



**COMPETENCY STANDARD
FOR
Welding**

(Light Engineering Sector)

Level: 04

Competency Standard Code: CSWL0008L4V1

**National Skills Development Authority
Prime Minister's Office, Bangladesh**

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Introduction

The National Skills Development Authority aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skill ecosystem and delivery mechanism through a combination of well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. "**Welding**" is selected as one of the priority occupations of **Light Engineering** Sector. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

Generally, a competency standard informs curriculum, learning materials, assessment and certification of trainees enrolled in Skills development. Trainees who successfully pass the assessment will receive a qualification under the NSQF and will be listed on the NSDA's online portal.

This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.

Overview

A **competency standard** is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of representative from NSDA, Key Institutions, ISC, and industry experts to identify the competencies required of an occupation in **light Engineering sector**.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guide

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide.

**Competency Standards for National Skill Certificate – 04 in
Welding**

Level descriptors of NTVQF/ NSQF (BNQF 1-6)

Level & Job classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyze, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break information into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.

List of Abbreviations

CS	- Competency Standard
ISC	- Industry Skills Council
FPS	- Foot, Pound, Second
NSDA	- National Skills Development Authority
MKS	- Meter, Kilogram, Second
NSQF	- National Qualifications Framework
OSH	- Occupational Safety and Health
PPE	- Personal Protective Equipment
SMAW	- Shielded Metal Arc Welding
GTAW	- Gas Tungsten Arc Welding
SS	- Stainless Steel
WPS	- Welding Procedure Specification
SCVC	- Standards and Curriculum Validation Committee
STP	- Skills Training Provider
SOP	- Standard Operating Procedure
UoC	- Unit of Competency

Approval of Competency Standard

Members of the Approval Committee

Member	Signature
Dulal Krishna Saha Executive Chairman (Secretary) National Skills Development Authority	 21.06.21
Md. Nurul Amin Member (Admin & Finance) & Member (Registration & Certification) Joint Secretary National Skills Development Authority	 21.06.21
Alif Rudaba Member (Planning & Skills Standard) Joint Secretary National Skills Development Authority	

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21.06.21

Dulal Krishna Saha

Executive Chairman (Secretary)
National Skills Development Authority

Date:

**National Competency Standards for National Skill Certificate – 4 in
Welding**

Course Structure

SL	Unit Code and Title		UoC Level	Nominal Hours
Generic Competencies				20
1.	GU011L4V1	Lead small team	4	20
Occupation Specific Competencies				250
2.	Ouwel001L4V1	Perform Weld Beads on metal plate using GTAW	4	40
3.	Ouwel002L4V1	Perform butt joint and 2F welding using GTAW	4	40
4.	Ouwel003L4V1	Perform pipe welding using GTAW – 1G and 2G positions	4	40
5.	Ouwel004L4V1	Perform welding on pipe using GTAW - 5G Position	4	50
6.	Ouwel005L4V1	Perform welding on pipe using GTAW - 6G Position	4	60
7.	Ouwel006L4V1	Contribute to Quality System	4	20
Total Nominal Learning Hours				270

Units & Elements at a Glance

Generic Competencies (20 Hours)

Code	Unit of Competency	Elements of Competency	Hours
GU011L4V1	Lead small team	<ol style="list-style-type: none"> 1. Provide team leadership 2. Assign responsibilities 3. Set performance expectations for team members 4. Supervise team performance 	20
Total Hour			20

Occupation Specific Competencies (250 Hours)

Code	Unit of Competency	Elements of Competency	Hours
OUWEL001L4V1	Perform Weld Beads on metal plate using GTAW	<ol style="list-style-type: none"> 1. Follow OSH practices 2. Select tools, equipment and prepare materials 3. Set up welding machine 4. Perform weld beads 5. Clean and store tools 	40
OUWEL002L4V1	Perform butt joint and 2F welding using GTAW	<ol style="list-style-type: none"> 1. Follow OSH practices 2. Select tools, equipment and prepare materials 3. Set up welding machine 4. Perform Butt joint 5. Perform 2F welding 6. Clean and store tools 	40
OUWEL003L4V1	Perform pipe welding using GTAW – 1G and 2G positions	<ol style="list-style-type: none"> 1. Follow OSH practices 2. Select tools, equipment and prepare materials 3. Set up welding machine 4. Perform welding Clean and store tools 	40
OUWEL004L4V1	Perform welding on pipe using GTAW - 5G Position	<ol style="list-style-type: none"> 1. Follow OSH practices 2. Select tools, equipment and prepare materials 3. Set up welding machine 4. Perform welding 5. Clean and store tools 	50
OUWEL005L4V1	Perform welding on pipe using GTAW - 6G Positions	<ol style="list-style-type: none"> 1. Follow OSH practices 2. Select tools, equipment and prepare materials 3. Set up welding machine 4. Perform welding 5. Clean and store tools 	60
OUWEL006L4V1	Contribute to quality system	<ol style="list-style-type: none"> 1. Inspect welding work 2. Apply quality standards to welding work 3. Protect company property and customer interests 	20
Total Hours			250

Generic Competencies

Unit Code and Title	GU011L4V1: Lead Small Team
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to lead small team.</p> <p>It specifically includes – provide team leadership; assign responsibilities; set performance expectations for team members; and supervised team performance.</p>
Nominal Hours	20 Hours
Elements of Competency	<p>Performance Criteria Bold & Underlined terms are elaborated in the Range of Variables</p>
1. Provide team leadership	<p>1.1 <u>Work requirements</u> are identified and presented to team members</p> <p>1.2 Reasons for instructions and requirements are communicated to team members</p> <p>1.3 <u>Team members' queries and concerns</u> are recognized, discussed and dealt with</p>
2. Assign responsibilities	<p>2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and attitudes required to properly undertake the assigned task</p> <p>2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible</p>
3. Set performance expectations for team members	<p>3.1 Performance expectations are established based on client needs and according to assignment requirements</p> <p>3.2 Performance expectations are based on individual team members' duties and area of responsibility</p> <p>3.3 Performance expectations are discussed and directed to implement in the workplace</p>
4. Supervise team performance	<p>4.1 <u>Monitoring of performance</u> are taken place against defined performance criteria and / or assignment instructions and corrective action taken if required</p> <p>4.2 Team members are provided <u>feedback</u>, positive support and advice on strategies to overcome any deficiencies</p> <p>4.3 <u>Performance issues</u> which cannot be rectified or addressed within the team are referenced to appropriate personnel</p> <p>4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which</p>

	<p>might impact on clients' / customers' needs and satisfaction</p> <p>4.5 Team operations are monitored to ensure that employer / client needs and requirements are met</p> <p>4.6 Follow-up communication is provided on all issues affecting the team</p> <p>4.7 All relevant documentation is completed</p>
Range of Variables	
Variable	Range (may include but are not limited to):
1. Work requirements	<p>1.1 Client Profile</p> <p>1.2 Assignment instructions</p>
2. Team member's queries and concerns	<p>2.1 Roster</p> <p>2.2 Shift details</p>
3. Monitoring of performance	<p>3.1 Formal process</p> <p>3.2 Informal process</p>
4. Feedback	<p>4.1 Formal process</p> <p>4.2 Informal process</p> <p>4.3 Sandwich process</p>
5. Performance issues	<p>5.1 Work output</p> <p>5.2 Work quality</p> <p>5.3 Team participation</p> <p>5.4 Compliance with workplace protocols</p> <p>5.5 Safety</p> <p>5.6 Customer service</p>
Evidence Guide	
<p>The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>1.1 Maintained or improved individuals and / or team performance given a variety of possible scenario</p> <p>1.2 Assessed and monitored team and individual performance against set criteria</p> <p>1.3 Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf</p> <p>1.4 Allocated duties and responsibilities, having regard to individual's knowledge, skills and attitude and the needs of the tasks to be performed</p> <p>1.5 Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members</p>

2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Company policies and procedures 2.2 Relevant legal requirements 2.3 How performance expectations are set 2.4 Methods of Monitoring Performance 2.5 Client expectations 2.6 Team members' duties and responsibilities
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Informal performance counselling skills 3.2 Team building skills 3.3 Negotiating skills
4. Required attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1 Workplace (actual or simulated) 5.2 Tools, equipment and facilities appropriate to processes or activity 5.3 Materials relevant to the proposed activity 5.4 Equipment and outfits appropriate in applying safety measures 5.5 Relevant drawings, manuals, codes, standards and reference material
6. Methods of assessment	<p>Methods of assessment may include but not limited to:</p> <ul style="list-style-type: none"> 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1 Competency assessment must be done in a training centre or in an actual or simulated workplace after completion of the training module 7.2 Assessment should be done by NSDA certified assessor
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by NSDA, the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of national skills qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Occupation Specific Competencies

Unit Code and Title	O UWEL001L4V1: Perform Weld Beads on Metal Plate Using GTAW
Nominal Hours	40 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to perform weld beads on metal plate using GTAW</p> <p>It specifically includes the tasks of It specifically includes the tasks of following OSH practices, selecting tools, equipment and preparing materials, setting up welding machine, performing weld beads and cleaning and storing tools.</p>
Elements of Competency	<p>Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.</p>
1. Follow OSH practices	<p>1.1 <u>PPE</u> is selected and collected as per requirements</p> <p>1.2 PPE is worn as required</p> <p>1.3 Safe work practices followed as per workplace standard</p>
2. Select tools, equipment and prepare materials	<p>2.1 Weld requirements are identified from workplace instruction</p> <p>2.2 <u>Tools, equipment and accessories</u> are selected and collected as per job requirements</p> <p>2.3 <u>Materials and Consumables</u> are selected as required</p> <p>2.4 Filler metal for GTAW is selected and collected as per job requirements</p> <p>2.5 Tungsten electrodes is selected as per job requirement</p> <p>2.6 Argon Gas cylinder is collected as per job requirement</p>
3. Set up welding machine	<p>3.1 Welding machine is prepared as per standard procedure</p> <p>3.2 Gas flow meter is adjusted as required</p> <p>3.3 Ampere is set as per job requirements</p> <p>3.4 Tip angle of tungsten electrodes is grinded as per job requirement</p>
4. Perform weld beads	<p>4.1 Job is cleaned and prepared as per requirements</p> <p>4.2 Job is positioned and clamped as required</p> <p>4.3 Weld <u>bead</u> is performed as per job specification</p>

	<p>4.4 Welds are cleaned as per standard operating procedure</p> <p>4.5 bead quality is visually checked and defects are identified</p> <p>4.6 Defects are rectified following SOP</p>
5. Clean and store tools	<p>5.1 Shutdown of welding machine is conducted as per instructional manuals</p> <p>5.2 Equipment and tools are cleaned and stored in accordance with workplace requirements</p> <p>5.3 The wastes are disposed and the workplace is cleaned in accordance with workplace requirements</p>
Range of Variables	
Variable	Range (may include but not limited to):
1. Personal Protective Equipment	<p>1.1 Safety glasses/Goggles</p> <p>1.2 Leather hand gloves for TIG welding</p> <p>1.3 Ear plugs</p> <p>1.4 Air respirator</p> <p>1.5 Safety shoes/boots</p> <p>1.6 Aprons</p> <p>1.7 Face masks</p> <p>1.8 Overalls</p> <p>1.9 Welding helmet/Auto dark helmet</p> <p>1.10 Safety helmet</p> <p>1.11 Face shield</p> <p>1.12 Arm guard</p>
2. Tools	<p>2.1 Ball pin hammer</p> <p>2.2 Chipping hammer</p> <p>2.3 Try square</p> <p>2.4 Tongs</p> <p>2.5 Wire brush</p> <p>2.6 Chisels</p> <p>2.7 Steel tape</p> <p>2.8 C-clamp</p> <p>2.9 Table vice</p> <p>2.10 Anvil</p> <p>2.11 Steel cup brush</p> <p>2.12 Center/trick punch</p> <p>2.13 Wire spacer</p>
3. Equipment and accessories	<p>3.1 GTAW machine set with standard accessories</p> <p>3.2 Inert gas (Argon) cylinder</p> <p>3.3 Regulator with flow meter</p>

	3.4 Hand shearing machine 3.5 Angle grinding machine 3.6 Ceramic cup
4. Materials and consumables	4.1 MS sheet thickness 5 mm (max) 4.2 SS sheet thickness 3 mm (max) 4.3 Aluminum/ aluminum alloy sheet thickness 2 mm (max) 4.4 Filler metal according to base metal 4.5 Tungsten electrode 4.6 Cleansing agent
5. Bead	5.1 Straight bead 5.2 Weaving bead 5.3 Smooth welding bead
6. Defects	6.1. Improper arc strike 6.2. Arc crater 6.3. Slag inclusion 6.4. Burn through 6.5. Concavity/convexity 6.6. Cracks 6.7. Crater cracks 6.8. Lack of fusion 6.9. Overlap 6.10. Tungsten inclusion 6.11. Undercut
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1. followed OSH practices 1.2. set up machine with accessories 1.3. performed beads 1.4. checked and rectified weld defects
2. Underpinning Knowledge	2.1. Safety and precaution of welding 2.2. Tip angle 2.3. Defects 2.4. Inert gas 2.5. Tungsten electrodes 2.6. Flow meter 2.7. Filler metal 2.8. Ampere settings
3. Underpinning Skills	3.1. Using PPE 3.2. Handling tools and equipment

	<ul style="list-style-type: none"> 3.3. Practicing safety rules and regulation 3.4. Interpreting drawings and specification 3.5. Interpreting welding sign and symbols
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace Respect for rights of peers and seniors in workplace
5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1. Workplace 5.2. Tools, equipment, TIG guide line and facilities appropriate to processes or activity 5.3. Materials relevant to the proposed activity. 5.4. Equipment and outfits appropriate in applying safety measures. 5.5. Relevant drawings, manuals, training manuals, poster, codes, standards and reference material 5.6. Standby firefighting system
6. Methods of assessment	<ul style="list-style-type: none"> 6.1. Demonstration 6.2. Oral questioning 6.3. Written test 6.4. Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1. Competency assessment must be done in NSDA accredited assessment centre 7.2. Assessment should be done by a NSDA certified/nominated assessor
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by NSDA, the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of national skills qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Unit Code and Title	Ouwel002L4V1: Perform Butt Joint and 2F welding using GTAW
Nominal Hours	40 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to perform butt joint and 2F welding using GTAW.</p> <p>It specifically includes the tasks of following OSH practices, selecting tools, equipment and preparing materials, setting up welding machine, performing butt joint, 2F welding, cleaning and storing tools.</p>
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Follow OSH practices	<p>1.1 <u>PPE</u> is selected and collected as per requirements</p> <p>1.2 PPE is worn as required</p> <p>1.3 Safe work practices followed as per workplace standard</p>
2. Select tools, equipment and prepare materials	<p>2.1 Weld requirements are identified from workplace instruction</p> <p>2.2 <u>Tools, equipment and accessories</u> are selected and collected as per job requirements</p> <p>2.3 <u>Materials and Consumables</u> are selected as required</p> <p>2.4 Filler metal for GTAW is selected and collected as per job requirements</p> <p>2.5 Tungsten electrodes is selected as per job requirement</p> <p>2.6 Argon Gas cylinder is collected as per job requirement</p>
3. Set up welding machine	<p>3.1 Welding machine is prepared as per standard procedure</p> <p>3.2 Gas flow meter is adjusted as required</p> <p>3.3 Ampere is set as per job requirements</p> <p>3.4 Tip angle of tungsten electrodes is grinded as per job requirement</p>
4. Perform butt joint	<p>4.1 Job is cleaned and prepared as per welding requirements</p> <p>4.2 Job is positioned and clamped as required</p> <p>4.3 Tack weld is performed and alignment is checked as per job requirement</p> <p>4.4 Welding is performed as per job specification</p> <p>4.5 Welds are cleaned as per standard operating procedure</p>

	<p>4.6 Weld quality is checked visually and defects are identified</p> <p>4.7 Defects are rectified following SOP</p>
5. Perform 2F welding	<p>5.1 Job is cleaned and prepared as per welding requirements</p> <p>5.2 Tack weld is performed and alignment is checked as per job requirement</p> <p>5.3 Job is positioned and clamped as required</p> <p>5.4 Welding is performed as per job specification</p> <p>5.5 Welds are cleaned as per standard operating procedure</p> <p>5.6 Weld quality is checked visually, defects are identified and rectified as required</p>
6. Clean and store tools	<p>6.1. Welding Machine is shutdown as per operating manual</p> <p>6.2. Equipment and tools are cleaned and stored in accordance with workplace requirements</p> <p>6.3. The wastes are disposed and the workplace is cleaned in accordance with workplace requirements</p>
Range of Variables	
Variable	Range (may include but not limited to):
1. Personal Protective Equipment	<p>1.1 Safety glasses/Goggles</p> <p>1.2 Leather hand gloves for TIG welding</p> <p>1.3 Ear plugs</p> <p>1.4 Air respirator</p> <p>1.5 Safety shoes/boots</p> <p>1.6 Aprons</p> <p>1.7 Face masks</p> <p>1.8 Overalls</p> <p>1.9 Welding helmet/Auto dark helmet</p> <p>1.10 Safety helmet</p> <p>1.11 Face shield</p> <p>1.12 Arm guard</p>
2. Tools	<p>2.1 Ball pin hammer</p> <p>2.2 Chipping hammer</p> <p>2.3 Try square</p> <p>2.4 Tongs</p> <p>2.5 Wire brush</p> <p>2.6 Chisels</p> <p>2.7 Steel tape</p> <p>2.8 C-clamp</p> <p>2.9 Table vice</p> <p>2.10 Anvil</p> <p>2.11 Steel cup brush</p> <p>2.12 Center/trick punch</p>

	2.13 Wire spacer
3. Equipment and accessories	3.1 GTAW machine set with standard accessories 3.2 Inert gas (Argon) cylinder 3.3 Regulator with flow meter 3.4 Shearing machine 3.5 Angle grinding machine 3.6 Ceramic cup
4. Materials and consumables	4.1 MS sheet thickness 5 mm (max) 4.2 SS sheet thickness 3 mm (max) 4.3 Aluminum/ aluminum alloy sheet thickness 2 mm (max) 4.4 Filler metal according to base metal 4.5 Tungsten electrode 4.6 Cleansing agent
5. Defects	5.1 Improper arc strike 5.2 Arc crater 5.3 Slag inclusion 5.4 Burn through 5.5 Concavity/convexity 5.6 Cracks 5.7 Crater cracks 5.8 Lack of fusion 5.9 Overlap 5.10 Tungsten inclusion 5.11 Undercut
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: <ol style="list-style-type: none"> 1.1. followed OSH practices 1.2. selected tools, equipment and prepare materials 1.3. set up welding machine 1.4. performed butt joint 1.5. performed 2F welding 1.6. cleaned and store tools
2. Underpinning Knowledge	<ol style="list-style-type: none"> 2.1. Operational procedure of GTAW 2.2. Application of GTAW 2.3. Basic components of GTAW equipment 2.4. advantages to the GTAW process 2.5. Shielding gas 2.6. Electrode 2.7. Materials that can be weld 2.8. Butt welding 2.9. 2F welding position 2.10. Welding defects

	2.11. Causes and rectification of defects 2.12. Visual test
3. Underpinning Skills	3.1. Following OSH 3.2. Handling tools and equipment 3.3. Using accessories 3.4. Interpreting drawings and specification 3.5. Interpreting and following instructions 3.6. Communicating in the workplace
4. Underpinning attitudes	4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources must be provided: 5.1. Workplace 5.2. Tools, equipment, TIG guide line and facilities appropriate to processes or activity. 5.3. Materials relevant to the proposed activity. 5.4. Equipment and outfits appropriate in applying safety measures. 5.5. Relevant drawings, manuals, training manuals, poster, codes, standards and reference material. 5.6. Standby firefighting system
6. Methods of assessment	6.1. Demonstration 6.2. Oral questioning 6.3. Written test 6.4. Portfolio
7. Context of assessment	7.1. Competency assessment must be done in NSDA accredited assessment centre 7.2. Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

Training Providers must be accredited by NSDA, the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of national skills qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	O UWEL003L4V1: Perform pipe welding using GTAW-1G and 2G positions
Nominal Hours	40 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to weld pipes using GTAW.</p> <p>It specifically includes the tasks of following OSH practices, selecting tools, equipment and preparing materials, setting up welding machine, performing welding, cleaning and storing tools.</p>
Elements of Competency	<p>Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.</p>
1. Follow OSH practices	<p>1.1 <u>PPE</u> is selected and collected as per requirements</p> <p>1.2 PPE is worn as required</p> <p>1.3 Safe work practices followed as per workplace standard</p>
2. Select tools, equipment and prepare materials	<p>2.1 Weld requirements are identified from workplace instruction</p> <p>2.2 <u>Tools, equipment and accessories</u> are selected and collected as per job requirements</p> <p>2.3 <u>Materials and Consumables</u> are selected as required</p> <p>2.4 Pipe's edge is prepared as required</p> <p>2.5 Filler metal for GTAW is selected and collected as per job requirements</p> <p>2.6 Tungsten electrodes is selected as per job requirement</p> <p>2.7 Argon gas cylinder is collected</p>
3. Set up welding machine	<p>3.1 Welding machine is prepared as per standard procedure</p> <p>3.2 Gas flow meter is adjusted as required</p> <p>3.3 Ampere is set as per job requirements</p> <p>3.4 Tip angle of tungsten electrodes is grinded as per job requirement</p>
4. Perform welding	<p>4.1 Tack welding is performed and alignment is checked as per job requirement</p> <p>4.2 Torch and filler metal angle is maintained as per job requirement</p> <p>4.3 Key hole techniques are maintained during root pass as required</p>

	<p>4.4 Consecutive hot pass, filling pass and cover pass/reinforcement is performed as required</p> <p>4.5 Welds are cleaned as per job requirements</p> <p>4.6 Weld quality is checked visually and defects are identified and rectified as required</p>
5. Clean and store tools	<p>5.1 Shutdown Welding Machine is conducted as per instructional manuals</p> <p>5.2 Equipment and tools are cleaned and stored in accordance with workplace requirements</p> <p>5.3 The wastes are disposed and the workplace is cleaned in accordance with workplace requirements</p>
Range of Variables	
Variable	Range (may include but not limited to):
1. Personal Protective Equipment	<p>1.1 Safety glasses/Goggles</p> <p>1.2 Leather hand gloves for TIG welding</p> <p>1.3 Ear plugs</p> <p>1.4 Air respirator</p> <p>1.5 Safety shoes/boots</p> <p>1.6 Aprons</p> <p>1.7 Face masks</p> <p>1.8 Overalls</p> <p>1.9 Welding helmet/Auto dark helmet</p> <p>1.10 Safety helmet</p> <p>1.11 Face shield</p> <p>1.12 Arm guard</p>
2. Tools	<p>2.1 Ball pin hammer</p> <p>2.2 Chipping hammer</p> <p>2.3 Try square</p> <p>2.4 Tongs</p> <p>2.5 Wire brush</p> <p>2.6 Chisels</p> <p>2.7 Steel tape</p> <p>2.8 C-clamp</p> <p>2.9 Table vice</p> <p>2.10 Anvil</p> <p>2.11 Steel cup brush</p> <p>2.12 Center/trick punch</p> <p>2.13 Wire spacer</p>
3. Equipment and accessories	<p>3.1 GTAW machine set with standard accessories</p> <p>3.2 Inert gas (Argon) cylinder</p> <p>3.3 Regulator with flow meter</p>

	3.4 Shearing machine 3.5 Angle grinding machine 3.6 Ceramic cup
4. Materials and consumables	4.1 MS pipe (50 - 150 mm dia and wall thickness 3 -12 mm) 4.2 SS pipe (40 – 75 mm dia and wall thickness 3 – 6 mm) 4.3 Filler metal according to base metal 4.4 Tungsten electrode 4.5 Cleansing agent
5. Defects	5.1 Improper arc strike 5.2 Arc crater 5.3 Slag inclusion 5.4 Burn through 5.5 Concavity/convexity 5.6 Cracks 5.7 Crater cracks 5.8 Lack of fusion 5.9 Overlap 5.10 Tungsten inclusion 5.11 Undercut

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1. followed OSH practices 1.2. selected tools, equipment and prepare materials 1.3. set up welding machine 1.4. performed root pass 1.5. performed hot pass 1.6. performed filling pass 1.7. performed capping pass 1.8. identified and rectified defects 1.9. cleaned and store tools
2. Underpinning Knowledge	2.1. GTAW procedure 2.2. 1G, 2G, 5G and 6G positions 2.3. Root pass 2.4. Hot pass 2.5. Filling pass 2.6. Capping pass 2.7. Welding defects 2.8. Causes and remedial measures of defects

	2.9. Testing for defects
3. Underpinning Skills	3.1. Following OSH 3.2. Handling tools and equipment 3.3. Using accessories 3.4. Interpreting drawings and specification 3.5. Interpreting and following instructions 3.6. Communicating in the workplace
4. Underpinning attitudes	4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources must be provided: 5.1. Workplace 5.2. Tools, equipment, TIG guide line and facilities appropriate to processes or activity. 5.3. Materials relevant to the proposed activity. 5.4. Equipment and outfits appropriate in applying safety measures. 5.5. Relevant drawings, manuals, training manuals, poster, codes, standards and reference material 5.6. Standby firefighting system
6. Methods of assessment	6.1. Demonstration 6.2. Oral questioning 6.3. Written test 6.4. Portfolio
7. Context of assessment	7.1. Competency assessment must be done in NSDA accredited assessment centre 7.2. Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	OUWEL004L4V1: Perform welding on pipe using GTAW - 5G Position
Nominal Hours	50 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required of a worker to perform GTAW – 5G position.</p> <p>It specifically includes the tasks of following OSH practices, selecting tools, equipment and preparing materials, setting up welding machine, performing welding, cleaning and storing tools.</p>
Elements of Competency	<p>Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.</p>
1. Follow OSH practices	1.1 <u>PPE</u> is selected and collected as per requirements 1.2 PPE is worn as required 1.3 Safe work practices followed as per workplace standard
2. Select tools, equipment and prepare materials	2.8 Weld requirements are identified from workplace instruction 2.9 <u>Tools, equipment and accessories</u> are selected and collected as per job requirements 2.10 <u>Materials and Consumables</u> are selected as required 2.11 Edge of both piece of pipe is beveled at 30° - 35° 2.12 Filler metal for GTAW is selected and collected as per job requirements 2.13 Tungsten electrodes is selected as per job requirement. 2.14 Argon gas cylinder is collected
3. Set up welding machine	3.1 Welding machine is prepared as per standard procedure 3.2 Gas flow meter is adjusted as required 3.3 Ampere is set as per job requirements 3.4 Tip angle of tungsten electrodes is grinded as per job requirement
4. Perform welding	4.1 Tack welding is performed and alignment is checked as per job requirement 4.2 Pipe is fixed with horizontal 4.3 Torch and filler metal angle is maintained as per job requirement 4.4 Key hole techniques are maintained during root pass as required 4.5 Consecutive hot pass, filling pass and cover pass/reinforcement is performed as required

	<p>4.6 Welds are cleaned as per job requirements</p> <p>4.7 Weld quality is checked visually and defects are identified and rectified as required</p>
5. Clean and store tools	<p>5.4 Shutdown Welding Machine is conducted as per instructional manuals</p> <p>5.5 Equipment and tools are cleaned and stored in accordance with workplace requirements</p> <p>5.6 The wastes are disposed and the workplace is cleaned in accordance with workplace requirements</p>
Range of Variables	
Variable	Range (may include but not limited to):
1. Personal Protective Equipment	<p>1.13 Safety glasses/Goggles</p> <p>1.14 Leather hand gloves for TIG welding</p> <p>1.15 Ear plugs</p> <p>1.16 Air respirator</p> <p>1.17 Safety shoes/boots</p> <p>1.18 Aprons</p> <p>1.19 Face masks</p> <p>1.20 Overalls</p> <p>1.21 Welding helmet/Auto dark helmet</p> <p>1.22 Safety helmet</p> <p>1.23 Face shield</p> <p>1.24 Arm guard</p>
2. Tools	<p>2.14 Ball pin hammer</p> <p>2.15 Chipping hammer</p> <p>2.16 Try square</p> <p>2.17 Tongs</p> <p>2.18 Wire brush</p> <p>2.19 Chisels</p> <p>2.20 Steel tape</p> <p>2.21 C-clamp</p> <p>2.22 Table vice</p> <p>2.23 Anvil</p> <p>2.24 Steel cup brush</p> <p>2.25 Center/trick punch</p> <p>2.26 Wire spacer</p>
3. Equipment and accessories	<p>3.1 GTAW machine set with standard accessories</p> <p>3.2 Inert gas (Argon) cylinder</p> <p>3.3 Regulator with flow meter</p> <p>3.4 Angle grinding machine</p> <p>3.5 Ceramic cup</p>

4. Materials and consumables	4.1 MS pipe (50 - 150 mm dia and wall thickness 3 -12 mm) 4.2 SS pipe (40 – 75 mm dia and wall thickness 3 – 6 mm) 4.3 Filler metal according to base metal 4.4 Tungsten electrode 4.5 Cleansing agent
5. Defects	5.12 Improper arc strike 5.13 Arc crater 5.14 Slag inclusion 5.15 Burn through 5.16 Concavity/convexity 5.17 Cracks 5.18 Crater cracks 5.19 Lack of fusion 5.20 Overlap 5.21 Tungsten inclusion 5.22 Undercut
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: <ol style="list-style-type: none"> 1.1. followed OSH practices 1.2. selected tools, equipment and prepare materials 1.3. set up welding machine 1.4. performed root pass 1.5. performed hot pass 1.6. performed filling pass 1.7. performed capping pass 1.8. identified and rectified defects 1.9. cleaned and store tools
2. Underpinning Knowledge	<ol style="list-style-type: none"> 2.1. GTAW process 2.2. GTAW machine and accessories 2.3. Regulator 2.4. Inert gas 2.5. Filler 2.6. Gas flow rate 2.7. Root pass 2.8. Hot pass 2.9. Filling pass 2.10. Capping pass 2.11. Reinforcement 2.12. Causes and rectification of defects
3. Underpinning Skills	<ol style="list-style-type: none"> 3.1. Following OSH 3.2. Interpreting drawings and specification

	<ul style="list-style-type: none"> 3.3. Handling hand tools and equipment 3.4. Adjusting welding machine 3.5. Following welding procedure specification 3.6. Communicating in the workplace 3.7. Performing measurement 3.8. Checking alignments
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace
5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1. Well ventilated workplace 5.2. Tools, equipment, TIG guide line and facilities appropriate to processes or activity 5.3. Materials relevant to the proposed activity 5.4. Equipment and outfits appropriate in applying safety measures 5.5. Relevant drawings, manuals, training manuals, poster, codes, standards and reference material
6. Methods of assessment	<ul style="list-style-type: none"> 6.1. Workplace observation 6.2. Demonstration 6.3. Oral questioning 6.4. Written test 6.5. Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1. Competency assessment must be done in NSDA accredited assessment centre 7.2. Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	OUWEL005L4V1: Perform welding on pipe using GTAW - 6G position
Nominal Hours	50 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to perform GTAW – 6G position.</p> <p>It specifically includes the tasks of following OSH practices, selecting tools, equipment and preparing materials, setting up welding machine, performing welding, cleaning and store tools.</p>
Elements of Competency	<p>Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.</p>
1. Follow OSH practices	<p>1.1 <u>PPE</u> is selected and collected as per requirements</p> <p>1.2 PPE is worn as required</p> <p>1.3 Safe work practices followed as per workplace standard</p>
2. Select tools, equipment and prepare materials	<p>2.7 Weld requirements are identified from workplace instruction</p> <p>2.8 <u>Tools, equipment and accessories</u> are selected and collected as per job requirements</p> <p>2.9 <u>Materials and Consumables</u> are selected as required</p> <p>2.10 Edge of both piece of pipe is beveled at 30°- 35°</p> <p>2.11 Filler metal for GTAW is selected and collected as per job requirements</p> <p>2.12 Tungsten electrodes is selected as per job requirement</p> <p>2.13 Argon gas cylinder is collected</p>
3. Set up welding machine	<p>3.1 Welding machine is prepared as per standard procedure</p> <p>3.2 Gas flow meter is adjusted as required</p> <p>3.3 Ampere is set as per job requirements</p> <p>3.4 Tip angle of tungsten electrodes is grinded as per job requirement</p>
4. Perform welding	<p>4.1 Tack welding is performed and alignment is checked as per job requirement</p> <p>4.2 Pipe is fixed in 45°±5° angle</p> <p>4.3 Torch and filler metal angle is maintained as per job requirement</p> <p>4.4 Key hole techniques are maintained during root pass as required</p>

	<p>4.5 Consecutive hot pass, filling pass and cover pass/reinforcement is performed as required</p> <p>4.6 Welds are cleaned as per job requirements</p> <p>4.7 Weld quality is checked visually and defects are identified and rectified as required</p>
5. Clean and store tools	<p>5.1 Shutdown Welding Machine is conducted as per instructional manuals</p> <p>5.2 Equipment and tools are cleaned and stored in accordance with workplace requirements</p> <p>5.3 The wastes are disposed and the workplace is cleaned in accordance with workplace requirements</p>
Range of Variables	
Variable	Range (may include but not limited to):
1. Personal Protective Equipment	<p>1.1 Safety glasses/Goggles</p> <p>1.2 Leather hand gloves for TIG welding</p> <p>1.3 Ear plugs</p> <p>1.4 Air respirator</p> <p>1.5 Safety shoes/boots</p> <p>1.6 Aprons</p> <p>1.7 Face masks</p> <p>1.8 Overalls</p> <p>1.9 Welding helmet/Auto dark helmet</p> <p>1.10 Safety helmet</p> <p>1.11 Face shield</p> <p>1.12 Arm guard</p>
2. Tools	<p>2.1 Ball pin hammer</p> <p>2.2 Chipping hammer</p> <p>2.3 Try square</p> <p>2.4 Tongs</p> <p>2.5 Wire brush</p> <p>2.6 Chisels</p> <p>2.7 Steel tape</p> <p>2.8 C-clamp</p> <p>2.9 Table vice</p> <p>2.10 Anvil</p> <p>2.11 Steel cup brush</p> <p>2.12 Center/trick punch</p> <p>2.13 Wire spacer</p>
3. Equipment and accessories	<p>1.1 GTAW machine set with standard accessories</p> <p>1.2 Inert gas (Argon) cylinder</p> <p>1.3 Regulator with flow meter</p> <p>1.4 Angle grinding machine</p> <p>1.5 Ceramic cup</p>
4. Materials and consumables	<p>4.1 MS pipe (50 - 150 mm dia and wall thickness 3 - 6 mm)</p>

	<ul style="list-style-type: none"> 4.2 SS pipe (40 – 75 mm dia and wall thickness 3 – 6 mm) 4.3 Filler metal according to base metal 4.4 Tungsten electrode 4.5 Cleansing agent
5. Defects	<ul style="list-style-type: none"> 5.1 Improper arc strike 5.2 Arc crater 5.3 Slag inclusion 5.4 Burn through 5.5 Concavity/convexity 5.6 Cracks 5.7 Crater cracks 5.8 Lack of fusion 5.9 Overlap 5.10 Tungsten inclusion 5.11 Undercut
<p>Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1. followed OSH practices 1.2. selected tools, equipment and prepare materials 1.3. set up welding machine 1.4. performed root pass 1.5. performed hot pass 1.6. performed filling pass 1.7. performed capping pass 1.8. identified and rectified defects 1.9. cleaned and store tools
2. Underpinning Knowledge	<ul style="list-style-type: none"> 2.1. Welding positions 2.2. GTAW process 2.3. GTAW machine and accessories 2.4. Regulator 2.5. Inert gas 2.6. Filler 2.7. Gas flow rate 2.8. Root pass 2.9. Hot pass 2.10. Filling pass 2.11. Capping pass 2.12. Reinforcement 2.13. Causes and rectification of defects
3. Underpinning Skills	<ul style="list-style-type: none"> 3.1. Following OSH 3.2. Interpreting drawings and specification 3.3. Handling hand tools and equipment

	<ul style="list-style-type: none"> 3.4. Adjusting welding machine 3.5. Following welding procedure specification 3.6. Communicating in the workplace 3.7. Performing measurement 3.8. Checking alignments
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace Respect for rights of peers and seniors in workplace
5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1. Well ventilated workplace 5.2. Tools, equipment, TIG guide line and facilities appropriate to processes or activity 5.3. Materials relevant to the proposed activity 5.4. Equipment and outfits appropriate in applying safety measures 5.5. Relevant drawings, manuals, training manuals, poster, codes, standards and reference material
6. Methods of assessment	<ul style="list-style-type: none"> 6.1. Demonstration 6.2. Oral questioning 6.3. Written test 6.4. Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1. Competency assessment must be done in NSDA accredited assessment centre 7.2. Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	Ouwel006L4V: Contribute to Quality System
Nominal Hours	20 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to contribute to quality system.</p> <p>It specifically includes the tasks of inspecting welding work, applying quality standards to welding work and protecting company property and customer interests.</p>
Elements of Competency	<p>Performance Criteria Bold and Underlined terms are elaborated in the Range of Variables.</p>
1. Inspect welding work	1.1 Responsibility is taken for quality of own work 1.2 Conformance to specification is ensured in every case at all situations 1.3 Appropriate inspections are conducted to ensure company <u>quality systems or procedures</u> or work instruction is maintained/ followed 1.4 Faults/defects are identified and rectified according to acceptance criteria
2. Apply quality standards to welding work	2.1 Inspections are conducted throughout the manufacturing processes to ensure quality standards are maintained 2.2 Appropriate quality standards are applied throughout the welding work 2.3 All activities are coordinated throughout the workplace to ensure efficient quality work outcomes 2.4 Records of work quality are maintained according to the company requirements or work instruction
3. Protect company property and customer interests	3.1 Possible damage to <u>company property</u> is avoided by adherence to company quality procedures 3.2 Quality of work is followed to ensure customer requirements and company standards are met
Range of Variables	
Variables	Range (may include but not limited to):
1. Quality system and procedures	1.1 Company/industry rules 1.2 Equipment maintenance schedules 1.3 Inspection and testing plan (ITP) 1.4 Product specifications 1.5 Safe work procedures 1.6 Technical procedures adopted or specifically prepared standards

	<ul style="list-style-type: none"> 1.7 Work instructions 1.8 WPS
2. Company property	<ul style="list-style-type: none"> 2.1 Base materials 2.2 Facilities 2.3 Hand and power tools 2.4 OSH 2.5 Production and/or fabrication equipment 2.6 Welding consumables
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<ul style="list-style-type: none"> 1.1 Applied quality standards to work 1.2 Inspected work done against specification 1.3 Followed procedure or work instruction or WPS 1.4 Protected company property and customer interests
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Communication/feedback methods-written and verbal 2.2 Company systems, processes and work quality requirements 2.3 Problem solving Technique 2.4 Quality objective 2.5 Safety precautionary measures 2.6 Detect defects, take corrective and/or quality improvement actions 2.7 Welder identification system 2.8 Work inspection techniques
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Handling materials, tools and equipment. 3.2 Communicating with superiors and co-workers 3.3 Keeping records in accordance with standard operating procedures. 3.4 Identifying customer requirements
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 Tools, equipment and facilities appropriate to processes or activity

	5.4 Relevant drawings, manuals, codes, standards and reference material
6. Methods of assessment	6.1 Workplace observation 6.2 Demonstration 6.3 Oral questioning 6.4 Written test 6.5 Portfolio
7. Context of assessment	1.1 Competency assessment must be done in NSDA accredited assessment centre 1.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Development of Competency Standard

The Competency Standards for National Skills Certificate in **Welding** is developed by NSDA on 14-21 March, 2021 in association with the following members.

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Validation of Competency Standard by Standard and Curriculum Validation Committee

The Competency Standards for National Skills Certificate level-03 in **Welding**, is validated by SCVC on 23 and 24 May 2021.

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