



Australian Government

MEM19035 Plan and apply casting techniques for jewellery or object designs

Release: 1

MEM19035 Plan and apply casting techniques for jewellery or object designs

Modification History

Release 1. Supersedes and is equivalent to MEM19035A Plan and apply casting techniques for jewellery and object designs.

Application

This unit of competency defines the skills and knowledge required to plan and apply casting techniques for constructing jewellery and object designs. It includes the use of wax models and moulds and application of metal casting skills.

This unit applies to individuals involved in jewellery or object design or manufacture in a small or large-scale production context. They use and adapt creative and technical skills and knowledge to produce work.

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

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency Field

Jewellery

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
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 personal protective equipment (PPE) in accordance with SOPs

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.4 Identify job requirements from specifications
2. Plan work	2.1 Determine type of casting techniques and resources required for design 2.2 Develop work plan for production that includes clear stages and resource requirements
3. Produce wax models	3.1 Determine process requirements for production of wax model 3.2 Identify required equipment and prepare for use in accordance with SOPs 3.3 Select and use tools to cut materials to required dimensions 3.4 Sculpt wax model to specifications and minimise imperfections 3.5 Apply required surface finishes based on job requirements
4. Produce moulds	4.1 Select a moulding material for style of master, and prepare, pack, dry and burn out in a correct manner 4.2 Complete required wax injection of moulds using tools, materials and processes in accordance with SOPs 4.3 Vulcanise rubber in accordance with SOPs 4.4 Release master pattern using appropriate tools
5. Cast metals for jewellery or object designs	5.1 Select metals and alloys in appropriate proportions and weigh in correct wax-to-metal ratios 5.2 Prepare casting equipment in accordance with SOPs 5.3 Carry out required pre-heating and glazing in accordance with SOPs 5.4 Cast jewellery item or object in accordance with SOPs with respect to maintaining temperature, applying required protective coating, and handling hot molten metal 5.5 Allow for adequate solidification time based on the design 5.6 Remove cast object from the mould and store in accordance with SOPs 5.7 Clean-up work area and equipment and dispose of waste in accordance with environmental requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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.

Specifications include one or more of the following:	• drawings • job sheets • work instructions.
Surface finishes include one or more of the following:	• fine emery • shellite.
Casting methods include one or more of the following:	• cuttlefish • centrifugal • vacuum casting • delft clay.
Wax injection includes one or more of the following:	• organic wax injection • synthetic wax injection • resin and plastic materials injected under pressure for investment and burn out aspects within 'lost wax' casting procedures.
Casting includes one or more of the following:	• 'lost wax' method of investment casting • cuttlebone processes • sand processes.
Metals and alloys include one or more of the following:	• gold • platinum • palladium • silver • copper • pewter • alloys.
Environmental requirements include one or more of the following:	• liquid waste • solid waste • emissions (gas, fumes, vapour, smoke, fugitive emissions or dust) • excessive energy and water use • excessive noise.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM19035A Plan and apply casting techniques for jewellery and object designs.

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 MEM19035 Plan and apply casting techniques for jewellery or object designs

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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:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- demonstrating the type of casting techniques and resources appropriate to design specifications
- selecting appropriate quality materials for the production of the wax model and producing wax model to given specifications
- minimising imperfections and applying required surface finish
- producing moulds for lost wax, cuttlefish or sand casting on at least two occasions
- vulcanising and curing rubber moulds
- releasing master pattern using appropriate tools
- establishing casting methods to meet specifications
- carrying out casting on at least two occasions in accordance with SOPs and allowing sufficient time for solidification
- removing castings from moulds and storing in accordance with SOPs
- disposing of waste according to environmental requirements.

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 work practices and procedures and use of personal protective equipment (PPE)
- design casting process
- casting methods
- types and properties of metals and alloys
- procedures for making the master model
- moulding procedures
- procedures for making the wax pattern
- procedures for establishing and removing investment, burn out, melting and casting

- techniques for removing castings from moulds
- cutting and finishing processes
- surface finishing processes
- mathematical procedures for estimation and measurement
- environmental considerations related to casting jewellery or objects
- types of casting defects and procedures for minimising defects.
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Assessment Conditions

- Assessors must:
 - have vocational competency in planning and applying casting techniques for jewellery or object designs 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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