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## Expansion for Heat Absorption

By **Thomas Yoon**

### Expansion for Heat Absorption by Thomas Yoon

In the refrigeration cycle, the refrigerant must undergo a change in state in order for the heat to be absorbed from the environment.

The refrigerant has the property of changing its state from liquid to vapor at normal room temperatures.

Have you ever felt your skin becoming cool whenever you put alcohol on it? Or even when a bit of petrol spilled onto your hands? It's because, the alcohol or petrol has evaporated when it comes in contact with your skin.

The result – heat is removed from your skin, and it feels cool!

In a closed-loop refrigeration circuit, the change of state from liquid to vapor is achieved mechanically by pressurizing the liquid at one end and forcing it through a small opening at another end.

Once the liquid comes out from the small opening, it expands into vapor. The effect is similar to the spray you get when you restrict the outlet of your garden hose. But water is not a refrigerant. It does not feel cold because it does not change to a vapor.

Bad example. But you get the idea? Pressurized restriction causes spray at the other end.

In many refrigeration circuits, the small opening is made in the form of a thermostatic expansion valve. Many other designs make use of small capillary tubes. In big chillers, orifice plates are common.

All of them achieve the same purpose – to expand the liquid to become vapor and to cause the evaporator tubes to become cold.

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Many years of working experience in Marine, Facilities, Construction has given the author material for writing e-books and articles related to engineering, and management.

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We have an online manual showing you how to build your very own cooling vest. Keep yourself cool in extreme heat.

### **Cooling Down by Evaporating**

**By Thomas Yoon**

#### **Cooling Down by Evaporating by Thomas Yoon**

Evaporator coils of air conditioning systems are sometimes called cooling coils. But cooling coils are also used in air-handling units. These contain chilled water. These are completely different from those used in direct expansion air cond units.

So cooling coils is not an accurate word to use in small air cond

## Expansion for Heat Absorption

units. Evaporator coils should be used instead. Evaporator tubes must contain refrigerant liquid that can evaporate to become gas.

In an air conditioning system, when the liquid refrigerant absorbs heat, it turns to gas. The heat is thus transferred to the refrigerant. That's how the heat is moved from one location to another location.

The evaporator coils are located in the low-pressure system of a refrigeration circuit.

A word of caution!

If you run the evaporator blower without running the air cond system, sometimes you might get a burst tube in the evaporator.

Why? The heat from the blower air, evaporating the refrigerant in the evaporator tubes, and with no where to go (remember the air cond compressor is not running), will cause high pressures in the tubes.

So be careful that you do not run the blower while the air cond system is not running.

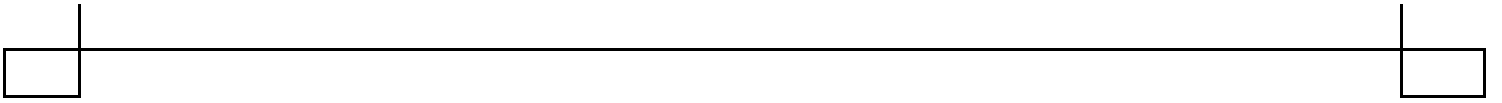
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