



Australian Government

MEM23136 Evaluate stamping and forging tools

Release: 1

MEM23136 Evaluate stamping and forging tools

Modification History

Release 1. Supersedes and is equivalent to MEM23136A Evaluate stamping and forging tools.

Application

This unit of competency defines the skills and knowledge required to evaluate design features and functions of stamping and forging tools and related processes used in manufacturing and engineering applications. Stamping and forging includes cold piercing, punching, shearing, forming and drawing, and hot forging.

It is suitable for people working as tool designers, maintenance technicians, paraprofessionals and draftspersons, and for those pursuing manufacturing engineering or related technical qualifications and careers.

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

Pre-requisite Unit

MEM23004 Apply technical mathematics

MEM23109 Apply engineering mechanics principles

Competency Field

Engineering science

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine scope of stamping or forging tool evaluation	1.1 Determine parameters and context of stamping and forging tools in manufacturing operations 1.2 Confirm stakeholders to be consulted on evaluation 1.3 Confirm that appropriate support, including technical and professional assistance, is available 1.4 Identify relevant work health and safety (WHS) and regulatory requirements, standards, codes of practice, risk management and organisational procedures

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
2. Prepare for evaluation of forging or stamping tool	2.1 Identify principles and techniques required to evaluate and optimise stamping and forging tools 2.2 Select appropriate analysis techniques 2.3 Investigate sustainability implications of forging or stamping tooling
3. Evaluate stamping and forging tools and related manufacturing processes	3.1 Review design and construction features and functions of stamping and forging tools, and related manufacturing processes 3.2 Assess stamping and forging tools and related manufacturing processes for compliance with WHS and other regulatory and risk management requirements 3.3 Assess stamping and forging tools, products and processes for sustainability 3.4 Assess suitability of stamping and forging tools for integration with lean manufacturing-related techniques 3.5 Review integration of stamping and forging tools with production management and control software 3.6 Apply systems thinking, continuous improvement, problem-solving and decision-making, and constraint and contingency management principles and techniques to evaluation 3.7 Review tooling in relation to product manufacturability and process maintainability
4. Report results	4.1 Record results of evaluation 4.2 Provide documentation including tool, product and process analysis, and computer-aided design (CAD) files

Foundation Skills

This section describes those language, literacy, numeracy and employment skills 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.	
Features and functions of stamping and forging tools include:	• materials used in their construction • method of manufacture • method of installation and any capacity for operator adjustment during use • method of adjustment for production changeover • the degree of training of operators required before use of the tool • any limitations on the use of the tool • cost of manufacture.
WHS, regulatory requirements and organisational procedures include:	• WHS acts, regulations and relevant standards • codes of practice from Australian and overseas engineering and technical associations and societies • risk assessments • registration requirements • safe work practices • state and territory regulatory requirements.
Appropriate technical and professional assistance includes:	• technical support and advice relating to elements which have intrinsic dangers including • professional support for technologies.
Sustainability includes:	• meeting all regulatory requirements • conforming to all industry covenants, protocols and best practice guides • minimising ecological and environmental footprint of process, plant and product • maximising economic benefit of process plant and product to the organisation and the community minimising the negative WHS impact on employees, community and customer.
Continuous improvement implementation includes one or more of the following techniques:	• balanced scorecard • current and future state mapping • measuring performance against benchmarks • process improvement, problem solving and decision making • data management, generation, recording, analysing, storing and use of software • training for improvement systems participation • technical training.
Constraints and contingencies include one or more of the following:	• financial • organisational • procedural

	• cultural • physical (resource, access and logistical limitations).
Lean principles affecting tooling and related processes include:	• quick change over • preventative maintenance • tooling and processing costs • capacity and responsiveness to product demand • quality of product • reliability of tooling, process and supply • waste minimisation which includes ease of tool change.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23136A Evaluate stamping and forging tools.

Links

Companion Volume Implementation Guides are available on VETNet -

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

Assessment Requirements for MEM23136 Evaluate stamping and forging tools

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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 include:

- determining parameters and context of stamping and forging tools in manufacturing processes
- reviewing design and construction features, functions, applications and limitations of stamping and forging tools on at least two occasions
- investigating sustainability implications of stamping and forging tools and associated manufacturing processes
- identifying principles, design, analysis techniques and software, including supervisory control and data acquisition (SCADA), required to evaluate and optimise stamping and forging tools and related manufacturing processes
- evaluating work health and safety (WHS), regulatory and risk management compliance
- reporting and documenting results of evaluation.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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:

- hot and cold working and recrystallization temperature
- features and functions of stamping and forging tools in manufacturing operations
- sources of technical and professional assistance
- WHS and regulatory compliance requirements and risk management practices for stamping and forging tools and related manufacturing and maintenance processes
- sustainability and lean systems implications for stamping and forging tools and related manufacturing processes
- stamping and forging processes, plant and tooling, including:
 - shearing
 - drawing
 - impact deformation
 - other forging processes
- forged component materials including carbon, alloy and stainless steels, tool steel, copper, nickel, aluminium and titanium alloys

- stamping and forging tools general design features, functions and constraints including:
 - shearing die design
 - deep drawing tool design
 - forging die tool design
- tool manufacture processes including:
 - post-processing of computer-aided design (CAD) files
 - lathes, milling machines, grinding machines, jig borers and jig grinders
 - computer numeric control (CNC) machining
 - electro-discharge machining (EDM) and wire EDM
 - drilling and tapping
 - 'rapid' processes
 - heat treatment and surface treatments
 - finish grinding and polishing
- tool design and analysis software including:
 - CAD software
 - analysis software, mould flows, heat dissipation and software validation techniques
- systems thinking, continuous improvement, problem-solving and decision-making, and constraint and contingency management principles and techniques
- reporting and documentation requirements
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Assessment Conditions

- Assessors must:
 - have vocational competency in evaluating stamping and forging tools 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.
- Where possible assessment must 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 that cover all aspects of workplace performance, including environment, 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.
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