



REFRIGERATION OPERATOR A (TSSA)

COURSE OUTLINE WITH OUTCOMES

These learning materials are designed to directly address the knowledge requirements for the TSSA Compressor Operator Certification.

Content

1. Refrigeration Cycle Controls

Learning Outcome

Describe the purposes and operating principles of the operational and safety controls on a refrigeration system.

Learning Objectives

1. Describe the operation of temperature, pressure and humidity controls for refrigeration systems.
2. Describe the actuators used in refrigeration control systems.
3. List and describe the typical refrigeration system safety shutdown devices.

2. Refrigerants

Learning Outcome

Describe the different refrigerants and explain the classification and various properties of each refrigerant.

Learning Objectives

1. Describe how refrigerants are classified.
2. Describe the thermodynamic properties of refrigerants.
3. Describe the properties of refrigerants relating to miscibility, leakage tendency, odour, moisture reaction, toxicity and flammability.

3. Compression Refrigeration Systems

Learning Outcome

Describe the operating principles of compression refrigeration systems.

Learning Objectives

1. Describe the basic layout of compression refrigeration systems.
2. Distinguish between direct and indirect refrigeration systems.
3. Explain how compression refrigeration system temperatures and pressures are related.
4. Describe the layout of packaged refrigeration systems and the role of a refrigeration economizers.

4. Heat Exchangers for Refrigeration Systems

Learning Outcome

Describe the different types of heat exchangers used in refrigeration systems.

Learning Objectives

1. Describe the designs and construction of refrigeration system evaporators.
2. Describe the designs and construction of refrigeration system condensers.
3. Discuss refrigeration condenser operation and maintenance.

5. Refrigeration Accessories

Learning Outcome

Describe the various accessories used in refrigeration systems.

Learning Objective

1. List and describe the operation of the gauges, separators, strainers and indicators used as accessories in refrigeration systems.



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6. Refrigeration Cycle Controls

Learning Outcome

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Learning Objectives

1. Describe the operation of temperature, pressure and humidity controls for refrigeration systems.
2. Describe the actuators used in refrigeration control systems.
3. List and describe the typical refrigeration system safety shutdown devices.

7. Thermodynamics of Refrigeration

Learning Outcome

Explain the terms and principles associated with the thermodynamics of refrigeration.

Learning Objectives

1. Explain the fundamentals of refrigeration.
2. Describe the cycle of operations in a vapour compression refrigeration system.
3. Explain how operating temperatures and pressures are selected and related for a vapour compression refrigeration system.
4. State how the capacity of a refrigeration system is described and how refrigeration tables are used to calculate system performance.

8. Refrigeration Calculations

Learning Outcome

Perform refrigeration system calculations.

Learning Objectives

1. Describe the general refrigeration cycle and the application of the Carnot cycle.
2. Describe the relationship between enthalpy and pressure for a refrigeration cycle.
3. Define and calculate the refrigerating effect and the mass of refrigerant circulated.
4. Calculate the coefficient of performance for a refrigeration system.
5. Calculate the capacity of a refrigeration machine.
6. Calculate the theoretical power of a refrigeration compressor.
7. Calculate the theoretical bore and stroke of a refrigeration compressor.