

Contractor Service Tips

Tip Card
15

Subcooling

Q: What is meant by subcooling?

Subcooling is the condition where the liquid refrigerant is colder than the minimum temperature (saturation temperature) required to keep it from boiling and, hence, change from the liquid to a gas phase.

The amount of subcooling, at a given condition, is the difference between its saturation temperature and the actual liquid refrigerant temperature.

Q: Why is subcooling desirable?

Subcooling is desirable for several reasons.

1. It increases the efficiency of the system since the amount of heat being removed per pound of refrigerant circulated is greater. In other words, you pump less refrigerant through the system to maintain the refrigerated temperature you want. This reduces the amount of time, which the compressor must run to maintain the temperature. The amount of capacity boost, which you get with each degree of subcooling, varies with the refrigerant being used.



2. Subcooling is beneficial because it prevents the liquid refrigerant from changing to a gas before it gets to the evaporator. Pressure drops in the liquid piping and vertical risers can reduce the refrigerant pressure to the point where it will boil or 'flash' in the liquid line. This change of phase causes the refrigerant to absorb heat before it reaches the evaporator. Inadequate subcooling prevents the expansion valve from properly metering liquid refrigerant into the evaporator resulting in poor system performance.