



**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**WELDING ARTISAN**

**LEVEL 4**



**TVET CDACC**  
**P.O. BOX 15745-00100**  
**NAIROBI**

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## **FOREWORD**

The provision of quality education and training is fundamental to the Government's overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya's development blue print and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution and this resulted to the formulation of the Policy Framework for Reforming Education and Training. A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms demand that industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for the purpose of developing a competency-based curriculum for Welding and Fabrication Level 4. These Occupational Standards will also be the bases for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for the Welding and Fabrication sector's growth and sustainable development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING  
MINISTRY OF EDUCATION**

## PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high-quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Welding Sector Skills Advisory Committee (SSAC), have developed these Occupational Standards for a Welding and Fabrication artisan. These occupational standards will be the bases for development of competency-based curriculum for Welding and Fabrication Level 4. These Standards will also be the basis for assessment of an individual for competence certification.

The occupational standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Welding SSAC, expert workers and all those who participated in the development of these occupational standards.

**Prof. CHARLES M. M. ONDIEKI, PhD, FIET (K), Con. EngTech.  
CHAIRMAN, TVET CDACC**

## **ACKNOWLEDGEMENT**

These Occupational Standards were developed through combined effort of various stakeholders from private and public organizations. I am sincerely thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) for providing guidance on the development of these Standards. My gratitude goes to the Welding Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the validation of these standards.

I acknowledge all institutions which in one way or another contributed to the development of these Standards.

### **CHAIRPERSON**

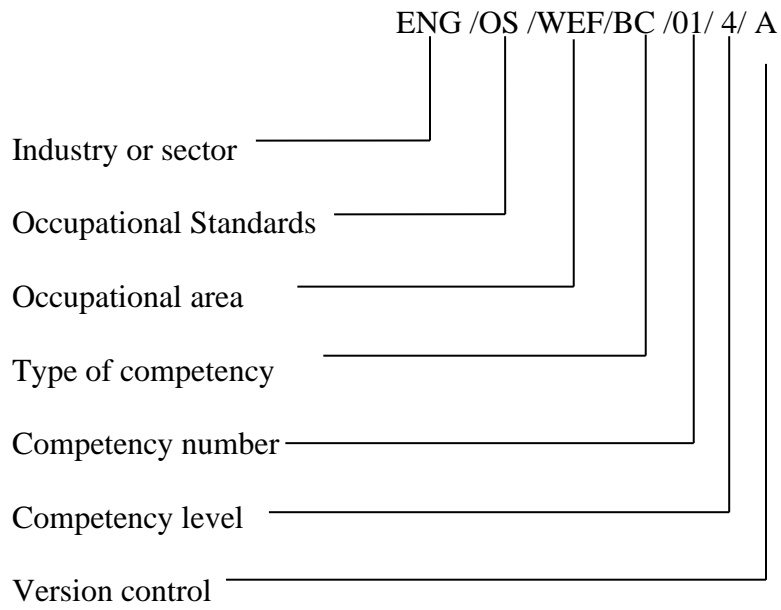
### **WELDING SECTOR SKILLS ADVISORY COMMITTEE**

## ACRONYMNS

BC	Basic Competency
CBET	Competency Based Education and Training
CC	Common Competency
CDACC	Curriculum Development Assessment and Certification Council
CR	Core Competency
CU	Curriculum
EMCA	Environmental Management and Coordination Act
KCSE	Kenya Certificate of Secondary Education
KNQA	Kenya National Qualifications Authority
MoE	Ministry of Education
NGO	Non-Governmental Organization
OS	Occupational Standards
OSHA	Occupation Safety and Health Act
PPE	Personal Protective Equipment
SSAC	Sector Skills Advisory Committee
WEF	Welding and Fabrication
KS	Kenyan Standard
ISO	International Organization for Standardization
BS	British Standard
NEMA	National Environmental Management Authority
ASME	American Society of Mechanical Engineers
SOPs	Standard Operating Procedures



## KEY TO UNIT CODE





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## OVERVIEW

Welding and Fabrication Level 4 qualification consists of competencies that a person must achieve to enable him/her to carry out various welding processes including gas welding in all positions, manual metal arc welding, Tungsten Inert Gas (TIG) welding and Gas Metal Arc Welding (GMAW).

The units of competency comprising this qualification include the following basic, common and core competencies:

### Basic Units of Competency

Unit Code	Unit Title
ENG/OS/WEF/BC/01/4/A	Demonstrate communication skills
ENG/OS/WEF/BC/02/4/A	Demonstrate numeracy skills
ENG/OS/WEF/BC/03/4/A	Demonstrate digital literacy
ENG/OS/WEF/BC/04/4/A	Demonstrate entrepreneurial skills
ENG/OS/WEF/BC/05/4/A	Demonstrate employability skills
ENG/OS/WEF/BC/06/4/A	Demonstrate environmental literacy
ENG/OS/WEF/BC/07/4/A	Demonstrate occupational safety and health practices

### Common Units of Competency

Unit Code	Unit Title
ENG/OS/WEF/CC/01/4/A	Apply workplace health, safety, environmental and emergency
ENG/OS/WEF/CC/02/4/A	Apply workplace essential skills
ENG/OS/WEF/CC/03/4/A	Plan and organise work activities
ENG/OS/WEF/CC/04/4/A	Apply fundamental skills of welding works

## Core Units of Competency

<b>Unit Code</b>	<b>Unit Title</b>
ENG/OS/WEF/CR/01/4/A	Perform manual arc (stick) welding in all positions with various metal work pieces
ENG/OS/WEF/CR/02/4/A	Perform TIG welding in all positions with various metal work pieces
ENG/OS/WEF/CR/03/4/A	Perform MIG welding in all positions with various metal work pieces
ENG/OS/WEF/CR/04/4/A	Perform gas welding in all positions with various metal work pieces

## **BASIC COMPETENCIES**

## DEMONSTRATE COMMUNICATION SKILLS

**UNIT CODE: ENG/OS/WEF/BC/01/4/A**

### UNIT DESCRIPTION

This unit covers the competencies required to gather, interpret and convey information in response to workplace requirements and to lead in the dissemination and discussion of ideas, information and issues in the workplace.

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
<p>These describe the key outcomes which make up workplace function</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i><b>Bold and italicized terms are elaborated in the Range</b></i></p>
<p>1. Obtain and convey workplace information</p>	<p>1.1 Specific and relevant information is accessed from <i><b>appropriate sources</b></i></p> <p>1.2 Effective questioning, active listening and speaking skills are used to gather and convey information</p> <p>1.3 Appropriate <i><b>medium</b></i> is used to transfer information and ideas</p> <p>1.4 Appropriate non- verbal communication is used</p> <p>1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed</p> <p>1.6 Defined workplace procedures for the location and <i><b>storage</b></i> of information are used</p> <p>1.7 Personal interaction is carried out clearly and concisely</p>
<p>2. Complete relevant work-related documents</p>	<p>2.1 Range of forms relating to conditions of employment are completed accurately and legibly</p> <p>2.2 Workplace data is recorded on standard workplace forms and documents</p> <p>2.3 Basic mathematical processes are used for routine calculations</p> <p>2.4 Errors in recording information on forms/ documents are identified and properly acted upon</p> <p>2.5 Reporting requirements to supervisor are completed according to organizational guidelines</p>
<p>3. Communicate information about</p>	<p>3.1 Appropriate method of communication is selected</p>

workplace processes	<p>3.2 Multiple operations involving several topics areas are communicated accordingly</p> <p>3.3 Questions are used to gain extra information</p> <p>3.4 Correct sources of information are identified</p> <p>3.5 Information is selected and organized correctly</p> <p>3.6 Verbal and written reporting is undertaken when required</p> <p>3.7 Communication skills are maintained in all situations</p>
4. Lead workplace discussion	<p>4.1 Response to workplace issues are sought</p> <p>4.2 Response to workplace issues are provided immediately</p> <p>4.3 Constructive contributions are made to workplace discussions on such issues as production, quality and safety</p> <p>4.4 Goals/objectives and action plan undertaken in the workplace are communicated accordingly</p>
5. Identify and communicate issues arising in the workplace	<p>5.1 Issues and problems are identified as they arise</p> <p>5.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication</p> <p>5.3 Dialogue is initiated with appropriate personnel</p> <p>5.4 Communication problems and issues are raised as they arise</p>

## RANGE

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

Variable	Range
<ul style="list-style-type: none"> <li>• Methods of communication include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Non-verbal gestures</li> <li>• Verbal</li> <li>• Face to face</li> <li>• Two-way radio</li> <li>• Speaking to groups</li> <li>• Using telephone</li> <li>• Written</li> <li>• Internet</li> </ul>
<ul style="list-style-type: none"> <li>• Workplace discussion include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Coordination meetings</li> <li>• Toolbox discussion</li> <li>• Peer-to-peer discussion</li> </ul>

## **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:

- Organize information
- Understand and convey intended meaning
- Participate in variety of workplace discussions
- Comply with organization requirements for the use of written and electronic communication methods
- Effective report writing
- Effective clarifying and probing skills

### **Required Knowledge**

The individual needs to demonstrate knowledge of:

- Organization requirements for written and electronic communication methods
- Effective verbal communication methods
- Report writing
- Effective questioning techniques (clarifying and probing)
- Workplace etiquette

## 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 Dealt with a range of communication/information at one time 1.2 Made constructive contributions in workplace issues 1.3 Sought workplace issues effectively 1.4 Responded to workplace issues promptly 1.5 Presented information clearly and effectively in written form 1.6 Used appropriate sources of information 1.7 Asked appropriate questions 1.8 Provided accurate information
2. Resource Implications	The following resources should be provided: 2.1 Variety of Information 2.2 Communication tools 2.3 Simulated workplace
3. Methods of Assessment	3.1 Case Study 3.2 Third-party reports 3.3 Portfolio 3.4 Interview 3.5 Role Play
4. Context of Assessment	Competency may be assessed individually in the actual workplace or through accredited institution
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.



## DEMONSTRATE NUMERACY SKILLS

**UNIT CODE: ENG/OS/WEF/BC/02/4/A**

### UNIT DESCRIPTION

This unit covers the competencies required to perform numerical functions. The person who is competent in this unit shall be able to: Identify and use whole numbers and simple fractions, decimals and percentages; Identify, measure and estimate familiar quantities for work, Read and use familiar maps, plans and diagrams for work, Identify and describe common 2D and some 3D shapes for work, Construct simple tables and graphs for work using familiar data, Identify and interpret information in familiar tables, graphs and charts for work.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements.  <i><b>Bold and italicized terms are elaborated in the Range.</b></i>
1. Identify and use whole numbers and simple fractions, decimals and percentages for work	1.1 Simple fractions, decimals and percentages identified and interpreted 1.2 understanding of place value by organising numbers from smallest to largest demonstrated 1.3 Required numerical information located and decision made on appropriate method to solve a problem 1.4 Limited range of calculations performed using the 4 operations 1.5 Links between operations described 1.6 Estimations made to check reasonableness of results of problem solving process 1.7 Numerical information recorded, and the result of the task communicated using informal and some formal language and symbolism

<p>2. Identify, measure and estimate familiar quantities for work</p>	<p>2.1 Measurement information in workplace tasks and texts identified and interpreted</p> <p>2.2 Familiar units of measurement needed for tasks is identified</p> <p>2.3 Familiar and simple amounts estimated</p> <p>2.4 Appropriate measuring equipment selected</p> <p>2.5 Simple measuring equipment graduated in familiar units to measure relevant quantities is used</p> <p>2.6 Calculation done using familiar units of measurement</p> <p>2.7 measurements and results checked against estimates</p> <p>2.8 Results are recorded or reported</p> <p>2.9 Results relevant to the workplace task are communicated using informal and some formal mathematical and general language</p>
<p>3. Read and use familiar maps, plans and diagrams for work</p>	<p>3.1 Items and places are in familiar maps, plans and diagrams</p> <p>3.2 Common symbols and keys recognised in familiar maps, plans and diagrams</p> <p>3.3 Understanding of direction and location demonstrated by describing the location of objects, or route to familiar places</p> <p>3.4 Instructions to locate familiar objects or places are given and followed</p> <p>3.5 Informal and some formal oral mathematical language and symbols are used</p>
<p>4. Identify and describe common 2D and some 3D shapes for work</p>	<p>4.1 Common 2D shapes and some common 3D shapes in familiar situations are identified and named</p> <p>4.2 Common 2D shapes and designs are compared and classified</p> <p>4.3 Informal and some formal language used to describe common two-dimensional shapes and some common three-dimensional shapes</p> <p>4.4 Simple items used to draw or construct common 2D shapes</p> <p>4.5 Common 3D shapes matched to their 2D sketches or nets</p>

5. Construct simple tables and graphs for work using familiar data	<p>5.1 Common types of graphs are identified and named</p> <p>5.2 Familiar data to be collected is determined</p> <p>5.3 A method to collect data is selected</p> <p>5.4 A small amount of simple familiar data is collected</p> <p>5.5 One or two variables determined from the data collected</p> <p>5.6 Data ordered and collated</p> <p>5.7 A table constructed, and data enter</p> <p>5.8 Graphs are constructed using data from table</p> <p>5.9 Results are promptly checked</p> <p>5.10 Graph information related to work is reported or discussed using informal and some formal mathematical and general language</p>
6. Identify and interpret information in familiar tables, graphs and charts for work	<p>6.1 Simple tables are identified in familiar texts and contexts</p> <p>6.2 Title, headings, rows and columns located in familiar tables</p> <p>6.3 Information and data in simple tables identified and interpreted</p> <p>6.4 Information is related to relevant workplace tasks</p> <p>6.5 Familiar graphs and charts are identified in familiar texts and contexts</p> <p>6.6 Title, labels, axes, scale and key from familiar graphs and charts are located</p> <p>6.7 Information and data in familiar graphs and charts is identified and interpreted</p> <p>6.8 Information related to relevant workplace tasks</p>

## RANGE

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

<b>Variable</b>	<b>Range</b>
<ul style="list-style-type: none"> <li>Simple measuring equipment includes but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Rulers</li> <li>Watches/clocks</li> <li>Scales</li> <li>Thermometers</li> <li>AVO meter</li> </ul>
<ul style="list-style-type: none"> <li>Common 2D shapes and common 3D shapes</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> </ul>

includes but not limited to:	<ul style="list-style-type: none"> <li>• Square</li> <li>• Rectangular</li> <li>• Triangle</li> <li>• Sphere</li> <li>• Cylinder</li> <li>• Cube</li> <li>• Polygons</li> <li>• Cuboids</li> </ul>
<ul style="list-style-type: none"> <li>• Diagrammatical representation includes but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Charts</li> <li>• Maps</li> <li>• Graphs</li> </ul>

## **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:

- Applying Fundamental operations (addition, subtraction, division, multiplication)
- Using calculator
- Using different measuring tools

### **Required knowledge**

The individual needs to demonstrate knowledge of:

- Types of common shapes
- Differentiation between two dimensional shapes / objects
- Formulae for calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Fundamental operations (addition, subtraction, division, multiplication)
- Rounding techniques

- Types of fractions
- Different types of tables and graphs
- Meaning of graphs, such as increasing, decreasing, and constant value
- Preparation of basic data, tables & graphs

## 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	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Simple fractions, decimals and percentages are correctly identified and interpreted</p> <p>1.2 Performed a limited range of calculations using the 4 operations</p> <p>1.3 Performed calculations using familiar units of measurement</p> <p>1.4 Recognised common symbols and keys in familiar maps, plans and diagrams</p> <p>1.5 Constructed simple tables and graphs using familiar data</p> <p>1.6 Identified and interpret information in familiar tables, graphs and charts</p>
2. Resource Implications	<p>2.1 Calculator</p> <p>2.2 Basic measuring instruments</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Written Test</p> <p>3.2 Interview/Oral Questioning</p> <p>3.3 Demonstration</p>
4. Context of Assessment	<p>Competency may be assessed in an off the job setting</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

## DEMONSTRATE DIGITAL LITERACY

UNIT CODE: ENG/OS/WEF/BC/03/4/A

### UNIT DESCRIPTION

This unit covers the competencies required to effectively demonstrate digital literacy in a working environment. It entails identifying and using digital devices such as smartphones, tablets, laptops and desktop PCs for purposes of communication and performing work related tasks at the work place.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function	These are assessable statements which specify the required level of performance for each of the elements.  <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Identify computer software and hardware	1.1 <i><b>Appropriate computer software</b></i> is identified according to manufacturer's specification 1.2 <i><b>Appropriate computer hardware</b></i> is identified according to manufacturer's specification
2. Apply security measures to data, hardware, software	2.1 <i><b>Data security and privacy are classified</b></i> in accordance with the technological situation 2.2 <i><b>Security and control measures</b></i> are applied in accordance with laws governing protection of ICT 2.3 Computer threats and crimes are detected. 2.4 Protection against computer crimes is undertaken in accordance with laws governing protection of ICT
3. Apply computer software in solving tasks	3.1 Basic <i><b>word processing concepts</b></i> are applied in resolving workplace tasks 3.2 <i><b>Word processing utilities</b></i> are applied in accordance with workplace procedures 3.3 Data is manipulated on worksheet in accordance with office procedures
4. Apply internet and email in communication at workplace	4.1 Electronic mail is applied in workplace communication in accordance with office procedures 4.2 Office internet functions are defined and executed in accordance with office procedures

	4.3 <i>Network configuration</i> and uses are determined in accordance with office operations procedures
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## RANGE

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

Range	Variable
<ul style="list-style-type: none"> <li>Appropriate computer software may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>A collection of instructions that enable the user to interact with a <i>computer</i>, its hardware, or perform tasks.</li> <li>Computer tools that will help <i>computer</i> users interact with the hardware in a <i>computer</i>.</li> </ul>
<ul style="list-style-type: none"> <li>Appropriate computer hardware may include but not limited to:</li> </ul>	Collection of physical parts of a computer system. This includes the computer case, monitor, keyboard, and mouse and all the parts inside the computer case, such as the hard disk drive, motherboard, video card,
<ul style="list-style-type: none"> <li>Data security and privacy may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Confidentiality</li> <li>Cloud computing</li> <li>Confidentiality</li> <li>Cyber terrorism</li> <li>Integrity -but-curious data serving</li> </ul>
<ul style="list-style-type: none"> <li>Security and control measures may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Countermeasures and risk reduction</li> <li>Cyber threat issues</li> <li>Risk management</li> </ul>
<ul style="list-style-type: none"> <li>Word processing concepts may include but not limited to:</li> </ul>	Using a special program to create, edit, and print documents
<ul style="list-style-type: none"> <li>Network configuration may include but not limited to:</li> </ul>	Organizing and maintaining information on the components of a computer network

## **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:

- Analytical skills
- Interpretation
- Typing
- Communication
- Computing (applying fundamental operations such as addition, subtraction, division and multiplication)
- Using calculator
- Basic ICT skills

### **Required Knowledge**

The individual needs to demonstrate knowledge of:

- Input and output devices
- Central processing Unit (CPU)
- Peripherals
- Storage Media
- Software concept
- Types of concept
- Function of computer software
- Data security and privacy
- Security threats and control measures
- Computer crimes
- Detection and protection of computer crimes
- Laws governing protection of ICT
- Word processing;
  - ✓ Functions and concepts of word processing.
  - ✓ Documents and tables creation and manipulations
  - ✓ Mail merging
  - ✓ Word processing utilities
- Spread sheet;
  - ✓ Meaning, formulae, function and charts, uses, layout, data manipulation and application to cell
- Networking and Internet;
  - ✓ Meaning, functions and uses of networking and internet.



- ✓ Electronic mail and world wide web
- Emerging trends and issues in ICT;
  - ✓ Identify and apply emerging trends and issues in ICT
  - ✓ Challenges posed by emerging trends and issues

## EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Identified input, output, CPU and storage media devices of computers in accordance to computer specification</li> <li>1.2 Identified concepts, types and functions of computer software according to operation manual</li> <li>1.3 Identified and controlled security threats</li> <li>1.4 Detected and protected computer crimes</li> <li>1.5 Applied word processing in office tasks</li> <li>1.6 Prepared work sheet and applied data to the cells in accordance to workplace procedures</li> <li>1.7 Used Electronic Mail for office communication as per workplace procedure</li> <li>1.8 Applied internet and World Wide Web for office tasks in accordance with office procedures</li> <li>1.9 Applied laws governing protection of ICT</li> </ul>
<p>2. Resource Implications</p>	<ul style="list-style-type: none"> <li>2.1 Smartphones</li> <li>2.2 Tablets</li> <li>2.3 Laptops and</li> <li>2.4 Desktop PCs</li> <li>2.5 Desktop computer</li> <li>2.6 Lap top</li> <li>2.7 Calculator</li> </ul>

	<p>2.8 Internet</p> <p>2.9 Smart phone</p> <p>2.10 Operations Manuals</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Written Test</p> <p>3.2 Demonstration</p> <p>3.3 Practical assignment</p> <p>3.4 Interview/Oral Questioning</p> <p>3.5 Demonstration</p>
4. Context of Assessment	<p>Competency may be assessed in an off and on the job setting</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

## DEMONSTRATE ENTREPRENEURIAL SKILLS

**UNIT CODE: ENG/OS/WEF/BC/04/4/A**

### UNIT DESCRIPTION

This unit covers the competencies required for creating and maintaining small scale business, establishing small business customer base, managing and growing a micro/small-scale business.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the <b>key outcomes</b> which make up workplace function.</p> <p>1. Create and maintain small-scale business</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i><b>Bold and italicized terms are elaborated in the Range</b></i></p> <p>1.1 Generation and evaluation of business ideas is undertaken in accordance with the existing procedure</p> <p>1.2 Competencies are matched with business opportunities in accordance with business practices.</p> <p>1.3 Procedure for starting a small business is identified as per the legal requirements</p> <p>1.4 SWOT/ PESTEL analysis and or industrial survey is carried out according to office procedures</p> <p>1.5 <b>Business operations</b> are monitored and controlled following established procedures.</p> <p>1.6 Quality assurance measures are implemented consistently.</p> <p>1.7 Good relations are maintained with staff/workers.</p> <p>1.8 Policies and procedures on occupational safety and health and environmental concerns are constantly observed.</p>
<p>2. Establish small business customer base</p>	<p>2.1 Good customer relations are maintained in accordance with office procedures</p> <p>2.2 New customers and markets are identified, explored and reached out to according to the marketing plan</p> <p>2.3 Promotions/Incentives are offered to loyal customers in accordance with office procedures</p> <p>2.4 Additional products and services are evaluated and tried in accordance with marketing strategy</p>

	2.5 Customer record is maintained in accordance with office procedures
3. Manage small scale business	<p>3.1 Enterprise is built up and sustained through judicious control of cash flows.</p> <p>3.2 <b>Profitability of enterprise</b> is ensured through appropriate internal controls.</p> <p>3.3 Unnecessary or lower-priority expenses and purchases are avoided to ensure profitability</p> <p>3.4 Basic cost-benefit analysis are undertaken in accordance with office procedures</p> <p>3.5 Basic financial management are undertaken in accordance with office procedures</p> <p>3.6 Basic financial accounting is undertaken in accordance with office procedures</p> <p>3.7 Business <b>internal controls</b> are implemented in accordance with office procedure</p> <p>3.8 Setting business priorities and strategies is carried out according to office procedures</p> <p>3.9 Preparation and interpretation of basic financial statements is undertaken in accordance with set procedures</p> <p>3.10 <i>Preparation of business plans</i> for small business is undertaken in accordance with business strategy</p> <p>3.11 Business Social Responsibility is maintained in accordance with Standard Operations Procedures (SOP)</p>
4. Grow/ expand small scale business	<p>4.1 Prepared business growth strategy for small scale business in accordance with office procedures</p> <p>4.2 Incorporated technology in small scale business growth in accordance with technological trends</p> <p>4.3 Emerging issues and trends are considered in accordance with business growth strategy</p> <p>4.4 Built audience interest in product/service according to growth strategy</p> <p>4.5 Boosted cooperative communication according to business <b>communication strategy</b></p>

## RANGE

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

<b>Variable</b>	<b>Range</b>
<ul style="list-style-type: none"><li>• Business Strategy include but not limited to:</li></ul>	Manage wastages, environmental conservation
<ul style="list-style-type: none"><li>• Business Operations include but not limited to:</li></ul>	<ul style="list-style-type: none"><li>• Purchasing</li><li>• Accounting/administrative</li><li>• Work production/operations/sales</li><li>• Marketing</li></ul>
<ul style="list-style-type: none"><li>• Internal control includes but not limited to:</li></ul>	<ul style="list-style-type: none"><li>• Accounting systems</li><li>• Financial statements/reports</li><li>• Cash management</li><li>• Human resource management</li></ul>
<ul style="list-style-type: none"><li>• Profitability of enterprise include but not limited to:</li></ul>	Operating expenses lower than income
<ul style="list-style-type: none"><li>• Communication strategy include but not limited to:</li></ul>	<ul style="list-style-type: none"><li>• Blue print of exchange of information</li><li>• Technology and exchange of information</li></ul>

## 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:

- Individual marketing skills
- Using basic advertising (posters/ tarpaulins, flyers, social media,
- Basic bookkeeping/ accounting skills
- Communication skills

## **Required Knowledge**

The individual needs to demonstrate knowledge of:

- Generation and evaluation of business ideas
- Legal requirements for starting a small business
- SWOT/ PESTEL analysis
- Occupational Safety and Health
- Public relations concepts
- Business plan
- Business financing
- Marketing strategies
- Business management and control
- Production/ operation process
- Product promotion strategies
- Market and feasibility studies
- Business ethics
- Building customer relations
- Business models and strategies
- Types and categories of businesses
- Business internal controls
- Relevant national and local legislation and regulations
- Basic quality control and assurance concepts
- Building relations with customer and employees
- Building competitive advantage of the enterprise
- Business growth strategies

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Demonstrated entrepreneurial skills</li> <li>1.2 Demonstrate competencies to create a small-scale business</li> <li>1.3 Demonstrated ability to conceptualize and plan a micro/small business</li> <li>1.4 Grew customer base for the small-scale business</li> <li>1.5 Demonstrated ability to manage/operate a micro/small-scale business</li> <li>1.6 Demonstrated competencies to grow a micro/small-scale business</li> </ul>
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Case studies on micro/small-scale enterprises</li> <li>2.2 Materials and location relevant to the proposed activity and tasks</li> </ul>
<p>3. Methods of Assessment</p>	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Case studies</li> <li>3.2 Oral Questioning</li> <li>3.3 Portfolio</li> <li>3.4 Projects</li> </ul>
<p>4. Context of Assessment</p>	<ul style="list-style-type: none"> <li>4.1 Competency may be assessed in workplace or in a simulated workplace setting</li> <li>4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group</li> </ul>
<p>5. Guidance information for assessment</p>	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

## DEMONSTRATE EMPLOYABILITY SKILLS

**UNIT CODE: ENG/OS/WEF/BC/05/4/A**

### UNIT DESCRIPTION

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating critical safe work habits, demonstrating workplace learning and workplace ethics.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i><b>Bold and italicized terms are elaborated in the Range</b></i></p>
<p>1. Conduct self-management</p>	<p>1.1 Personal vision, mission and goals are formulated based on potential and in relation to organization objectives</p> <p>1.2 Emotions are managed as per workplace requirements</p> <p>1.3 Individual performance is evaluated and monitored according to the agreed targets.</p> <p>1.4 Assertiveness is developed and maintained based on the requirements of the job.</p> <p>1.5 Accountability and responsibility for own actions are demonstrated.</p> <p>1.6 Self-esteem and a positive self-image are developed and maintained.</p> <p>1.7 Time management, attendance and punctuality are observed as per the organization policy.</p> <p>1.8 Goals are managed as per the organization's objective</p> <p>1.9 Self-strengths and weaknesses are identified as per <i><b>personal objectives</b></i></p> <p>1.10 Critics are managed as per personal objectives</p> <p>1.11 Demonstrate interpersonal communication</p> <p>1.12 Information is shared as per communication structure</p> <p>1.13 Work activity is organized with other involved personnel as per the SOPs</p>



<p>2. Demonstrate critical safe work habits</p>	<p>2.1 Stress is managed in accordance with workplace procedures.</p> <p>2.2 Punctuality and time consciousness is demonstrated in line with workplace policy.</p> <p>2.3 Personal objectives are integrated with organization goals based on organization’s strategic plan.</p> <p>2.4 Work priorities are set in accordance to workplace procedures.</p> <p>2.5 <b>Feedback</b> on performance is collected and evaluated based on established <b>team</b> learning process</p> <p>2.6 Leisure time is recognized in line with organization policy.</p> <p>2.7 Abstinence from <b>drug and substance abuse</b> is observed as per workplace policy.</p> <p>2.8 Awareness of HIV and AIDS is demonstrated in line with workplace requirements.</p> <p>2.9 Safety consciousness is demonstrated in the workplace based on organization safety policy.</p> <p>2.10 <b>Emerging issues</b> are dealt with in accordance with organization policy.</p>
<p>3. Demonstrate workplace learning</p>	<p>3.1 Personal training needs are identified and assessed in line with the requirements of the job</p> <p>3.2 Own learning is managed as per workplace policy.</p> <p>3.3 Learning opportunities are sought and allocated based on job requirement and in line with organization policy.</p> <p>3.4 Contribution to the learning community at the workplace is carried out.</p> <p>3.5 <b>Range of media for learning</b> are identified as per the training need</p> <p>3.6 Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job</p> <p>3.7 Enthusiasm for ongoing learning is demonstrated</p> <p>3.8 Time and effort is invested in learning new skills-based job requirements</p> <p>3.9 Willingness to learn in different context is demonstrated based on available learning opportunities arising in the workplace.</p> <p>3.10 Opportunities for performance improvement are identified proactively in area of work.</p> <p>3.11 Awareness of personal role in workplace <b>innovation</b> is demonstrated.</p>

4. Demonstrate workplace ethics	4.1 Policies and guidelines are observed as per the workplace requirements 4.2 Self-worth and profession is exercised in line with personal goals and organizational policies 4.3 Code of conduct is observed as per the workplace requirements 4.4 Personal and professional integrity is demonstrated as per the personal goals 4.5 Commitment to jurisdictional laws is demonstrated as per the workplace requirements
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## RANGE

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

Range	Variable
<ul style="list-style-type: none"> <li>• Drug and substance abuse includes but not limited to:</li> </ul>	Commonly abused <ul style="list-style-type: none"> <li>• Alcohol</li> <li>• Tobacco</li> <li>• Miraa</li> <li>• Over-the-counter drugs</li> <li>• Cocaine</li> <li>• Bhang</li> <li>• Glue</li> </ul>
<ul style="list-style-type: none"> <li>• Feedback includes but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Verbal</li> <li>• Written</li> <li>• Informal</li> <li>• Formal</li> </ul>
<ul style="list-style-type: none"> <li>• Team includes but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Small work group</li> <li>• Staff in a section/department</li> <li>• Inter-agency group</li> </ul>
<ul style="list-style-type: none"> <li>• Personal objectives include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Long term</li> <li>• Short term</li> <li>• Broad</li> <li>• Specific</li> </ul>
<ul style="list-style-type: none"> <li>• Innovation include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• New ideas</li> <li>• Original ideas</li> </ul>

	<ul style="list-style-type: none"> <li>• Different ideas</li> <li>• Methods/procedures</li> <li>• Processes</li> <li>• New tools</li> </ul>
<ul style="list-style-type: none"> <li>• Emerging issues include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Terrorism</li> <li>• Social media</li> <li>• National cohesion</li> <li>• Open offices</li> </ul>
<ul style="list-style-type: none"> <li>• Range of media for learning include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Mentoring</li> <li>• peer support and networking</li> <li>• IT and courses</li> </ul>

## 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:

- Personal hygiene practices
- Intra and Interpersonal skills
- Communication skills
- Knowledge management
- Interpersonal skills
- Critical thinking skills
- Observation skills
- Organizing skills
- Negotiation skills
- Monitoring skills
- Evaluation skills
- Record keeping skills
- Problem solving skills
- Decision Making skills
- Resource utilization skills
- Resource mobilization skills

## Required Knowledge

The individual needs to demonstrate knowledge of:

- Work values and ethics
- Company policies
- Company operations, procedures and standards
- Occupational Health and safety procedures
- Fundamental rights at work
- Personal hygiene practices
- Workplace communication
- Concept of time
- Time management
- Decision making
- Types of resources
- Work planning
- Resources and allocating resources
- Organizing work
- Monitoring and evaluation
- Record keeping
- Workplace problems and how to deal with them
- Negotiation
- Assertiveness
- Team work
- Gender mainstreaming
- HIV and AIDS
- Drug and substance abuse
- Leadership
- Safe work habits
- Professional growth and development
- Technology in the workplace
- Learning
- Creativity
- Innovation
- Emerging issues
  - Social media
  - Terrorism
  - National cohesion

## 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 Conducted self-management 1.2 Demonstrated critical safe work habits 1.3 Demonstrated workplace learning 1.4 Demonstrated workplace ethics
2. Resource Implications	The following resources should be provided: 2.1 Case studies/scenarios
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Oral Interview 3.2 Observation 3.3 Third Party Reports 3.4 Written
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## DEMONSTRATE ENVIRONMENTAL LITERACY

**UNIT CODE: ENG/OS/WEF/BC/06/4/A**

### UNIT DESCRIPTION

This unit specifies the competencies required to follow procedures for environmental hazard control, follow procedures for environmental pollution control, comply with workplace sustainable resource use and evaluate current practices in relation to resource usage.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements.  <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Control environmental hazard	1.1 <i><b>Storage methods</b></i> for environmentally hazardous materials are strictly followed according to environmental regulations and OSHS. 1.2 <i><b>Disposal methods</b></i> of hazardous wastes are followed always according to environmental regulations and OSHS. 1.3 <i><b>PPE</b></i> is used according to OSHS.
2. Control environmental Pollution control	2.1 Environmental pollution <i><b>control measures</b></i> are compiled following standard protocol. 2.2 Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999 2.3 Methods for minimizing <i><b>noise pollution</b></i> complied following environmental regulations.
3. Demonstrate sustainable resource use	3.1 Methods for minimizing wastage are complied with. 3.2 Waste management procedures are employed following principles of 3Rs (Reduce, Reuse, Recycle) 3.3 Methods for economizing or reducing resource consumption are practiced.
4. Evaluate current practices in relation to resource usage	4.1 Information on resource efficiency <i><b>systems and procedures</b></i> are collected and provided to the work group where appropriate. 4.2 Current resource usage is measured and recorded by members of the work group.

	<p>4.3 Current purchasing strategies are analyzed and recorded according to industry procedures.</p> <p>4.4 Current work processes to access information and data is analyzed following enterprise protocol.</p>
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## RANGE

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

Variable	Range
<ul style="list-style-type: none"> <li>PPE may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Masks</li> <li>Gloves</li> <li>Goggles</li> <li>Safety hat</li> <li>Overall</li> <li>Hearing protector</li> <li>Safety boots</li> </ul>
<ul style="list-style-type: none"> <li>Environmental pollution control measures may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Methods for minimizing or stopping spread and ingestion of airborne particles</li> <li>Methods for minimizing or stopping spread and inhaling gases and fumes</li> <li>Methods for minimizing or stopping spread and ingestion of liquid wastes</li> </ul>
<ul style="list-style-type: none"> <li>Waste management Procedures may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Sorting</li> <li>Storing of items</li> <li>Recycling of items</li> <li>Disposal of items</li> <li>Handling</li> <li>Transport</li> </ul>
<ul style="list-style-type: none"> <li>Resources may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Electric</li> <li>Water</li> <li>Fuel</li> <li>Telecommunications</li> <li>Supplies</li> <li>Materials</li> </ul>

<ul style="list-style-type: none"> <li>• Workplace environmental hazards may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Biological hazards</li> <li>• Chemical and dust hazards</li> <li>• Physical hazards</li> </ul>
<ul style="list-style-type: none"> <li>• Organizational systems and procedures may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Supply chain, procurement and purchasing</li> <li>• Quality assurance</li> <li>• Making recommendations and seeking approvals</li> </ul>

## 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:

- Following storage methods of environmentally hazardous materials
- Following disposal methods of hazardous wastes
- Using PPE
- Practicing OSHS
- Complying environmental pollution control
- Observing solid waste management
- Complying methods of minimizing noise Pollution
- Complying methods of minimizing wastage
- Employing waste management procedures
- Economizing resource consumption
- Listing of resources used
- Measuring current usage of resources
- Identifying and reporting workplace environmental hazards
- Conveying all environmental issues
- Following environmental regulations
- Identifying environmental regulations
- Assessing procedures for assessing compliance
- Collecting information on environmental and resource efficiency systems and procedures, and Providing information to the work group
- Measuring and recording current resource usage
- Analysing and recording current purchasing strategies.
- Analysing current work processes to access information and data and Assisting identifying areas for improvement



## Required Knowledge

The individual needs to demonstrate knowledge of:

- Storage methods of environmentally hazardous materials
- Disposal methods of hazardous wastes
- Usage of PPE Environmental regulations
- OSHS
- Types of pollution
- Environmental pollution control measures
- Different solid wastes
- Solid waste management
- Different noise pollution
- Methods of minimizing noise pollution
- Solid Waste Act
- Methods of minimizing wastage
- Waste management procedures
- Economizing of resource consumption
- Principle of 3Rs
- Types of resources
- Techniques in measuring current usage of resources
- Calculating current usage of resources
- Types of workplace environmental hazards
- Environmental regulations
- Environmental regulations applying to the enterprise.
- Procedures for assessing compliance with environmental regulations.
- Collection of information on environmental and resource efficiency systems and procedures,
- Measurement and recording of current resource usage
- Analysis and recording of current purchasing strategies.
- Analysis current work processes to access information and data Analysis of data and information
- Identification of areas for improvement

## 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 Controlled environmental hazard  1.2 Controlled environmental pollution  1.3 Demonstrated sustainable resource use  1.4 Evaluated current practices in relation to resource usage
2. Resource Implications	The following resources should be provided:  2.1 Workplace with storage facilities 2.2 Tools, materials and equipment relevant to the tasks (ex. Cleaning tools, cleaning materials, trash bags, etc.) 2.3 PPE 2.4 Manuals and references 2.5 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 2.6 Case studies/scenarios relating to environmental Protection
3 Methods of Assessment	Competency in this unit may be assessed through:  3.1 Demonstration 3.2 Oral questioning 3.3 Written examination 3.4 Third Party Reports 3.5 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad) 3.6 Simulations and role-plays
4 Context of Assessment	Competency may be assessed on the job, off the job or a combination of these as well as in work placement (internship). Off the job assessment must be undertaken in a closely simulated workplace environment.
5 Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## DEMONSTRATE OCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE: ENG/OS/WEF/BC/07/4/A**

### UNIT DESCRIPTION

This unit specifies the competencies required to practice safety and health, and comply with OSH requirements relevant to work

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><b><i>Bold and italicized terms are elaborated in the Range</i></b></p>
<p>1. Observe workplace procedures for hazards and risk prevention</p>	<p>1.1 Arrangement of work area and items in accordance with Company housekeeping procedures is followed</p> <p>1.2 Work standards and procedures are followed</p> <p>1.3 <b><i>Prevention and control measures</i></b>, including use of <b><i>safety gears/PPE</i></b> are applied</p> <p>1.4 Standards and procedures for <b><i>incidents and emergencies</i></b> are studied and applied, as needed</p>
<p>2. Participate in arrangements for workplace safety and health maintenance</p>	<p>2.1 Orientations on <b><i>OSH requirements/regulations</i></b> of tasks is participated</p> <p>2.2 Feedback on health, safety, and security concerns are provided to appropriate personnel as required in a sufficiently detailed manner.</p> <p>2.3 Workplace procedures for reporting hazards, incidents, injuries and sickness are practiced</p> <p>2.4 OSH requirements/ regulations and workplace safety and hazard control procedures are reviewed, and compliance reported to appropriate personnel, as needed</p> <p>2.5 Needed <b><i>OSH-related trainings</i></b> are identified and proposed to appropriate personnel</p>

## RANGE

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

Variable	Range
<ul style="list-style-type: none"> <li>Prevention and control measures may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate the hazard (i.e., get rid of the dangerous machine)</li> <li>Isolate the hazard (i.e. keep the machine in a closed room and operate it remotely; barricade an unsafe area off)</li> <li>Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one)</li> <li>Use administrative controls to reduce the risk (i.e. give trainings on how to use equipment safely; OSH-related topics, issue warning signages, rotation/shifting work schedule)</li> <li>Use engineering controls to reduce the risk (i.e. use safety guards to machine)</li> <li>Use personal protective equipment</li> <li>Safety, Health and Work Environment Evaluation</li> <li>Periodic and/or special medical examinations of workers</li> </ul>
<ul style="list-style-type: none"> <li>Safety gears /PPE (Personal Protective Equipment's) may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Arm/Hand guard, gloves</li> <li>Eye protection (goggles, shield)</li> <li>Hearing protection (ear muffs, ear plugs)</li> <li>Hair Net/cap/bonnet</li> <li>Hard hat</li> <li>Face protection (mask, shield)</li> <li>Apron/Gown/coverall/jump suit</li> <li>Anti-static suits</li> <li>High-visibility reflective vest</li> </ul>
<ul style="list-style-type: none"> <li>Incidents and emergencies may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Chemical spills</li> <li>Equipment/vehicle accidents</li> <li>Explosion</li> <li>Fire</li> <li>Gas leak</li> <li>Injury to personnel</li> <li>Structural collapse</li> <li>Toxic and/or flammable vapors emission.</li> </ul>

<ul style="list-style-type: none"> <li>• OSH requirements / regulations may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Building code</li> <li>• Permit to Operate</li> </ul>
<ul style="list-style-type: none"> <li>• OSH-related trainings may include but are not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Safety Orientations relevant to tasks</li> <li>• Safe and Correct Operation of Tools and Equipment</li> <li>• Health Orientations/trainings (Healthy Lifestyle, Prevention of drug/alcohol dependence, violence in the workplace, work-stress)</li> <li>• Prevention and Control of OSH Hazards in the workplace</li> <li>• Chemical Handling</li> <li>• Safety Trainings (Fire Safety, Construction Safety, Confined Space)</li> <li>• Prevention and Control of Work-related Injuries and Illness</li> <li>• Basic First-aid Trainings</li> <li>• Emergency Response Trainings</li> <li>• Trainings on use of fire-extinguisher</li> </ul>

## 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:

- Communication Skills
- Knowledge management
- Collaborating skills
- Interpersonal Skills
- Troubleshooting skills
- Critical thinking Skills
- Observation Skills

### Required Knowledge

The individual needs to demonstrate knowledge of:

- General OSH principles and legislations
- Principles of good housekeeping (5S)
- Company/workplace policies/ guidelines
- Standards and safety requirements of work process and procedures
- Standard Workplace emergency plan and procedures

- Safety and health requirements of tasks
- Workplace guidelines on providing feedback on OSH and security concerns
- OSH regulations
- Hazard control procedures
- OSH trainings relevant to work

## 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	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> <li>1.1 Follows work and housekeeping procedures, and complies with its requirements</li> <li>1.2 Follows work standards and procedures</li> <li>1.3 Applies OSH preventive and control measures, including emergency plan, standards and procedures</li> <li>1.4 Participates in orientations on OSH requirements of tasks</li> <li>1.5 Provides feedback on health, safety, and security concerns in a sufficiently detailed manner.</li> <li>1.6 Practices workplace procedures for reporting hazards, incidents, injuries and sickness</li> <li>1.7 Reviews and reports compliance to workplace OSH regulations and hazard control procedures</li> <li>1.8 Identifies and proposes OSH trainings relevant to work</li> </ol>
2. Resource Implications	<p>The following resources should be provided:</p> <ol style="list-style-type: none"> <li>2.1 Facilities, materials tools and equipment necessary for the activity</li> </ol>
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ol style="list-style-type: none"> <li>3.1 Observation/Demonstration with oral questioning</li> <li>3.2 Third party report</li> <li>3.3 Written exam</li> </ol>
4. Context of Assessment	<p>Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

## **COMMON COMPETENCIES**

## APPLY WORKPLACE HEALTH, SAFETY, ENVIRONMENTAL AND EMERGENCY PRACTICES

**UNIT CODE: ENG/OS/WEF/CC/01/4/A**

### UNIT DESCRIPTION

This unit standard has been developed to assist with the advancement of people who wish to gain paid employment or enter into self-employment in a variety of contexts. It specifies the competencies required to: Apply workplace health and safety practices; Perform basic firefighting techniques; Perform first aid practices; Adhere to site emergency plans; and Apply environmental integrity.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Apply workplace health and safety practices	1.1 Factors affecting health and safety in the workplace are identified 1.2 General work site and employer safety rules are applied 1.3 <i><b>Personal protective equipment (PPE)</b></i> is identified, selected and used
2. Perform basic fire-fighting techniques	2.1 The <i><b>type of fire</b></i> encountered is classified 2.2 <i><b>Fire-fighting equipment</b></i> is identified and selected according to class of fire 2.3 The use of different fire-fighting equipment is demonstrated 2.4 <i><b>Fire-fighting report</b></i> is completed
3. Perform first aid practices	3.1 Nature and <i><b>context of the injury and/or medical emergency</b></i> are determined 3.2 First aid is applied 3.3 Injured and/or ill person is handed over to medical personnel 3.4 Incident and/or <i><b>accident report</b></i> is completed
4. Adhere to site emergency plans	4.1 <i><b>Information</b></i> on site emergency plans are interpreted 4.2 Instructions are followed and/or communicated 4.3 Risks are assessed and course of action determined 4.4 Emergency equipment and supplies are operated
5. Apply environmental integrity	5.1 General environmental impacts are described 5.2 Spill prevention, control and countermeasure (SPCC) techniques are applied



	<p>5.3 Work site techniques to minimize environmental damage are applied</p> <p>5.4 Housekeeping procedures are applied in accordance with environmental control and worksite requirements</p>
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## RANGE

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

<ul style="list-style-type: none"> <li>Type of fire may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>A</li> <li>B</li> <li>C</li> <li>D</li> <li>E</li> </ul>
<ul style="list-style-type: none"> <li>Firefighting equipment may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Fire extinguishers</li> <li>Fire hoses</li> <li>Hose reels</li> </ul>
<ul style="list-style-type: none"> <li>Personal Protective Equipment (PPE) may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Safety boots</li> <li>Hard hat</li> <li>High visibility vest</li> <li>Hearing protection</li> <li>Fall protection</li> <li>Gloves</li> <li>Goggles</li> </ul>
<ul style="list-style-type: none"> <li>Firefighting report may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Location and time of fire</li> <li>People involved</li> <li>Accident details</li> <li>Safety precautions that were/were not in place</li> <li>Machinery or substances involved</li> <li>Responses of emergency services.</li> </ul>
<ul style="list-style-type: none"> <li>Context of the Injury may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Inaccessible places</li> <li>Places of extreme temperature</li> <li>High risk areas.</li> </ul>
<ul style="list-style-type: none"> <li>Medical emergencies may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>Stopped heart and breathing (CPR)</li> <li>Stopping bleeding</li> <li>Splinting and binding fractures</li> </ul>

	<ul style="list-style-type: none"> <li>• Covering and calming, and dealing with epileptic fits</li> <li>• Hyper ventilation</li> <li>• Hypo/hyperthermia</li> <li>• Chemical and fire burns</li> <li>• Respiratory problems or suffocation</li> <li>• Electrical and any other shock</li> </ul>
<ul style="list-style-type: none"> <li>• Accident report may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Location and time of injury/medical emergency</li> <li>• People involved</li> <li>• Accident details</li> <li>• Safety precautions that were/were not in place</li> <li>• Machinery or substances involved</li> <li>• Responses of emergency services</li> </ul>
<ul style="list-style-type: none"> <li>• Information may include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>• Evacuation routes</li> <li>• Procedures</li> <li>• Contact protocol.</li> </ul>

## 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:

- Communication
- Team Work
- Problem solving
- Planning and Organizing
- Self-management
- Technology
- Work safety
- Preparing materials
- Proper handling of tools and equipment

## Required Knowledge

The individual needs to demonstrate knowledge of:

- Company policies and procedures, including site emergency plans
- Manufacturers' specifications
- Legislative requirements
- Risks and consequences of HIV and AIDS, STDs and STIs to self and others
- Personal Protective Clothing and Equipment
- Causes and classes of fire
- Range of firefighting equipment
- Basic first aid procedures and techniques
- Gender parity issues, non-discrimination of women including raping
- Environmental awareness, protection and enhancement

## 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 Applied workplace health and safety practices 1.2 Performed basic fire-fighting techniques 1.3 Performed first aid practices 1.4 Adhered to site emergency plans 1.5 Applied environmental integrity
2. Resource Implications	The following resources must be provided: 2.1 Workplace 2.2 Materials, tools and equipment relevant to the proposed activity
3. Methods of Assessment	Competency may be assessed through: 3.1 Demonstration 3.2 Direct observation with oral questioning 3.3 Written tests 3.4 Third party reports
4. Context of Assessment	4.1 Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## APPLY WORKPLACE ESSENTIAL SKILLS

**UNIT CODE: ENG/OS/WEF/CC/02/4/A**

### UNIT DESCRIPTION:

This unit standard has been developed to assist in the advancement of people who wish to gain paid employment or enter into self-employment in a variety of contexts. It specifies the competencies required to: Follow principles of work ethics; Resolve conflict with others; Demonstrate effective speaking and listening skills; Read and interpret work document; Interact with team members; and Perform individual role in a team.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. ( <i><b>Bold and italicized terms are elaborated in the Range</b></i> )
1. Follow principles of work ethics	1.1 Integrity <i><b>work ethics</b></i> and expectations are identified 1.2 Open mind and flexibility is kept at the time 1.3 Conflicts are avoided whenever necessary 1.4 Company policies and procedures are operated as required 1.5 Self-assessment from time to time is carried out
2. Resolve conflict with others	2.1 <i><b>Problems</b></i> at the work site are identified and analyzed 2.2 Company policies and procedures for solving the problem are applied 2.3 Problem and disagreement resolution are justified with applicable legislation 2.4 Conflict resolution techniques are formulated 2.5 Effectiveness of problem or conflict resolution is evaluated
3. Demonstrate effective speaking and listening skills	3.1 Correct oral message to be communicated is identified 3.2 Clarity of the oral message to be communicated is determined 3.3 Appropriate means of oral communication is selected 3.4 Clear and accurate oral message is conveyed 3.5 Feedback on the message conveyed is obtained and interpreted 3.6 Corrective message communication measures are applied

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. ( <i><b>Bold and italicized terms are elaborated in the Range</b></i> )
	3.7 Prepared documentation to keep record of communication is used
4. Read and interpret work document	4.1 Required work document are gathered and interpreted 4.2 <i><b>Work document</b></i> details are verified against actual work 4.3 Work document to correspond to actual work are reviewed
5. Interact with team members	5.1 Correct team members are identified according to task requirements 5.2 Capabilities of each team member are determined according to task requirements 5.3 Acceptable, non-offensive language and gestures are used 5.4 Relationships between members are maintained 5.5 Suitable corrective measures for deviating members are employed 5.6 Cross cultural diversities are accommodated
6. Perform individual role in a team	6.1 Individual roles in a team are identified and described 6.2 Assigned roles to the individual are conveyed and monitored

## RANGE

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

<b>Variable</b>	<b>Range</b>
<ul style="list-style-type: none"> <li>Work ethics include but not limited to :</li> </ul>	<ul style="list-style-type: none"> <li>Honesty</li> <li>Selflessness</li> <li>Consistency</li> <li>Moral</li> <li>Courage</li> <li>Respect.</li> </ul>
<ul style="list-style-type: none"> <li>Problems include but not limited to :</li> </ul>	<ul style="list-style-type: none"> <li>Interpersonal problems</li> <li>Organisational problems</li> <li>Group problems</li> <li>Inter organizational problems</li> </ul>

<ul style="list-style-type: none"> <li>• Work documents include but not limited to :</li> </ul>	<ul style="list-style-type: none"> <li>• Work timesheets</li> <li>• Attendance registers</li> <li>• Job cards site maps</li> <li>• Plans</li> <li>• Inspection licenses</li> <li>• Authority approvals documents</li> <li>• Equipment inspection checks sheets</li> <li>• Safe systems of work documents.</li> </ul>
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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:

- Communication
- Team Work
- Problem solving
- Planning and Organising
- Self-management
- Technology

### Required knowledge

The individual needs to demonstrate knowledge of:

- Concept of a team and team work
- Multi-cultural diversity
- Team goals and motivation
- Problem/conflict solving techniques

## EVIDENCE GUIDE

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

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Followed principles of work ethics 1.2 Resolved conflict with others 1.3 Demonstrated effective speaking and listening skills 1.4 Read and interpreted work document 1.5 Interacted with team members 1.6 Performed individual role in a team
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant or appropriate environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Written tests 3.2 Direct Observation 3.3 Demonstration with Oral Questioning
4. Context of Assessment	Competency may be assessed individually in the actual workplace or through accredited institution
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## PLAN AND ORGANISE WORK ACTIVITIES

**UNIT CODE:ENG/OS/WEF/CC/03/4/A**

### UNIT DESCRIPTION

This unit standard has been developed to assist with the advancement of people who wish to gain paid employment or enter into self-employment in a variety of contexts. It specifies the competencies required to: Apply time management techniques; Apply quality improvement principles; and Apply productivity improvement measures.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range.</b></i>
1. Apply time management techniques	1.1 Prepared activity time plan is identified 1.2 Activity goals and action plan are set 1.3 Time allocated for each activity is monitored and reviewed 1.4 Activity management techniques are applied 1.5 Activity intervention strategies are applied when required
2. Apply quality improvement principles	2.1 Principles of quality control are identified 2.2 Suitable quality control principles are selected 2.3 Relevant quality management principles are applied 2.4 Appropriate control strategies are determined 2.5 Required quality improvement principles are applied 2.6 Effects of change of quality control strategies are assessed
3. Apply productivity improvement measures	3.1 Productivity cycle is identified and described 3.2 Challenges in production activities are determined 3.3 Possible solutions are formulated 3.4 <i><b>Productivity measures</b></i> are implemented 3.5 Productivity improvement measure is appraised



## **RANGE**

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

<b>Variable</b>	<b>Range</b>
<ul style="list-style-type: none"><li>• Productivity measures may include but not limited to:</li></ul>	<ul style="list-style-type: none"><li>• Productivity data</li><li>• Cycles and targets.</li></ul>

## **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:

- Communication
- Team Work
- Problem solving
- Planning and Organizing
- Self-management
- Technology

### **Required knowledge**

The individual needs to demonstrate knowledge of:

- Quality requirements
- Time management concepts
- Team goals and motivation

## **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 Applied time management techniques 1.2 Applied quality improvement principles 1.3 Applied productivity improvement measures
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Measuring equipment and instruments 2.3 Materials relevant to the tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Direct Observation 3.2 Demonstration with Oral Questioning 3.3 Written tests
4. Context of Assessment	Competency may be assessed individually in the actual workplace or through accredited institution
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## APPLY FUNDAMENTAL SKILLS OF WELDING WORKS

UNIT CODE: ENG/OS/WEF/CC/03/4/A

### UNIT DESCRIPTION

This unit standard is intended for those who carry out welding operations. It specifies the competencies required to: Apply hand tools used in welding operations; Apply power tools and equipment used in welding operations; Read and interpret drawings and specifications; Perform basic measurements and calculations; and Perform advanced measurements and calculations.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Apply hand tools used in welding operations	1.1 Hand tools used in welding practice are identified 1.2 Hand tools are used as per manufacturer's specifications 1.3 Hand tools are stored and cared for as per procedures and best practices
2. Apply power tools and equipment used in welding operations	2.1 Power tools and equipment used in welding practice are identified 2.2 Power tools are inspected for damage, completeness and wear 2.3 Power tools and equipment are used as per manufacturer's specifications 2.4 Power tools and equipment are stored and cared for as per procedures and best practices
3. Perform basic measurements and calculations	3.1 SI units were explained 3.2 Conversion between metric and imperial measurements was performed 3.3 Accurate linear measurements were done 3.4 Basic area calculations were performed
4. Read and interpret drawings and specifications	4.1 Scales, symbols and types of drawings are described 4.2 Material requirements and specifications are extracted from the drawings 4.3 Drawings are cared for and stored properly
5. Perform advanced measurements	5.1 Measurements are conducted using a Vernier caliper 5.2 Measurements are conducted using a gauge/gap/fillet/angle measurement

## 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:

- Communication
- Team Work
- Problem solving
- Planning and Organizing
- Self-management
- Technology

### Required knowledge

The individual needs to demonstrate knowledge of:

- Basic mathematics
- How to use a calculator

## EVIDENCE GUIDE

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

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Applied hand tools used in welding operations 1.2 Applied power tools and equipment used in welding operations 1.3 Performed basic measurements and calculations 1.4 Read and interpreted drawings and specifications 1.5 Performed advanced measurements
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Measuring equipment and instruments 2.3 Materials relevant to the tasks
3. Methods of Assessment	Competency may be assessed through: 3.1 Practical tests 3.2 Observation
4. Context of assessment	Competency may be assessed individually in the actual workplace or a simulated work place setting
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## **CORE COMPETENCIES**

# PERFORM MANUAL ARC (STICK) WELDING IN ALL POSITIONS WITH VARIOUS METAL

**UNIT CODE: ENG/OS/WEF/CR/01/4/A**

## UNIT DESCRIPTION

This unit standard is intended for those who carry out welding operations. It specifies the competencies required to: Apply safety to a workplace; Apply housekeeping principles to welding work area; Prepare tools, equipment, consumables and work pieces for manual arc (stick) welding processes; Weld work pieces in all positions in accordance with national and international specifications and procedures; and Inspect finished product quality against national and international specifications and procedures.

## ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Apply safety to a workplace	1.1. Correct Personal Protective Equipment (PPE) for the job is identified 1.2. PPE is worn correctly 1.3. All required permits and approvals are obtained prior to starting work 1.4. Any incidents, hazards and risks are reported
2. Apply housekeeping principles to welding work area	2.1 Workplace is cleaned and prepared before and after welding is completed 2.2 Tools, equipment and unused materials and consumables are returned to safe area 2.3 Completed work piece is stored correctly Refrigeration unit is handed over to user as per work place procedures
3. Prepare tools, equipment, consumables and work pieces for manual arc (stick) welding processes	3.1 Drawings and specifications are obtained and interpreted 3.2 Consumables, materials, tools and equipment for job are obtained 3.3 Work pieces are measured, marked, cut and prepared according to specifications 3.4 Equipment is set up according to manufacturer's specification Task is completed in line with workplace procedures and environmental requirements
4. Weld work pieces in all positions in	4.1 <i><b>Welding positions</b></i> are identified

accordance with national and international specifications and procedures	<p>4.2 Welding is conducted according to drawings and specifications</p> <p>4.3 All relevant safety aspects are adhered to during the welding process</p> <p>4.4 Accidents and incidents are reported according to workplace procedure</p>
5. Inspect finished product quality against national and international specifications and procedures	<p>5.1 The weld joint is completed (full coverage)</p> <p>5.2 Weld appearance, quality and integrity is found to be in accordance with the specifications</p> <p>5.3 Weld is dressed as required by the specification</p> <p>5.4 Any defects/deviations are reported according to workplace procedure following inspection</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
<ul style="list-style-type: none"> <li>Welding positions include but not limited to:</li> </ul>	<ul style="list-style-type: none"> <li>F1</li> <li>F2</li> <li>F3</li> <li>F4</li> <li>1G</li> <li>2G</li> <li>3G</li> <li>4G</li> <li>5G</li> <li>6G.</li> </ul>

## **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
- Problem solving
- Planning and Organizing
- Self-management
- Technology

### **Required Knowledge**

- The individual needs to demonstrate knowledge of:
- Different types of PPE
- Different weld positions F1, F2, F3, F4, 1G, 2G, 3G, 4G, 5G, 6G
- Types of tools, equipment and consumables
- Different types of metals in order to be able to select the correct metal
- Types of welding rods and applications
- Correct amperage for the type and thickness of metal to be welded and electrode selected
- Ability to read and interpret welding drawings and specifications
- Weld finishes and methods
- 5S principles and their application in housekeeping
- 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 Applied safety to a workplace 1.2 Applied housekeeping principles to welding work area 1.3 Prepared tools, equipment, consumables and work pieces for manual arc (stick) welding processes 1.4 Weld work pieces in all positions in accordance with national and international specifications and procedures 1.5 Inspected finished product quality against national and international specifications and procedures
2. Resource implications	The following resources must be provided: 2.1 Work place location and domestic refrigeration units 2.2 Tools, equipment and instruments 2.3 Materials relevant to the task 2.4 Manufacturer's specifications and manuals relevant to the task
3. Methods of assessment	Competency may be assessed through: 3.1 Demonstration 3.2 Direct observation with oral questioning 3.3 Written tests 3.4 Portfolio 3.5 Third party reports
4. Context for assessment	Competency may be assessed individually on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the sector, workplace and job role is recommended.

## PERFORM TIG WELDING IN ALL POSITIONS WITH VARIOUS METAL WORK PIECES

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

### UNIT DESCRIPTION

This unit standard is intended for those who carry out welding operations. It specifies the competencies required to: Apply safety to a workplace; Apply housekeeping principles to welding work area; Prepare tools, equipment, consumables and work pieces for the TIG welding processes; Weld work pieces in all positions in accordance with national and international specifications and procedures; and Inspect finished product quality against national and international specifications and procedures.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Apply safety to a workplace	1.1 Correct Personal Protective Equipment (PPE) for the job is identified 1.2 PPE is worn correctly 1.3 All required permits and approvals are obtained prior to starting work 1.4 Any incidents, hazards and risks are reported
2. Apply housekeeping principles to welding work area	2.1 Workplace is cleaned and prepared before and after welding is completed 2.2 Tools, equipment and unused materials and consumables are returned to safe area 2.3 Completed work piece is stored correctly
3. Prepare tools, equipment, consumables and work pieces for TIG welding processes	3.1 Drawings and specifications are obtained and interpreted 3.2 Consumables, materials, tools and equipment for job are obtained 3.3 <i><b>Work pieces</b></i> are measured, marked, cut and prepared according to specifications 3.4 Equipment is set up according to manufacturer's specification
4. Weld work pieces in all positions in accordance with national and international	4.1 Welding is conducted according to drawings and specifications 4.2 All relevant safety aspects are adhered to during the welding process

specifications and procedures	4.3 Accidents and incidents are reported according to workplace procedure
5. Inspect finished product quality against national and international specifications and procedures	5.1 The weld joint is completed (full coverage) 5.2 Weld appearance, quality and integrity is found to be in accordance with the specifications 5.3 Weld is dressed as required by the specification 5.4 Any defects/deviations are reported according to workplace procedure following inspection

## 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
<ul style="list-style-type: none"> <li>Work pieces</li> </ul>	<ul style="list-style-type: none"> <li>Mild Steel</li> <li>Cast Iron</li> <li>Aluminum</li> <li>Alloy Steels</li> <li>Stainless Steel</li> <li>Carbon Steel</li> </ul>

## 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:

- Communication
- Team Work
- Problem solving
- Planning and Organizing
- Self-management
- Technology

### Required Knowledge

The individual needs to demonstrate knowledge of:

- Different types of PPE
- Different weld positions F1, F2, F3, F4, 1G, 2G, 3G, 4G, 5G, 6G
- Types of tools, equipment and consumables
- Different types of metals in order to be able to select the correct metal
- Types of welding rods and applications

- Correct amperage for the type and thickness of metal to be welded and electrode selected
- Ability to read and interpret welding drawings and specifications
- Weld finishes and methods
- 5S principles and their application in housekeeping
- 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	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Applied safety to a workplace</p> <p>1.2 Applied housekeeping principles to welding work area</p> <p>1.3 Prepared tools, equipment, consumables and work pieces for TIG welding processes</p> <p>1.4 Weld work pieces in all positions in accordance with national and international specifications and procedures</p> <p>1.5 Inspected finished product quality against national and international specifications and procedures</p>
2. Resource implications	<p>The following resources must be provided:</p> <p>2.1 Work place location</p> <p>2.2 Tools, equipment and instruments</p> <p>2.3 Materials relevant to the task</p> <p>2.4 Manufacturers manual, specifications relevant to the task</p>
3. Methods of assessment	<p>Competency may be assessed through:</p> <p>3.1 Demonstration</p> <p>3.2 Direct observation with oral questioning</p> <p>3.3 Written tests</p> <p>3.4 Portfolio</p> <p>3.5 Third party reports</p>
4. Context for assessment	<p>Competency may be assessed individually on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the sector, workplace and job role is recommended.</p>

## PERFORM MIG WELDING IN ALL POSITIONS WITH VARIOUS METAL WORK PIECES

**UNIT CODE: ENG/OS/WEF/CR/03/4/A**

### UNIT DESCRIPTION

This unit standard is intended for those who carry out welding operations. It specifies the competencies required to: Apply safety to a workplace; Apply housekeeping principles to welding work area; Prepare tools, equipment, consumables and work pieces for the MIG welding processes; Weld work pieces in all positions in accordance with national and international specifications and procedures; and Inspect finished product quality against national and international specifications and procedures.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Apply safety to a workplace	1.1. Correct Personal Protective Equipment (PPE) for the job is identified 1.2. PPE is worn correctly 1.3. All required permits and approvals are obtained prior to starting work 1.4. Any incidents, hazards and risks are reported
2. Apply housekeeping principles to welding work area	2.1 Workplace is cleaned and prepared before and after welding is completed 2.2 Tools, equipment and unused materials and consumables are returned to safe area 2.3 Completed work piece is stored correctly.
3. Prepare tools, equipment, consumables and work pieces for MIG welding processes	3.1 Drawings and specifications are obtained and interpreted 3.2 Consumables, materials, tools and equipment for job are obtained 3.3 <i><b>Work pieces</b></i> are measured, marked, cut and prepared according to specifications 3.4 Equipment is set up according to manufacturer's specification Task is completed in line with workplace procedures and environmental requirements
4. Weld work pieces in all positions in accordance with national and	4.1 Welding is conducted according to drawings and specifications 4.2 All relevant safety aspects are adhered to during the welding process

international specifications and procedures	4.3 Accidents and incidents are reported according to workplace procedure
5. Inspect finished product quality against national and international specifications and procedures	5.1 The weld joint is completed (full coverage) 5.2 Weld appearance, quality and integrity is found to be in accordance with the specifications 5.3 Weld is dressed as required by the specification 5.4 Any defects/deviations are reported according to workplace procedure following inspection

### **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.

<b>Variable</b>	<b>Range</b>
<ul style="list-style-type: none"> <li>• Work pieces</li> </ul>	<ul style="list-style-type: none"> <li>• Mild Steel</li> <li>• Cast Iron</li> <li>• Aluminum</li> <li>• Alloy Steels</li> <li>• Stainless Steel</li> <li>• Carbon Steel</li> </ul>

### **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:

- Communication
- Team Work
- Problem solving
- Planning and Organizing
- Self-management
- Technology

## Required Knowledge

The individual needs to demonstrate knowledge of:

- Different types of PPE
- Different weld positions F1, F2, F3, F4, 1G, 2G, 3G, 4G, 5G, 6G
- Types of tools, equipment and consumables
- Different types of metals in order to be able to select the correct metal
- Types of welding wire, gases and applications
- Correct amperage for the type and thickness of metal to be welded
- Ability to read and interpret welding drawings and specifications
- Weld finishes and methods
- 5S principles and their application in housekeeping
- 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 Apply safety to a workplace 1.2 Apply housekeeping principles to welding work area 1.3 Prepare tools, equipment, consumables and work pieces for MIG welding processes 1.4 Weld work pieces in all positions in accordance with national and international specifications and procedures 1.5 Inspect finished product quality against national and international specifications and procedures
2. Resource implications	The following resources must be provided: 2.1 Work place location 2.2 Tools, equipment and instruments 2.3 Materials relevant to the task 2.4 Manufacturer's specifications and manuals relevant to the task
3. Methods of assessment	Competency may be assessed through: 3.1 Demonstration 3.2 Direct observation with oral questioning 3.3 Written tests 3.4 Portfolio 3.5 Third party reports

4. Context for assessment	Competency may be assessed individually on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the sector, workplace and job role is recommended.



## PERFORM GAS WELDING IN ALL POSITIONS WITH VARIOUS METAL WORK PIECES

**UNIT CODE: ENG/OS/WEF/CR/04/4/A**

### UNIT DESCRIPTION

This unit standard is intended for those who carry out welding operations. It specifies the competencies required to: Apply safety to a workplace; Apply housekeeping principles to welding work area; Prepare tools, equipment, consumables and work pieces for the gas welding processes; Weld work pieces in all positions in accordance with national and international specifications and procedures; and Inspect finished product quality against national and international specifications and procedures.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><b><i>Bold and italicized terms are elaborated in the Range</i></b></p>
<p>1. Apply safety to a workplace</p>	<p>1.1. Correct Personal Protective Equipment (PPE) for the job is identified</p> <p>1.2. PPE is worn correctly</p> <p>1.3. All required permits and approvals are obtained prior to starting work</p> <p>1.4. Any incidents, hazards and risks are reported</p>
<p>2. Apply housekeeping principles to welding work area</p>	<p>2.1 Workplace is cleaned and prepared before and after welding is completed</p> <p>2.2 Tools, equipment and unused materials and consumables are returned to safe area</p> <p>2.3 Completed work piece is stored correctly.</p>
<p>3. Prepare tools, equipment, consumables and work pieces for gas welding processes</p>	<p>3.1 Drawings and specifications are obtained and interpreted</p> <p>3.2 Consumables, materials, tools and equipment for job are obtained</p> <p>3.3 <b><i>Work pieces</i></b> are measured, marked, cut and prepared according to specifications</p> <p>3.4 Equipment is set up according to manufacturer's specification Task is completed in line with workplace procedures and environmental requirements</p>
<p>4. Weld work pieces in all positions in accordance with</p>	<p>4.1 Welding is conducted according to drawings and specifications</p>

national and international specifications and procedures	4.2 All relevant safety aspects are adhered to during the welding process 4.3 Accidents and incidents are reported according to workplace procedure
5. Inspect finished product quality against national and international specifications and procedures	5.1 The weld joint is completed (full coverage) 5.2 Weld appearance, quality and integrity is found to be in accordance with the specifications 5.3 Weld is dressed as required by the specification 5.4 Any defects/deviations are reported according to workplace procedure following inspection

## 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
<ul style="list-style-type: none"> <li>Work pieces</li> </ul>	<ul style="list-style-type: none"> <li>Mild Steel</li> <li>Cast Iron</li> <li>Aluminum</li> <li>Alloy Steels</li> <li>Stainless Steel</li> <li>Carbon Steel</li> </ul>

## 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:

- Communication
- Team Work
- Problem solving
- Planning and Organizing
- Self-management
- Technology

## Required Knowledge

The individual needs to demonstrate knowledge of:

- Different types of PPE
- Different weld positions F1, F2, F3, F4, 1G, 2G, 3G, 4G, 5G, 6G
- Types of tools, equipment and consumables
- Different types of metals in order to be able to select the correct metal
- Types of welding wire, gases and applications
- Correct amperage for the type and thickness of metal to be welded
- Ability to read and interpret welding drawings and specifications
- Weld finishes and methods
- 5S principles and their application in housekeeping
- 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 Apply safety to a workplace 1.2 Apply housekeeping principles to welding work area 1.3 Prepare tools, equipment, consumables and work pieces for gas welding processes 1.4 Weld work pieces in all positions in accordance with national and international specifications and procedures 1.5 Inspect finished product quality against national and international specifications and procedures 1.6
2. Resource implications	The following resources must be provided: 2.1 Work place location 2.2 Tools, equipment and instruments 2.3 Materials relevant to the task 2.4 Manufacturer's specifications and manuals relevant to the task
3. Methods of assessment	Competency may be assessed through: 3.1 Demonstration 3.2 Direct observation with oral questioning 3.3 Written tests 3.4 Portfolio 3.5 Third party reports

4. Context for assessment	Competency may be assessed individually on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the sector, workplace and job role is recommended.