



**Australian Government**

# **MEM04013 Develop and manufacture polystyrene patterns**

**Release: 2**

# MEM04013 Develop and manufacture polystyrene patterns

## Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM04013 Develop and manufacture polystyrene patterns (Release 1).

Release 1. Supersedes and is equivalent to MEM04013B Develop and manufacture polystyrene patterns.

## Application

This unit of competency defines the skills and knowledge required to develop and manufacture all types of patterns using polystyrene, including patterns for the lost foam process and for those areas on a wood pattern and core box where polystyrene is required.

Where the selection and use of precision measurement is required unit MEM12003 Perform precision mechanical measurement should also be selected.

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

**Band: A**

**Unit Weight: 2**

## Pre-requisite Unit

|          |                                                                                            |
|----------|--------------------------------------------------------------------------------------------|
| MEM04010 | Develop and manufacture wood patterns                                                      |
| MEM04018 | Perform general woodworking machine operations                                             |
| MEM09002 | Interpret technical drawing                                                                |
| MEM11011 | Undertake manual handling                                                                  |
| MEM12006 | Mark off/out (general engineering)                                                         |
| MEM12023 | Perform engineering measurements                                                           |
| MEM12024 | Perform computations                                                                       |
| MEM12026 | Perform advanced trade calculations in a manufacturing, engineering or related environment |
| MEM13015 | Work safely and effectively in manufacturing and engineering                               |
| MEM14006 | Plan work activities                                                                       |
| MEM16006 | Organise and communicate information                                                       |

|          |                                      |
|----------|--------------------------------------|
| MEM18001 | Use hand tools                       |
| MEM18002 | Use power tools/hand held operations |

## 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.                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 <b>Determine job requirements</b>       | <ul style="list-style-type: none"><li>1.1 Follow standard operating procedures (SOPs)</li><li>1.2 Comply with work health and safety (WHS) requirements at all times</li><li>1.3 Use appropriate personal protective equipment (PPE) in accordance with SOPs</li><li>1.4 Identify job requirements from specifications, drawings, job sheets or work instructions</li><li>1.5 Select the appropriate grade and type of polystyrene to meet specifications</li></ul> |
| 2 <b>Mark out pattern</b>                 | <ul style="list-style-type: none"><li>2.1 Determine contraction allowance by performing calculations</li><li>2.2 Mark out pattern/pattern components to specifications</li></ul>                                                                                                                                                                                                                                                                                    |
| 3 <b>Manufacture pattern</b>              | <ul style="list-style-type: none"><li>3.1 Join and secure pattern components in an appropriate manner using adhesives appropriate to the task</li><li>3.2 Select appropriate tools and techniques to manufacture polystyrene patterns to specification</li><li>3.3 Check pattern for conformance to specifications and mark for identification</li></ul>                                                                                                            |

Elements describe the essential outcomes.

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

4 **Protect pattern from damage**

4.1 Handle and store patterns in a safe manner least likely to cause damage using appropriate procedures

## 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.

**Grade/type includes:**

- size and density of bead

**Adhesives include one (1) or more of the following:**

- PVA
- hot glue

**Tools include one (1) or more of the following:**

- hot wire
- knives
- saws

## Unit Mapping Information

Release 2. Supersedes and is equivalent to MEM04013 Develop and manufacture polystyrene patterns (Release 1).

Release 1. Supersedes and is equivalent to MEM04013B Develop and manufacture polystyrene patterns.

## Links

The MEM Metal and Engineering Training Package Companion Volume Implementation Guide is available from VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

# Assessment Requirements for MEM04013 Develop and manufacture polystyrene patterns

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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, sketches and drawings for developing and manufacturing polystyrene patterns, including determining the grade and type of bead
- marking out pattern/pattern components to specifications, including determining the contraction allowance
- manufacturing pattern by joining and securing pattern components using appropriate adhesives
- selecting and using appropriate tooling
- checking and marking pattern for identification purposes to specification
- handling and storing patterns in an appropriate manner.

## 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)
- types and applications of polystyrene for pattern making
- formulae and mathematical techniques required for manufacturing patterns/core boxes, i.e. contraction, taper, clearances and machining allowances
- marking out techniques for polystyrene patterns, including undercuts and holes
- types and applications of adhesives
- tools and their uses in the manufacture of polystyrene patterns
- pattern checking techniques
- handling and storage techniques.

## Assessment Conditions

- Assessors must:
  - have vocational competency in the development and manufacture of polystyrene patterns 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.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including 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.

## Links

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