

Training Package	Metal and Engineering (MEM05)			HSC Requirements and Advice
Title	Perform manual heating and thermal cutting			
Unit code	Competency field	Band	Unit weight	HSC Indicative Hours
MEM05007C	Fabrication	A	2	10

Unit descriptor	This unit covers performing manual heating, thermal cutting and gouging including the assembly and disassembly and operation of the equipment on a range of materials (ferrous, non-ferrous and non-metallic) using a variety of methods.
Prerequisites	None
Application of the competency	This unit applies to manual, straight line cutting standards. Manual or automatic processes are used to cut and heat to specifications. Cutting may include flame gouging by hand. All work is carried out to legislative and regulatory requirements. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures.
Related units	None

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 perform manual heating and thermal cutting.	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 manual heating/thermal 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. Questions should not require language, literacy and numeracy skills beyond those required in this unit. 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"> performing pre-start checks safely starting equipment following standard operating procedures adjusting equipment to operating specifications making cutting allowances economising material and minimising wastage identifying cutting defects and taking corrective action heating and cutting materials to specifications reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings following oral instructions performing measurements needed to meet the requirements of this unit entering routine and familiar information onto proformas and standard workplace forms. 	<p>Look for evidence that confirms knowledge of:</p> <ul style="list-style-type: none"> cutting processes appropriate to various materials heating and cutting specifications procedures for heating and cutting the tools, equipment and techniques for heating and cutting assembling procedures for equipment and accessories hazards and control measures associated with manual heating and thermal cutting use and application of personal protective clothing and equipment equipment pre-checks and operation procedures for adjusting heating and cutting equipment cutting allowances and reasons for applying them procedures for minimising waste material reasons for minimising waste material cutting defects and their causes procedures for correcting cutting defects tools, equipment and techniques required to correct cutting defects use and application of personal protective equipment safe work practices and procedures. 	<ul style="list-style-type: none"> communication corrective action cutting allowances defects equipment adjustments equipment start-up procedures ferrous and non-ferrous metals gouging manual heating manual heating, thermal cutting and gouging techniques and procedures manual, straight-line cutting standards material characteristics and capabilities non-metallic materials personal protective equipment (PPE) plan and prepare pre-start checks safe work practices and procedures safety procedures select, assemble/disassemble and operate tools, accessories and equipment specification standard operating procedures (SOP) thermal cutting waste minimisation work instructions and procedures workplace standards.

Elements	Performance criteria	Range Statement	HSC Requirements and Advice
1 Assemble/disassemble plant and equipment	1.1 Accessories and equipment are correctly selected and assembled for manual heating and thermal cutting.	<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>Planning and preparation for a range of manual heating, thermal cutting and gouging tasks/projects.</p> <p>Knowledge of:</p> <ul style="list-style-type: none"> • a range of tools, accessories and equipment required for manual heating, thermal cutting and gouging • assembling procedures for tools, accessories and equipment • safety precautions when assembling • equipment pre-start checks.

Elements	Performance criteria	Range Statement	HSC Requirements and Advice
2 Operate heating and thermal cutting equipment	2.1 <i>Cutting process</i> and/or procedure appropriate for <i>material</i> is selected.	<p>Cutting</p> <ul style="list-style-type: none"> • use of hand held and self-propelled straight line cutters. <p>Process</p> <ul style="list-style-type: none"> • fuel gas, oxy fuel gas and air fuel gas. <p>Material</p> <ul style="list-style-type: none"> • various thicknesses and types including ferrous, non-ferrous and non-metallic materials. 	<p>Learning experiences for the HSC must address:</p> <p>Knowledge of a range of material characteristics and capabilities including:</p> <ul style="list-style-type: none"> • metals <ul style="list-style-type: none"> - ferrous - non-ferrous • non-metallic materials. <p>Knowledge of a range of manual heating, thermal cutting and gouging techniques and procedures appropriate for a range of materials.</p> <p>Knowledge of:</p> <ul style="list-style-type: none"> • manual, straight-line cutting standards • manual and/or automatic processes.
	2.2 All safety procedures are observed.		<p>Learning experiences for the HSC must address:</p> <p>Safe work practices and procedures.</p> <p>Hazard identification and risk control</p>
	2.3 Equipment start-up procedures are followed correctly to standard operating procedures.		<p>Learning experiences for the HSC must address:</p> <p>A range of manual heating, thermal cutting and gouging machines/equipment.</p> <p>Safe work practices for using machinery including:</p> <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:

Elements	Performance criteria	Range Statement	HSC Requirements and Advice
			<ul style="list-style-type: none"> • footwear • head protection • gloves • protective clothing • face mask/shield • hearing protection • eye protection. <p>Importance of correct fitting PPE.</p>
	2.4 Equipment adjustments are made correctly using standard operating procedures.		<p>Learning experiences for the HSC must address:</p> <p>Knowledge of procedures for adjusting heating, cutting and gouging equipment.</p>
	2.5 Appropriate cutting allowances are made.		<p>Learning experiences for the HSC must address:</p> <p>Knowledge of cutting allowances and reasons for applying them.</p>
	2.6 Material is used in the most economical way.		<p>Learning experiences for the HSC must address:</p> <p>Knowledge of:</p> <ul style="list-style-type: none"> • the reasons for minimising waste material • procedures for minimising waste during manual heating, thermal cutting and gouging.
	2.7 Defects are identified and corrective action is taken to standard operating procedures.		<p>Learning experiences for the HSC must address:</p> <p>Knowledge of:</p> <ul style="list-style-type: none"> • a range of manual heating, thermal cutting and gouging defects and their causes • tools, equipment and procedures/techniques required to correct defects.
	2.8 Material is heated and cut to specification.		<p>Learning experiences for the HSC must address:</p> <p>Knowledge of heating, cutting and gouging specifications.</p>
	2.9 Shape/size/length is to accepted workplace standards.		