

Unit ID: 246

Domain

**METAL FABRICATION-CORE**

Title:

**Weld stainless steel using the tungsten inert gas welding process in the down hand position**

Level: 3

Credits: 3

### Purpose

This unit standard specifies the competencies required to weld stainless steel work pieces using the tungsten inert gas welding process in the down hand position in metal fabrication operations. It includes preparation of materials and equipment, welding stainless steel in the down hand position, post weld inspection as well as completion of work and cleaning up. This unit standard is intended for those who work as welders and boilermakers.

### 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 four welds on stainless steel to include a butt joint, T-joint and lap joint in the down hand position using the tungsten inert gas welding process. These tasks should be performed ensuring correct identification of requirements and finishing of the tasks, correct identification and selection of appropriate processes, tools and equipment as well as completing all work to specification.
3. Assessment evidence may be collected from a real workplace or a 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' instructions 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 are limited to stainless steel not exceeding 3 millimeters in thickness.
7. Regulations and legislation relevant to this unit standard should be adhered to.
  - Occupational Health and Safety Regulations No. 18, 1997
  - Labour Act 6 of 1992and 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 protection clothing and equipment is selected and inspected in accordance with standard operating procedures.
- 1.3 Appropriate material is selected, prepared and aligned in accordance with job requirements.
- 1.4 Welding equipment is assembled and set up safely and in accordance with standard operating procedures.
- 1.5 Welding machine settings and electrodes are identified against predetermined specifications and welding procedures.
- 1.6 Test runs are undertaken and verified in accordance with specifications.

### **Element 2: Weld stainless steel in the down hand position**

#### **Performance Criteria**

- 2.1 Risks associated with tungsten inert gas welding are identified and minimised prior to welding.
- 2.2 Appropriate personal protective clothing and equipment is used in accordance with standard operating 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 accordance with task requirements.
- 2.5 Materials are welded to specifications and in accordance with requirements and instructions.

**Element 3: Conduct post weld inspection**

**Range**

Visual inspection of work piece to include but 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 accordance with workplace procedures.
- 4.2 Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures.
- 4.3 Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with workplace procedures.
- 4.4 Work completion details are finalised in accordance with workplace procedures.

**Registration Data**

<b>Subfield:</b>	Mechanical Engineering
<b>Date first registered:</b>	29 March 2007
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