

## General Usage Formulas:

Heating water with steam	$\text{Lbs./hr. Condensate} = \frac{\text{GPM}}{2} \times \text{Temperature Rise } ^\circ\text{F}$
Heating fuel oil with steam	$\text{Lbs./hr. Condensate} = \frac{\text{GPM}}{4} \times \text{Temperature Rise } ^\circ\text{F}$
Heating air with steam coils	$\text{Lbs./hr. Condensate} = \frac{\text{CFM}}{900} \times \text{Temperature Rise } ^\circ\text{F}$
Radiation conversion	$\text{Lbs./hr. Condensate} = \frac{\text{sq. ft. EDR}}{4}$
Heating liquids other than water with steam	$\text{Lbs./hr. Condensate} = \frac{(\text{R}) \times (\text{W}) \times (\Delta\text{T}) \times (\text{H})}{1,000}$ <p>where:</p> <p>(R) = Rate of flow of fluid to be heated (gal./hr.)                      (W) = Weight of fluid (lbs./hr.)                      (ΔT) = Fluid temperature rise °F                      (H) = Specific heat of fluid being heated (BTU/lb./°F)</p>
Cv (valve coefficient) for steam, when: P <sub>1</sub> = Inlet pressure in psia  P <sub>2</sub> = Outlet pressure in psia P = Pressure drop (P <sub>1</sub> - P <sub>2</sub> )	When P <sub>2</sub> ≤ 0.5 P <sub>1</sub> : $C_v = \frac{\text{lbs./hr.}}{1.5 \times P_1}$ When P <sub>2</sub> > 0.5 P <sub>1</sub> : $C_v = \frac{\text{lbs./hr.}}{2.1\sqrt{\Delta P \times (P_1 + P_2)}}$
Cv (valve coefficient) for liquid	$C_v = \frac{\text{GPM} \sqrt{\text{specific gravity}}}{\sqrt{\text{Pressure drop}}}$
Steam Velocity	$V = 2.4 \times \frac{\text{Steam flow (lbs./hr.)} \times \text{specific volume (ft}^3\text{/lbs.)}}{\text{Area of pipe (in.)}}$

## Conversion Factors:

Multiply	By	To Get
Boiler hp	33,475	BTU/hr.
Boiler hp	34.5	Lbs./hr/ steam at 0 psig
Boiler hp	140	Sq. ft. EDR
1000 sq. ft EDR	0.5	GPM condensate
EDR (sq. ft.)	0.25	Lbs./hr. condensate
EDR (sq. ft.)	240	BTU/hr. for 2 psig steam filling radiator with 70°F air surrounding radiator
lbs./hr.	960	BTU/hr.
lbs./in. <sup>2</sup>	2.307	Feet water column (cold)
lbs./in. <sup>2</sup>	2.41	Feet water column (hot)
lbs./in. <sup>2</sup>	2.036	in. Hg
lbs./in. <sup>2</sup>	0.069	bar
lbs. steam / hr.	0.454	kg. steam / hr.