



Australian Government

Department of Education, Employment and Workplace Relations

RIISAM205A Cut, weld and bend materials

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the cutting, welding and bending of materials in resources and infrastructure industries. It includes the planning and preparation for the work, the setting up and testing of the equipment, the cutting, heating and bending of materials using oxyacetylene, the shutdown of equipment and the completion of clean-up activities.

Application of the Unit

This unit covers the cutting, non load-bearing welding and bending of materials using manual metal arc welding, oxyacetylene and cutting equipment and systems and LPG. It is appropriate for those working in operational, service and maintenance roles, at worksites within:

- Civil construction
- Coal mining
- Drilling
- Extractive industries
- Metalliferous mining

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare	1.1. Access, interpret and apply <i>compliance documentation</i> relevant to the cutting, welding and bending of materials 1.2. Obtain, confirm and apply work instructions for the allocated work 1.3. Follow safety requirements in accordance with safety plans and policies 1.4. Identify and implement signage/barricade requirements 1.5. Select plant, tools and equipment to carry out tasks that are consistent with the requirements of the job, and check them for serviceability and rectify or report any faults prior to commencement 1.6. Calculate material quantity requirements in accordance with plans and/or specifications 1.7. Identify, obtain, prepare, safely handle and locate materials ready for use appropriate to the work application 1.8. Identify and apply environmental protection requirements for the project in accordance with environmental plans and regulatory obligations
2. Set up and test equipment	2.1. Select and locate correct fire extinguisher to be readily accessible prior to and during operations 2.2. Attach regulators to Oxy and Acetylene bottles in accordance with manufacturer's specifications and OHS regulations 2.3. Purge lines to manufacturer's recommendations prior to lighting up 2.4. Test equipment for leaks and undertake corrective action or report faults 2.5. Select correct pressures and cutting tips in accordance with material to be cut and manufacturer's specifications
3. Cut material using oxyacetylene	3.1. Accurately mark and secure or clamp material ready for cutting 3.2. Light torch correctly and safely according to manufacturer's specifications 3.3. Adjust setting of flame for cutting to

	<p>manufacturer's recommendations</p> <p>3.4. Adopt correct cutting position during cutting to set out mark</p>
4. Cut and weld materials using electric welding equipment	<p>4.1. Undertake and verify test runs in accordance with manufacturer instructions and site specifications</p> <p>4.2. Carry out welding and cutting in accordance with site procedures</p> <p>4.3. Clean welds using appropriate tools and techniques</p> <p>4.4. Confirm weld and cut specifications by visual inspection and defects identified and repaired</p>
5. Heat and bend material	<p>5.1. Accurately mark and secure or clamp material ready for bending</p> <p>5.2. Light torch correctly and safely according to manufacturer's specifications</p> <p>5.3. Apply heat to specified material and so weakening effects of the heating process are minimised</p> <p>5.4. Bend material to specification and cool correctly</p>
6. Shutdown	<p>6.1. Switch off torch according to manufacturer's specifications</p> <p>6.2. Shut off gas supply according to manufacturer's specifications</p>
7. Clean up	<p>7.1. Clear work area and dispose of, reuse or recycle materials in accordance with</p> <p>7.2. legislation/regulations/code of practice and job specification</p> <p>7.3. Clean, check, maintain and store plant, tools and equipment in accordance with</p> <p>7.4. Manufacturer's recommendations and standard work practices</p> <p>7.5. Process records in accordance with site requirements</p>

Required Skills and Knowledge

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

Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to cut, weld and bend materials:

- apply legislative, organisation and site requirements and procedures
- apply manufacturer's requirements and procedures
- apply operational safety requirements
- access, interpret and apply technical information
- apply hand-eye coordination
- read and interpret sketches or basic drawings
- identify and select from a range of welding equipment and accessories
- identify and match cutting equipment with specified tasks
- apply environmental compliance requirements

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following, as required to cut, weld and bend materials:

- workplace and equipment safety requirements
- quality requirements
- construction and steel fixing terminology
- manual metal arc welding, oxyacetylene and LPG heating and cutting equipment types, characteristics, uses and limitations
- manual metal arc welding, oxyacetylene and LPG heating and cutting equipment set-up and operating techniques
- the types and properties of steel fixing materials
- processes for the calculation of material requirements
- materials safety data sheets (MSDS)
- plans, drawings and specifications
- materials handling, storage and environmentally friendly waste management
- JSA's/safe work method statement

Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following:</p> <ul style="list-style-type: none"> • knowledge of the requirements, procedures and instructions for cutting, welding and bending of materials • implementation of requirements, procedures and techniques for the safe, effective and efficient completion of the cutting, welding and bending of materials • working with others to undertake and complete the cutting, welding and bending of materials that meets all of the required outcomes • consistent timely completion of cutting, welding and bending of materials that safely, effectively and efficiently meets the required outcomes
<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity. • Aboriginal people and other people from a non

	<p>English speaking background may have second language issues.</p> <ul style="list-style-type: none"> • Assessment of this competency requires typical resources normally used in the work environment. Selection and use of resources for particular worksites may differ due to site circumstances. • Where applicable, physical resources should include equipment modified for people with disabilities. • Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	<p>This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods:</p> <ul style="list-style-type: none"> • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes • consistently achieving the required outcomes • first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • working with others to undertake and complete the cutting, welding and bending of materials
Guidance information for assessment	<p>Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.</p>

Range Statement

<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p>Relevant compliance documentation may include:</p>	<ul style="list-style-type: none"> • legislative, organisation and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • code of practice • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
<p>Work instructions may include:</p>	<ul style="list-style-type: none"> • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, charts and hand drawings, memos, materials safety data sheets (MSDS) and diagrams or sketches • plans and specifications • quality requirements, including: dimensions, tolerances, standards of work and material standards • operational details • safe work procedures
<p>Safety requirements may include:</p>	<ul style="list-style-type: none"> • protective clothing and equipment • use of tools and equipment • workplace environment and safety • handling of materials • use of fire fighting equipment • use of First Aid equipment • hazards and risks control, including: <ul style="list-style-type: none"> • uneven/unstable terrain • trees • fires • overhead and underground services • bridges • buildings • traffic • embankments

	<ul style="list-style-type: none"> • excavations and cuttings • structures and • hazardous materials and substances • safe operating procedures <ul style="list-style-type: none"> • underground and overhead services • other machines • personnel restricted access barriers • traffic control • working at heights • working in proximity to others • worksite visitors and • the public • emergency procedures, including: <ul style="list-style-type: none"> • emergency shutdown and stopping • extinguishing equipment fires • organisational First Aid requirements and • evacuation
Equipment may include:	<ul style="list-style-type: none"> • cylinders • regulators • gas tubing • cutting blowpipes • flint lighters • measuring tapes/rules • clamps and • support stands
Materials are to include:	<ul style="list-style-type: none"> • deformed bars, plain rods, mesh sheets of plain bars and mesh sheets of deformed bars, cutting consumables and may include scaffolding components, pipe sections and structural steel sections
Environmental protection requirements may include:	<ul style="list-style-type: none"> • organisational/project environmental management plan • waste management • water quality protection • noise, vibration and dust management and • clean-up management
Cutting of steel may include:	<ul style="list-style-type: none"> • cutting up of waste for salvage • cutting reinforcement steel and • cutting holes in plate
Bending is to include:	<ul style="list-style-type: none"> • reinforcement steel

Unit Sector(s)

Service and Maintenance

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.