

Welding Core: Gas Metal Arc Welding (GMAW)

Course Outcome Summary

Course Information

Description

Through classroom and/or shop/lab learning and assessment activities, students in this course will: explain gas metal arc welding process (GMAW); demonstrate the safe and correct set up of the GMAW workstation.; correlate GMAW electrode classifications with base metals and joint criteria; demonstrate proper electrode selection and use based on metal types and thicknesses; build pads of weld beads with selected electrodes in the flat position; build pads of weld beads with selected electrodes in the horizontal position; produce basic GMAW welds on selected weld joints; and conduct visual inspection of GMAW welds.

Types of Instruction

Instruction Type

Credits

3

Competencies

- 1. Explain gas metal arc welding process (GMAW).**

Properties
Domain: Cognitive Level: Synthesis

You will demonstrate your competence:

 - o through an instructor-provided written or oral evaluation tool

Your performance will be successful when:

 - o you describe different modes of transfer
 - o you differentiate between types and uses of current
 - o you identify the advantages and disadvantages of GMAW
 - o you identify types of welding power sources
 - o you identify different components of a GMAW station
 - o you describe basic electrical safety
- 2. Demonstrate the safe and correct set up of the GMAW workstation.**

Properties
Domain: Cognitive Level: Application

You will demonstrate your competence:

 - o in the lab or shop setting
 - o using a GMAW workstation

Your performance will be successful when:

 - o you demonstrate proper inspection of equipment
 - o you demonstrate proper use of PPE
 - o you demonstrate proper placement of workpiece connection
 - o you check for proper setup of equipment
 - o you inspect area for potential hazards/safety issues
 - o you troubleshoot the GMAW equipment and perform minor maintenance

3. Correlate GMAW electrode classifications with base metals and joint criteria

Properties

Domain: Cognitive Level: Analysis

You will demonstrate your competence:

- o through a written or oral instructor-provided evaluation tool

Your performance will be successful when:

- o you explain the AWS electrode nomenclature
- o you determine proper electrode for given joint based on material and position of weld
- o you determine proper type of electrodes to be used in a variety of industry applications
- o you identify proper electrode storage and handling
- o you identify consumables

4. Demonstrate proper electrode selection and use based on metal types and thicknesses

Properties

Domain: Cognitive Level: Application

You will demonstrate your competence:

- o in the lab or shop setting
- o using GMAW equipment

Your performance will be successful when:

- o you identify consumables for various electrode sizes
- o you select the proper electrode type and size relative to metal size, type and thickness
- o you select the proper electrode type and size based on material specifications

5. Build pads of weld beads with selected electrodes in the flat position

Properties

Domain: Psychomotor Level:

You will demonstrate your competence:

- o in the lab or shop setting
- o using GMAW equipment

Your performance will be successful when:

- o you implement safety procedures and PPE
- o you implement proper equipment setup
- o you use the proper metal transfer
- o you create a pad of beads using GMAW
- o your weld exhibits proper uniformity and profile

6. Build pads of weld beads with selected electrodes in the horizontal position

Properties

Domain: Psychomotor

You will demonstrate your competence:

- o in the lab or shop setting
- o using GMAW equipment

Your performance will be successful when:

- o you implement safety procedures and PPE
- o you implement proper equipment setup
- o you use the proper metal transfer
- o you create a pad of beads using GMAW

- o your weld exhibits proper uniformity and profile

7. Produce basic GMAW welds on selected weld joints.

Properties

Domain: Cognitive Level: Synthesis

You will demonstrate your competence:

- o in the lab or shop setting
- o using GMAW welding equipment
- o using appropriate tools

Your performance will be successful when:

- o you implement safety procedures and PPE
- o you implement proper equipment setup
- o you perform fillet weld in flat position
- o you perform a fillet weld in horizontal position
- o you perform a groove weld in a flat position
- o you perform a groove weld in a horizontal position
- o you use tools appropriate for the task

8. Conduct visual inspection of GMAW welds

Properties

Domain: Cognitive Level: Application

You will demonstrate your competence:

- o in the lab or shop setting
- o using appropriate inspection tools

Your performance will be successful when:

- o you identify common visual discontinuities and defects on welds
- o you determine causes of discontinuities and defects of welds
- o you inspect welds for pass/fail ratings according to industry standards
- o you use appropriate tools for inspection