TRAINING AND PROJECTS

"making your skills a priority"

Course Title: Weld Carbon Steel Workpieces Using the Gas Metal Arc Welding (GMAW) Process in All Positions

SAQA ID: 243064

NQF Level: 2

Credits: 15

Course Description:

This course equips learners with the knowledge and skills to weld carbon steel workpieces using the gas metal arc welding (GMAW) process in various positions, including flat, vertical, overhead, and horizontal. Emphasis is placed on GMAW principles, equipment setup, material preparation, welding techniques, and adherence to safety protocols, enabling learners to produce high-quality welds across different welding positions.

Course Objectives:

By the end of this course, learners will be able to:

- Understand the principles of the GMAW process and its applications.
- Set up and safely operate GMAW equipment.
- Perform high-quality welds on carbon steel in all positions.
- Recognize and troubleshoot common welding defects.
- Comply with safety standards and best practices in welding.

Benefits of Completing this Course:

- Develop advanced welding skills applicable across multiple industries.
- Improve employability in welding, metal fabrication, and construction.
- Enhance proficiency in GMAW, a versatile and widely used welding method.
- Build confidence in producing quality welds in all positions.
- Obtain a recognized qualification supporting career advancement.

Who Should Attend:

- Welders and fabricators looking to advance their skills in GMAW.
- Apprentices and trainees in metalworking or welding programs.
- Supervisors and quality control personnel in welding operations.
- Individuals seeking to pursue a career in professional welding.

Assessment:

Assessment will be based on the learner's ability to:

- Demonstrate knowledge of GMAW principles, techniques, and equipment setup.
- Perform welds in all positions and troubleshoot defects.
- Participate in discussions and activities focused on welding safety and quality.

Specific Outcomes and Assessment Criteria:

By successfully completing this SAQA Unit Standard, learners will demonstrate competency in the following:

1. **Understand Gas Metal Arc Welding Principles:**
    - Explain GMAW principles, including the advantages and limitations of using this process for carbon steel.
    - Discuss the factors that influence weld quality, such as wire feed speed, voltage, and gas type.
    - Assessment Criteria: Written assessment covering GMAW principles and weld quality factors.
2. **Set Up and Operate GMAW Equipment:**
    - Identify and assemble GMAW equipment and consumables, including the correct wire and shielding gas.
    - Adjust machine settings according to workpiece specifications and position.
    - Assessment Criteria: Practical exercise demonstrating correct setup of GMAW equipment.
3. **Perform Welds in All Positions:**
    - Execute welds in flat, vertical, horizontal, and overhead positions.
    - Apply appropriate techniques for each position to ensure proper fusion, penetration, and appearance.
    - Assessment Criteria: Practical assessment of welding proficiency in all positions, focusing on joint integrity and quality.
4. **Identify and Correct Welding Defects:**
    - Recognize common defects associated with GMAW, such as porosity, undercutting, and lack of fusion.
    - Implement corrective actions to address defects and maintain weld quality.
    - Assessment Criteria: Written assessment on defect identification and corrective measures.

5. **Ensure Compliance with Safety Standards:**
    - Explain and implement safety protocols for GMAW, including PPE use and workspace management.
    - Maintain a safe working environment while using GMAW equipment.
    - Assessment Criteria: Group discussion and practical assessment on safety in GMAW operations.

By completing this course, learners will be equipped to perform high-quality GMAW on carbon steel workpieces in any welding position, adhering to industry safety and quality standards.