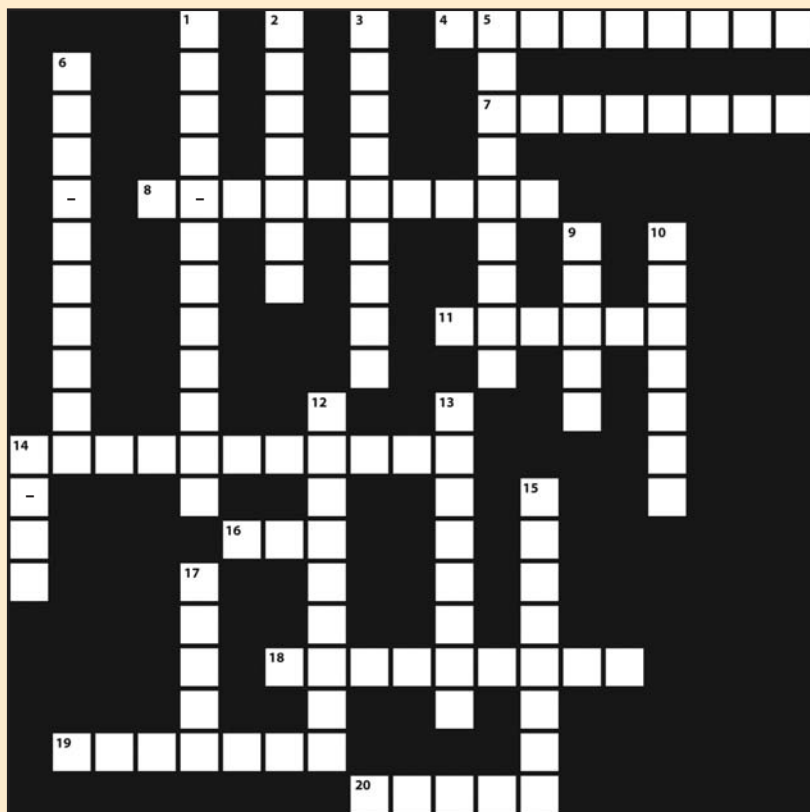




Take the HVAC CHALLENGE™

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

Secondary Coolants



ACROSS

4. This type of chloride secondary coolant has a freeze point of negative 142°F when used at 100% concentration by weight.
7. The time it takes to drop the secondary coolant temperature from the normal to peak operating load requirements.
8. This secondary coolant has a performance rating of 6.47 gpm/ton based on 25° at the pump when used at 100% concentration by weight.
11. This type of chloride secondary coolant has a freeze point of negative 5.1° when used at 23% concentration by weight.
14. This type of primary coolant may be used as a secondary coolant in a system by being pumped at a flow rate and pressure high enough that the primary heat exchange occurs without evaporation.
16. This is dictated by the coincident highest pressure and lowest secondary coolant temperature.
18. These coolants are liquids that are used as heat transfer fluids and that change temperature as they gain or lose heat energy without changing into another phase.
19. These types of tanks can shave peak loads for brief periods, limit the size of the refrigeration equipment, and reduce energy costs.
20. Piping used to carry salt brines should not be made of iron, copper, or this material.

DOWN

1. This secondary coolant has a freeze point of negative 7.0° when used at 14% concentration by weight.
2. This type of chloride secondary coolant has a freeze point of negative 7.8° when used at 22% concentration by weight.
3. This must be considered when selecting a secondary coolant, an inhibitor, and system components.
5. This volume of this secondary fluid type of tank is determined by considering the total coolant inventory, and the differences in coolant density at the lowest temperature of coolant pumped to the load location and the maximum temperature.
6. Pumps using sodium chloride as a secondary coolant should use pump of this material make-up or all-iron material makeup.
9. This should not be allowed to change from an alkaline to an acid condition.
10. These costs are a function of the secondary coolant selected, the load and the temperature range where energy is transferred, the pump head required by the system pressure drop, the mechanical efficiencies of the pump, and other electrical factors.
12. This secondary glycol coolant has a freeze point of negative 5.1° when used at 39% concentration by weight.
13. This secondary glycol coolant has a freeze point of negative 6.9° when used at 38% concentration by weight.
14. This secondary coolant has a performance rating of 7.61 gpm/ton based on 25° at the pump when used at 100% concentration by weight.
15. This secondary coolant has a freeze point of negative 5.3° when used at 26% concentration by weight.
17. This is the pressure at the lowest operating temperature that determines whether a vacuum could exist in the secondary coolant system.

To brush up on the facts behind this month's clues, refer to Chapter 4 ("Secondary Coolants") in the 2002 ASHRAE Handbook - Refrigeration.



Liescheidt is a sales engineer with Langendorf Supply Co., Inc. in St. Louis. E-mail him at stevel@lsc-inc.com.

Solution to August's HVAC Challenge™

