

# ATSM-1802: SPECIAL TOPICS: NEW EPA #608

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## Cuyahoga Community College

**Viewing: ATSM-1802 : Special Topics: New EPA #608**

**Academic Term:**

Spring 2019

**Subject Code**

ATSM - Applied Ind Tech- Sheetmetal

**Course Number:**

1802

**Title:**

Special Topics: New EPA #608

**Catalog Description:**

Certification course covering the new EPA standards with respect to the Clean Air Act enabling the participant to receive current certifications in the refrigerant usage, transportation and disposal procedures. In addition testing requirements, including the Montreal Protocol, vapor/compression cycles and gage manifold is covered.

**Credit Hour(s):**

1

**Lecture Hour(s):**

1

## Requisites

**Prerequisite and Corequisite**

Departmental approval: admission to Sheetmetal Worker's apprenticeship program.

## Outcomes

**Course Outcome(s):**

I Discuss the aspects of the new EPA #608 standards including subsections with respect to the Clean Air Act, an overview of the "certification core" and aspects of the certificate.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. Explain the divisions of the "certificate core" including stratospheric ozone depletion, the Montreal Protocol and vapor/compression cycle.
2. Identify the different certification types and explain the parameters of each.
3. Describe the testing requirements for each section and explain the conditions of each.
4. Review vapor/compression refrigeration cycle including the gage manifold set for determination of respective pressures.
5. Identify the different categories of the EPA #608 core examination including ozone depletion potential, refrigeration recovery, environmental and health hazards and shipping and transporting virgin refrigerant.

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**Methods of Evaluation:**

Students will be graded on their class participation, quizzes and tests and must meet the standards set forth by the Environmental Protection Agency.

**Course Content Outline:**

**Course Outline**

**1. EPA #608 overview**

**a. Terminology**

- i. EPA
- ii. Ozone
- iii. Ozone depletion
- iv. Global warming
- v. Clean Air Act
- vi. Montreal Protocol
- vii. 3 R's
- viii. Recovery devices
- ix. Sales restrictions
- x. Substitute refrigeration and oils
- xi. Recovery technique
- xii. Leak detection
- xiii. Dehydration
- xiv. Recovery cylinder
- xv. Type I
- xvi. Type II
- xvii. Type III
- xviii. Universal
- xix. Core
- xx. Greenhouse gasses
- xxi. Recovery cylinder
- xxii. Microns
- xxiii. Vacuum
- xxiv. Vacuum pump
- xxv. Gage manifold set

**b. Types of certification**

**i. Core**

- 1. Purpose
  - a. Ozone depletion
  - b. Global warming
  - c. Clean Air Act
- 2. Refrigeration recovery
  - a. Techniques
  - b. Leak detection
  - c. Repair
  - d. System replacement
- 3. Shipping and transport

**ii. Type I**

- 1. Certification limitations
  - a. Small appliances
  - b. Pre assembled units
  - c. Hermetically sealed systems
- 2. Service
- 3. Repair
- 4. Disposal

**iii. Type II**

- 1. Limitations
  - a. Medium, high and very high pressure
  - b. Greater than 5# refrigerant
- 2. Allows for re charge of system
- 3. Type I and universal certification
- 4. Recovery equipment
  - a. Manifold gages
  - b. Recovery machine
  - c. Recovery tank
  - d. Self-piercing service port

- e. **UL listed/EPA lab**
  - f. **80% recovery requirement**
  - g. **90% recovery requirement/operating compressor**
- c. Type III**
- i. **Limitations**
    - 1. **Low pressure applications**
    - 2. **Allowable leak rate**
  - ii. **Recordkeeping**
    - 1. **Service**
    - 2. **Leak verification**
  - iii. **Description**
    - 1. **Low pressure**
    - 2. **Below atmosphere operation**
    - 3. **Mandatory leak repair**
  - iv. **Leak detection**
    - 1. **Controlled hot water**
    - 2. **Heating blankets**
    - 3. **Nitrogen for pressure increase**
      - a. **10psig maximum**
      - b. **Disc rupture potential**
    - 4. **Water leaks**
      - a. **Water box**
      - b. **Tubes**
      - c. **Open drive compressor**
    - 5. **Major repair (EPA)**
      - a. **Compressor**
      - b. **Condenser**
      - c. **Evaporator**
      - d. **Auxiliary heat exchange coil**
  - v. **Leak repair requirements**
    - 1. **2019 EPA regulations**
    - 2. **Annual leak rate**
      - a. **Percent of refrigerant charge**
      - b. **Appliance based**
      - c. **Mothballed condition**
    - 3. **System: > fifty pounds**
      - a. **Retrofit or replace**
      - b. **Repair time limit: 18 months**
    - 4. **ASHRAE American Society of Heating Refrigeration and Air Conditioning Engineers guideline**
    - 5. **Time limitations**
      - a. **Initial leak-test verification: 30 days**
      - b. **Industrial process shutdown: 120 days**
      - c. **Follow-up leak- test: within 10 days of initial leak-test**
    - 6. **Recordkeeping**
      - a. **No deadline extension**
      - b. **Three year record keeping**
- d. Testing requirements/ conditions**
- i. **Mandatory core section passing grade**
    - 1. **25 questions**
    - 2. **70 percent passing**
  - ii. **Type I, II, III**
    - 1. **25 questions**
    - 2. **70 percent passing**
    - 3. **Universal certification**
  - iii. **Federal regulations**
    - 1. **Closed book**
    - 2. **Proctored exam**
  - iv. **Test format**
    - 1. **PICTURE IDENTIFICATION**
    - 2. **SOCIAL SECURITY NUMBER**

3. HOME ADDRESS
  4. DATE OF BIRTH
  5. PHONE
  6. E-MAIL ADDRESS
- e. Vapor/compression refrigeration cycle
- i. Gauge manifold set
    1. High pressure reading
    2. Low pressure reading
  - ii. Flow direction
  - iii. Compressor
  - iv. Evaporator
  - v. Metering device
- f. Exam categories
- i. Core
    1. 25 general knowledge questions
    2. Ozone depletion
    3. Clean air act
    4. Montreal protocol
    5. Refrigerant
      - a. Recovery
      - b. Recycling
      - c. Reclaiming
      - d. Recovery devices
    6. Refrigerant substitution
    7. dehydration
    8. safety
    9. slipping
    10. global warming potential
  - ii. ozone depletion potential
    1. science
    2. ozone hole
    3. relative miles from earth
      - a. 7miles
      - b. 30 miles
      - c. Depletion
      - d. Stratosphere shield
      - e. Green house gases
  - iii. Refrigeration recovery guidelines
    1. Proper disposal of appliances
    2. Proper recovery of refrigerant
  - iv. Environmental and health hazards
    1. Human health
      - a. Oxygen displacement
      - b. Heart irregularities
      - c. Asphyxia
    2. Environmental
      - a. Ozone depletion
      - b. Global warming
  - v. Shipping and transporting
    1. Record keeping
      - a. Labeling
      - b. Refrigerant type
      - c. Quantity
    2. Transport position (upright)
    3. Refrigerant classification
      - a. Department of transportation tag ODOT
      - b. Use
      - c. Flammable/non-flammable

## Resources

• *Refrigeration and Air Conditioning Technologies Eighth Edition.*

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• *Esco EPA 608 preparatory manual.*

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• *ESCO institute Mount Prospect IL , Cengage Learning Boston MA.*

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*Refrigeration and Air Conditioning technologies 8th Edition Workbook and lab manual Mount Prospect IL 2018.*

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## Resources Other

### Additional Resource

<http://www.esco group.org>

<http://www.natex.org>

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