8 kj / kg. As seen; An excess of 237.8 kj / kg of energy is released and this energy vaporizes some part of the condensate. This steam is called flash steam.To calculate the amount of Flash Steam released we can use the following formula.



1 Kg Flash Steam/ Kg Condensate

Flash Steam Amount : (Hf1-Hf2) /Hfg2

Hf1: Enthalpy of condensate at high pressure

(Enthalpy of condensate at 8 bar pressure = 743,6 kj/kg)

Hf2: Enthalpy of condensate at low pressure

(Enthalpy of condensate at 1 bar pressure = 505,8 kj/kg)

Hfg2: Evaporation enthalpy of steam at low pressure (Evaporation enthalpy of steam at 1 bar 2202,3 kj/kg)

Flash Steam Rate = 0,11 = %11

Another way to determine the flash steam rate is the graphic on the side.

Let's assume that the condensate load in this process is 1200 kg / h.

1200 kg/h * %11 = 132 kg/h (Flash Steam Amount)

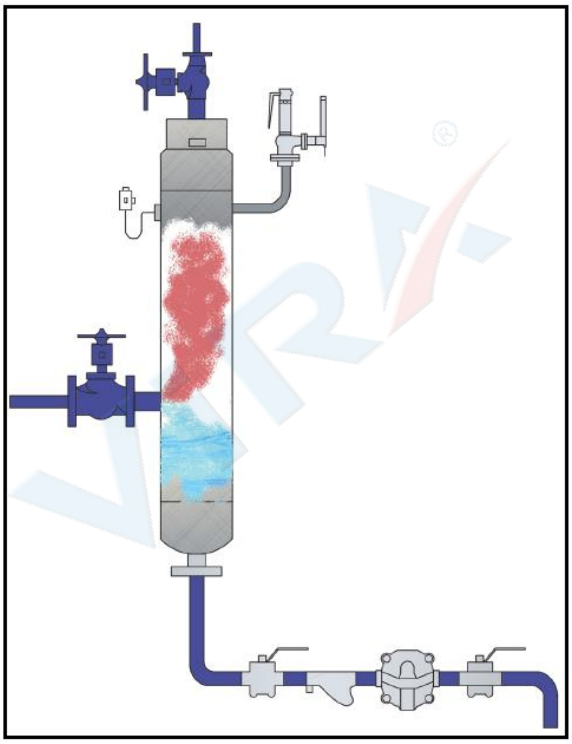
1200 - 120 =1068 kg/h (Condensate Amount)

Flash steam tank can be selected according to these data.

FLASH STEAM TANK

Flash Steam Tank Design

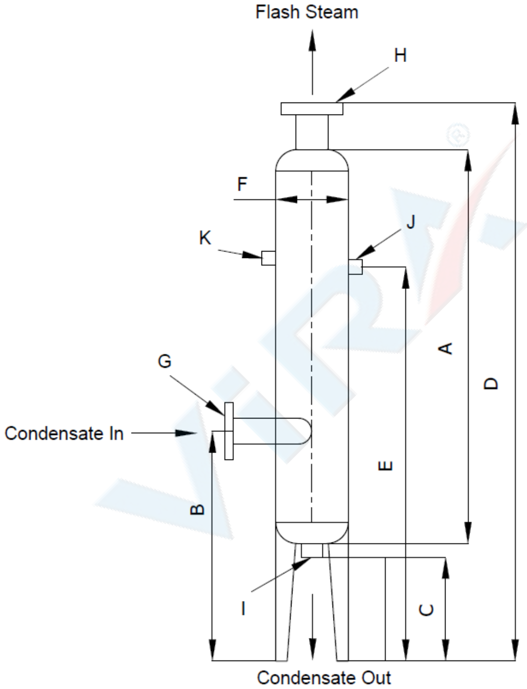
- There must be sufficient high-pressure condensate to release enough flash vapor. In this way, flash steam recovery will be more economical.
- There must be a low pressure application area for the recovered flash steam.
- Flash steam application should be reasonably close to the high pressure condensate source. Otherwise, the pipe diameters to be used will be bigger and these systems will be expensive to install in the long term.



- Tank diameter should be chosen so that steam can flow to the upper outlet at a speed of 3 m / s.
- The entrance of the condensate should be taken from the bottom about 1/3 of the tank length.
- The diameter of the flash steam tank should be chosen so that the diameter will allow condensate to pass without turbulence.
- Both the inlet and flash steam outlet diameters should be chosen so as not to exceed 15 m / s speed.

FLASH STEAM TANK

Flash Steam Tank Dimensions



Physical Data – Standart Design				
Model No	**VFS-6**	**VFS-8**	**VFS-12**	**VFS-16**
	mm	**mm**	**mm**	**mm**
A	914	914	1016	1219
B	533	533	584	660
C	241	241	241	241
D	1295	1321	1407	1613
E	914	914	1016	1219
F	168,3	219,1	323	406
	DN	**DN**	**DN**	**DN**
G	50	80	100	150
H	65	100	150	150
	in	**in**	**in**	**in**
I	1 1/2″	1 1/2″	2″	2″
J	3/4″	1″	1 1/2″	2″
K	3/4″	1″	1 1/2″	1 1/2″

Flash Steam Tank Capacities

Capacities – Standart Design		
Model No	**Maximum Condensate Load**	**Maximum Flash Steam Load**
	kg/hr	**kg/hr**
VFS-6	907	227
VFS-8	2268	454
VFS-12	4536	907
VFS-16	9072	1361

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