LOW TEMPERATURE PSYCHROMETRIC CHART

ENERGY EQUATIONS

\[ Q_{\text{E}} = Q_{\text{Enthalpy}} = Q_{\text{Latent}} \]

\[ Q_{\text{Enthalpy}} = 4.5 \times \text{CFM} \times \Delta h \text{ (BTU/hr)} \]

\[ Q_{\text{Enthalpy}} = 0.68 \times \text{CFM} \times \Delta t_{\text{wet}} \text{ (BTU/hr)} \]

\[ Q_{\text{Enthalpy}} = 4.84 \times \text{CFM} \times \Delta t_{\text{dry}} \text{ (BTU/hr)} \]

\[ \text{MR} = \text{Moisture removal rate from air (lbwtr/Hr)} \]

\[ \text{SHR} = \text{Sensible Heat Ratio} = \frac{Q_{\text{Enthalpy}}}{Q_{\text{Enthalpy}} + Q_{\text{Latent}}} \]

FAN LAWS

If fan speed is changed in a given system, with no other system modifications:

\[ \text{CFM} = \text{CFM} \times \left( \frac{\text{RPM}}{1200} \right)^{2} \]

\[ \text{HP} = \text{HP} \times \left( \frac{\text{RPM}}{1200} \right)^{3} \]

To estimate fan horsepower:

\[ \text{HP} = \frac{\text{CFM} \times \text{TP}}{3.306 \times 10^3} \]

\[ \text{HP} = \frac{\text{CFM} \times 2.310}{\text{CFM}} \]

PUMP LAWS

If pump speed is changed in a given system, with no other system modifications:

\[ \text{GPM} = \text{GPM} \times \left( \frac{\text{RPM}}{1200} \right) \]

\[ \text{HP} = \text{HP} \times \left( \frac{\text{RPM}}{1200} \right)^{3} \]

To estimate pump horsepower:

\[ \text{HP} = \frac{\text{GPM} \times \text{H}}{3500 \times \text{EFF}} \]

DEFINITIONS OF STANDARD AIR FLOW

English Units: Standard air is air at 70°F, bone dry, and 29.92 in. Hg barometric pressure. Its density is 0.075 lb/ft³.

Airflow in Standard CFM (SCFM) = Airflow in Actual CFM (ACFM) x 33.4

(Science CFM x 4.5 = (Science CFM in lbs. dry air ft³))

Metric Units: Normal air is air at 0°C, bone dry, and 29.92 in. Hg barometric pressure. Its density is 1.253 kg/m³.

Airflow in Normal M³/min (m³/min) = Airflow in Actual M³/min x 0.773

(Science CFM x 77.8 = (Science CFM in kg, dry air))