



Australian Government

Department of Education, Employment and Workplace Relations

MEM06009A Hand forge complex shapes

Release: 2

MEM06009A Hand forge complex shapes

Modification History

Editorial correction to unit application to include missing band identifier and unit weight

Unit Descriptor

Unit descriptor	This unit covers producing intricate solid forged shapes by hand forging of different metals, using specialised techniques, tools and jigs.
------------------------	---

Application of the Unit

Application of the unit	This unit applies to hand forging of complex shapes commonly forged in the forging and fabrication areas of industry. Specialised methods of holding, positioning and lifting complex forgings are covered. Equipment may include diesel, electric and gas furnaces, coke fires and gaseous oxygen/fuel equipment. For hand forging of simple shapes, Unit MEM06001B (Perform hand forging) should be selected. Band: A Unit Weight: 4
--------------------------------	--

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM06001B	Perform hand forging

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. Forge complex shapes using hand tools on an anvil	1.1.Task requirements for complex hand forging are identified and clarified as required. 1.2.Material volume is correctly calculated. 1.3.Allowances for bending, material shrinkage and oxidisation are made as required. 1.4.Hand tools and formers are selected and used correctly in accordance with standard operating procedures. 1.5.Safe hand forging procedures are followed. 1.6.Techniques and principles for producing complex shapes are applied correctly. 1.7.Forging is checked to ensure conformance to tolerances and specifications.
2. Perform splitting and bundling on anvil	2.1.Tools and equipment are selected and used correctly. 2.2.Hand forging techniques and procedures are applied to forging and opening bundled and split sections. 2.3.Allowance is made for material shrinkage, distortion and oxidisation. 2.4.Heat is applied and controlled in specified areas of the material to be forged in accordance with standard operating procedures. 2.5.Forgings are handled safely and correctly according to workplace procedures. 2.6.Forgings are checked to ensure conformance to tolerances and specifications.
3. Produce jigs and tools for complex shapes	3.1.Tools and equipment required to taper and bend materials are selected appropriate to task requirements. 3.2.Techniques for producing jigs and tools are applied correctly. 3.3.Jigs and patterns are bent and shaped to specifications. 3.4.Hand held tools are forged to cut pattern, in accordance with specifications. 3.5.Final shaping, heat treatment and sharpening is performed to specifications

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Look for evidence that confirms skills in:

- selecting and using measuring guides
- calculating allowance for material volume, bending, shrinkage and oxidation
- selecting tools and equipment
- forging and splitting sections
- forging bundled sections and opening bundled sections
- positioning material
- handling materials
- selecting and setting up heating equipment
- performing heat treatment process(es) for forging
- applying and controlling heat

Required knowledge

Look for evidence that confirms knowledge of:

- hand tools and their applications
- techniques and procedures for hand forging complex shapes
- numerical operations and calculations/formulae within the scope of this unit
- procedures for measuring forged articles
- forging temperatures and heat specifications for multiple pieces
- tools, techniques and equipment required to taper and bend materials
- effects of material shrinkage and oxidation on the dimensions of the forged article
- methods of overcoming/allowing for the effects of shrinkage and oxidation when hand forging articles
- procedures for handling forgings
- heating equipment and applications
- heat treatment processes for forging
- heat treatment requirements for given materials

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

A person who demonstrates competency in this unit must be able to hand forge complex shapes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

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.

Context of and specific resources for 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.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with hand forging complex shapes 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.

EVIDENCE GUIDE**Guidance information for assessment****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.

Complex hand forging

Shaping, reverse tapering, jump up section for bends

Hand forging techniques

Spreading, surface chasing, hot splitting

Unit Sector(s)**Unit sector****Co-requisite units**

Co-requisite units		

Competency field

Competency field	Forging
------------------	---------