

Training Package	Metal and Engineering (MEM05)			HSC Requirements and Advice
Title	Carry out mechanical cutting			
Unit code	Competency field	Band	Unit weight	HSC Indicative Hours
MEM05005B	Fabrication	A	2	5

Unit descriptor	This unit covers setting up and operating a range of mechanical cutting and holing equipment.
Prerequisites	MEM12023A Perform engineering measurements MEM18001C Use hand tools
Application of the competency	This unit applies to sawing, shearing, cropping and/or holing and includes setting up and operating a range of equipment. Examples of machines that could be covered include guillotines, croppers, cold saws, band saws, automatic saws etc. Typical applications of this unit may include cutting for manufacture, production cutting and cutting of materials selected from stores in a maintenance environment.
Related units	<p>This unit does not cover hand or hand held power tools used for cutting e.g. circular saws, nibblers and side grinder. These skills are covered by Unit MEM18001C (Use hand tools) and Unit MEM18002B (Use power tools/hand held operations).</p> <p>This unit does not include the skills required for operational maintenance of the equipment used; these skills are covered by Unit MEM07001B (Perform operational maintenance of machines/equipment).</p> <p>For repair and welding of band saw blades where blade repair unit is not attached to the machine, refer to Unit MEM05013C (Perform manual production welding).</p>

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	Context of assessment	Interdependent assessment	Method of assessment
A person who demonstrates competency in this unit must be able to carry out mechanical cutting on a range of machines. Competency in this unit cannot be claimed until all prerequisites have been satisfied.	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 carrying out mechanical cutting or other units requiring the exercise of the skills and knowledge covered by this unit.	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 cont/d			HSC Requirements and Advice
Consistency of performance	Required skills	Required knowledge	Key Terms and Concepts
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.	<p>Look for evidence that confirms skills in:</p> <ul style="list-style-type: none"> loading and adjusting cutting machines selecting machines and tooling installing cutting tool setting up and adjusting cutting machine securing and correctly positioning materials cutting and holing materials applying relevant codes and standards reading and interpreting routine information on written job instructions, specifications and standard operating procedures following oral instruction measuring materials to specified workplace tolerances and within the machine range clarifying routine task-related information. 	<p>Look for evidence that confirms knowledge of:</p> <ul style="list-style-type: none"> the characteristics of cutting methods and machines effect of materials on the machine tooling, tooling defects and adjustments effect of adjustments on the dimensions of the cut material applicable tolerances methods of marking out materials to ensure minimum wastage any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standard use and application of personal protective equipment for mechanical cutting safe work practices and procedures. 	<ul style="list-style-type: none"> acceptable workplace tolerances characteristics and application/use of method/machine codes and standards communication compliance test/checks conformance to specification effect of materials ferrous and non-ferrous metals and non-metallic materials install tooling job requirements measuring instruments and gauges measuring materials mechanical cutting and holing methods and equipment to mark out materials minimise waste operation of mechanical cutting and holing machines personal protective equipment (PPE) position and secure material quality assurance required adjustments safe work practices and procedures selection of method, machine and tooling set up, load and adjust machine specifications standard operating procedures (SOP) start and stop machine safely stops and guards work instructions and procedures workplace tolerances.

Elements	Performance criteria	Range Statement	HSC Requirements and Advice
1 Determine job requirements	1.1 Job requirements and specifications are determined from job sheets and/or instructions.	<p>The range statement provides information about the context in which the unit of competency is carried out. The variables [in bold] and scope [dot points] 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.</p> <p>The following variables may be present and <i>may include</i>, but are not limited to, the examples listed under the scope. All work is undertaken to relevant legislative requirements, where applicable.</p>	<p>Learning experiences for the HSC must address:</p> <p>A range of sources for work instructions and procedures including:</p> <ul style="list-style-type: none"> • work schedules • job card/sheet/plans/specifications • standard operating procedures (SOP) • standard operation sheets • Material Safety Data Sheets (MSDS) • drawings/diagrams/sketches • regulations/legislation • manufacturing workplace guidelines, policies and procedures • Australian Standards. <p>An awareness of various modes of communication to receive work instructions including:</p> <ul style="list-style-type: none"> • verbal <ul style="list-style-type: none"> - face to face (supervisor to employee) - telephone/mobile phone - workplace meetings • written communication <ul style="list-style-type: none"> - work plans - drawings - memos/messages - job descriptions/statements - workplace forms - rosters • non-verbal <ul style="list-style-type: none"> - signage - diagrams. <p>Safe work practices and procedures.</p> <p>A basic overview of the role of employees in quality assurance.</p>
	1.2 Appropriate method/machine is selected to meet specifications.		<p>Learning experiences for the HSC must address:</p> <p>An awareness of the differences in selection of appropriate machine, method and tooling for:</p> <ul style="list-style-type: none"> • sawing

Elements	Performance criteria	Range Statement	HSC Requirements and Advice
			<ul style="list-style-type: none"> • shearing • cropping • holing. <p>Knowledge of the characteristics and correct application/use of a range of methods/machines appropriate for mechanical cutting and holing.</p> <p>Consideration/s for the selection of method/machine including:</p> <ul style="list-style-type: none"> • skills/training • time • cost • occupational health and safety (OHS) requirements • appropriateness for purpose.
	1.3 <i>Machine</i> is loaded and adjusted for operation consistent with standard operating procedures.	Machine <ul style="list-style-type: none"> • guillotines, croppers, cold saws, band saws, automatic saws etc. 	Learning experiences for the HSC must address: A range of mechanical cutting and holing machines.
2 Select/set up machine tooling	2.1 <i>Tooling</i> is selected to match job requirements.	Tooling <ul style="list-style-type: none"> • tooling to suit guillotines, croppers, cold saws, band saws, automatic saws etc. 	Learning experiences for the HSC must address: A range of tooling to suit a range of mechanical cutting and holing machines. Consideration/s for the selection of tooling including: <ul style="list-style-type: none"> • skills/training • time • cost • OHS requirements • appropriateness for purpose • effect of materials.
	2.2 Tooling is correctly installed using standard operating procedures.		
	2.3 Machine is set up and adjusted using standard operating procedures.		

Elements	Performance criteria	Range Statement	HSC Requirements and Advice
3 Operate mechanical cutting machine	3.1 Appropriate <i>stops and guards</i> are set and adjusted as required.	Stops and guards <ul style="list-style-type: none"> • all safety equipment/stops/guards on guillotines, croppers, cold saws, band saws, automatic saws etc. 	Learning experiences for the HSC must address: Stops/guards for a range of machines.
	3.2 <i>Material</i> is secured and correctly positioned using measuring equipment as necessary.	Material <ul style="list-style-type: none"> • ferrous and non-ferrous metals and non-metallic products. 	Learning experiences for the HSC must address: A range of ferrous and non-ferrous metals and non-metallic products. Knowledge of the effect of materials on: <ul style="list-style-type: none"> • machine tooling • tooling defects • tooling/machine adjustments. Knowledge of: <ul style="list-style-type: none"> • the methods and equipment to mark out materials to ensure minimum wastage • measuring materials to specified workplace tolerances and within machine range.
	3.3 Machine is started and stopped safely to standard operating procedures.		Learning experiences for the HSC must address: A range of mechanical cutting and holing machines. Safe work practices for using machinery including: <ul style="list-style-type: none"> • following SOP and manufacturer’s specifications before, during and after use • risk management (identifying hazards and implementing control measures) • correct manual handling • safe handling, application and storage of hazardous substances • appropriate use of personal protective equipment (PPE) • regular servicing and maintenance of machinery • selection of appropriate machine for use • working with electricity in a safe manner • adequate ventilation • attaching appropriate safety guards where required. Use and application of PPE including: <ul style="list-style-type: none"> • footwear

Elements	Performance criteria	Range Statement	HSC Requirements and Advice
			<ul style="list-style-type: none"> • head protection • gloves • protective clothing • face mask/shield • hearing protection • eye protection. <p>Importance of correct fitting PPE.</p>
	3.4 Machine is operated to cut/hole material to specifications using standard operating procedures.		<p>Learning experiences for the HSC must address:</p> <p>Mechanical cutting/holing of a range of materials using a range of machines to produce engineering components (of varying degrees of difficulty).</p>
4 Check material for conformance to specification	4.1 Material is checked against specification.		<p>Learning experiences for the HSC must address</p> <p>Knowledge of compliance tests/checks to be undertaken to ensure quality assurance of finished product within acceptable tolerances.</p>
	4.2 Machine and/or tooling is adjusted as required and in process adjustments carried out as necessary.		
	4.3 Material is cut and/or holed to within workplace tolerances.		<p>Learning experiences for the HSC must address:</p> <p>An awareness of a range of measuring instruments and gauges and their use.</p>
	4.4 Material is used in most economical way.		<p>Learning experiences for the HSC must address:</p> <p>An awareness of the importance of waste minimisation when carrying out mechanical cutting.</p> <p>Strategies to minimise waste including:</p> <ul style="list-style-type: none"> • mark out • set up • allowance for adjustment.
	4.5 <i>Codes and standards</i> are observed.	<p>Codes and standards</p> <ul style="list-style-type: none"> • legislative and regulatory requirements, industry and enterprise codes and standards. 	