

PERFORM GAS METAL ARC WELDING

UNIT CODE: ENG/OS/WEF/CR/02/4/A

UNIT DESCRIPTION

This unit of competency specifies skills required to prepare welding work, set up and carry out gas metal arc welding (GMAW) while observing safety. GMAW is known as metal inert gas (MIG) when an inert gas is used for shielding. It also known as metal active gas (MAG) when an active gas is used for shielding.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Apply safety to a workplace	1.1. <i>Personal Protective Equipment (PPE)</i> for the job are selected. 1.2. Wore PPE as per job requirements 1.3. Permits and approvals confirmed prior to starting work 1.4. <i>Incidents, hazards and risks</i> are identified.
2. Apply housekeeping to welding work area	2.1 Housekeeping before, during and after welding is performed. 2.2 Tools, equipment and unused materials and consumables are cleaned and/or returned to safe area. 2.3 Completed work piece is stored/ handed over as per work place procedures.
3. Take-in Instructions	3.1 Interpreted welding instructions as per supervisor/mentor guidelines. 3.2 Drawings and specifications are interpreted according to standard operating procedures. 3.3 Executed supervisor/mentor's instructions.
4. Prepare materials, tool and equipment	4.1 <i>Consumables</i> , materials, tools and equipment for the specific job are obtained. 4.5 <i>Work pieces</i> are measured, marked, cut and prepared according to specifications. 4.6 MIG/MAG Equipment is set up according to manufacturer's specification

	4.7 MIG/MAG Equipment setting up checklist completed.
5. Weld work pieces	<p>5.1 Set up weld workpiece as per the supervisor/ mentor's instructions/ job card requirements.</p> <p>5.2 Conducted <i>positional</i> arc welding according to supervisor/ mentor's instructions.</p> <p>5.3 Weld is completed as per acceptance criteria and job requirements</p> <p>5.4 Adhered to applicable arc welding safety.</p> <p>5.5 Accidents- and incidents-checklist completed according to workplace procedure.</p>
6. Repair welds	<p>6.1 Weld is completed as per job requirements</p> <p>6.2 Weld <i>repaired</i> as per job requirements</p> <p>6.3 Discontinuities/ defects identified according to acceptance criteria.</p>

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Personal Protective Equipment (PPE) may include but not limited to/limited to;	<ul style="list-style-type: none"> ● Fire retardant overall/leather apron ● Welding gloves ● Welding shields ● Safety boots ● Ear safety devices ● Head protection devices
2. Consumables may include but not limited to/limited to;	<ul style="list-style-type: none"> ● Argon/ CO₂ gases ● Filler wire
3. Work pieces may include but not limited to/limited to;	<ul style="list-style-type: none"> ● Mild Steel ● Cast Iron ● Aluminium ● Alloy Steels ● Stainless Steel ● Carbon Steel
4. Position weld may include but not limited to/limited to;	<ul style="list-style-type: none"> ● Flat butt (1G) and fillet (1F) ● Horizontal butt (2G) and fillet (2F) ● Vertical fillet (3F) and butt (3G)

	<ul style="list-style-type: none">● Overhead fillet (4F) and butt (4G)● Pipe joint 5G and 6G
5. Repaired	<ul style="list-style-type: none">● Grinding and re-welding

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REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Use of PPEs
- Communication
- Team Work
- Planning
- Self-management

Required Knowledge

The individual needs to demonstrate knowledge of:

- Types of PPE
- Use shop tools, equipment and materials
- Uses of different sizes of filler wires
- Amperage and its influence on the selection of filler wire
- Housekeeping procedures
- Safety rules and regulations applicable to the job

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Personal Protective Equipment (PPE) for the job is selected. 1.2 PPE worn as per job requirements 1.3 Permits and approvals required for welding works are confirmed as per standard operating procedures. 1.4 Incidents, hazards and risks are identified Housekeeping before, during and after welding is performed. 1.5 Welding instructions are interpreted as per supervisor/mentor guidelines. 1.6 Drawings and specifications are interpreted according to standard operating procedures. 1.7 Executed supervisor/mentor's instructions. 1.8 Work pieces are measured, marked, cut and prepared according to specifications. 1.9 MIG/MAG Equipment setting up checklist complete
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	<p>1.10 Workpieces are set up as per the supervisor/ mentor's instructions/ job card requirements.</p> <p>1.11 Positional arc welding is conducted according to supervisor/ mentor's instructions.</p> <p>1.12 Welding safety is observed.</p> <p>1.13 Accidents- and incidents-checklist completed according to workplace procedure</p> <p>1.14 Weld is completed as per acceptance criteria and job requirements</p> <p>1.15 Weld is repaired as per job requirements/acceptance criteria</p> <p>1.16 Discontinuities/ defects are identified according to acceptance criteria</p>
2. Resource implications	<p>The following resources must be provided:</p> <p>2.1 Equipped welding work place</p> <p>2.2 Tools, equipment and accessories for arc welding works</p> <p>2.3 Materials relevant to the task</p> <p>2.4 Manufacturer's specifications and manuals relevant to the task</p>
3. Methods of assessment	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral questioning</p> <p>3.3 Written test</p> <p>3.4 Portfolio of Evidence</p> <p>3.5 Interview</p> <p>3.6 Third party report</p>
4. Context for assessment	<p>4.1 On-the-job</p> <p>4.2 Off-the –job</p> <p>4.3 During Industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>