



Australian Government

MEM19001 Perform jewellery metal casting

Release: 1

MEM19001 Perform jewellery metal casting

Modification History

Release 1. Supersedes and is equivalent to MEM19001B Perform jewellery metal casting

Application

This unit of competency defines the skills and knowledge required to perform jewellery metal casting using the 'lost wax' method of investment casting.

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

Band: A

Unit Weight: 6

Pre-requisite Unit

MEM13004	Work safely with molten metals/glass
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

Competency Field

Jewellery and horological

Elements and 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, drawings, job sheets or work instructions

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

2	Prepare metals for casting	2.1	Select required metals and alloys
		2.2	Weigh out metals and alloys in correct wax-to-metal ratios
		2.3	Record data according to SOPs
3	Conduct pre-casting operations	3.1	Prepare equipment according to SOPs, including checking required inert gas supply, delivery and vacuum systems
		3.2	Carry out required pre-heating and glazing
		3.3	Maintain temperature of invested flask
4	Melt jewellery metal and cast metals	4.1	Apply protective coating, including borax, fluxes and inert gases to jewellery metal
		4.2	Heat jewellery metal to achieve casting temperature
		4.3	Position burn-out flask
		4.4	Tap molten metal, making allowance for adequate solidification time
		4.5	Operate furnace in accordance with SOPs
5	Perform post-casting operations	5.1	Remove casting flask and store in a safe manner
		5.2	Clean, store and dispose of casting materials and consumables

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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.

Metals and alloys include one (1) or more of the following:

- gold
- platinum
- palladium
- silver
- copper
- their alloys

Equipment includes one (1) or more of the following:

- resistance coils
- induction coils
- hand held torches fuelled by a variety of combinations of gas, propane, acetylene, air and oxygen

Protective coatings include one (1) or more of the following:

- borax
- fluxes
- inert gases

Unit Mapping Information

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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 MEM19001 Perform jewellery metal casting

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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 on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications and drawings for performing jewellery metal casting
- undertaking numerical operations and calculations associated with performing jewellery metal castings
- identifying and weighing metals and their alloys appropriate to the correct wax-to-metal ratios
- setting up, checking and operating equipment
- heating metals and alloys and maintaining furnace temperatures to achieve jewellery metal casting temperature
- applying safe casting procedures working within heating timeframe constraints and tapping molten metal, making allowances for adequate solidification time
- cleaning, storing and disposing of casting materials and consumables in accordance with SOPs.

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 work practices and procedures and use of personal protective equipment (PPE)
- identification of precious metals and alloys
- properties of jewellery metals in relation to casting
- calculations for proportions and quantities of alloys
- data recording procedures
- consequences of poor work practices
- equipment preparation and operating procedures
- burn-out cycles and testing procedures for heat register or control device
- procedures for checking and maintaining inert gas supply and delivery seals and vacuum systems
- melting points of various metals and alloys

- furnace start-up and shutdown procedures.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing jewellery metal casting 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
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- 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.

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