Australian Government

Department of Education, Employment and Workplace Relations

PMC553070B Design and construct moulds for fibrous plaster products

Revision Number: 1

PMC553070B Design and construct moulds for fibrous plaster products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the design and construction of moulds for fibrous plaster products. It involves creating an image of the product to be produced, converting the image to an imagined negatively shaped mould cavity, selecting and mounting material for mould construction and ensuring mould meets requirements.

Application of the Unit

Application of the unit	This unit of competency applies to plaster modellers who are responsible for designing from scratch by intuitive means or determining, either from an existing shape or product, the shape of a product to be created in fibrous plaster. The modeller then, by a process of hand carving, creates a negatively shaped mould impression from which a positively shaped fibrous plaster impression would be created. This competency is typically performed by an experienced modeler, leading hand or supervisor.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	PMC552024C	*Hand mould products*

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop mould design	1.1. Establish original product concept or design from 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

ELEMENT	PERFORMANCE CRITERIA
	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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- using and maintaining all required materials, tools and parts
- recognising situations which could cause production problems and taking appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of moulds and dies
- diagnosing and solving problems involved in the work
- communicating effectively with team members, management and other departments
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- specified quality standards
- characteristics of different materials
- requirements from drawings, specifications or job sheets
- distinguish between causes of faults such as:
  - materials faults
  - dimensional inaccuracies
  - inappropriate allowance for material shrinkage
  - damage to components

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • OHS requirements are met • quality improvement techniques are applied • emergency procedures are understood and applied • waste is minimised.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation or case studies/scenarios may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Moulds	Moulds may be manufactured from: • plaster • timber • rubber • metal • a combination of these
Materials	Materials may include: • additives • body materials • epoxy resins • metal strapping • plaster • release agents • rubber • timber • water
Equipment	Equipment may include: • moulds • chisels and hand held cutting tools • hand and power tools • jigs and fixtures • personal safety equipment • mixing equipment • models • weighing equipment
Typical problems	Typical problems may include: • personal injuries • complexities of mould design and shape

RANGE STATEMENT	
	• lack of appropriate illumination
Occupational health and safety (**OHS**)	The identification and control of hazards and the application of OHS are to be in accordance with current, applicable legislation and regulations, and company procedures. All work is carried out at all times in accordance with these requirements

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		