



Australian Government

Department of Education, Employment and Workplace Relations

MEM04005B Produce moulds and cores by hand (jobbing)

Release: 1

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Modification History

There are no notes for this unit

Unit Descriptor

This unit covers hand making of sand moulds and cores for metal casting.

Application of the Unit

This unit applies to the production of sand moulds and cores by manual (jobbing) methods to produce metal castings. A range of materials and types of patterns may be used. Knowledge of the metal casting process is also required.

Licensing/Regulatory Information

Pre-Requisites

Path 1

MEM09002B Interpret technical drawing

MEM18001C Use hand tools

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency.

Together, performance criteria specify the requirements for competent performance. Text in *italics* is explained in the range statement following.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Identify job requirements	<p>1.1 Job requirements are correctly identified from drawings, instructions and specifications.</p> <p>1.2 Material is selected appropriate to job requirements.</p>
2 Determine sequence of operation	<p>2.1 Sequence of operation including job set-up is determined for maximum efficiency and to meet job specifications.</p>
3 Select inspect and prepare pattern equipment	<p>3.1 Pattern equipment is correctly identified from specifications to standard operating procedures.</p> <p>3.2 Pattern equipment is inspected to specifications, and damaged patterns are identified for repair or replacement to standard operating procedures.</p> <p>3.3 Pattern is assembled to specification.</p> <p>3.4 Pattern equipment is set up to specification according to standard operating procedures.</p>
4 Make mould and core	<p>4.1 Core is positioned in prints utilising chaplets and chills as required and vented to specification according to standard operating procedures.</p> <p>4.2 Mould is closed and checked for compliance to component specification in accordance with standard operating procedures.</p> <p>4.3 Appropriate moulding/core making equipment is selected and positioned according to standard operating procedures.</p> <p>4.4 Appropriate moulding media is selected to produce mould and core to specification.</p> <p>4.5 Mould is secured according to standard operating procedures.</p> <p>4.6 Moulding media is used to produce mould and core according to standard operating procedures.</p> <p>4.7 Pouring basin is selected or manufactured to</p>

- specification and positioned in accordance with standard operating procedures.
- 4.8 Mould and cores are rammed up with joints and drawbacks as required to standard operating procedures.
 - 4.9 **Parting and stripping systems** are utilised in accordance with standard operating procedures.
 - 4.1 Loose pieces, vents, risers and **runners** are positioned and secured as required to standard operating procedures.
 - 4.1 Pattern and loose pieces are removed from mould and core box in a safe manner least likely to cause damage to the pattern and in accordance with standard operating procedures.
 - 4.1 Mould is inspected and repaired as required.
 - 4.1 Mould and core is cleaned and painted according to specification using standard operating procedures.
- 5 Clean and restore work area
- 5.1 All materials/debris is cleared and work site cleaned and left in a safe state.
 - 5.2 Unwanted treated sand is disposed of according to standard operating procedures and legislative and statutory requirements.

Required Skills and Knowledge

Evidence Guide

The evidence guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the unit descriptor, performance criteria, range statement and the assessment guidelines for the Metal and Engineering Training Package

Overview of assessment requirements

A person who demonstrates competency in this unit must be able to produce jobbing moulds and cores by hand. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Context of assessment

This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Interdependent assessment

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with producing jobbing moulds and cores by hand or other units requiring the exercise of the skills and knowledge covered by this unit.

Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant

workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Consistency of performance

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Required skills

Look for evidence that confirms skills in:

interpreting written instruction sketches and drawings

assembling and positioning pattern in the moulding box

positioning ancillary methoding components

preparing moulding media

filling and compacting the mould assembly

stripping the pattern

inspecting the mould

finishing the mould

positioning cores in prints

closing moulds

placing pouring basin

securing mould

following oral instruction

entering routine and familiar information onto proforma and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

metal casting process

variety of pattern types and their application

pattern assembly techniques

selection of moulding box

how to select ancillary components

sand types and their bonding systems

compaction processes

parting and stripping systems

mould requirements

finishing and closing techniques

core placement

pouring requirements

securing systems

pattern care and storage

environmental requirements

use and application of personal protective equipment

safe work practices and procedures

hazards and control measures associated with producing moulds and cores by hand (jobbing)

Range Statement

The range statement provides information about the context in which the unit of competency is carried out. The variables and scope cater for different work requirements, work practices and knowledge between States, Territories and the Commonwealth, and between organisations and workplaces. The range statement relates to the unit as a whole and provides a focus for assessment. Text in **italics** in the performance criteria is explained here.

The following variables may be present and may include, but are not limited to, the examples listed under the scope. All work is undertaken to relevant legislative requirements, where applicable

Variable	Scope
Materials	Binders, hardeners, sand additives, mould coatings
Patterns	Flatback, uneven, plated patterns , multi-joint, consumable, split patterns, loose piece patterns, patterns requiring odd sides, cored moulds, drag and cope mould etc.
Moulds	Flatback, uneven jointed, multi-part moulds
Core	Full, half and segment cores
Secured	Weights, clamps, bolting
Moulding media	Green sand, shell sand, chemically bonded media etc. may be used
Pouring basin	Hand and pattern formed
Parting and stripping systems	Dry and wet
Runners	Hand and pattern formed

Unit Sector(s)

Related units

Where lifting and moving moulds and cores requires the use of mobile load shifting equipment or overhead cranes, appropriate manual handling units should also be selected. Where the securing of moulds requires welding skills, see unit MEM05012C (Perform routine manual metal arc welding) and Unit MEM05050B (Perform routine gas metal arc welding) as appropriate.

Band

A

Unit Weight

16

Competency field

Casting&moulding