

## Heat Pipes

Serck designs and manufacture's bespoke heat pipe to suit all applications.

### What is a Heat Pipe?

A heat pipe is a simple device that can transfer heat from one point to another without having to use an external power supply. It is a sealed tube that has been partially filled with a working fluid. In HVAC applications, this fluid is refrigerant.

The sealed refrigerant - which will boil under low-grade heat - absorbs heat from the warm return air such as in an air-conditioning system and vaporizes inside the tube. The vapor then travels to the other end of the heat pipe (the high end), which is placed in the stream of cold air that is produced by the air conditioner.

The heat that was absorbed from the warm air at the low end is now transferred from the refrigerant's vapor through the pipe's wall into the cool supply air. This loss of heat causes the vapor inside the tube to condense back into a fluid. The condensed refrigerant then travels by gravity to the low end of the heat pipe where it begins the cycle all over again.

### Working Principle

In an air conditioning system, when the air is pre-cooled before the cooling coil (evaporator), more moisture is condensed out. The heat pipe is designed to have one section in the warm incoming stream and the other in the cold outgoing stream of the evaporator. By transferring heat from the warm return air to the cold supply air, the heat pipes create the double effect of pre-cooling the air before it goes to the evaporator and then immediately re-heating it, thereby reducing the supply air relative humidity.

Activated by temperature difference alone, heat pipe consumes no energy. Due to pre-cooling effect, heat pipe allows the evaporator coil to operate at a lower temperature, thus increasing the moisture removal capability of the air conditioning system by 50-100%.

With lower relative humidity, indoor comfort can be achieved at higher thermostat settings, which results in net energy savings. Generally, for each 1° F rise in thermostat setting, there is a 7% savings in electricity cost. In addition, the pre-cooling effect of the heat pipe allows the use of a smaller compressor.

### Benefits

- Reduces Humidity.
- Improves Air Quality And Comfort Level.
- No Moving Parts.

- No Additional Energy Required To Operate.
- Recovers Cooling From Exhaust Air.
- Reduces Air-Conditioning Energy.
- Reduces HVAC Load.

### Applications

- Dehumidification in Air Conditioning.
- HVAC Heat Recovery Application.
- Industrial Heat Recovery Application.

