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| <b>Domain</b>   | <b>METAL FABRICATION-WELDER</b>  | <b>Unit ID: 253</b> |
| <b>Title:</b>   | <b>Perform advanced tungsten inert gas welding on aluminium in all positions</b> |                     |
| <b>Level: 4</b> |  | <b>Credits: 6</b>   |

### Purpose

This unit standard specifies the competencies required to perform advanced tungsten inert gas welding on aluminium in all positions. It includes preparing materials and equipment, welding aluminium in the specified position, post welding inspection as well as completion of work and cleaning up. This unit standard is intended for those who work as welders.

### Special Notes

1. Entry information

Prerequisite:

- *Unit 228* - Apply safety rules and regulations in a metal fabrication work environment or demonstrated equivalent knowledge and skills.
2. To demonstrate competence, at a minimum, evidence is required of performing one butt, one T-joint and one lap joint weld on aluminium in all welding positions. These tasks should be performed ensuring correct identification of requirements of the task, correct selection and use of appropriate processes, tools and equipment and completing all work to specification.
  3. Assessment evidence may be collected from a real workplace or simulated real workplace or an appropriate simulated realistic environment in which metal fabrication operations are carried out.
  4. Performance of all elements in this unit standard must comply with manufacturers' specifications and workplace specific requirements.
  5. '*Specifications*' refers to any, or all of the following: manufacturers' specifications and recommendations, site and workplace specific requirements.
  6. Materials to be used are to be limited to aluminium.
  7. Regulations and legislation relevant to this unit standard include:
    - Labour Act 6 of 1992
    - Occupational Health and Safety Regulations No 18, 1997 and all subsequent amendments.

## **Quality Assurance Requirements**

This unit standard and others within this Subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority on [www.nta.com.na](http://www.nta.com.na).

## **Elements and Performance Criteria**

### **Element 1: Prepare materials and equipment**

#### **Range**

Test procedures may include voltage drop, amperage setting, earthing, electrode and wire conductivity, electrode flux condition.

Preparation of materials is to include pre-heating, setting up jigs, fixtures and clamps.

#### **Performance Criteria:**

- 1.1 Weld requirements are identified from specifications and drawings.
- 1.2 Personal protective clothing and equipment is selected and inspected in line with workplace procedures.
- 1.3 Appropriate material is selected, prepared and aligned in line with job requirements.
- 1.4 Welding equipment is assembled and set up safely and in line with manufacturer's instructions.
- 1.5 Welding machine settings and electrodes are identified against predetermined specifications and welding procedures.
- 1.6 Test runs are undertaken and verified in line with specifications.

### **Element 2: Weld aluminium in all positions**

#### **Range**

Welding positions include down hand, vertical up, vertical down, overhead and horizontal.

#### **Performance Criteria:**

- 2.1 Risks associated with tungsten inert gas welding are identified and minimised prior to commencing of task.
- 2.2 Appropriate personal safety clothing and personal protective equipment is used in accordance with workplace procedures.

- 2.3 Distortion prevention measures are identified and applied as required and appropriate action to prevent distortion is taken.
- 2.4 Equipment start up procedure is undertaken in line with task requirements.
- 2.5 Materials are welded to specifications and in line with requirements and instructions.

**Element 3: Conduct post weld inspection**

**Range**

Visual inspection of work piece includes but is not limited to metal control, penetration, undercutting and porosity.

**Performance criteria:**

- 3.1 Welds are cleaned in accordance with enterprise procedures.
- 3.2 Welds are visually inspected for correctness and quality in accordance with specified method.

**Element 4: Complete work and clean up**

**Performance Criteria**

- 4.1 Work is completed and appropriate personnel notified in line with workplace procedures.
- 4.2 Work area is cleared of waste, cleaned, restored and secured in line with workplace procedures.
- 4.3 Plant, tools and equipment are cleaned, checked, maintained and stored in line with workplace procedures.
- 4.4 Work completion details are finalised in line with workplace procedures.

**Registration Data**

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|--------------------------------------|----------------------------|
| <b>Subfield:</b>                     | Mechanical Engineering     |
| <b>Date first registered:</b>        | 29 March 2007              |
| <b>Date this version registered:</b> | 29 March 2007              |
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| <b>Body responsible for review:</b>  | Namibia Training Authority |