



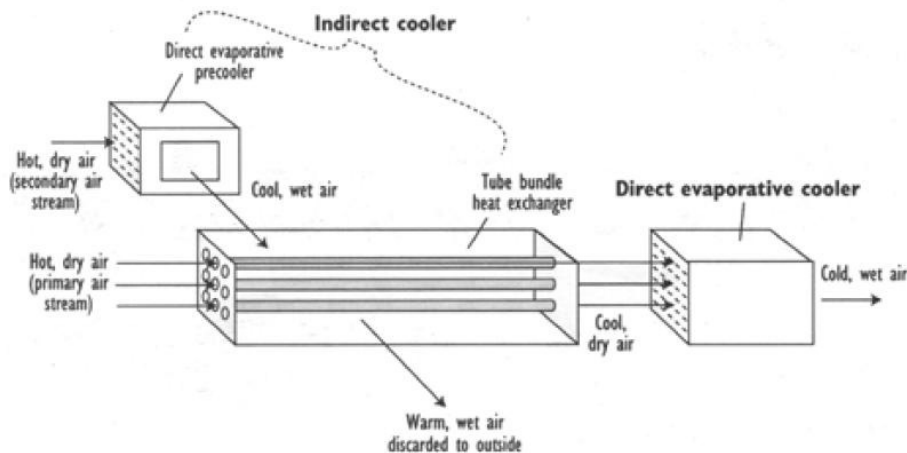
Advanced Evaporative Cooling

The mention of Advanced Evaporative Cooling (AEC) in the previous Going Green column sparked quite a bit of interest, so I'll cover this technology in a little more detail in today's column.

What separates AEC from the "swamp cooler" you may have a low opinion of are three things –

- 1) They produce colder air.
- 2) They work automatically, requiring no opening or closing of windows.
- 3) They are ducted (with fewer but larger ducts than used for an air conditioner and furnace system).

Let's take a look at each of these key differences. Using Grass Valley summer "design conditions" a standard swamp cooler will deliver air at about 71 degrees. But an AEC can deliver air as cold as 63 degrees in the case of a two-stage AEC, or 67 degrees in the case of a single-stage AEC. That's because the AEC uses a very different, much thicker and more efficient "pad" than the Aspen pads used in standard coolers. The two-stage AEC works by first cooling down the incoming air indirectly, without adding moisture, before the air is passed through the AEC's second stage where moisture is added (see graphic).



SOURCE: ROY OTTERBEIN

In addition to providing cooler air, the relative humidity in the home resulting from an AEC would be about 60% whereas the standard cooler would be about 70%. The optimum humidity level inside a building is generally considered to be in the 40% to 50% range, but 30% to 60% is considered acceptable. In contrast, a typical air conditioner can lower indoor humidity to well below 40%, which

is one reason why many people actually prefer evaporative systems. But it's the combination of the cooler air and less humidity that makes the comfort of an AEC superior to a standard swamp cooler.

Another key difference is that rather than a manual, two-speed switch, AEC's use a thermostat so they function automatically. Some AEC's also use a variable speed fan rather than a two-speed fan for further savings. And instead of manually opening and closing windows, AEC's use a pressure-activated vent, similar to those you may have noticed on the outlet of your clothes dryer or bath exhaust fan. Because the fresh air coming in must also go out, the exhaust air from an AEC goes out these vents, into your attic, helping to cool the attic slightly in the process. Keep in mind that, if windows don't need to be left open, any concerns you may have about security have just evaporated away (sorry, bad pun).

Many folks I've talked to over the years here in Nevada County rave about how they can reduce – and in some cases eliminate – the need to run their air conditioner at all if they cool their home way down at night when outside temperatures often drop into the 50's and 60's. People with AEC's typically use them to provide this “night ventilation cooling”, thereby avoiding the need for a whole house fan as well as daily opening and closing of windows!

The ducting used with an AEC avoids the disadvantages of standard evaporative coolers, whole house fans and opening/closing of windows. Interior doors can be kept closed for privacy. The noise generated by a whole house fan, as well as a standard through-the-wall or window-mounted cooler, is avoided because the ducts act similar to a muffler. And because air movement helps further cool you down – up to 5 degrees compared to no air movement, the outlet grilles used with AECs can be used to direct the breeze towards your body for even more comfort, which is especially helpful during those rare times when we have both high outside temperature and humidity.

But perhaps the most compelling reason to choose an AEC over standard cooling is the operating cost – up to 83% less than a relatively efficiency air conditioner (SEER 13). For more information, the following are some links to several popular AEC's –

Indirect/Direct AECs

<http://www.oasysairconditioner.com/>

<http://www.coolerado.com/>

Direct AECs

<http://www.breezaircooler.com/>

http://evapcool.com/aerocool_pro/

Ray Darby is President of Sustainable Energy Group Inc., a Grass Valley company offering energy efficiency and solar services for residential and commercial buildings, from comparing the alternatives through installation and servicing of energy systems of all types. You can reach him at 530-273-4422, via email RayDarby@SustainableEnergyGroup.com, or visit their web site at www.SustainableEnergyGroup.com.