

ATPF-2175: DOMESTIC REFRIGERATION

Cuyahoga Community College

Viewing: ATPF-2175 : Domestic Refrigeration

Board of Trustees:

2015-12-03

Academic Term:

Spring 2019

Subject Code

ATPF - Applied Ind Tech - Pipefitters

Course Number:

2175

Title:

Domestic Refrigeration

Catalog Description:

Covers the refrigeration cycle and process of domestic refrigeration including component function and defrost procedures. Also included are trouble shooting and maintenance procedures and related safety hazards.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to pipefitter's apprenticeship program.

Outcomes

Course Outcome(s):

Discuss the refrigeration cycle and processes pertaining to domestic refrigeration and describe the various defrost systems and heaters.

Objective(s):

1. Describe the types, physical characteristics and typical locations of the evaporator, condenser and metering devices.
2. Explain the various defrost condensate disposal systems.
3. Describe the electrical controls used in household refrigeration.
4. Discuss ice maker operation and sweat prevention heaters and fan motors.

Course Outcome(s):

Describe the operation of the domestic freezer and the function of the capillary tube, condenser efficiency and manual defrost procedures.

Objective(s):

1. Describe two types of freezer compressor and natural draft condensers.
2. Explain the function of the capillary tube in the freezer.
3. Describe condenser efficiency relative to ambient air passing over it.
4. Explain the manual defrost frost system in freezer operations.

Course Outcome(s):

Discuss the components of the refrigeration cycle, the purpose of the heat exchanger and state procedures for charging air conditioning units.

Objective(s):

1. Explain the purpose of the heat exchange between the suction line and the capillary tube.
 2. State the proper procedures for charging room air conditioners.
 3. List the different expansion valves that are substituted for capillary tubes.
 4. List the major components of the refrigeration cycle.
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Course Outcome(s):

Discuss the field service procedures and safety practices used for trouble shooting problems and routine maintenance.

Objective(s):

1. Discuss the specialized training requirements for service technicians.
 2. Identify common trouble shooting problems with respect to charging, leakage and electrical shortages.
 3. Discuss standard maintenance procedures followed for domestic refrigeration.
 4. Identify safety hazards common to trouble shooting and maintenance operations.
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Methods of Evaluation:

1. Quizzes
2. Tests
3. Final exam

Course Content Outline:

1. Domestic refrigeration
 - a. Types, characteristics and components
 - i. Types
 1. Side by side
 2. Over/under
 - ii. Characteristics
 1. Cabinet
 2. Materials
 - iii. Component location
 1. Type
 2. Placement
 3. Purpose/function
 - b. Defrost condensate
 - i. Evaporation system
 - ii. Function
 - iii. Condensed air
 - iv. Disposal system
 - c. Electrical controls
 - i. Thermostat
 - ii. Starter motor
 - iii. Relays Timer
 - iv. Capacitors
 - v. Timer
 - d. Sweat prevention
 - i. Purpose
 - ii. Humidity effects
 - iii. Heaters
2. Freezer and component functions
 - a. Compressor types
 - i. Reciprocating
 - ii. Hermetic
 - b. Capillary tube
 - i. Metering device
 - ii. Serviceable
 - iii. Critical sizing
 - c. Condenser

- i. Efficiency
 - 1. Air cooled
 - 2. Natural convection
 - 3. Forced draft
 - ii. Ambient air
 - d. Manual defrost system
 - i. Controls
 - ii. Frequency
 - iii. Maintenance
- 3. Operation and function
 - a. Domestic freezer
 - b. Refrigeration cycle
 - i. Condenser
 - ii. Evaporator
 - iii. Compressor
 - c. Heat exchange
 - i. Purpose
 - 1. Heat dissipation
 - 2. Transfer
 - ii. Suction line
 - 1. Evaporator coil
 - 2. Refrigerant gases
 - iii. Capillary tube
 - 1. High pressure
 - 2. Temperature
 - d. Charging
 - i. Refrigerant manifold
 - ii. Frequency
 - iii. Scale
- 4. Field service
 - a. Personnel
 - i. Training
 - 1. Experience
 - 2. Customer relations
 - 3. Self- starting
 - ii. Specialized training
 - b. Trouble shooting problems
 - i. Electrical
 - 1. Shorts
 - 2. Wiring
 - 3. Lubrication
 - ii. Defrost timer
 - iii. Coolant charging
 - c. Maintenance
 - i. Charge
 - ii. Lubrication
 - iii. Coil cleaning
 - iv. Leak detection
 - v. Filters
 - d. Safety hazards
 - i. Electrical
 - ii. Pinch points
 - iii. Combustion
 - iv. Respiratory
 - v. Burns
 - vi. Personal protection equipment
 - e. .

Resources

R. Jesse Phagan. *Applied Mathematics*. 4th edition. Goodheart-Wilcox Co./Tinley Park, IL, 2010.

Althouse, Turnquist and Bracciano. *Modern Refrigeration and Air Conditioning*. 4th edition. Goodheart-Willcox Co., South Holland, Illinois, 1979.

United Association Training Department. *HVAC/R Training*. current edition. International Pipe Trades Training Committee, Inc., Washington, D.C., 2006.

Resources Other

<http://www.free-ed.net/sweethaven/MechTech/Refrigeration/coursemain.asp?lesNum=4&modNum=1>

<http://www.refrigerationbasics.com/1024x768/definitions1.htm>

<http://physics.about.com/od/glossary/g/heat.htm>

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