



**SAQA ID**  
94100

**DURATION**  
36 Months

**CREDITS**  
373

**QCTO**

Occupational Certificate:

**WELDER**

Level 4



## WHO SHOULD STUDY THIS COURSE?

The purpose of this qualification is to prepare a learner to:

Join metal products in accordance with Welding Procedure Specifications using an electric arc or gas welding process.

A qualified learner will be able to:

- Perform cutting, gouging and gas welding of ferrous materials using oxy fuel, carbon arc and plasma cutting equipment.
- Produce fillet welds using various welding processes.
- Produce plate welds using various welding processes.
- Produce pipe welds using various welding processes.

## Rationale

This qualification is a listed trade qualification and falls within the Occupational Qualifications Framework of the NQF of South Africa. Of specific importance is the fact that this qualification elevates training of Welders in South Africa to accepted international standards.

A wide range of industries in the South African economy employs welders, qualified as artisans. Inclusive are companies in the manufacturing sector, mining, petro-chemical as well as engineering contractors in large and small projects - including projects that are key to the economic development of South Africa such as power supply. This qualification addresses one of the key trades in which labour market shortages for skilled artisans are experienced. Reports of large number of welders contracted from other countries to address the scarcity of welding skills are common.

The availability of this Welding qualification for training of trades persons to accepted international

standards is regarded as an important resource to support of national artisan development initiatives in South Africa.

The qualification ensures that a sound skills base is developed at artisan level that can serve as the foundation for achieving coded welding status required for the execution of specialised welds by industry.

The importance of providing opportunities for persons that are unemployed, who seeks to develop skills that allows them to enter into small welding business opportunities in rural and developed areas of the country is supported by the design of the qualification. Specific skill sets in basic welding practices are inclusive and allows for the training of such persons within the overall structure of the trade. Recognition achieved for completion of these skills sets, when delivered by accredited providers, allows the learners to build their portfolio and towards completion of the full trade.

## Exit Level Outcomes

1. The ability to cut, gouge and gas weld ferrous materials.
2. The ability to weld ferrous materials including stainless steel using Shielded Metal Arc Welding.
3. The ability to weld ferrous and non-ferrous materials using Gas Metal Arc Welding processes.
4. The ability to weld ferrous and non-ferrous materials using the Gas Tungsten Arc Welding process.

## ASSOCIATED ASSESSMENT CRITERIA

### Exit Level Outcome 1:

- Tools and equipment are selected, used and cared for to accepted standards.
- Safe work procedures, precautions and Personal Protective Equipment required for each process can be described and is adhered to.
- Cutting techniques, equipment setup and nozzle selection criteria and consequences if not adhered

to can be explained for specific applications.

- Gouging equipment setup and settings/ parameters and consequences if not adhered to can be explained for specific applications.
- Gas welding techniques, equipment setup and nozzle selection criteria and consequences if not adhered to can be explained for specific applications.
- Cut and gouge profiles meets accepted quality standards.
- Gas welded joints meet excepted quality standards.
- Safe storage and handling practices of gases and consequences if not adhered to can be explained and is adhered to...

### Exit Level Outcome 2:

- Schematic illustrations of Shielded Metal Arc Welding equipment can be labelled and the functions of selected components explained.
- Diagrams of welds are labelled using the correct welding terminology.
- Answers on welding of joints, demonstrates understanding of welding codes, the critical monitoring points, equipment settings, quality standards, and safety procedures.
- Answers on welding of materials demonstrate understanding of characteristics of materials.
- Shielded Metal Arc Welding processes can be explained in terms applications, and steps required to perform a quality weld and probable causes of defects.
- Welding symbols can be recognised and correlated to the type of joint.
- Welding consumables classification and applications can be explained.
- Safe work procedures, precautions and Personal Protective Equipment required for Shielded Metal Arc Welding can be described.
- Shielded Metal Arc welded fillet, plate and

pipe joints meets prescribed welding codes or standards.

### Exit Level Outcome 3:

- Schematic illustrations of Gas Metal Arc Welding equipment can be labelled and the functions of selected components explained.
- Diagrams of welds are labelled using the correct welding terminology.
- Answers on welding of joints, demonstrates understanding of welding codes, the critical monitoring points, equipment settings, quality standards, and safety procedures.
- Answers on welding of materials demonstrate understanding of characteristics of materials.
- Gas Metal Arc Welding processes can be explained in terms applications, and steps required to perform a quality weld and probable causes of defects.
- Welding symbols can be recognized and correlated to the type of joint.
- Welding consumables classification and applications can be explained.
- Safe work procedures, precautions and Personal Protective Equipment required for Gas Metal Arc Welding can be described.
- Gas Metal Arc welded fillet, plate and pipe joints meets prescribed welding codes or standards.

### Exit Level Outcome 4:

- Schematic illustrations of Gas Tungsten Arc Welding equipment can be labelled and the functions of selected components explained.
- Diagrams of welds are labelled using the correct welding terminology.
- Answers on welding of joints, demonstrates understanding of welding codes, the critical monitoring points, equipment settings, quality standards, and safety procedures.
- Answers on welding of materials demonstrate



understanding of characteristics of materials.

- Gas Tungsten Arc Welding processes can be explained in terms applications, and steps required to perform a quality weld and probable causes of defects.
- Welding symbols can be recognised and correlated to the type of joint.
- Welding consumables classification and applications can be explained.
- Safe work procedures, precautions and Personal Protective Equipment required for Gas Tungsten Arc Welding can be described.
- Gas Metal Tungsten Arc welded fillet, plate and pipe joints meet prescribed welding codes or standards.

### **Integrated Assessment: Integrated Formative Assessment**

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

### **Integrated summative assessment.**

The external summative assessment will be a trade test conducted in terms of Section 26 D of the Skills Development Act through an evaluation of written and practical tasks covering critical aspects of the trade and conducted in a simulated environment at an assessment centre accredited by QCTO by an assessor registered by National Artisan Moderation Body. The assessment will take place over a minimum of 2 days.

### **ARTICULATION OPTIONS**

Articulation opportunities with other metal trade specific qualifications in the unit group 6512, Welders and Flame Cutters, such as Pressure Welders and Fitter Welders, 6513, Sheet Metal Workers such as Boiler Makers will become reality as trade qualifications for these are developed.

The structure of the curriculum recognizes the internationally accepted progressive development route of welders through skill sets as:

- Fillet Welder.
- Plate Welder.
- Pipe Welder.

<b>Unit Standard</b>			
<b>KNOWLEDGE MODULES</b>	Introduction to the welding trade	2	2
	Occupational Safety, Health and Environmental Protection	2	4
	Welding schematics, calculations, welds and welded joints	2	6
	Weld imperfections	2	2
	Cutting and gouging,	2	2
	Welding consumable classification and handling	2	4
	Metals and weldability of metals,	3	8
	Fusion welding	3	6

KNOWLEDGE MODULES			
Arc welding		3	8
Gas welding and cutting		3	4
Welding codes, standards and parameters		4	6
Shrinkage, residual stress and distortion		4	4
Manual Metal Arc, MMA welding process		4	7
The Metal Inert Gas/Metal Active Gas/Flux Cored Arc, MIG/MAG/FCAW welding process		7	7
Manual Metal Arc, MMA welding process		4	7
Welding inspection and quality		4	4
			<b>81</b>
Unit Standard			
PRACTICAL SKILLS MODULES			
Fabricate simple components or work pieces		2	4
Cut, gouge and gas weld material manually		2	12
Perform fillet welds using the Shielded Metal Arc Welding process		3	12
Perform fillet welds using the Gas Metal Arc Welding process		3	12
Perform fillet welds using the Gas Tungsten Arc Welding process		3	16
Perform plate butt welds using the Shielded Metal Arc Welding process		4	16
Perform plate butt welds using the Gas Metal Arc Welding process		4	16
Perform plate butt welds using the Gas Tungsten Arc Welding process		4	16
Perform pipe welds using the Shielded Metal Arc Welding process,		4	16
Perform pipe welds using the Gas Metal Arc Welding process		4	16
Perform pipe welds using the Gas Tungsten Arc Welding process		4	20
			<b>140</b>



Unit Standard			
WORK XP	Cut and gouge a range of materials in the workplace	2	8
	Produce a range of fillet welds using various welding processes in a workplace	4	40
	Care for, control and handle consumables and materials in a workshop	2	4
	Produce a range of plate welds using various welding processes in a workplace	4	40
	Team work, communication and reporting in the workplace	3	8
	Produce a range of pipe welds using various welding processes in a workplace	4	52
			152

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