



Australian Government

MEM04002 Perform gravity die casting

Release: 1

MEM04002 Perform gravity die casting

Modification History

Release 1. Supersedes and is equivalent to MEM04002B Perform gravity die casting

Application

This unit of competency defines the skills and knowledge required to perform gravity die casting into permanent dies.

Where the interpretation of technical drawings is required unit MEM09002 Interpret technical drawing should also be selected.

Where the selection and use of engineering measuring equipment is required unit MEM12023 Perform engineering measurements should also be selected.

Where the selection and use of tools is required unit MEM18001 Use hand tools and unit MEM18002 Use power tools/hand held operations, should also be selected as appropriate.

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

Band: A

Unit Weight: 2

Pre-requisite Unit

MEM11011	Undertake manual handling
MEM13004	Work safely with molten metals/glass
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

Competency Field

Casting and moulding

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
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1	Determine job	1.1	Follow standard operating procedures (SOPs)
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Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
	requirements	1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Use appropriate personal protective equipment (PPE) and apparatus in accordance with SOPs
		1.4	Identify job requirements from specifications, job sheets or work instructions
2	Prepare equipment	2.1	Mix die coat in correct proportion in accordance with SOPs
		2.2	Lift and maintain die temperatures at the appropriate level
		2.3	Apply die coat in the correct sequence
		2.4	Locate and close die
		2.5	Place die on machine and attach and tighten toggle clamps to required torque
		2.6	Attach air cooling to the die as specified if required
3	Carry out manual pouring	3.1	Undertake pour in a manner which reduces porosity and lamination
		3.2	Identify conditions that contribute to inferior castings or rejects
		3.3	Allow adequate cooling time
		3.4	Pour at a continuous and appropriate rate during filling
		3.5	Monitor condition of die coating condition and re-spray as required
4	Remove materials	4.1	Remove parts in a manner that minimises damage
		4.2	Remove any flash from the die surface

Elements describe the essential outcomes.

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

4.3 Store parts in a manner that minimises damage

5 **Clean die**

5.1 Operate shot blaster according to procedures

5.2 Take chemical analysis of melt and apply remedial action as required

5.3 Dross and/or degas furnace

5.4 Clean work area of coating and shot residue

5.5 Complete reports/records in accordance with SOPs

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 include one (1) or more of the following:

- aluminium
- aluminium alloys
- non-ferrous
- ferrous

Appropriate safety clothing and apparatus includes one (1) or more of the following:

- Aluminium Association safety status sheet recommendations
- glasses
- aluminised suits
- masks
- gloves
- gauntlet

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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM04002B Perform gravity die casting

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 MEM04002 Perform gravity die 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 other applicable reference documents for gravity die casting operation
- preparing equipment for gravity die casting, including:
 - mixing and applying die coat in correct proportion and sequence
 - lifting and maintaining die temperatures at the correct level
 - locating, placing securing die on machine and attaching air cooling if required
- carrying out manual pouring in a continuous and appropriate rate that reduces porosity and lamination, avoiding conditions that can contribute to inferior castings or rejects
- removing and storing components and removing any flash from the die surface
- cleaning die using a shot blaster in a safe manner
- taking chemical analysis of melt and applying remedial action as required
- drossing and/or degassing furnace to SOPs
- completing records as required.

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) and apparatus
- die coat function(s) in gravity die casting
- correct proportions and consistency of die coats as determined by manufacturers' specifications
- correct identification of die coat materials
- procedures for raising the temperature of the die to the correct level and maintaining the required temperature in accordance with SOPs
- procedures to be followed when pouring molten metal to produce sound castings
- causes of defects in castings
- curing times for castings of various volumes and materials

- timing of die coat application and quantity of die coat to be used for different applications
- correct procedures for removing castings from the die and storing of castings
- die condition and need for shot blasting
- shot blaster operating procedures.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing gravity die 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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