SEMME2081

Welding materials using mechanised arc welding equipment

Overview

This standard identifies the competences you need to operate one type of mechanised MIG/MAG, flux cored wire, submerged arc, TIG, or plasma arc welding installation, which has already been prepared for production, in accordance with approved instructions or welding procedures. You will be expected to check that the equipment has been approved for production and that sufficient supplies of all the required materials and consumables are present and correct, and ready for production operations to be performed.

You must operate the installation safely and correctly, in accordance with instructions and approved procedures and achieve a weld quality and tolerances that meet the product specification. The production output may be inspected by visual and non-destructive testing methods, to check that the specified quality is being achieved. You must continuously monitor the operation of the installation and make any necessary adjustments to equipment settings, in line with your permitted authority, in order to produce the welded joints to the required specification. Meeting production requirements will be an important issue and your production records must show consistent and satisfactory performance.

Your responsibilities will require you to comply with organisational policy and procedures for operating the welding installation and to report any problems or adjustments to the installation that you cannot resolve, or are outside your permitted authority, to the relevant people. You will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, enabling you to adopt an informed approach to applying welding procedures and instructions. You will have an understanding of how the welding process works and is applied in mechanised form and will know about the equipment, materials and consumables, in adequate depth to provide a sound background to the process operation and for carrying out the welding activities to the required specification.

You will understand the safety precautions required when working with the machine and with its associated tools and equipment. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the relevant joining procedure and work instructions
3. confirm that the machine is set up and operating correctly, ready for the joining operations to be carried out
4. check that the parent material, components, consumables and joint preparation comply with specifications
5. carry out and monitor the machine operations in accordance with specifications and job instructions
6. weld the materials and achieve joints of the required quality and specified dimensional accuracy
7. produce welded components to relevant standards
8. make sure that the rate of output is as specified
9. deal promptly and effectively with problems within your control and report those that you cannot solve
10. shut down the equipment to a safe condition on conclusion of the joining activities

Knowledge and understanding

You need to know and understand:

1. the safe working practices and procedures to be observed when operating mechanised arc welding installations (to include working with machinery; the use of personal protective equipment (PPE); protecting others from the effects of the electric arc; appropriate machine guards; operation of machine safety devices; stopping the machine in an emergency; closing the machine down on completion of activities)
2. statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations
3. the hazards associated with arc welding machines (such as dangers from the electric arc; live electrical components; fumes and gases; hot metal; grinding and mechanical metal/slag removal; moving parts of machinery) and how they can be minimised
4. the basic principles of mechanised and automated welding (such as types of installations; machine functions; control systems; safety features)
5. the key components and features of the equipment used (such as power source; electrical parameters such as arc voltage, current, wire dispensing and feed mechanisms; flux dispensing and recovery; shielding gas supply; control and storage of consumables; how variations in the parameters influence weld features, quality and output)
6. extracting the necessary information from drawings and welding procedure specifications; welding symbols and abbreviations used (to include symbols and conventions to appropriate British, European or relevant International standards in relation to work undertaken)
7. operation of the machine controls and their function
8. how to care for the welding equipment used
9. setting up and aligning the workpiece, and the equipment to be used
10. monitoring the installation during the welding process; recognition of problems and action to be taken
11. problems that can occur with the welding activities (such as distortion, material and weld defects)
12. why tool/equipment control is critical and what to do if a tool or piece of equipment is unaccounted for on completion of the activities
13. how to carry out self inspection of completed work and the methods and

equipment to be used

14. organisational quality systems (such as standards to be achieved; production records to be kept)
15. personal approval tests, and their applicability to your work
16. the disposal of waste materials in a safe and environmentally friendly way
17. the extent of your own authority and whom you should report to if you have problems that you cannot resolve
18. reporting lines and procedures, line supervision and technical experts

Scope/range related to performance criteria

1.

Confirm that the installation is ready for welding operations, to include checking all of the following:

- 1.1 the installation has been approved for production
- 1.2 supplies of components and consumables are adequate and correctly prepared
- 1.3 machine settings comply with instructions and the welding procedure specification
- 1.4 jigs and fixtures are in place and operate correctly
- 1.5 all machine functions operate correctly
- 1.6 all safety equipment is in place and functioning correctly

2.

Operate one of the following mechanised arc welding processes, in the specified materials, forms and positions:

- 2.1 MIG/MAG
- 2.2 submerged arc
- 2.3 flux cored wire
- 2.4 plasma arc
- 2.5 TIG

3.

Produce welded components covering both of the following:

- 3.1 two different joint configurations
- 3.2 two different material groups

4.

Monitor the process operation and machine functions, and make adjustments, as required, to parameters and mechanisms within your permitted authority and tolerances, to include adjusting all of the following:

- 4.1 electrical parameters
- 4.2 welding speed
- 4.3 flux dispensing and recovery mechanisms
- 4.4 safety devices
- 4.5 wire feed rate
- 4.6 gas shielding system
- 4.7 mechanical functions (such as handling, loading, workholding, transfer)

5.

Produce welded components which:

- 5.1 achieve a weld quality equivalent to the relevant level of BS EN ISO 5817, as required by the application standard (for aluminium, EN 30042/ISO 10042 applies)

5.2 meet and verify the required dimensional accuracy, within specified tolerances

Behaviours

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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