



Australian Government

MEM05085 Select welding processes

Release: 1

MEM05085 Select welding processes

Modification History

Release 1. Unit code changed. Changes to elements and performance criteria, performance evidence and knowledge evidence. Supersedes and is not equivalent to MEM05051 Select welding processes.

Application

This unit of competency was developed for engineering fabrication trade training and the recognition of trade skills in selecting welding processes.

It defines the skills and knowledge required to identify basic material properties and select appropriate welding processes to produce welds that conform to AS 1554 General Purpose (GP) and American Bureau of Shipping (ABS) or equivalent as defined by the unit in conjunction with its prerequisites.

The unit includes all welding processes within the scope of AS 1554 GP and the identification of basic properties and characteristics of all commonly welded metals to the extent required to inform the selection of appropriate welding processes.

This unit must be selected in combination with one or more of the following units:

- MEM05090 Weld using manual metal arc welding process
- MEM05091 Weld using gas metal arc welding process
- MEM05092 Weld using gas tungsten arc welding process
- MEM05093 Weld using submerged arc welding process
- MEM05096 Weld using flux core arc welding process
- MEM05097 Weld using oxy fuel gas welding process.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 2

Pre-requisite Unit

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency Field

Fabrication

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Determine job requirements	1.1 Follow standard operating procedures (SOPs) 1.2 Comply with work health and safety (WHS) requirements at all times 1.3 Use appropriate personal protective equipment (PPE) in accordance with SOPs 1.4 Identify job requirements from specifications, job sheets or work instructions
2. Identify properties of commonly used metals	2.1 Identify materials to be welded 2.2 Identify characteristics and properties of commonly used materials 2.3 Identify uses and purposes of commonly used materials 2.4 Consider basic metallurgical characteristics of job requirements
3. Identify and provide for welding contingencies	3.1 Source Information relevant to welding processes to meet job requirements 3.2 Identify potential contingencies and consider solutions
4. Identify appropriate welding process	4.1 Identify effects of welding processes on materials being used for the job 4.2 Identify distortion prevention measures 4.3 Identify situations where alternative joining methods may be more appropriate than welding 4.4 Identify and select welding processes to achieve specified outcomes with selected metals

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Basic metallurgical characteristics include:	alloys and grades of metals and different types of fuel and shielding gases, fluxes, and electrodes.
Reference information includes one or more of the following:	• steel suppliers' handbooks • welding company materials • SOPs • safety documentation.
Welding processes include one or more of the following:	• fusion – electric arc welding, gas (oxy-fuel) welding and thermit welding • pressure welding processes – resistance welding, fire or forge welding, friction welding and explosive welding • low temperature processes – soldering and brazing • other – ultrasonic welding and electron beam welding.
Effects include one or more of the following:	• thermal expansion • heat affected zones • fume emissions • altered density • distortion.
Distortion prevention measures include one or more of the following:	• heat treatments • consolidations.

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM05085 Select welding processes

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include the ability to:

- follow work instructions, standard operating procedures (SOPs) and safe work practices
- match type and grade of base material from manufacturer's marks or documentation to specifications on at least two occasions
- identify properties of commonly used metals and alloys using reference information contained in materials and equipment suppliers handbooks, enterprise documentation or SOPs
- identify potential welding related contingencies and consider solutions
- identify and select appropriate welding process, considering process effects on materials on at least two occasions.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe welding practices and procedures and use of personal protective equipment (PPE)
- hazards associated with the use of chemicals and the fumes emitted by welding processes
- properties and characteristics of common metals and materials used in welding including tensile strength, grade, heat resistance, density, physical properties, flammable limits and melting point to the extent required to inform selection of an appropriate welding process
- basic metallurgy principles associated with the effects of heat on alloys and grades of metals
- common metal and alloying elements used in welding
- common carbon steels, alloy steels and stainless steel grades used in welding
- uses and purposes of various metals and alloys
- distortion prevention measures for various metals
- different types of electrodes.

Assessment Conditions

- Assessors must:
 - have vocational competency in selecting welding processes at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills.
- Knowledge assessment may be either verbal or written but must adequately reflect the knowledge requirements of the unit in a functioning workplace.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Links

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