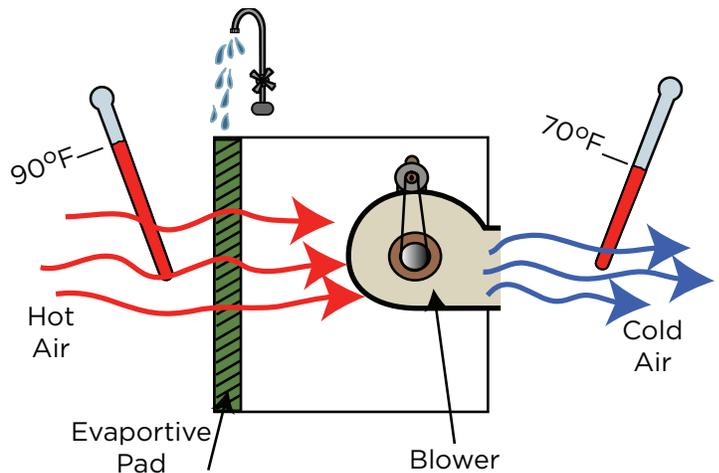


Evaporative Coolers

Called an evaporative cooler, or “swamp cooler,” this cooling system uses seventy-five percent less electrical energy than a refrigerated central air-conditioning system. Evaporative coolers have a catch: they only work in very dry climates.

How Does it Work?

Evaporative cooling takes advantage of a simple physical principle: the process of water evaporating (changing from a liquid into a vapor), which uses a great deal of heat energy. So how does this process cool your house?



This diagram above shows a simple evaporative cooler:

- Water is sprayed on a mesh of plastic or melamine, or trickles through pads made of excelsior (wood wool, aspen fibers).
- A blower draws hot, dry air from outside the house through the mesh or pads and blows the now-cooled air into the house.
- Water sucks heat out of this incoming air stream.
- The air emerging from the evaporative cooler is 20 to 30 degrees cooler than what went into it. That's it!

So Why Only Dry Climates?

The water involved in the vaporization process also goes into house as moisture. In a hot, dry climate, this moisture is probably a welcome addition. But in a humid climate, additional moisture is uncomfortable and can cause all kinds of problems such as mold, rust and rot.

The hotter and dryer the climate, the more evaporation will occur, and the more effective the cooling system. For example, at the time this article was written, the forecast for Phoenix, AZ called for a high of 100° F and a relative humidity of 5%. In these conditions, the air generated from the evaporative cooler will be about 70°F.

Air Balance

Since the evaporative cooling system draws air into the home from outside, excess air in the home must be expelled through open windows. The amount of cooling for any room of the house is controlled by adjusting the window opening. Opening a window wider allows more air out of the room and more fresh cool air to flow into the room.

Maintenance

Evaporative coolers need more frequent maintenance than conventional central air conditioning systems: a major cleaning and maintenance every season as well as routine inspection and cleaning throughout the season. A technician usually performs the seasonal maintenance. But you can do routine maintenance yourself. However, if the cooler is located on the roof, routine maintenance may be more difficult and you should leave this job for a technician.

The homeowner maintenance protocols depend on the type of system you have, but in general the following should be done several times during the cooling season, or as often as once per month in very hot climates:

- Shut off the power to the cooler.
- Drain and flush the water and remove scale and sediment from the water reservoir.
- Inspect and replace, or clean, pads and filters.
- Inspect and clean the water distribution system.

Benefits

There are many benefits to an evaporative cooler:

- They are inexpensive to install and operate.
- They work better as the day heats up, performing at peak operation during the hottest part of the day.
- They provide a steady stream of fresh air from outside, and a constant cool breeze throughout the home.
- Humidification makes the home more comfortable and helps keep woodwork from drying out.

And Now the Cons

- Water usage may be an issue in some areas.
- Constant maintenance is required.
- They do not work well on humid days.
- Allergy sufferers may have a problem from the constant stream of air and pollen from outside.

If you live in a hot and humid climate, this system is not for you. But if you live in a hot dry climate, you can take advantage of this economical and effective form of cooling.

