



Australian Government

PMC553070 Design and construct moulds for fibrous plaster products

Release: 1

PMC553070 Design and construct moulds for fibrous plaster products

Modification History

Release 1. Supersedes and is equivalent to PMC553070B Design and construct moulds for fibrous plaster products

Application

This unit of competency covers the skills and knowledge required to design and construct moulds for fibrous plaster products.

This unit of competency applies to plaster modellers, leading hands, supervisors or those in similar roles who are required to design or determine the product shape, create an image of the design, convert it to the negatively shaped mould cavity, hand carve the mould impression, make adjustments to remedy faults and non-conformity and solve problems within area of responsibility.

This unit of competency applies to a plaster modeller demonstrating theoretical and technical knowledge and well developed skills in situations that require some discretion and judgement. The plaster modeller may work alone or as a member of a team or group and will work in liaison with other shift team members, team leader and supervisor, as appropriate.

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

Pre-requisite Unit

PMC552024 Hand mould products

Competency Field

Operations

Unit Sector

Not applicable

Elements and Performance Criteria

Elements describe the essential outcomes.

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

- | | | | |
|---|----------------------|-----|---|
| 1 | Develop mould | 1.1 | Establish original product concept or design from |
|---|----------------------|-----|---|

	design		drawings, originals or consultation with the customer
		1.2	Sketch out product prototype design and establish product sizes making appropriate allowance for material shrinkage
		1.3	Identify areas where undercuts, cutbacks or other special features are required
		1.4	Determine parting line
		1.5	Determine material from which mould is to be made
2	Select mould material and prepare for mould production	2.1	Set up material for mould making, ensuring that the mould can be handled or moved without damage
		2.2	Establish datum point and mark out design dimensions using geometric and lineal calculations
		2.3	Determine correct cavity depths and contours
		2.4	Ensure there is adequate ventilation and light to facilitate an appropriate work environment
3	Produce working mould	3.1	Fit appropriate protective equipment to prevent inhalation or irritation of by-products of the mould making process
		3.2	Use appropriate tools to carve out mould cavity and detail
		3.3	Accurately follow the design detail to produce a mould cavity to specification
		3.4	Avoid undercuts which will prevent removal of the plaster product from the mould
		3.5	Ensure appropriate degrees of taper are provided to facilitate product removal
		3.6	Carve reliefs according to design and remove debris as the work proceeds
4	Complete mould	4.1	Clean down completed mould and clean up work area

- 4.2 Inspect mould surface for defects or irregularities
 - 4.3 Compare design details with mould cavity to confirm accuracy of translation
 - 4.4 Coat mould surface to preserve finish and allow to dry
- 5 **Produce product prototype**
 - 5.1 Apply slipping agent to mould surface
 - 5.2 Prepare and insert anchors or ties
 - 5.3 Prepare plaster mixture and appropriate amount of glass fibre
 - 5.4 Cast plaster mix and fibre into mould cavity, strike off and allow to set
 - 5.5 Remove prototype from mould or mould from prototype
 - 5.6 Check prototype for dimensional and detail accuracy
 - 5.7 Compare prototype and mould to identify any faults or mould inaccuracies
 - 5.8 Adjust or dress mould to remove imperfections and clean mould surface
 - 5.9 Cast second prototype and recheck product and mould
 - 5.10 Clean up mould and mark in accordance with organisation identification practice
- 6 **Control hazards**
 - 6.1 Identify hazards in modelling work area
 - 6.2 Assess the risks arising from those hazards
 - 6.3 Implement measures to control those risks in line with procedures and duty of care
- 7 **Respond to problems**
 - 7.1 Identify possible routine and non-routine problems in the equipment or process
 - 7.2 Determine problems needing action

- 7.3 Determine possible fault causes
- 7.4 Rectify problem using appropriate solution within area of responsibility
- 7.5 Report problems outside area of responsibility to designated person

Foundation Skills

This section describes those required skills (language, literacy and numeracy) 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.

Regulatory framework The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.

Applicable legislation, regulations, standards and codes of practice include:

- health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, equipment and production processes and hazardous materials
- Australian/international standards relevant to the materials being used and products being made
- any relevant licence and certification requirements.

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and such requirements the legislative requirements take precedence.

Procedures All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, and include one or any combination of:

- manufacturer's technical information
- job cards
- drawings
- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant.

Hazards

Hazards must be identified and controlled. Identifying hazards requires consideration of:

- heat, smoke, dust, vapours or other atmospheric hazards
- weight, shape, volume of materials to be handled
- hazardous products and materials
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- electricity
- gas
- gases and liquids under pressure
- noise
- rotational equipment or vibration
- plant services (steam, condensate, cooling water, etc)
- structural hazards
- equipment failures
- machinery, equipment and product mass
- limited head spaces or overhangs
- working at heights
- working in restricted or confined spaces
- other hazards that might arise.

Problems

Routine and non-routine problems must be resolved.

Routine problems are predictable and have known solutions and include one

or more of:

- personal injuries
- complexities of mould design and shape
- lack of appropriate illumination
- mould problems
- product faults.

Non-routine problems are unexpected problems or variations of previous problems.

Non-routine problems must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person.

Operational knowledge includes one or more of:

- procedures
- training
- technical information, such as journals and engineering specifications
- remembered experience
- relevant knowledge obtained from appropriate people.

Tools and equipment

Tools and equipment include:

- moulds/mould parts
- chisels and hand held cutting tools
- hand and power tools
- jigs and fixtures
- mixing equipment.

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=45a7f1d5-61a5-447a-9688-7abbd7e1a5c7>

Assessment Requirements for PMC553070 Design and construct moulds for fibrous plaster products

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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 demonstrate the ability to:

- read and interpret product specifications, designs, drawings/plans, material labels and safety data sheets (SDS)
- establish product concept and develop mould design to meet specifications
- determine datum point and mark out dimensions, contours and cavity depths
- carve out mould to meet specifications
- prepare mould, produce and demould prototype product
- review prototype for conformity to specifications
- make adjustments to mould to remedy faults and non-conformity
- identify hazards and apply relevant hazard controls
- apply safety procedures
- apply housekeeping procedures
- distinguish between causes of problems, including:
 - equipment failure/malfunction
 - wrong readings/measurements
 - materials faults
 - dimensional inaccuracies
 - inappropriate allowance for material shrinkage
 - damage to components
- recognise and prioritise problems requiring action
- resolve routine and non-routine problems
- communicate effectively with team/work group and supervisors
- complete workplace records
- perform geometric and lineal calculations.

Knowledge Evidence

Must provide evidence that demonstrates knowledge relevant to their job sufficient to operate independently and to solve routine and non-routine problems, including knowledge of:

- principles of fibrous plaster product moulding processes
- types and application of mould making materials, including:

- plaster
- timber
- rubber
- metal
- product specifications/materials properties that may affect mould design, materials and construction
- quality requirements at each stage of construction
- factors which may affect mould quality and appropriate remedies
- non-routine problems that may arise, the range of possible causes and appropriate actions
- organisation procedures relevant to the work environment/job role
- hierarchy of control
- hazards that may arise in the job/work environment and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence shall be based on a holistic assessment of the evidence.
- The collection of performance evidence:
 - should occur over a range of situations which include typical disruptions to normal, smooth operation of an operating plant
 - will typically include a supervisor/third-party report or other evidence, focusing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
 - must include the use of an appropriate industrial item/s of equipment requiring demonstration of operation, start-up and shutdown procedures and responding to problems
 - may use industry-based simulation for all or part of the unit particularly where safety, lack of opportunity or significant cost is an issue.
- Assessment should 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.
- Assessment in a simulated environment should use evidence collected from demonstration of skills and one or more of:
 - walk-throughs
 - pilot plant operation
 - industry-based case studies/scenarios

- ‘what ifs’.
- Knowledge evidence may be collected concurrently with performance evidence (provided a record is kept) or through an independent process such as workbooks, written assessments or interviews (provided a record is kept).
- 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.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition the assessor or anyone acting in subject matter expert role in assessment shall demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they shall assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
 - appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation’s policies and procedures
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
 - conducting on the job training/assessments of the type of work being assessed
 - being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work.

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