



Tonnage saved with supplemental evaporative cooling

In many locations and for many applications, evaporative cooling is all the cooling required to maintain a comfortable indoor environment. In hotter areas or where cooling loads are high, such as in office buildings, one of the most useful applications for indirect evaporative cooling is supplementing a chiller or DX system. By cooling the air stream before it reaches the cooling coil, an indirect evaporative unit extends chiller life, cuts energy costs, and provides the boost the chiller needs to function effectively on hot days. You can add an indirect evaporative cooling unit to an existing system or design a new cooling system that incorporates the indirect unit with the chiller or a standard roof-top DX system.

For cities in Idaho, Oregon, and Washington, the following calculations show the tonnage you can save by adding evaporative cooling.

Example conditions

Required outside air volume: 10,000 cfm

Required refrigeration tonnage to meet building cooling load: 25 tons

Effectiveness of single-stage indirect evaporative cooling: 70%

Formula

Tons saved = $[1.08][\text{Design delta T}][\text{efficiency}][\text{cfm}]/12,000$

Idaho

Boise: $[1.08][94-63][.70][10,000]/12,000 = 19.5$ tons saved

Idaho Falls: $[1.08][89-60][.70][10,000]/12,000 = 18.3$ tons saved

Pocatello: $[1.08][90-60][.70][10,000]/12,000 = 18.9$ tons saved

Oregon

Astoria: $[1.08][71-63][.70][10,000]/12,000 = 5.04$ tons saved

Bend: $[1.08][90-64][.70][10,000]/12,000 = 16.4$ tons saved

Eugene: $[1.08][84-67][.70][10,000]/12,000 = 10.71$ tons saved

Klamath Falls: $[1.08][84-64][.70][10,000]/12,000 = 12.6$ tons saved

Medford: $[1.08][91-67][.70][10,000]/12,000 = 15.12$ tons saved

Pendleton: $[1.08][90-64][.70][10,000]/12,000 = 16.4$ tons saved

Portland: $[1.08][84-67][.70][10,000]/12,000 = 10.71$ tons saved

Salem: $[1.08][85-67][.70][10,000]/12,000 = 11.34$ tons saved

Washington

Bellingham: $[1.08][76-64][.70][10,000]/12,000 = 7.56$ tons saved

Hanford: $[1.08][96-65][.70][10,000]/12,000 = 19.53$ tons saved

Olympia: $[1.08][83-65][.70][10,000]/12,000 = 11.34$ tons saved

Seattle: $[1.08][81-64][.70][10,000]/12,000 = 10.71$ tons saved

Spokane: $[1.08][89-61][.70][10,000]/12,000 = 17.64$ tons saved

Tacoma: $[1.08][82-63][.70][10,000]/12,000 = 11.97$ tons saved

Walla Walla: $[1.08][95-65][.70][10,000]/12,000 = 18.9$ tons saved

Wenatchee: $[1.08][92-65][.70][10,000]/12,000 = 17.01$ tons saved

Yakima: $[1.08][92-64][.70][10,000]/12,000 = 17.64$ tons saved