

ATCT-1390: WELDING FOR CARPENTRY

Cuyahoga Community College

Viewing: ATCT-1390 : Welding for Carpentry

Board of Trustees:

May 2024

Academic Term:

Fall 2024

Subject Code

ATCT - Appld Indus Tech - Carpentry

Course Number:

1390

Title:

Welding for Carpentry

Catalog Description:

Introduction to base level knowledge and skills in elementary shielded metal arc welding techniques and practices. Included are general theory of arc welding process, operation of welding equipment, welding safety practices, electrode characteristics and selection, identification of types of weld joints, and guided instruction and practice in arc welding.

Credit Hour(s):

2

Lecture Hour(s):

2

Lab Hour(s):

0

Requisites

Prerequisite and Corequisite

Departmental approval: admission to any Applied Industrial Technology program

Outcomes

Course Outcome(s):

Make a straight weld bead, lap, fillet, and butt welds in the horizontal and flat positions in accordance with established safety procedures.

Objective(s):

1. Exhibit proper safety practices for arc welding.
 2. Identify types and positions of welded joints.
 3. Differentiate between uses for the horizontal weld position and the flat weld position.
 4. Describe the various weld types including straight weld bead, lap, fillet, and butt welds.
 5. Demonstrate weave and whipping motions.
 6. Strike and establish an arc utilizing both scratch and tap methods.
 7. Make a straight weld bead in the flat position.
 8. Make a straight weld bead in the horizontal position.
 9. Describe the uses and characteristics of metal electrodes.
 10. Make lap, fillet, and butt welds in the horizontal and flat positions.
 11. Explain the shielded metal arc welding process.
 12. Identify the welding machine needed for a given application.
 13. Determine the proper electrical current for a given welding application.
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Course Outcome(s):

Selecting, connecting, operating, and maintaining arc welding equipment.

Objective(s):

1. Describe proper maintenance procedures for arc welding equipment.
2. Differentiate between appropriate uses for various arc welding equipment.
3. Demonstrate how to properly connect various types of arc welding equipment.
4. Demonstrate how to operate various types of arc welding equipment in accordance with OSHA guidelines.

Course Outcome(s):

Determine the proper electrical current for a given welding application.

Objective(s):

1. Recognize the effects of correct and incorrect polarity, determined by visual inspection.
2. Recognize the arc blow and its causes by DC welding current.
3. Identify electrodes and their operating characteristics.
4. Describe the uses and characteristics of metal electrodes.

Methods of Evaluation:

1. Quizzes
2. Exams
3. Classroom participation
4. Completion of assigned projects

Course Content Outline:

1. Concepts
 - a. Arc welding process, welding arc, and welding circuit
 - b. Arc welding safety
 - c. Proper use of arc welding equipment
 - d. Types of arc welding machines
 - e. Uses and characteristics of metal arc welding electrodes
 - f. Effects of correct and incorrect polarities
 - g. Visual inspection techniques
 - h. Causes and effects of arc blow.
 - i. Effect of welding heat on metals.
 - j. AWS numbering system
 - k. Scratch method
 - l. Tap method
 - m. Safety regulations
 - n. OSHA guidelines
 - o. Electrode operating characteristic
 - i. fast-freeze electrodes
 - ii. fast-fill electrodes
 - iii. fill-freeze electrodes
 - p. Definitions
 - i. straight weld bead
 - ii. lap weld
 - iii. fillet weld
 - iv. butt weld
2. Skills
 - a. Selecting correct arc welding equipment.
 - b. Connecting arc welding equipment.
 - c. Operating arc welding equipment.
 - d. Maintaining arc welding equipment.

- e. Using personal protective equipment.
- f. Striking and establishing an arc using scratch method and tap method
- g. Holding and breaking the arc.
- h. Running a straight bead in the flat position.
 - i. Determining current setting for a weld.
 - j. Restarting a bead and crater fill.
- k. Using weave and whipping motions.
 - l. Creating various joint and position types.
- m. Identifying electrodes using fast-freeze electrodes, fast-fill electrodes, and fill-freeze electrodes by using AWS numbering systems.
 - n. Running a bead in horizontal position.
 - o. Lapping weld in flat and horizontal positions.
 - p. Filletting weld in flat and horizontal positions.
 - q. Butting weld in flat and horizontal positions.
- 3. Issues
 - a. Safety
 - b. Scrapping and salvaging materials

Resources

Miller, R. T. *Welding Skills*. Homewood: American Technical Publishers, 1997.

Gibson, Stuart W. *Advanced Welding*. Basingstoke; Macmillan, 1997.

The Lincoln Electric Company. "New Lessons in Arc Welding"

Carpenters International Training Fund. *Welding and Cutting*. Las Vegas, NV: Carpenters International Training Fund, 2022.

Miller, R. T. *Welding Skills*. Homewood: American Technical Publishers, 1997.

Gibson, Stuart W. *Advanced Welding*. Basingstoke; Macmillan, 1997.

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