

Flash Separators

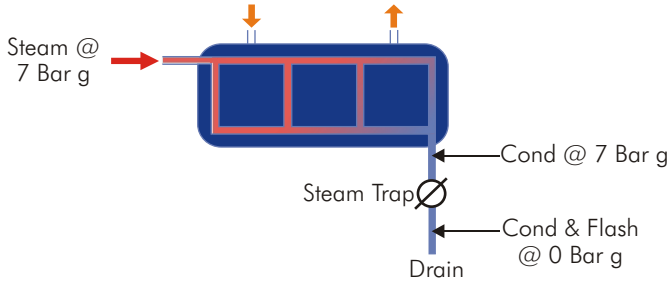


What is Flash Steam ?

In most steam installations, it is common to see a plume of steam rising above the boiler house or a condensate tank. This "flash steam" is just like live steam and contains as much heat as live steam at the same pressure.

When pressure is reduced, water boils at a lower temperature. As steam is discharged from the steam space of equipment, its pressure reduces from that of the steam supply (or, steam space) to that of the outlet.

Flash steam is generated at the point at which pressure drops. For e.g. At trap outlets. The pipe downstream of the trap will contain a mixture of condensate and flash steam (at the lower pressure) .

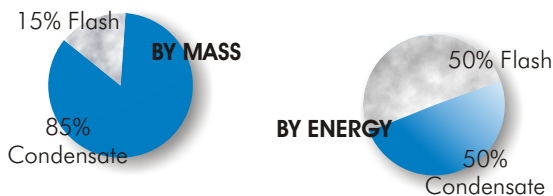


For example, if the heat exchanger shown above is supplied with steam at 7 bar g, and this is discharged through the trap to the atmosphere, the pressure after the trap is close to atmospheric pressure (0 bar g). The boiling point (and therefore, temperature) drops sharply. This means that the sensible heat of the condensate is suddenly reduced from 171.3 kcal/kg to 100 kcal/kg. So, where does the surplus sensible heat of $171.3 - 100 = 71.3$ kcal/kg go ? It is converted into latent heat, and "flashes" into vapour , or steam.

Pressure kg/cm ² (absolute)	Temp. Deg C	Enthalpy of water kcal/kg	Enthalpy of steam kcal/kg	Latent heat of vapourisation kcal/kg
P	T	hf	hg	hfg=hg-hf
1	99.1	100	638.5	539.4
2	119.6	119.9	645.8	525.9
4	142.9	143.6	653.4	509.8
6	158.1	159.3	657.8	498.5
8	169.6	171.3	660.8	489.5
10	179.0	181.2	663.0	481.8
11	183.2	185.6	663.9	478.3

Does it Matter ?

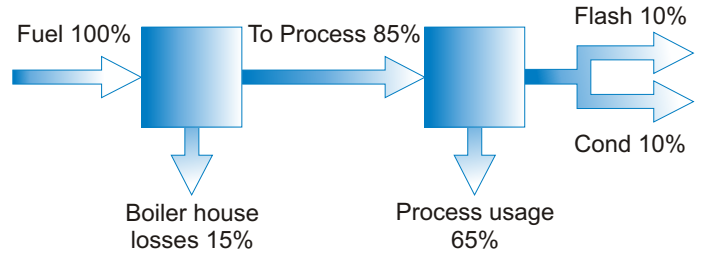
A condensate pipe contains only 15% flash steam as compared to 85% of condensate by mass. The flash steam may therefore, seem trivial. However, the heat energy present in steam at 1kg/cm² is more than **6 times** that of water !!



In other words, half the energy in condensate can be lost if flash steam is vented !

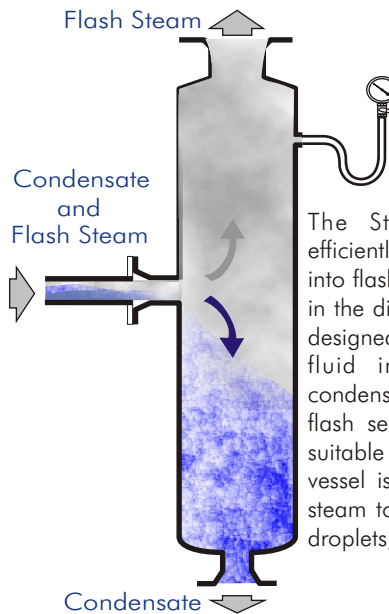
Typical Steam System Energy Balance

Even if condensate is returned, but flash is vented, the energy lost is still almost 10%



Saving energy from Flash

As seen here, any condensate pipe carries approximately 99% (by volume) of flash steam, and 1% of condensate. This bi-phase condition occurs immediate downstream of the trap or discharge orifice.



The Steamline Flash Separator efficiently separates this bi-phase fluid into flash steam & condensate as seen in the diagram. The vessel diameter is designed so as to reduce the velocity of fluid in the pipe. The heavier condensate falls to the bottom of the flash separator and is drained by a suitable steam trap. The height of the vessel is chosen so as to allow flash steam to rise without entraining water droplets, resulting in drier steam.

This flash steam can be recovered from condensate. It can then be used for low pressure steam applications, for removing dissolved oxygen in deaerator tanks and heating boiler feedwater. Even blowdown or contaminated condensate can be flashed and put to good use. Remember, flash is as good as live steam hence, flash recovery is the best form of energy conservation.

Features of Steamline Flash Separators

Low separation velocity ensures dryness

Supplied complete with all required accessories

Designed in accordance with IBR code

IBR certified versions available

Superior build quality and parts



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