Commercial Refrigeration for Air Conditioning Technicians 3rd edition Wirz Solutions Manual

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Chapter 2 Review Questions

Evaporators

Instructor's Answer Sheet

1. What is considered the "evaporator temperature"?

   a. The temperature of the refrigerant inside the evaporator tubing.

2. How do you calculate evaporator temperature from the suction pressure?

   b. Use a pressure/temperature (P/T) chart.

3. How is evaporator TD calculated for a walk-in cooler?

   c. Subtract the saturated suction temperature (SST) from the box temperature.

4. What is "hot pull-down"?

   a. When the evaporator is subject to higher temperatures and loads than under normal operating conditions.

5. During hot pull-down what is the evaporator experiencing?

   b. Starving because the refrigerant is boiling off quickly.

6. What is the approximate humidity in a walk-in refrigerator with a 10°F TD evaporator?

   c. 85%

7. As TD increases, how does it affect box humidity?

   b. Decreases humidity.

8. If airflow across an evaporator is decreased, what effect does it have on evaporator temperatures and suction pressure?

   c. Evaporator temperature and suction pressure both decrease.

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9. Why are multiple circuits used on larger evaporator coils?

a. They provide less pressure drop than a long single circuit evaporator.

10. If the suction pressure of an R22 unit is 55 psig, what is the approximate evaporator temperature?

b. 30°F

11. If the suction pressure of an R404A unit is 21 psig, what is the approximate evaporator temperature?

a. -14°F

12. How do you determine the evaporator superheat of a refrigeration system?

b. Subtract evaporator temperature from the temperature of the suction line at the expansion valve bulb.

13. A -10°F walk-in freezer using R404A has a suction pressure of 15 psig. The suction line temperature at the TEV bulb is -20°F. What is the evaporator superheat?

a. 2°F

14. Based on the superheat in the previous question, is the evaporator normal, flooding, or starving?

a. Flooding

15. Within how many degrees of the design box temperature can you check evaporator superheat?

c. 5°F

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16. What are the two main categories of evaporator problems?

Air flow problems and refrigerant problems.

17. Why is it necessary for the fin spacing in a freezer evaporator to be wide?

a. Frost buildup will not occur as fast if the fin spacing is wide.

18. What is the basic sequence of operation at the beginning of a freezer defrost?

b. Evaporator fans shut off, compressor shuts off, and heaters come on.

19. Which freezer defrost system is more efficient: hot gas or electric? Why?

Hot gas is quicker because the heat goes through the evaporator tubing which was the coldest part of the coil during the freeze cycle. Electric heaters are usually near the outer edge of the coil and it takes longer for the heat to penetrate the interior of the evaporator. Hot gas is more efficient because the compressor can generate the same amount of Btuh as electric heaters, but with less electrical energy.

20. If a walk-in is operating at a box temperature of 35°F, what type of defrost should it have?

b. Planned defrost: a defrost clock only.

21. What is an effective way to check a DTFD control?

c. Freeze the control in another freezer then measure the continuity of the contacts with an ohmmeter.

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