

Direct Evaporative Cooling

Direct evaporative coolers are the simplest and most economical choice of evaporative cooling systems. It uses a fan to pull outside air through a media which is kept saturated by water that is sprayed or dripped on them. This activity both filters the air and cools it. The water is typically delivered through tubes from a small pump which draws from a reservoir that is replenished with tap water whose level is controlled by a float valve. The resulting fresh, cool, humidified air is blown into buildings where the pattern of flow (and cool air delivered) is determined by the location and extent of openings in the conditioned envelope such as windows or special dedicated ducts.

Improvements to these systems include high-performance media with lower velocity air flow and the use of thermostat controls. Older styles typically used two inches of wooden, aspen shavings that achieved a direct saturation effectiveness of 50-80%. Modern systems now use a thicker and rigid media of 10-12 inches to achieve 93% effectiveness. This media is made of special cellulose materials and chemicals that resist bacteria and decay.

Many evaporative coolers are now equipped with two-speed motors. The benefit is the low speed can be used when outside temperatures are lower, especially at night. The high speed is then used when the temperatures rise and more cooling is needed inside the dwelling. Coolers tend to run more quietly at low speeds and use 30% less energy to operate.

A thermostat also improves the efficiency of an evaporative cooler. It automatically turns off the cooler when the air reaches the desired temperature inside the building. Evaporative coolers without thermostats have separate switches for the fan and pump that are manually controlled.

Manufacturers