

ATSM-2360: LOAD CALCULATIONS

Cuyahoga Community College

Viewing: ATSM-2360 : Load Calculations

Board of Trustees:

2013-05-23

Academic Term:

Spring 2019

Subject Code

ATSM - Applied Ind Tech- Sheetmetal

Course Number:

2360

Title:

Load Calculations

Catalog Description:

Covers heating and air conditioning load calculations required for selecting the proper size equipment for various types of buildings. Included are sections dealing with heat transmission, design temperatures, and air infiltration.

Credit Hour(s):

1

Lecture Hour(s):

1

Requisites

Prerequisite and Corequisite

Departmental approval: admission to Sheet Metal Worker's Apprenticeship program.

Outcomes

Course Outcome(s):

I. Compare the different types of heat transmission and discuss the effects of each.

Objective(s):

1. A. Describe the effect of the sun on the roof and walls results in solar heat gain.
2. B. Discuss the heat transmission factors of different types of glass windows, doors and floors.
3. C. Explain how temperature differences between indoor and outdoor air effects heat conduction

Course Outcome(s):

II. Explain the use of design temperatures to determine load calculations.

Objective(s):

1. A. Discuss why the design temperatures are used instead of using peak temperatures.
2. B. Explain the difference between dry bulb and wet bulb temperatures.
3. C. Compare how the design conditions vary in different regions of the United States and Canada.
4. D. Identify the design conditions used in your location.

Course Outcome(s):

III. Identify the effects that air infiltration has on load calculations.

Objective(s):

1. C. Calculate the amount of infiltration based on the velocity of air using the various velocity charts that are available.
2. D. List the different ways that infiltration can be controlled.
3. A. Describe how air infiltration effects the load calculations.

4. B. Determine the effects of moisture content of the entering air and how it adds to the refrigeration load.

Course Outcome(s):

IV. Calculate the load of a structure and the size of equipment required.

Objective(s):

1. A. Explain the use of load surveys for doing load calculations.
 2. B. List the various types of measurements needed to be taken.
 3. C. Discuss the different insulation materials used and the effects they have on load calculations.
 4. D. Perform a load survey on a sample project.
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Methods of Evaluation:

1. Quizzes
2. Tests
3. Class participation

Course Content Outline:

1. Heat transmission
 - a. Solar heat gain
 - i. Roofs
 - ii. Walls
 - iii. Windows
 - b. Temperature factors
 - i. Glass
 - ii. Doors
 - iii. Floor Construction
 - iv. Concrete
 - v. Full basement
 - vi. Crawl space
 - c. Temperature difference
 - i. Indoor
 - ii. Outdoor
 - iii. Heat conduction
 - d. Conditions
 - i. Dry bulb
 - ii. Wet bulb
 - iii. Humidity
2. Design temperatures
 - a. Design versus peak temperature
 - b. Dry bulb versus wet bulb
 - i. Standard measure
 - ii. Moisture content
 - iii. Relative humidity
 - c. Regional differences
 - i. Northwest
 - ii. Midwest
 - iii. South
 - iv. Canada
3. Air infiltration
 - a. Calculations
 - b. Load charts
4. Infiltration control
 - a. Air barrier system
 - b. Air sealing
 - c. Moisture control
5. Load calculations

- a. Heat transfer
 - i. Solar
 - ii. Infiltration
 - iii. Moisture
- 6. Equipment sizing
 - a. Load surveys
 - i. Measurements
 - ii. Insulation materials
 - iii. Calculations

Resources

1. Eugene Silberstein. *Refrigeration and Air Conditioning Technology*. Sixth Edition. Delmar Publishers Inc, Clifton Park, NY, 2009.

Andrew D. Althouse. *Modern Refrigeration and Air Conditioning*. current. Goodheart-Willcox Co Tinley Park, IL, 2000.

Faye C. McQuiston. *Heating, Ventilating and Air Conditioning Analysis and Design [Hardcover]*. {ts '2005-10-12 00:00:00'}.

Resources Other

1. **[Refrigeration & Air Conditioning Technology | Honolulu Community ...](#)**
2. [www2.honolulu.hawaii.edu › Academics](#)
3. [www.licensedelectrician.com/Store/DE/Refrig_AC_Tech.htm](#)
4. [www.neit.edu/...Technologies/RefrigerationAir-Conditioning](#)
5. [www.ecampus.com/refrigeration-air-conditioning-technology/](#).

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