



REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARDS

FOR

GAS WELDER

LEVEL 3



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 in 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 Welder Level 3. These Occupational Standards will also be the basis 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.14 of 2012 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 basis for development of competency-based curriculum for Welder Level 3. 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.

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

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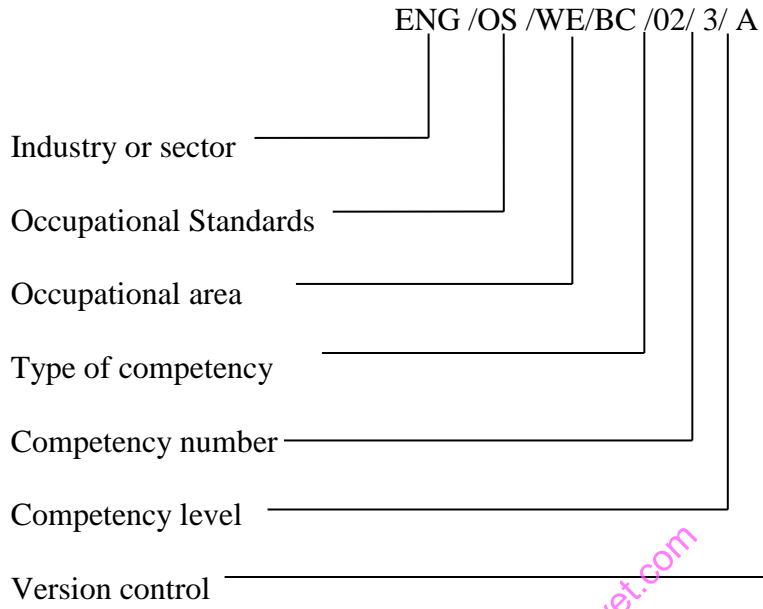
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ABBREVIATIONS AND ACRONYMS

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
WE	Welding
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



OVERVIEW

Gas Welding Level 3 qualification consists of competencies that a person must achieve to enable him/her to carry out gas welding, in flat and horizontal positions..

This course consists of the following basic, common and core units of learning:

Basic Units of Competency

Unit Code	Unit Title
ENG/OS/WEL/BC/01/3/A	Demonstrate Communication skills
ENG/OS/WEL/BC/02/3/A	Demonstrate Numeracy skills
ENG/OS/WEL/BC/03/3/A	Demonstrate Digital literacy
ENG/OS/WEL/BC/04/3/A	Demonstrate Entrepreneurial skills
ENG/OS/WEL/BC/05/3/A	Demonstrate Employability skills
ENG/OS/WEL/BC/06/3/A	Demonstrate Environmental literacy
ENG/OS/WEL/BC/07/3/A	Demonstrate Occupational safety and health practices

Common Units of Competency

Unit of Learning Code	Unit of Learning Title
ENG/OS/WEL/CC/01/3/A	Basic Workshop Concepts

Core Units of Competency

Unit of Learning Code	Unit of Learning Title
ENG/OS/WEL/CR/01/3/A	Oxy-Acetylene welding

BASIC COMPETENCIES

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DEMONSTRATE COMMUNICATION SKILLS

UNIT CODE: ENG/OS/WEL/BC/01/3/A

UNIT DESCRIPTION

This unit specifies the competencies required to demonstrate communication skills. It involves obtaining and conveying workplace information, speaking English at a basic operational level, participating in workplace meetings and discussions, and completing relevant work-related documents.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
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>Bold and italicized terms are elaborated in the Range</i>
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from <i>appropriate sources</i> based on standard procedures 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information based on communication needs 1.3 Appropriate <i>medium</i> is used to transfer information and ideas in accordance with workplace guidelines 1.4 Appropriate non- verbal communication is used as per the communication needs 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed based on workplace requirements 1.6 Location and storage of information is undertaken according to workplace procedures 1.7 Personal interaction is carried out clearly and concisely according to workplace requirements
2. Speak English at a basic operational level	2.1 Participation in simple conversations with work colleagues is undertaken based on familiar topics 2.2 Simple verbal instructions and requests are responded to according to workplace guidelines 2.3 <i>Routine procedures</i> are provided in accordance with workplace policy 2.4 Likes, dislikes and preferences are expressed based on individual preference

	2.5 Different forms of expression in English are identified in line with workplace requirements
3. Participate in workplace meetings and discussions	<p>3.1 Team meetings are attended on time according to schedules</p> <p>3.2 Own opinions are clearly expressed and those of others are listened to in accordance with workplace guidelines</p> <p>3.3 Meeting inputs are provided based on the meeting purpose and established <i>protocols</i></p> <p>3.4 <i>Workplace interactions</i> are conducted as per organizations' code of conduct</p> <p>3.5 Work-related questions are asked and responded based on set protocols</p> <p>3.6 Meetings outcomes are interpreted and implemented as per organizations' objectives</p>
4. Complete relevant work-related documents	<p>4.1 Range of forms relating to conditions of employment are completed according to workplace procedures</p> <p>4.2 Workplace data is recorded based on workplace requirements</p> <p>4.3 Errors in recording information are identified and acted upon in accordance with workplace policies</p> <p>4.4 Reporting requirements are completed according to organizational guidelines</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
1. Appropriate Sources may include but not limited to:	<ul style="list-style-type: none"> • Various department heads, • organization documents
2. Medium may include but not limited to:	<ul style="list-style-type: none"> • Method of communication • Physical media • Mechanical media
3. Routine procedures may include but not limited to:	<ul style="list-style-type: none"> • Day to day activities

4. Protocols may include but not limited to:	<ul style="list-style-type: none"> • Procedures for doing a task
5. Workplace interactions may include but not limited to:	<ul style="list-style-type: none"> • Official inter relations

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
- Active Listening
- Communication
- writing
- Interpretation
- Basic Information Technology (IT)

Required Knowledge

The individual needs to demonstrate knowledge of:

- Minutes writing
- Report writing

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 Prepared written communication following standard format of the organization</p> <p>1.2 Accessed information using communication equipment</p> <p>1.3 Spoken English at a basic operational level</p> <p>1.4 Made use of relevant terms as an aid to transfer information effectively</p> <p>1.5 Conveyed information effectively adopting the formal or informal communication</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2. 1Access to relevant workplace where assessment can take place</p>

	<p>2. 2Appropriately simulated environment where assessment can take place</p> <p>2. 3Materials relevant to the proposed activity or tasks</p>
3. Methods of Assessment	<p>3.1 Direct Observation</p> <p>3.2 Interview</p> <p>3.3 Written test</p>
4. Context of Assessment	<p>Competency may be assessed</p> <p>4.1 On the job</p> <p>4.2 Off the job</p> <p>4.3 During industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

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DEMONSTRATE NUMERACY SKILLS

UNIT CODE: ENG/OS/WEL/BC/02/3/A

UNIT DESCRIPTION:

This unit covers the competencies required to demonstrate numeracy skills. It involves using whole numbers and money up to one hundred thousand for work, Locating, comparing and using highly familiar measurement for work, using highly familiar maps and diagrams for work, identifying and using some common 2D shapes for work and locating specific information in highly familiar tables, graphs and charts for work

Elements and Performance Criteria

Element	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element. <i>Bold and italicized terms are elaborated in the Range</i>
1. Use whole numbers for work	1.1 Whole numbers and money amount up to 100,000 in highly familiar workplace documents and tasks are named and read according to workplace procedures. 1.2 Understanding of place value and the role of zero is demonstrate according to standard operating procedures. 1.3 Halves are recognised and understood in workplace as per Standard operating procedures. 1.4 Whole numbers and money amounting up to 100,000 are organised in size order and are compared as per workplace procedures. 1.5 Counting is done in numbers as per standard operating procedures. 1.6 Addition and subtraction of whole numbers and money up to 100,000 done in accordance with workplace requirement 1.7 Links between operations of addition and subtraction are clearly described as per job requirement. 1.8 Reasonableness of outcome with prompting and support is checked as per work requirement. 1.9 Numerical information is recorded, and the result of the task is communicated using informal language and symbolism as per workplace procedures.

Element	Performance Criteria
<p>2. Locate, compare and use highly familiar measurement for work</p>	<p>2.1 Measurements in highly familiar workplace documents and tasks are located as per standard operating procedures</p> <p>2.2 Different units of measurements and their uses are identified in accordance with job specifications</p> <p>2.3 The comparative relationship between the units of measurement identified as per standard operating procedures.</p> <p>2.4 Understanding of conversion of amounts is demonstrated in accordance with requirements.</p> <p>2.5 Informal language is used to compare measurements as per workplace procedures.</p> <p>2.6 Digital time is well read and am and pm used in reference to time</p> <p>2.7 Calendar used appropriately to record information in accordance with organizational events.</p> <p>2.8 Basic measurement information is well read and recorded as per the manuals</p> <p>2.9 Additions and subtraction of simple quantities done in workplace as per SOPs.</p>
<p>3. Use highly familiar maps and diagrams for work</p>	<p>3.1 Familiar items or places are in highly familiar maps and diagrams in accordance with SOPs</p> <p>3.2 Simple symbols and pictorial representations are identified in accordance with familiar maps and diagrams</p> <p>3.3 Simple oral directions are given to locate objects as per SOPs</p> <p>3.4 Simple oral directions followed to locate objects as per job specifications</p> <p>3.5 Understanding of informal directional language is demonstrated as per work procedures.</p>
<p>4. Identify and use some common 2D shapes for work</p>	<p>4.1 Common two-dimensional shapes are identified and named as per SOPs</p> <p>4.2 Common objects are described in terms of size and shape as per SOPs</p> <p>4.3 Common, every day, informal language is used to compare objects in accordance SOPs</p> <p>4.4 Common objects are grouped based on shape, size, colour and features as per job requirements</p>

Element	Performance Criteria
5. Locate specific Information in highly familiar tables, graphs and charts for work	5.1 Features of simple tables identified as per work place procedures 5.2 Specific numerical information located in highly familiar tables using grid movement (up and down columns and across rows) and key as graph and chart manuals 5.3 Numerical information and data in highly familiar tables compared using appropriate informal language as per workplace procedures. 5.4 Information related to relevant workplace tasks as per workplace procedures 5.5 Features of simple graphs and charts identified as per SOPs 5.6 Specific numerical information located in highly familiar graphs and charts as per workplace procedures. 5.7 Numerical information and data compared using appropriate informal language as per SOPs.

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
1. Common two - dimensional shapes: may include but not limited to:	<ul style="list-style-type: none"> • Round/circle • Square • Rectangular • Triangle

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:

- Measuring
- Logical thinking
- Computing
- Drawing of graphs
- Applying mathematical formulas
- Analytical

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	Assessment requires evidence that the candidate: 1.1 Measured objects or materials as per job requirements 1.2 Used calculator to perform the four fundamental operations 1.3 Performed calculations involving money up to one hundred thousand 1.4 Performed conversions between hours, minutes and seconds 1.5 Calculated area and volume of regular shapes 1.6 Created tables and graphs to represent and interpret information
2.Resource Implications for competence assessment	The following resources should be provided: 2. 1Access to relevant workplace where assessment can take place 2. 2Appropriately simulated environment where assessment can take place 2. 3Materials relevant to the proposed activity or tasks
3.Methods of Assessment	Competency may be assessed through:

	<ul style="list-style-type: none"> 3.1 Written Test 3.2 Interview 3.3 Oral Questioning 3.4 Demonstration
4.Context of Assessment	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On the job 4.2 Off the job 4.3 During industrial attachment
5.Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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1. DEMONSTRATE DIGITAL LITERACY

UNIT CODE: ENG/OS/WEL/BC/03/3/A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate digital literacy in a working environment. It entails identifying computer software and hardware, applying security measures to data, hardware, software, applying computer software in solving tasks and applying internet and email in communication at workplace.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
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>Bold and italicized terms are elaborated in the Range</i>
1. Identify computer software and hardware	1.1 <i>Computer software</i> are identified according to manufacturer's specification 1.2 <i>Appropriate computer hardware</i> is identified according to manufacturer's specification
2. Apply security measures to data, hardware, software	2.1 <i>Data security and privacy are classified</i> in accordance with the technological situation 2.2 <i>Security and control measures</i> are applied in accordance with laws governing protection of ICT 2.3 Computer threats and crimes are detected in accordance with information management guidelines. 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>word processing concepts</i> are applied in resolving workplace tasks as per job requirement. 3.2 <i>Word processing utilities</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.

Variable	Range
1. Computer software may include but not limited to:	<ul style="list-style-type: none"> • Operating system • MS office • Web browser • Media players
2. Computer hardware may include but not limited to:	<ul style="list-style-type: none"> • Computer Case • Monitor • Keyboard • Mouse • Hard Disk Drive • Motherboard • Video Card
3. Data security and privacy may include but not limited to:	<ul style="list-style-type: none"> • Confidentiality • Cloud computing • Confidentiality • Cyber terrorism • Integrity -but-curious data serving
4. Security and control measures may include but not limited to:	<ul style="list-style-type: none"> • Countermeasures and risk reduction • Cyber threat issues • Risk management
5. Word processing concepts may include but not limited to:	<ul style="list-style-type: none"> • Create • Edit • Print • Documents

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 skills
- 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"> 1.1 Identified input, output, CPU and storage media devices of computers in accordance to computer specification 1.2 Identified concepts, types and functions of computer software according to operation manual 1.3 Identified and controlled security threats 1.4 Detected and protected computer crimes 1.5 Applied word processing in office tasks 1.6 Prepared work sheet and applied data to the cells in accordance to workplace procedures 1.7 Used Electronic Mail for office communication as per workplace procedure 1.8 Applied internet and World Wide Web for office tasks in accordance with office procedures 1.9 Applied laws governing protection of ICT
<p>2. Resource Implications for competence assessment</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Materials relevant to the proposed activity or tasks
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Written Test 3.2 Observation 3.3 Practical assignment 3.4 Interview 3.5 Oral Questioning
<p>4. Context of Assessment</p>	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On the job 4.2 Off the job 4.3 During industrial attachment
<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>

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DEMONSTRATE ENTREPRENEURIAL SKILLS

UNIT CODE : ENG/OS/WEL/BC/04/3/A

UNIT DESCRIPTION

This unit specifies the competencies required to demonstrate Entrepreneurial skills. It involves developing entrepreneurial culture, identifying entrepreneurial opportunities, starting, operating and growing a small business.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
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. Bold and italicized terms are elaborated in the Range
1. Develop entrepreneurial culture	1.1 <i>Entrepreneurship terminologies</i> are defined following established procedures. 1.2 Contribution of entrepreneurship towards national development is identified in accordance to national development goals 1.3 Self-employment benefit are identified and emphasized to help create a positive attitude 1.4 Cultural factors that promote or inhibit entrepreneurial development are identified and emphasis made on entrepreneurial promotion 1.5 Ways of managing factors that inhibit development of entrepreneurial culture are identified in accordance with cultural background and national social economic situation
2. Identify entrepreneurial opportunities	2.1 Myths associated with entrepreneurship, types of entrepreneurs and characteristics of entrepreneurship are determined in accordance with the set procedures 2.2 Identification of <i>sources of business ideas</i> , generation of business ideas is undertaken in accordance with the existing procedure 2.3 Evaluation of business opportunities is undertaken according to prevailing office procedures

	2.4 Competencies are matched with business opportunities in accordance with business practices.
3. Start a small business	<p>3.1 Factors to consider when starting a small business are identified according to business sector.</p> <p>3.2 Forms of business ownership are identified and procedure of starting a small business stipulated according to relevant legal requirements</p> <p>3.3 Procedure of starting a small business is identified as per the legal requirements</p> <p>3.3 Challenges faced when starting a small business are identified and mitigating factors provided for in accordance prevailing legal and regulatory requirement</p> <p>3.4 Resource requirement for a small business are specified according to nature of business</p> <p>3.5 Business life cycle is projected as per the nature of business and national social economic situation</p>
4. Operate a small business	<p>4.1 Relevant terms are defined in accordance with the set rules</p> <p>4..3 Small business record is maintained in accordance with office procedures</p> <p>4.4 Business support services are set up in accordance with the nature and size of business</p> <p>4.5 Marketing activities are effected according to the nature and size of business</p> <p>4.6 Small enterprise business plan is prepared depending on the size and nature of business and the client specification</p> <p>4.6 Small business resources are run for efficiency and profitability</p> <p>4.6 Small business records are kept for decision making purposes</p> <p>4.7 Word processing concepts are applied in the management of small business according to office procedures</p> <p>4.8 Basic computer application software and emerging trends and concerns are applied in small business management in accordance with office procedures</p>
5. Grow a small business	5.1 Methods of growing/expanding a small business are identified and implemented in accordance with growth schedule

	<p>5.2 Resources for growing small business are identified and implementing</p> <p>5.3 Small business growth plans are prepared according to growth schedule</p> <p>5.4 ICT and small business growth schedule is prepared in accordance with office procedures</p> <p>5.5 Use of computers and technology is incorporated in small scale business growth schedule in accordance with technological trends</p> <p>5.6 Social media is used for business growth and profitability</p> <p>5.7 Emerging issues and trends are considered in accordance with business growth schedule and activities</p> <p>5.8 Community interest is built in product/service according to growth plan</p> <p>5.9 Business communication is enhanced according to business communication plan and profitability</p> <p>5.10 Basic business growth strategies are identified and implemented for increased profitability</p> <p>5.11 Word processing concepts are applied in growing of small business according to office procedures</p> <p>5.12 Basic computer application software, programming and emerging trends and concerns are applied in small business growth in accordance with office procedures for growth and profitability</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

Variable	Range
1. Entrepreneurship terminologies include but not limited to:	<ul style="list-style-type: none"> • Intrapreneurship • Enterprise • Business vision. Mission, core values, objectives
2. Sources of business ideas may include but not limited to:	<ul style="list-style-type: none"> • Brainstorming • Personal hobbies • Newspapers, magazines, • Friends and relatives • Accounting/Administrative work • Modern trends and concerns

<p>3. Forms of business ownership may include but not limited to:</p>	<ul style="list-style-type: none"> • Sole proprietorship • Partnership • Limited Company • Unlimited Company
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REQUIRED SKILLS AND KNOWLEDGE

Required Skills

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

The individual needs to demonstrate the following skills:

- Marketing skills
- Advertising
- Basic book-keeping
- accounting skills
- Communication skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Public relations concepts
- Basic product promotion strategies
- Basic market and feasibility studies
- Basic 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

EVIDENCE GUIDE

This section describes the required skills which supports performance. These skills will need to be considered in the learning and assessment process.

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Demonstrated basic entrepreneurial skills 1.2 Demonstrated ability to conceptualize and plan a micro/small enterprise 1.3 Demonstrated ability to manage/operate a micro/small-scale business 1.4 Demonstrated basic marketing skills
2. Resource Implications for assessment	The following resources should be provided: 2. 1 Access to relevant workplace where assessment can take place 2. 2 Appropriately simulated environment where assessment can take place 2. 3 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 Oral Questioning 3.3 Observation 3.4 Third Party Report
4. Context of Assessment	4 Competency may be assessed 4.1 On the job 4.2 Off the job 4.3 During industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

DEMONSTRATE EMPLOYABILITY SKILLS

UNIT CODE: ENG/OS/WEL/BC/05/3/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

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>Bold and italicized terms are elaborated in the Range</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 Emotional intelligence is demonstrated 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 based on workplace instructions.</p> <p>1.6 Self-esteem and a positive self-image are developed and maintained based on values.</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 objectives</p> <p>1.9 Self-strengths and weaknesses are identified based on personal objectives</p>
<p>2. Demonstrate critical safe work habits</p>	<p>2.1. Stress is managed in accordance with workplace policy.</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.Resources are utilized in accordance with workplace policy.</p> <p>2.5.Work priorities are set in accordance to workplace goals and objectives.</p> <p>2.6.Leisure time is recognized and utilized in line with personal objectives.</p> <p>2.7.Drugs and substances of abuse are identified and avoided based on workplace policy.</p> <p>2.8.HIV and AIDS prevention awareness is demonstrated in line with workplace policy.</p> <p>2.9.Safety consciousness is demonstrated in the workplace based on organization safety policy.</p> <p>2.10. Emerging issues are identified and dealt with in accordance with organization policy.</p>
3. Demonstrate workplace learning	<p>3.1 Learning opportunities are sought and managed based on job requirement and organization policy.</p> <p>3.2 Improvement in performance is demonstrated based on courses attended.</p> <p>3.3 Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job</p> <p>3.4 Time and effort is invested in learning new skills based on job requirements</p> <p>3.5 Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy.</p> <p>3.6 New systems are developed and maintained in accordance with the requirements of the job.</p> <p>3.7 Awareness of personal role in workplace innovation is demonstrated based on requirements of the job.</p>
4. Demonstrate workplace ethics	<p>4.1 Policies and guidelines are observed as per the workplace requirements</p> <p>4.2 Self-worth and professionalism is exercised in line with personal goals and organizational policies</p> <p>4.3 Code of conduct is observed as per the workplace requirements</p> <p>4.4 Integrity is demonstrated as per legal requirement</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.

Range	Variable
1. Drug and substance abuse may include but not limited to:	Commonly abused <ul style="list-style-type: none"> • Alcohol • Tobacco • Miraa • Over-the-counter drugs • Cocaine • Bhang • Glue
2. Feedback may include but not limited to:	<ul style="list-style-type: none"> • Verbal • Written • Informal • Formal
3. Team may include but not limited to:	<ul style="list-style-type: none"> • Small work group • Staff in a section/department • Inter-agency group
4. Innovation may include but not limited to:	<ul style="list-style-type: none"> • New ideas • Original ideas • Different ideas • Methods/procedures • Processes • New tools
5. Emerging issues may include but not limited to:	<ul style="list-style-type: none"> • Terrorism • Social media • National cohesion • Open offices

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
- Critical thinking
- Observation
- Organizing
- Record keeping

- Problem solving
- Decision Making
- Resource utilization

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
- Organizing work
- Record keeping
- Workplace problems and how to deal with them
- Assertiveness
- Team work
- HIV and AIDS
- Drug and substance abuse
- Safe work habits
- Professional growth and development
- Technology in the workplace
- 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place
3. Methods of Assessment	Competency in this unit may be assessed through: <ul style="list-style-type: none"> 3.1 Oral questioning 3.2 Portfolio of evidence 3.3 Third Party Reports 3.4 Written tests
4. Context of Assessment	Competency may be assessed <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
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/WEL/BC/06/3/A

UNIT DESCRIPTION

This unit specifies the competencies required to demonstrate environmental literacy. It involves controlling environmental hazard, controlling environmental pollution and demonstrating sustainable resource use.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Control environmental hazard	1.1 Storage and handling methods for environmentally hazardous materials are strictly followed according to environmental regulations and OSHS. 1.2 Disposal methods of hazardous wastes are followed at all times according to environmental regulations and OSHS. 1.3 PPE is used according to OSHS.
2. Control environmental Pollution	2.1 Environmental pollution control measures are complied with following standard protocol. 2.2 Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999 2.3 Methods for minimizing noise pollution complied following environmental regulations.
3. Demonstrate sustainable use of resource	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.

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
1. PPE may include but not limited to:	<ul style="list-style-type: none"> • Mask • Gloves • Goggles • Safety hat • Overall • Hearing protector
2. Environmental pollution control measures may include but not limited to:	<ul style="list-style-type: none"> • Methods for minimizing or stopping spread and ingestion of airborne particles • Methods for minimizing or stopping spread and ingestion of gases and fumes • Methods for minimizing or stopping spread and ingestion of liquid wastes
3. Waste management procedures may include but not limited to:	<ul style="list-style-type: none"> • Sorting • Storing of items • Recycling of items • Disposal of items
4. Resources may include but not limited to:	<ul style="list-style-type: none"> • Electric • Water • Fuel • Telecommunications • Supplies • Materials
5. Workplace environmental hazards may include but not limited to:	<ul style="list-style-type: none"> • Biological hazards • Chemical and dust hazards • Physical hazards

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
- Observation
- Writing
- Analytical

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

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> <p>1.1 Controlled environmental hazard</p> <p>1.2 Controlled environmental pollution</p> <p>1.3 Demonstrated sustainable resource use</p>
<p>2. Resource Implications for assessment</p>	<p>The following resources should be provided:</p> <p>2.1 Workplace with storage facilities</p> <p>2.2 Tools, materials and equipment relevant to the tasks (ex. Cleaning tools, cleaning materials, trash bags, etc.)</p> <p>2.3 PPE</p>

	2.4 Manuals and references
3 Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Written examination
4 Context of Assessment	Competency may be assessed 4.1 On the job 4.2 Off the job 4.3 During industrial attachment
5 Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: ENG/OS/WEL/BC/07/3/A

UNIT DESCRIPTION

This unit specifies the competencies required to practice and promote safety and health at work. This entails preparing to practice safety and health at work and complying and promoting compliance of workers to organization's occupational safety and health instructions and requirements

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>Bold and italicized terms are elaborated in the Range</i></p>
<p>1. Prepare to practice safety and health at work</p>	<p>1.1 Awareness of legislation that outlines the minimum standards for occupational safety and health requirements/ regulations are emphasized</p> <p>1.2 Benefits of implementing an occupational safety and health program are identified</p> <p>1.3 <i>Safety requirements/ regulations</i> of own work and of other workers are familiarized</p> <p>1.4 Workplace standards and procedures <i>for incidents and Emergencies</i> are determined</p> <p>1.5 <i>Prevention and control measures</i>, including use of <i>safety gears/PPE</i> (Personal Protective Equipment) to avoid accident, injuries and sickness are identified</p>
<p>2. Comply and promote compliance of workers to organization's occupational safety and health instructions and requirements</p>	<p>2.1 Safety instructions and safety signs are followed and disseminated to co-workers</p> <p>2.2 Safe handling of tools, equipment and materials is learned and shared with co-workers</p> <p>2.3 Execution of own work and of co-workers is monitored in according to safe work procedures</p>

	<p>2.4 Use of safe guards and safety devices is monitored</p> <p>2.5 Hazards, incidents, injuries and sickness in the workplace are reported properly following standards and procedures</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
1. <i>Safety requirements / regulations</i> may include but are not limited to:	<ul style="list-style-type: none"> • Building code • Permit to Operate • Occupational Safety and Health Standards
2. <i>Incidents and emergencies</i> may include but are not limited to:	<ul style="list-style-type: none"> • Chemical spills • Equipment/vehicle accidents • Explosion • Fire • Gas leak • Injury to personnel • Structural collapse • Toxic and/or flammable vapors emission.
3. <i>Prevention and control measures</i> may include but are not limited to:	<ul style="list-style-type: none"> • Eliminate the hazard • Isolate the hazard • Substitute the hazard with a safer alternative • Use administrative controls to reduce the risk • Use engineering controls to reduce the risk • Use personal protective equipment • Safety, Health and Work Environment Evaluation • Periodic and/or special medical examinations of workers

<p>4. Safety devices/ PPEs (personal protective equipment) May include but are not limited to:</p>	<ul style="list-style-type: none"> • Arm/Hand guard, gloves • Eye protection (goggles, shield) • Hearing protection (ear muffs, ear plugs) • Hair Net/cap/bonnet • Hard hat • Face protection (mask, shield) • Apron/Gown/coverall/jump suit • Anti-static suits • High-visibility reflective vest
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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
- Observation
- Reporting
- Organizing

Required Knowledge

The individual needs to demonstrate knowledge of:

- Elements of an effective occupational safety and health program
- Benefits of implementing an occupational safety and health program
- Safety requirements of own work and of other workers
- Standard emergency plan and procedures in the workplace
- Different OSH control measures
- General OSH principles
- Work standards and procedures
- Safe handling procedures of tools, equipment's and materials
- Standard emergency plan and procedures in the workplace
- Different OSH control measures
- Standard accident and illness reporting procedures in the workplace
- Monitoring system on compliance to work safety and health

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"> 1.1. Arranged work area and items in accordance with workplace procedures requirements 1.2. Followed work standards and procedures based on instructions 1.3. Applied Prevention and control measures based on instructions 1.4. Undertook orientations on OSH requirements and regulations in line with policy. 1.5. Provided feedback on occupational health and safety as per workplace instructions. 1.6. Adhered to workplace procedures for reporting hazards, incidents, injuries and sickness to as per workplace policy. 1.7. Identified and proposed OSH-related training needs as per workplace policy.
2. Resource Implications for assessment	<p>The following resources should be provided:</p> <ol style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ol style="list-style-type: none"> 3.1 Oral questioning 3.2 Portfolio of evidence 3.3 Third Party Reports 3.4 Written tests
4. Context of Assessment	<p>Competency may be assessed</p> <ol style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the-job 4.3 During Industrial attachment
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

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APPLY BASIC WORKSHOP CONCEPTS

UNIT CODE: ENG/OS/WEL/CC/01/3/A

UNIT DESCRIPTION

This unit describes the competencies required by a gas welding worker in order to apply basic calculations, measurements, and workshops while carrying out day-to-day welding works.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
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>Bold and italicized terms are elaborated in the Range.</i>
1. Apply basic calculations and measurements	<ul style="list-style-type: none"> 1.1 Computed basic mathematical operations based on 1.2 Solved fractions and ratios problems 1.3 Carried out mensuration and calculations 1.4 Converted units of measurements from metric to imperials based on needs of the industry.
2. Apply geometrical concepts	<ul style="list-style-type: none"> 2.1 Drew different lines based on engineering drawings 2.2 Constructed different plane figures based on geometry principles 2.3 Constructed different angles based on geometry principles 2.4 Performed free hand sketching based on design.
3. Apply shop safety	<ul style="list-style-type: none"> 3.1 Observed safe behaviour in workshop as per workshop procedures 3.2 Demonstrated firefighting skills as per workplace safety procedures 3.3 Demonstrated first aid practices as per first aid procedures. 3.4 Completed industrial-hazards checklist based on OSHA, 2007. 3.5 Demonstrated safe movement of materials based on workplace procedures 3.6 Worn protective clothing as per workplace procedures and OSHA 3.7 Observed machine safety as per the manufacturers specifications 3.8 Identified incidents and/or <i>accident</i> as per workplace procedures.
4. Apply shop tools	<ul style="list-style-type: none"> 4.1 Utilized workshop tools in welding works as per manufacturer's specifications 4.2 Cared and maintained workshop tools as per workplace procedures and best practices

	<p>4.3 Cleaned and stored workshop tools after use as per workplace procedures</p> <p>4.4 Identified incidences and/or accident as per workplace procedures</p>
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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
- Self-management

Required knowledge

The individual needs to demonstrate knowledge of:

- Ability to use measuring instruments
- Ability to use gas-welding equipment

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	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Computed basic mathematical operations</p> <p>1.2 Solved fractions and ratios problems</p> <p>1.3 Carried out mensuration and calculations</p> <p>1.4 Performed free hand sketching</p> <p>1.5 Observed safe behaviour in workshop as per workshop procedures</p> <p>1.6 Performed first aid practices as per first aid procedures</p> <p>1.7 Completed industrial-hazards checklist</p> <p>1.8 wore protective clothing</p> <p>1.9 Observed machine safety</p> <p>1.10 Utilized workshop tools in welding works as per manufacturer's specifications</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Equipped and conducive workplace</p> <p>2.2 Banners/charts of safety signs</p>

	<p>2.3 Materials relevant to the tasks</p> <p>2.4 Tools and equipment relevant to the task</p> <p>2.5 First aid tool kit</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral questioning</p> <p>3.3 Written test</p> <p>3.4 Portfolio of Evidence</p> <p>3.5 Interview</p> <p>3.6 Third party report</p>
4. Context of assessment	<p>4.1 On-the-job</p> <p>4.2 Off-the –job</p> <p>4.3 During Industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

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CORE COMPETENCIES

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PERFORM OXY-ACETYLENE WELDING

UNIT CODE: ENG/OS/WEL/CR/01/3/A

UNIT DESCRIPTION

This unit standard is intended for those who carry out oxy-acetylene gas welding & cutting, and soldering operations. It specifies competencies required in setting up and carrying out welding, cutting and/ or soldering tasks while observing appropriate safety.

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>Bold and italicized terms are elaborated in the Range</i></p>
<p>1. Apply safety to a workplace</p>	<p>1.1 Selected appropriate <i>Personal Protective Equipment (PPE)</i> for the job.</p> <p>1.2 Wore PPE as per task requirements</p> <p>1.3 Confirmed permits and approvals exist prior to starting work</p> <p>1.4 Identified any incidents, hazards and risks as per OSHA</p> <p>1.5 Identified and used firefighting equipment as per workplace procedures</p>
<p>2. Apply housekeeping to welding work area</p>	<p>2.1 Conducted housekeeping before, during and after welding.</p> <p>2.2 Tools, equipment and unused materials and consumables are cleaned and/or returned to safe area.</p> <p>2.3 Completed work piece is stored/ handed over as per work place procedures.</p>
<p>3. Take-in Instructions</p>	<p>3.1 Interpreted welding instructions as per supervisor/mentor's guidelines/drawings</p> <p>3.2 Executed supervisor/mentor's instructions/drawings as per task requirements.</p>
<p>4. Select materials, tool and equipment</p>	<p>4.1 <i>materials, tools and equipment</i> for the specific task are obtained.</p> <p>4.2 <i>Work pieces</i> are measured, marked, cut and prepared according to specifications.</p> <p>4.3 Oxy-acetylene equipment is set up according to manufacturer's specification</p>

5. Weld work pieces in flat and horizontal positions	<p>5.1 Set up weld workpieces as per the supervisor/ mentor's instructions/drawings.</p> <p>5.2 Conducted positional oxy-acetylene welding according to supervisor/ mentor's instructions/drawings.</p> <p>5.3 Adhered to applicable gas welding safety according to OSHA.</p> <p>5.4 Identified accidents and incidents according to workplace procedure.</p>
6. Repair welds	<p>6.1 The weld is completed as per task requirements</p> <p>6.2 Repaired weld as per task requirements</p> <p>6.3 Identified weld defects according to acceptable criteria.</p>
7. Select materials, tools and oxy-acetylene gas cutting equipment	<p>7.1 Identified and used materials, tools and equipment for the specific task as per task requirements</p> <p>7.2 Work pieces are measured, marked, cut and prepared according to specifications.</p> <p>7.3 Oxy-acetylene equipment is set up according to manufacturer's specification</p>
8. oxy-acetylene cutting process	<p>8.1 Set up weld workpieces as per the supervisor/ mentor's instructions/drawings.</p> <p>8.2 Conducted oxy-acetylene cutting according to supervisor/ mentor's instructions/drawings.</p> <p>8.3 Adhered to applicable oxy-acetylene cutting safety according to OSHA 2007.</p> <p>8.4 Identified accidents and incidents according to workplace procedure.</p>
9. Select materials, tool and soldering equipment	<p>9.1 Consumables, materials, tools and equipment for the specific soldering job are obtained.</p> <p>9.2 Work pieces are measured, marked, cut and prepared according to specifications.</p> <p>9.3 Equipment is set up according to manufacturer's specification</p>
10. Solder work pieces	<p>10.1 Set up weld workpiece as per the supervisor/ mentor's instructions/drawings.</p> <p>10.2 Light up the gas welding equipment as per manufacturers requirements</p> <p>10.3 The right flame is selected depending on type, size and thickness of materials</p> <p>10.4 Conducted soldering according to supervisor/ mentor's instructions/drawings.</p>

	<p>10.5 Adhered to applicable soldering safety according to OSHA.</p> <p>10.6 Identified accidents and incidents according to workplace procedure.</p>
11. Repair soldered sections	<p>11.1 Soldering is completed as per task requirements</p> <p>11.2 Repaired soldered sections as per task requirements</p> <p>11.3 Identified soldering defects according to acceptable criteria</p>

RANGE

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

Variable	Range
1. Personal Protective Equipment (PPE)	<ul style="list-style-type: none"> • Fire retardant overall/leather apron • Welding gloves • Welding goggles with filter lens • Clear goggles • Safety boots • Ear safety devices • Head protection devices • Shoe cover
2. Materials, tools and equipment	<ul style="list-style-type: none"> • Acetylene and oxygen gases and its accessories • Filler rods • Soldering flux • Solder
3. Work pieces	<ul style="list-style-type: none"> • Carbon steels • Aluminum • Stainless Steel • Tin
4. Repaired	<ul style="list-style-type: none"> • Heat treatment • Grinding and re-welding

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Use of PPEs

- Communication
- Team Work
- Planning
- Self-management
- Ability to uniformly solder work pieces
- Ability to light and extinguish gases
- Ability to select the right oxy-acetylene flame

Required Knowledge

The individual needs to demonstrate knowledge of:

- Types of PPE
- Use shop tools, equipment and materials
- Uses of metals in order to be able to select the correct metal
- Uses of fillers rods
- Selection of torch sizes
- Housekeeping procedures
- Safety rules and regulations applicable to the job

EVIDENCE GUIDE

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

<p>1. Critical aspects of competency</p>	<p>1.1 Wore PPE as per job requirements 1.2 Performed housekeeping as per workplace procedures. 1.3 Executed supervisor/mentor's instructions/drawings. 1.4 Light up the gas welding equipment as per manufacturers requirements 1.5 The right flame is selected depending on type, size and thickness of materials 1.6 Measured, marked, cut and prepared workpieces according to specifications 1.7 Set up workpieces and equipment as per relevant instructions. 1.8 Repaired weld or soldered sections as per job requirements.</p>
<p>2. Resource implications</p>	<p>The following resources must be provided: 2.1 Equipped soldering area/ welding area 2.2 Tools, equipment and accessories for welding/cutting/soldering works. 2.3 Materials relevant to the tasks 2.4 Manufacturer's specifications and manuals relevant to the task</p>

<p>3. Methods of assessment</p>	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Practical</p> <p>3.3 Oral questioning</p> <p>3.4 Written tests</p> <p>3.5 Portfolio</p> <p>3.6 Projects</p>
<p>4. Context for assessment</p>	<p>4.1 On-the-job</p> <p>4.2 Off-the -job</p> <p>4.3 During Industrial attachment</p>
<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>

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