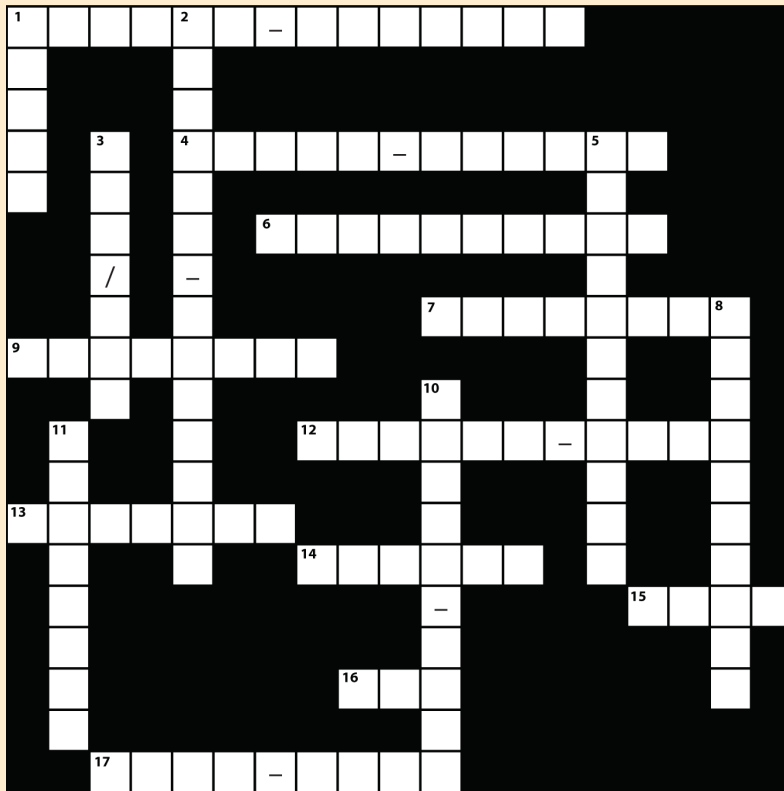


Take the HVAC CHALLENGE™

BY STEVEN G. LIESCHEIDT, P.E., CSI-CCS, CCPR

► Cooling Towers



ACROSS

- This type of evaporative cooling device, also known as an open cooling tower, deposits water directly to the cooling atmosphere and transfers the source heat load directly to the air.
- Of the direct-contact devices, this is the most rudimentary type of tower that exposes water to the air without any heat transfer media or fill.
- This type of spray tower uses high-pressure sprays to induce large air quantities and improve air/water contact.
- The difference between the leaving water temperature and entering air wetbulb temperature of a cooling tower.
- This type of spray tower has air velocities that are relatively low and are susceptible to adverse wind effects, and it is normally used to satisfy a low-cost requirement when operating temperatures are not critical to the system.
- This type of cooling tower film maximizes contact area and time by forcing the water to cascade through successive elevations of splash bars arranged in staggered rows.

- This may be predicted by projecting a straight line on a psychrometric chart from the tower entering air conditions to a point representing the discharge conditions.
- This organization publishes Guideline 12, "Minimizing the Risk of Legionellosis Associated with Building Water Systems."
- The heat transfer media in a cooling tower that is installed below the water distribution system in the path of the air.
- The organization that publishes Standard ATC-1055, "Acceptance Test Code for Closed Circuit Cooling Towers."
- This type of cooling type fill achieves the same effect by causing the water to flow in a thin layer over closely spaced sheets.

DOWN

- The rate of this loss from a tower is a function of tower configuration, eliminator design, airflow rate through the tower, and water loading; in general, an efficient eliminator design reduces this loss to between 0.001% and 0.005% of the

- water circulation rate.
- This type of evaporative cooling device involves indirect contact between heated fluid and atmosphere and essentially combines a heat exchanger and cooling tower into one relatively compact device.
- Special-purpose towers containing a conventional mechanical-draft unit in combination with an air cooled heat exchanger.
- This rate at design conditions is approximately 1% of the water flow rate for each 12.5°F of water temperature range.
- Chimney towers that have air induced through the tower by the air density differentials that exist between the lighter, heat-humidified chimney air and the outside atmosphere.
- An economizer that is known as free cooling.
- Heated water discharged from a cooling tower.

To brush up on the facts behind this month's clues, refer to Chapter 36 ("Cooling Towers") in the 2004 ASHRAE Handbook – Systems and Equipment.



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Solution to March's HVAC Challenge™

