ATLT-1090: INTRODUCTION TO WELDING FOR LIFTING TECHNOLOGIES

Cuyahoga Community College

Viewing: ATLT-1090 : Introduction to Welding for Lifting Technologies

Board of Trustees:
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Spring 2019

Subject Code
ATLT - AIT-Lifting Technologies

Course Number:
1090

Title:
Introduction to Welding for Lifting Technologies

Catalog Description:
Covers the safety requirements for welding and cutting proceses used in the lifting technologies industry. The physics of welding, various joints and positions and guided practices using oxygen - fuel and gas cutting is covered. In addition, welding processes using metal inert gas (MIG) and tungsten (TIG) used for specific applications will be addressed.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
Departmenal approval: admission to Lifting Technologies apprenticeship program.

Outcomes

Course Outcome(s):
Discuss the various welding processes.

Objective(s):
1. List and differentiate between the various welding machines.
2. Discuss the various welding torches and the areas of use for each one,
3. List the different types of welding gases.
4. Differentiate between the different welding electrodes used in the rigging shop,
5. Explain how the machine settings will determine the quality and ease of the welding process.

Course Outcome(s):
Describe the various welding types and specific uses for each.

Objective(s):
1. List the different weld joints used for lifting technologies.
2. Identify the different types of weld processes.
3. List and explain the respective uses for specific weld processes.
4. Differentiate between MIG and TIG welds.
5. Identify the respective applications for each weld type.

Course Outcome(s):

Discuss the safety precautions followed as prescribed by AWS including PPE.

Objective(s):

1. Identify the safety precautions to be followed during welding practices.
2. List the respective personal protective equipment (PPE) required during various welding processes.
3. Describe the proper equipment selections and set-up for safe operations.
4. Describe the procedures followed for enclosures required for workers outside welding operations.
5. Discuss environmental factors considered for worker protection.

Methods of Evaluation:

1. Participation
2. Assignments
3. Quizzes & Exams
4. Practical application projects1

Course Content Outline:

1. Processes
    a. Welding processes
        i. Metal Inert Gas (MIG)
        ii. Tungsten Inert Gas (TIG)
        iii. Shielded Metal Arc Welding (SMAW)
    b. Torches and use
        i. Water cooled
            1. Link welding
            2. Aluminum structure
            3. Below the hook
        ii. Automatic wire feed
            1. Structures
            2. Mobility application
        iii. Shielded metal arc welding SMAW
            1. Structural
            2. Maintenance and repair
            3. Versatile application
    c. Gases
        i. Argon
        ii. Oxygen
        iii. Acetylene
    d. Welding Electrodes
        i. Tungsten
        ii. E 7018
        iii. E 6010
        iv. E 8620
        v. Aluminum E 6061
    e. Machine settings
        i. Amperage
        ii. AC wave balance
        iii. Argon post flow
        iv. Down slope timer
2. Welding types
    a. Oxygen fuel gas
        i. Cutting
        ii. Brazing
        iii. Taper and weld
        iv. Joining/brazing
    b. Tungsten inert gas TIG
        i. Chain welding
        ii. Below the hook joining BTH

iii. Structural steel
iv. Aluminum joining

c. Metal inert gas MIG
i. BTH
ii. Structural steel

d. Shielded metal arc SMAC
i. BTH
ii. Structural
iii. Maintenance
1. Swager
2. Proof tester
3. Winder
4. Sling fabricating machine
a. Weld Joints
i. Butt Joint
ii. Fillet
iii. “V” groove
b. Environmental factors
i. Exhaust
ii. Combustion
iii. Chemical
iv. Impurities

3. Safety
a. American Welding Society AWS
i. ARC RAYS
ii. Noise
iii. House keeping
iv. Shop hazards

b. PPE
i. Face shield
ii. Lens
iii. Gloves
iv. Clothing
v. Helmet

c. Equipment
i. Portable
ii. Fixed
iii. Gas
iv. Electrical
v. Settings
1. Amperage
2. Wave balance
3. *Polarity*

d. *Enclosures*
i. *Booth*
ii. *Screening*

Resources

o Power Tool Safety and Operation: Woodworking, Metalworking, Metalsand Welding. *Hoerner, Thomas A., Mervin Bettis, Melvin D. Bettis.* 3rd ed. Hobar Publications, 1998.

Klinke, Jerry. *Rigging Handbook.* 4th Edition. 2012.

Resources Other

1. https://www.mazzellacompanies.com
2. http://www.dol.gov/apprenticeship/find-opportunities.htm
3. https://www.mynextmove.org/find/apprenticeship

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