Australian Government

Department of Education, Employment and Workplace Relations

MSA07 Manufacturing Training Package

Release: 6.0

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

CONTENTS

Manufacturing Skills Australia

Modification History

Version Modification History

Version	Release Date	Comments
6	April 2011	**Endorsed changes** Addition of eight new qualifications and six new units of competency for recreational vehicle manufacture, retailing, service and repair. Inclusion of an additional 82 imported units as electives for recreational vehicle qualifications. Two new units of competency for water jetting included as electives in MSA30309. One new unit of competency to replace a deleted imported unit. **ISC upgrades** 11 qualifications adjusted for flexibility/sustainability requirements (refer to mapping for details) Minor edits to 5 MSAPM units (MSAPMOHS100A, OHS200A, OPS101A, OPS363A and SUP106A) Imported units updated and minor typographical errors corrected in mapping. ***Refer to Summary Mapping for details of changes to qualifications and units.***
5.1	July 2010	**ISC Updates**: Eight qualifications adjusted to comply with flexibility rules: MSA10107, MSA10207,

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		MSA20107, MSA21108, MSA30107, MSA30309, MSA31108, MSA41108.

Confined Space Entry units updated to comply with revised Australian Standard AS2685-2009: MSAPMPER200C, MSAPMPER205C and MSAPMPER300C.

Sustainability units (MSAENV272B, MSAENV472B and MSAENV672B) updated to clarify terminology and to expand Range of Variables to better incorporate environmental sustainability.

PML04 units of competency updated to MSL09 units in MSA30208, MSA40108, MSA50108 and MSA60108. |
| 5 | November 2009 | • One new qualification - MSA30309 Certificate III in Surface Preparation and Coating Application.

• Three new units of competency and an additional 35 imported units for inclusion in MSA07 aligned to the new certificate.

• Fourteen (14) new units of competency and five Skill Sets for Trade Measurement (not aligned to any qualifications).

Refer to History for details.

In addition, minor corrections have been made to the Overview of Assessment Requirements in the |

Version	Release Date	Comments
		Evidence Guide for two sustainability units (MSAENV272A and MSAENV472A).
4	27 July 2009	MSA07v4 includes two new qualifications: MSA71109 Vocational Graduate Certificate in Competitive Manufacturing MSA81109 Vocational Graduate Diploma of Competitive Manufacturing. It also includes 21 new units of competency.
3.1	12 March 2009	Version 3.1 includes six new units and the importation of an additional 10 MEM units for a new structural steel detailing stream in the following existing qualifications: • MSA30208 Certificate III in Manufacturing Technology • MSA50108 Diploma of Manufacturing Technology. Miscellaneous typographical errors have been corrected. Refer to Modification History for details.
3	27 August 2008	MCM04 qualifications and units of competency recoded and placed in MSA07. Key Competencies replaced in Competitive Manufacturing units with Employability Skills. Two new specialist streams for metallurgy and polymer technology have been added to the existing Technology Cadetship qualifications, now coded MSA30208 and MSA40108. Two new Technology Cadetship qualifications – MSA50108 and

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Version	Release Date	Comments
		MSA60108.

Category 1 changes to following MSAPM units resulting from review of PMA08: MSAPMPER200B, MSAPMPER205B, MSAPMPER300B and MSAPMOHS210B.

Two additional MSAPM units: MSAPMPER202A and MSAPMPER400A

Deletion of MSAPM302A

Category 1 changes to MSA10107, MSA10207, MSA20107 and MSA30107 as a result of recoding of MCM units and changes to MSAPM units.

Additional Category 1 changes to MSA10107 to include updated versions of LMT and LMF units. |
| 2 | 16 November 2007 | Addition of three production support certificates and other generic units for use across the three process manufacturing Training Packages (PMA, PMB and PMC). This included the three new sustainability units.

Units of competency in MSA10107 Certificate I in Manufacturing (Pathways) updated with units from PMB07 (details below). |
| 1 | April 2007 | Initial release |

Imprint

MSA07 Manufacturing Training Package

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Preliminary Information

Important Note to Users
Training Packages are not static documents; they are amended periodically to reflect the latest industry practices and are version controlled. It is essential that the latest version is always used.

Check the version number before commencing training or assessment
This Training Package is Version - check whether this is the latest version by going to the National Training Information Service (www.ntis.gov.au) and locating information about the Training Package. Alternatively, contact Manufacturing Industry Skills Council at http://www.mskills.com.au to confirm the latest version number.

Explanation of version number conventions
The primary release Training Package is Version 1. When changes are made to a Training Package, sometimes the version number is changed and sometimes it is not, depending on the extent of the change. When a Training Package is reviewed it is considered to be a new Training Package for the purposes of version control, and is Version 1. Do not confuse the version number with the Training Packages national code (which remains the same during its period of endorsement).

History

History

The Manufacturing Training Package (MSA07) has been developed as part of the rationalisation work being undertaken by Manufacturing Skills Australia.

Version 1
MSA07v1 contained the Certificate I in Manufacturing (Pathways).

Version 2
MSA07v2 was expanded to include the newly developed Certificates I, II and III in Process Manufacturing which are for use across the three process manufacturing sectors covered by PMA, PMB and PMC Training Packages.

Also included in Version 2 were the following units of competency that are available for importation to Certificates IV, Diplomas and Advanced Diplomas in PMA, PMB and PMC:

MSAENV472A Implement and monitor environmentally sustainable work practices
MSAENV672A Develop workplace policy and procedures for sustainability
MSAPMOHS400A Contribute to OHS management system

MSAPMOHS401A Assess risk
MSAPMOHS503A Maintain the workplace OHS management system
MSAPMOHS510A Manage risk
MSAPMOHS601A Establish workplace OHS management system
MSAPMOPS400A Optimise process/plant area
MSAPMOPS401A Trial new process or product
MSAPMOPS404A Co-ordinate maintenance
MSAPMOPS405A Identify problems in fluid power system
MSAPMOPS406A Identify problems in electronic control systems
MSAPMSUP400A Develop and monitor quality systems

In Version 2, the PMB and process manufacturing units in MSA10107 Certificate I in Manufacturing (Pathways) were updated and recoded. Refer to Mapping of units for details.

Three environmental sustainability units have been developed by Manufacturing Skills Australia. They were included in the Process Manufacturing production support certificates and will be made available across all manufacturing Training Packages. The units are:

- *MSAENV272A Participate in environmentally sustainable work practices*
- *MSAENV472A Implement and monitor environmentally sustainable work practices*
- *MSAENV672A Develop workplace policy and procedures for sustainability.*
-
- *In version 3 (see below) these three units have been incorporated into the Competitive Manufacturing qualifications.*

Version 3
Following are details of changes to MSA07v2:

1) *inclusion of the current Competitive Manufacturing and Manufacturing Technology qualifications and units of competency*
2) *variation to existing Competitive Manufacturing qualifications to incorporate the three new units of competency covering sustainability skills and to include Employability Skills Summaries*
3) *updating of existing MCM units to replace Key Competencies with Employability Skills*
4) *updating of the MSAPMPER units and one MSAPMOHS unit which have been revised as part of the current review of the Chemical, Hydrocarbons & Oil Refining Training Package*
5) *MSA07v2 qualifications (MSA10107, MSA10207, MSA20107 and MSA30107) updated with recoded MCM units, revised MSAPMPER units and updated LMT and LMF units.*
6) *addition of new metallurgy and polymer pathways for the existing Certificate III in Manufacturing Technology*
7) *addition of new polymer pathway for the existing Certificate IV in Manufacturing Technology*
8) *addition of Diploma and Advanced Diploma of Manufacturing Technology (metallurgy and polymer pathways)*

Version 3.1

Version 3.1 includes six new MSA Technology Cadetship units and 10 additional MEM units as electives for a new structural steel detailing stream in MSA30208 Certificate III in Manufacturing Technology and MSA50108 Diploma of Manufacturing Technology.

Miscellaneous typographical errors related to unit codes have been corrected in the unit tables in the following qualifications: MSA10107, MSA20107, MSA20208, MSA30208, MSA40108, MSA50108 and MSA60108.

PMBPREP508A has been removed from the Manufacturing Technology elective bank in MSA50108 as it duplicates MEM09003B.

Version 4

Inclusion of two new Competitive Manufacturing Vocational Graduate qualifications and the following new units:

MSACMG700A	Review continuous improvement processes
MSACMG701A	Prepare for and implement change
MSACMG702A	Review manufacturing practice tools and techniques
MSACMG703A	Analyse process changes
MSACMG704A	Facilitate improvements in the value chain
MSACMG705A	Undertake a qualitative review of a process change
MSACMG706A	Build relationships between teams in a manufacturing environment
MSACMG707A	Respond to a major non-conformance
MSACMG708A	Capture learning from daily activities in a manufacturing organisation
MSACMG709A	Facilitate improvements in the external value chain
MSACMG710A	Improve visual management in the workplace
MSACMG711A	Manage benchmarking studies
MSACMG712A	Lead a problem solving process to determine and solve root cause
MSACMG800A	Analyse data for relevance to organisational learning
MSACMG801A	Develop the competitive manufacturing approach

MSACMG802A	Audit the use of competitive tools
MSACMG803A	Develop models of future state manufacturing practice
MSACMG804A	Develop the value chain
MSACMG805A	Develop the learning processes of the manufacturing organisation
MSACMG806A	Develop and refine systems for continuous improvement in manufacturing organisations
MSACMG807A	Develop problem solving capability of a manufacturing organisation

Version 5

New units of competency

Unit code	Unit title
MSAPMOPS201A	Cut polymer materials
MSAPMOPS202A	Fabricate polymer materials
MSAPMOPS301A	Treat corrosion
MSATMINS301A	Inspect a range of simple measures
MSATMINS302A	Inspect a range of simple measuring instruments
MSATMINS401A	Inspect a range of weighing instruments
MSATMINS402A	Inspect a range of liquid measuring instruments using volume measures
MSATMINS403A	Inspect a range of trading practices
MSATMINS404A	Inspect a range of pre-packaged products
MSATMINS501A	Inspect a range of complex measuring instruments
MSATMREF301A	Use and maintain reference standards
MSATMVER301A	Verify simple measures

MSATMVER302A	Verify a simple measuring instruments
MSATMVER401A	Verify a limited weighing instrument
MSATMVER402A	Verify a liquid measuring instrument using volume measures
MSATMVER403A	Verify inspector's class reference standards
MSATMVER501A	Verify a complex measuring instrument

Additional imported units

MEM07001B	Perform operational maintenance of machines/equipment
MEM08002C	Pre-treat work for subsequent surface coating
MEM08007B	Control surface finish production and finished product quality
MEM08011B	Prepare surfaces using solvents and/or mechanical means
MEM08012B	Prepare surfaces by abrasive blasting (basic)
MEM08013B	Prepare surfaces by abrasive blasting (advanced)
MEM08014B	Apply protective coatings (basic)
MEM08015B	Apply protective coatings (advanced)
MEM08016B	Control blast coating by-products, materials and emissions
MEM11001C	Erect/dismantle scaffolding and equipment
MEM11002C	Erect/dismantle complex scaffolding and equipment
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment
MEM11004B	Undertake dogging
MEM11010B	Operate mobile load shifting equipment
MEM11011B	Undertake manual handling
MEM11012B	Purchase materials
MEM11016B	Order materials
MEM11021B	Perform advanced operation of load shifting equipment

MEM11022B	Operate fixed/moveable load shifting equipment
MEM12001B	Use comparison and basic measuring devices
MEM13001B	Perform emergency first aid
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16002C	Conduct formal interviews and negotiations
MEM16011A	Communicate with individuals and small groups
MEM16013A	Operate in a self directed team
MEM17001B	Assist in the development and delivery of training in the workplace
MEM17003A	Assist in the provision of on the job training
MNMG237A	Work safely at heights
PMBPROD241C	Lay up rubber lining or lag pulleys
PMBPROD242A	Bond polymers to surfaces
PMBPROD248C	Prepare surfaces for coating
PMBPROD265C	Operate portable vulcanising equipment
PMBPROD323C	Produce powder coated products
PMBPROD375B	Vulcanise products using an autoclave

Version 6

Refer to summary mapping for details of changes to MSA07 and Recreational Vehicle qualifications and units of competency.

List of AQF Qualifications

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New qualifications – MSA07v6

Qualification Code	Title
MSA10107	Certificate I in Manufacturing (Pathways)
MSA10207	Certificate I in Process Manufacturing
MSA20107	Certificate II in Process Manufacturing
MSA20208	Certificate II in Manufacturing Technology
MSA20510	Certificate II in Recreational Vehicle Service and Repair
MSA20610	Certificate II in Recreational Vehicle Manufacture
MSA21108	Certificate II in Competitive Manufacturing
MSA30107	Certificate III in Process Manufacturing
MSA30208	Certificate III in Manufacturing Technology
MSA30309	Certificate III in Surface Preparation and Coating Application
MSA30510	Certificate III in Recreational Vehicle Service and Repair
MSA30610	Certificate III in Recreational Vehicle Manufacture
MSA30710	Certificate III in Recreational Vehicle and Accessories Retailing
MSA31108	Certificate III in Competitive Manufacturing
MSA40108	Certificate IV in Manufacturing Technology
MSA40510	Certificate IV in Recreational Vehicles
MSA40710	Certificate IV in Recreational Vehicle and Accessories Retailing
MSA41108	Certificate IV in Competitive Manufacturing
MSA50108	Diploma of Manufacturing Technology
MSA50510	Diploma of Recreational Vehicles
MSA51108	Diploma of Competitive Manufacturing
MSA60108	Advanced Diploma of Manufacturing Technology
MSA61108	Advanced Diploma of Competitive Manufacturing

Qualification Code	Title
MSA71109	Vocational Graduate Certificate in Competitive Manufacturing
MSA81109	Vocational Graduate Diploma of Competitive Manufacturing

List of ALL Units within Training Package

Code	Title	Prerequisite
MSACMC210A	Manage the impact of change on own work	None
MSACMC410A	Lead change in a manufacturing environment	None
MSACMC411A	Lead a competitive manufacturing team	None
MSACMC413A	Lead team culture improvement	None
MSACMC610A	Manage relationships with non-customer external organisations	None
MSACMC611A	Manage people relationships	None
MSACMC612A	Manage workplace learning	None
MSACMC613A	Facilitate holistic culture improvement in a manufacturing enterprise	None
MSACMC614A	Develop a communications strategy to support production	None
MSACMG700A	Review continuous improvement processes	None
MSACMG701A	Prepare for and implement change	None
MSACMG702A	Review manufacturing practice tools and techniques	None
MSACMG703A	Analyse process changes	None
MSACMG704A	Facilitate improvements in the value chain	None
MSACMG705A	Undertake a qualitative review of a process change	None
MSACMG706A	Build relationships between teams in a manufacturing environment	None
MSACMG707A	Respond to a major non-conformance	None
MSACMG708A	Capture learning from daily activities in a manufacturing organisation	None
MSACMG709A	Facilitate improvements in the external value chain	None
MSACMG710A	Improve visual management in the workplace	None
MSACMG711A	Manage benchmarking studies	None

MSACMG712A	Lead a problem solving process to determine and solve root cause	None
MSACMG800A	Analyse data for relevance to organisational learning	None
MSACMG801A	Develop the competitive manufacturing approach	None
MSACMG802A	Audit the use of competitive tools	None
MSACMG803A	Develop models of future state manufacturing practice	None
MSACMG804A	Develop the value chain	None
MSACMG805A	Develop the learning processes of the manufacturing organisation	None
MSACMG806A	Develop and refine systems for continuous improvement in manufacturing organisations	None
MSACMG807A	Develop problem solving capability of a manufacturing organisation	None
MSACMS200A	Apply competitive manufacturing practices	None
MSACMS201A	Sustain process improvements	None
MSACMS400A	Implement a competitive manufacturing system	None
MSACMS401A	Ensure process improvements are sustained	None
MSACMS405A	Lead a manufacturing team using a balanced score card approach	None
MSACMS600A	Develop a competitive manufacturing system	None
MSACMS601A	Analyse and map a value chain	MSACMT631A
MSACMS602A	Manage a value chain	(MSACMS601A MSACMT631A)
MSACMS603A	Develop manufacturing related business plans	None
MSACMS604A	Manage competitive manufacturing processes in a jobbing shop environment	(MSACMS601A MSACMT280A MSACMT631A)
MSACMS605A	Develop a balanced score card for use in competitive manufacturing	(MSACMS601A MSACMT280A MSACMT631A)
MSACMS606A	Introduce competitive manufacturing to a small or medium enterprise	None
MSACMT220A	Apply quick changeover procedures	None
MSACMT221A	Apply Just in Time (JIT) procedures	None
MSACMT230A	Apply cost factors to work practices	None

MSACMT231A	Interpret product costs in terms of customer requirements	None
MSACMT240A	Apply 5S procedures in a manufacturing environment	None
MSACMT250A	Monitor process capability	None
MSACMT251A	Apply quality standards	None
MSACMT260A	Use planning software systems in manufacturing	None
MSACMT261A	Use SCADA systems in manufacturing	None
MSACMT270A	Use sustainable energy practices	None
MSACMT271A	Use sustainable environmental practices	None
MSACMT280A	Undertake root cause analysis	None
MSACMT281A	Contribute to the application of a proactive maintenance strategy	None
MSACMT421A	Facilitate a Just in Time (JIT) system	None
MSACMT423A	Monitor a manufacturing levelled pull system	None
MSACMT430A	Improve cost factors in work practices	None
MSACMT432A	Analyse manual handling processes	None
MSACMT440A	Lead 5S in a manufacturing environment	None
MSACMT441A	Facilitate continuous improvement in manufacturing	None
MSACMT450A	Undertake process capability improvements	MSACMT452A
MSACMT451A	Mistake proof a production process	None
MSACMT452A	Apply statistics to processes in manufacturing	None
MSACMT453A	Use six sigma techniques	MSACMT452A
MSACMT460A	Facilitate the use of planning software systems in manufacturing	MSACMT260A
MSACMT461A	Facilitate SCADA systems in a manufacturing team or work area	MSACMT261A
MSACMT481A	Undertake proactive maintenance analyses	None
MSACMT482A	Assist in implementing a proactive maintenance strategy	None
MSACMT483A	Support proactive maintenance	None
MSACMT620A	Develop quick changeover procedures	None
MSACMT621A	Develop a Just in Time (JIT) system	MSACMC410A
MSACMT622A	Design a process layout	None
MSACMT623A	Develop a levelled pull system of manufacturing	None
MSACMT630A	Optimise cost of product	MSACMT631A

MSACMT631A	Undertake value analysis of product costs in terms of customer requirements	MSACMT230A
MSACMT632A	Analyse cost implications of maintenance strategy	None
MSACMT640A	Manage 5S system in a manufacturing environment	None
MSACMT641A	Implement a continuous improvement system	None
MSACMT650A	Determine and improve process capability	MSACMT452A
MSACMT652A	Design an experiment	MSACMT452A
MSACMT653A	Apply six sigma to process control and improvement	MSACMT452A
MSACMT660A	Develop the application of enterprise systems in manufacturing	None
MSACMT661A	Determine and establish information collection requirements and processes	None
MSACMT662A	Develop a documentation control strategy for a manufacturing enterprise	None
MSACMT670A	Develop and manage sustainable energy practices	None
MSACMT671A	Develop and manage sustainable environmental practices	None
MSACMT675A	Facilitate the development of a new product	MSACMT452A
MSACMT681A	Develop a proactive maintenance strategy	None
MSACMT682A	Adapt a proactive maintenance strategy to the process manufacturing sector	MSACMT681A
MSACMT683A	Adapt a proactive maintenance strategy for a seasonal or cyclical manufacturing operation	MSACMT681A
MSAENV272B	Participate in environmentally sustainable work practices	None
MSAENV472B	Implement and monitor environmentally sustainable work practices	None
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	None
MSAPCI101A	Adapt to work requirements in industry	None
MSAPCI102A	Apply effective work practices	None
MSAPCI103A	Demonstrate care and apply safe practices at work	None
MSAPCII295A	Operate manufacturing equipment	None
MSAPCII296A	Make a small furniture item from timber	None
MSAPCII297A	Make an object from cloth using an existing pattern	None
MSAPCII298A	Make an object from metal	None

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MSAPCII299A	Make an object from plastic	None
MSAPMOHS100 A	Follow OHS procedures	None
MSAPMOHS110 A	Follow emergency response procedures	None
MSAPMOHS200 A	Work safely	None
MSAPMOHS205 A	Control minor incidents	None
MSAPMOHS210 B	Undertake first response to non-fire incidents	None
MSAPMOHS212 A	Undertake first response to fire incidents	None
MSAPMOHS216 A	Operate breathing apparatus	None
MSAPMOHS217 A	Gas test atmospheres	None
MSAPMOHS220 A	Provide initial first aid response	None
MSAPMOHS300 A	Facilitate the implementation of OHS for a work group	MSAPMOHS200
MSAPMOHS400 A	Contribute to OHS management system	MSAPMOHS300
MSAPMOHS401 A	Assess risk	None
MSAPMOHS503 A	Maintain the workplace OHS management system	None
MSAPMOHS510 A	Manage risk	MSAPMOHS401
MSAPMOHS601 A	Establish workplace OHS management system	MSAPMOHS503
MSAPMOPS100A	Use equipment	None
MSAPMOPS101A	Make measurements	None
MSAPMOPS102A	Perform tasks to support production	None
MSAPMOPS200A	Operate equipment	None
MSAPMOPS201A	Cut polymer materials	None
MSAPMOPS202A	Fabricate polymer materials	None

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MSAPMOPS212A	Use enterprise computers or data systems	None
MSAPMOPS244A	Layout and cut materials	None
MSAPMOPS301A	Treat corrosion	None
MSAPMOPS363A	Organise on site work	None
MSAPMOPS400A	Optimise process/plant area	MSAPMSUP390
MSAPMOPS401A	Trial new process or product	None
MSAPMOPS404A	Co-ordinate maintenance	None
MSAPMOPS405A	Identify problems in fluid power system	None
MSAPMOPS406A	Identify problems in electronic control systems	None
MSAPMOPS601A	Design equipment and systems modifications	None
MSAPMPER200C	Work in accordance with an issued permit	None
MSAPMPER201A	Monitor and control work permits	None
MSAPMPER202A	Observe permit work	None
MSAPMPER205C	Enter confined space	MSAPMPER200
MSAPMPER300C	Issue work permits	RIIRIS201A
MSAPMPER400A	Coordinate permit process	MSAPMPER300
MSAPMSUP100A	Apply workplace procedures	None
MSAPMSUP101A	Clean workplace or equipment	None
MSAPMSUP102A	Communicate in the workplace	None
MSAPMSUP106A	Work in a team	None
MSAPMSUP172A	Identify and minimise environmental hazards	None
MSAPMSUP200A	Achieve work outcomes	None
MSAPMSUP201A	Receive or despatch goods	None
MSAPMSUP204A	Pack products or materials	None
MSAPMSUP205A	Transfer loads	None
MSAPMSUP210A	Process and record information	None
MSAPMSUP230A	Monitor process operations	None
MSAPMSUP240A	Undertake minor maintenance	None
MSAPMSUP273A	Handle goods	None
MSAPMSUP280A	Manage conflict at work	None
MSAPMSUP291A	Participate in continuous improvement	None
MSAPMSUP292A	Sample and test materials and product	None

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MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP200
MSAPMSUP301A	Apply HACCP to the workplace	None
MSAPMSUP303A	Identify equipment faults	None
MSAPMSUP309A	Maintain and organise workplace records	None
MSAPMSUP310A	Contribute to development of plant documentation	None
MSAPMSUP330A	Develop and adjust a production schedule	None
MSAPMSUP382A	Provide coaching/mentoring in the workplace	None
MSAPMSUP383A	Facilitate a team	None
MSAPMSUP390A	Use structured problem solving tools	None
MSAPMSUP400A	Develop and monitor quality systems	None
MSAPMWJ201A	Use high pressure water jetting equipment	None
MSAPMWJ301A	Operate a high pressure water jetting system	None
MSARVG201A	Tow a recreational vehicle safely	None
MSARVS201A	Install LP gas systems in a recreational vehicle	None
MSARVS202A	Repair/service LP gas systems in a recreational vehicle	None
MSARVS301A	Develop and update caravan industry knowledge	None
MSARVS401A	Assess and quote to service a recreational vehicle	None
MSARVT201A	Apply technical knowledge of recreational vehicle manufacturing to work activities	None
MSATCM301A	Test the mechanical properties of materials	None
MSATCM302A	Monitor basic ferrous melting and casting processes	None
MSATCM303A	Monitor basic non-ferrous melting and casting processes	None
MSATCM304A	Interpret basic binary phase diagrams	None
MSATCM305A	Demonstrate basic knowledge of casting operations	None
MSATCM401A	Prepare and examine metallographic samples	MSATCM304A
MSATCM402A	Monitor and test sands, cores and moulds	None
MSATCM403A	Evaluate mould design and gating	(MSATCM304A MSATCM305A)
MSATCM404A	Undertake and interpret results of chemical analysis on metal samples	None
MSATCM405A	Determine and supervise heat treatment of metal	(MEM06003C MSATCM304A)

MSATCM406A	Apply basic chemistry principles to metallurgy	None
MSATCM501A	Calculate and predict chemical outcomes in metallurgical situations	MSATCM406A
MSATCM502A	Identify and describe equipment for mineral and chemical processing plants	(MSATCM304A MSATCM406A)
MSATCM503A	Recommend a refractory for an application	None
MSATCM504A	Select metal forming process	(MEM30007A MEM09002B MSATCM501A)
MSATCM505A	Select metal joining process	(MEM30007A MEM09002B MSATCM406A)
MSATCM506A	Monitor blast furnace operations	(MSATCM304A MSATCM406A MSATCM501A)
MSATCM507A	Monitor primary steel making process	(MSATCM304A MSATCM406A MSATCM501A)
MSATCM508A	Monitor secondary steelmaking operations	(MSATCM301A MSATCM304A MSATCM503A)
MSATCM509A	Recommend ferrous and non ferrous metals or alloys for an application	MSATCM304A
MSATCM510A	Apply metallurgical principles and techniques in welding and other thermal processes	MSATCM505A
MSATCM511A	Apply metallurgy principles and practice to determine metal forming and shaping processes	None
MSATCM512A	Apply metallurgy principles and practice to optimise furnace operation	None
MSATCM513A	Plan and complete metallurgical projects	(MEM16008A MEM30012A MEM23061A MEM23071A MSATCM405A MSATCM509A MSATCM510A)
MSATCM514A	Select surface treatment methods for metallic components or products	None
MSATCM515A	Analyse metallurgical failures of components and recommend preventative measures	(MSATCM401A MSATCM406A)

MSATCM516A	Select non metallic materials for engineering applications manufacturing, engineering and structural	None
MSATCM517A	Determine corrosion prevention strategies for metal and alloys	None
MSATCM518A	Interpret complex binary phase diagrams	MSATCM304A
MSATCS301A	Interpret architectural and engineering design specifications for structural steel detailing	MEM09002B
MSATCS302A	Detail bolts and welds for structural steelwork connections	(MEM05051A MEM09002B MSATCS301A)
MSATCS501A	Detail standardised structural connections	(MEM05051A MEM09002B MSATCS301A)
MSATCS502A	Detail structural steel members	(MEM09002B MSATCS301A)
MSATCS503A	Incorporate structural steel detailing into fabrication and construction project management	None
MSATCS504A	Detail ancillary steelwork	(MEM09002B MSATCS301A)
MSATMINS301A	Inspect a range of simple measures	None
MSATMINS302A	Inspect a range of simple measuring instruments	None
MSATMINS401A	Inspect a range of weighing instruments	None
MSATMINS402A	Inspect a range of liquid measuring instruments using volume measures	None
MSATMINS403A	Inspect a range of trading practices	None
MSATMINS404A	Inspect a range of pre-packaged products	None
MSATMINS501A	Inspect a range of complex measuring instruments	None
MSATMREF301 A	Use and maintain reference standards	None
MSATMVER301 A	Verify simple measures	None
MSATMVER302 A	Verify a simple measuring instruments	None
MSATMVER401 A	Verify a limited weighing instrument	None
MSATMVER402 A	Verify a liquid measuring instrument using volume measures	None

MSATMVER403A	Verify inspector's class reference standards	None
MSATMVER501A	Verify a complex measuring instrument	None

Imported units of competency in this Training Package

Code	Title	Origin
AUM3003B	Document designs	AUM08
AUM4003A	Interpret customer requirements - complex	AUM00
AUM8012B	Prepare and document quotation	AUM08
AUM8081B	Apply trim to components	AUM08
AURA354616A	Determine legal aspects of an automotive service and repair contract	AUR05
AURA454516A	Determine retail rates for work	AUR05
AURC252327A	Identify, clarify and resolve problems	AUR05
AURC270421A	Establish relations with customers	AUR05
AURC341903A	Apply relevant finance, leasing and insurance contracts/policies	AUR05
AURC361101A	Adapt work processes to new technologies	AUR05
AURC362721A	Establish customer requirements of a complex nature	AUR05
AURC362807A	Build customer relations	AUR05
AURC363337A	Maintain business image	AUR05
AURC365722A	Estimate complex jobs	AUR05
AURC463238A	Manage complex customer issues	TBA
AURC465349A	Prepare written repair quotation	TBA
AURC561614A	Contribute to business improvement	AUR05
AURE218670A	Service, maintain or replace batteries	AUR05
AURE218708A	Carry out repairs to single electrical circuits	AUR05
AURE220140A	Manufacture and repair wiring harness/looms	AUR05
AURE311666A	Repair electric braking systems	AUR05
AURS238127A	Identify and select automotive parts and products	AUR05
AURS238150A	Present stock and sales area	AUR05
AURS241303A	Apply sales procedures	AUR05

AURS241608A	Carry out cash and/or credit/funds transfer transactions	AUR05
AURS241769A	Sell product(s)	AUR05
AURS241803A	Apply legal requirements relating to product sales	AUR05
AURS242621A	Promote products and services	AUR05
AURS252290A	Process customer complaints	AUR05
AURS338103A	Apply automotive parts interpretation process	AUR05
AURT210170A	Inspect and service braking systems	AUR05
AURT216170A	Inspect and service suspension systems	AUR05
AURT217865A	Remove and refit wheel hubs and associated brake components	AUR05
AURT365508A	Carry out vehicle safety/roadworthy inspection	AUR05
AURT577620A	Develop and document specifications and procedures	AUR05
AURT577727A	Identify and calculate total costs of work	TBA
AURV226965A	Remove and replace/fit protector mouldings, transfers and decals	AUR05
AURV230449A	Apply paint touch-up techniques	AUR05
AURV324866A	Repair fibreglass/composite material components	AUR05
AURV328366A	Repair chassis/frame and associated components	AUR05
AURV331423CA	Fabricate and install canvas products	AUR05
AURV331423DA	Fabricate and install frame structures	AUR05
AURV331423GA	Fabricate and install canopies and curtains	AUR05
AURV334031A	Install side windows	AUR05
AURV365356A	Read and interpret vehicle body repair estimation/quotation	TBA
AURV465116A	Determine vehicle damage and recommended repair procedures	AUR05
BSBCUS501A	Manage quality customer service	TBA
BSBFIM501A	Manage budgets and financial plans	BSB07
FDFOPTSD2A	Work in a socially diverse environment	FDF03
FPICOT2206A	Cross cut materials with a hand-held chainsaw	TBA
LMFFM1002B	Operate basic woodworking machines	LMF02
LMFFM2001B	Use furniture making sector hand and power tools	LMF02
LMFFM2002B	Assemble furnishing components	LMF02
LMFFM2003B	Select and apply hardware	LMF02

LMFFM2005B	Join solid timber	LMF02
LMFSF1001B	Produce basic soft furnishing accessories	LMF02
LMFSF2001B	Cut single layer fabrics	LMF02
LMTCL2001B	Use a sewing machine	LMT07
LMTCL2003B	Identify fibres and fabrics	LMT07
LMTCL2006B	Press work	LMT07
LMTCL2007B	Lay up, mark and cut uncomplicated fabrics and lays	LMT07
LMTCL2008B	Finish garment production	LMT07
LMTGN2008B	Coordinate work of team or section	LMT07
LMTGN4002A	Participate in product engineering	LMT07
LMTGN4016A	Contribute to the development of products or processes	LMT07
LMTGN5004A	Manage installation and commissioning of equipment and systems	LMT07
MEM03001B	Perform manual production assembly	MEM05
MEM03003B	Perform sheet and plate assembly	MEM05
MEM03006B	Set assembly stations	MEM05
MEM05005B	Carry out mechanical cutting	MEM05
MEM05007C	Perform manual heating and thermal cutting	MEM05
MEM05012C	Perform routine manual metal arc welding	MEM05
MEM05050B	Perform routine gas metal arc welding	MEM05
MEM05051A	Select welding processes	MEM05
MEM05052A	Apply safe welding practices	MEM05
MEM06003C	Carry out heat treatment	MEM05
MEM07001B	Perform operational maintenance of machines/equipment	MEM05
MEM07015B	Set computer controlled machines/processes	MEM05
MEM07024B	Operate and monitor machine/process	MEM05
MEM07028B	Operate computer controlled machines/processes	MEM05
MEM08002C	Pre-treat work for subsequent surface coating	MEM05
MEM08007B	Control surface finish production and finished product quality	MEM05
MEM08011B	Prepare surfaces using solvents and/or mechanical means	MEM05
MEM08012B	Prepare surfaces by abrasive blasting (basic)	MEM05

MEM08013B	Prepare surfaces by abrasive blasting (advanced)	MEM05
MEM08014B	Apply protective coatings (basic)	MEM05
MEM08015B	Apply protective coatings (advanced)	MEM05
MEM08016B	Control blast coating by-products, materials and emissions	MEM05
MEM09002B	Interpret technical drawing	MEM05
MEM09003B	Prepare basic engineering drawing	MEM05
MEM09004B	Perform electrical/electronic detail drafting	MEM05
MEM09005B	Perform basic engineering detail drafting	MEM05
MEM09006B	Perform advanced engineering detail drafting	MEM05
MEM09009C	Create 2D drawings using computer aided design system	MEM05
MEM09010C	Create 3D models using computer aided design system	MEM05
MEM09011B	Apply basic engineering design concepts	MEM05
MEM09021B	Interpret and produce curved 3-dimensional shapes	MEM05
MEM09141A	Represent mechanical engineering designs	MEM05
MEM09142A	Represent mechatronic engineering designs	MEM05
MEM09151A	Apply computer aided modelling and data management techniques to mechanical engineering designs	MEM05
MEM09152A	Apply computer aided modelling and data management techniques to mechatronic engineering designs	MEM05
MEM10002B	Terminate and connect electrical wiring	MEM05
MEM11001C	Erect/dismantle scaffolding and equipment	MEM05
MEM11002C	Erect/dismantle complex scaffolding and equipment	MEM05
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment	MEM05
MEM11004B	Undertake dogging	MEM05
MEM11005B	Pick and process order	MEM05
MEM11006B	Perform production packaging	MEM05
MEM11007B	Administer inventory procedures	MEM05
MEM11010B	Operate mobile load shifting equipment	MEM05
MEM11011B	Undertake manual handling	MEM05
MEM11012B	Purchase materials	MEM05
MEM11016B	Order materials	MEM05
MEM11017B	Organise and lead stocktakes	MEM05

MEM11021B	Perform advanced operation of load shifting equipment	MEM05
MEM11022B	Operate fixed/moveable load shifting equipment	MEM05
MEM12001B	Use comparison and basic measuring devices	MEM05
MEM12002B	Perform electrical/electronic measurement	MEM05
MEM12003B	Perform precision mechanical measurement	MEM05
MEM12005B	Calibrate measuring equipment	MEM05
MEM12006C	Mark off/out (general engineering)	MEM05
MEM12022B	Program coordinate measuring machines (advanced)	MEM05
MEM12023A	Perform engineering measurements	MEM05
MEM12024A	Perform computations	MEM05
MEM12025A	Use graphical techniques and perform simple statistical computations	MEM05
MEM13001B	Perform emergency first aid	MEM05
MEM13002B	Undertake occupational health and safety activities in the workplace	MEM05
MEM13003B	Work safely with industrial chemicals and materials	MEM05
MEM13004B	Work safely with molten metals/glass	MEM05
MEM13010A	Supervise occupational health and safety in an industrial work environment.	MEM05
MEM13013B	Work safely with ionizing radiation	MEM05
MEM13014A	Apply principles of occupational health and safety in the work environment	MEM05
MEM14001B	Schedule material deliveries	MEM05
MEM14002B	Undertake basic process planning	MEM05
MEM14003B	Undertake basic production scheduling	MEM05
MEM14004A	Plan to undertake a routine task	MEM05
MEM14005A	Plan a complete activity	MEM05
MEM14061A	Plan and design mechanical engineering projects	MEM05
MEM14062A	Plan and design mechatronic engineering projects	MEM05
MEM14063A	Plan and design manufacturing engineering projects	MEM05
MEM14064A	Plan and design maintenance engineering projects	MEM05
MEM14081A	Apply mechanical engineering fundamentals to support design and development of projects	MEM05

MEM14082A	Apply mechatronics fundamentals to support design and development of engineering projects	MEM05
MEM15001B	Perform basic statistical quality control	MEM05
MEM15002A	Apply quality systems	MEM05
MEM15003B	Use improvement processes in team activities	MEM05
MEM15004B	Perform inspection	MEM05
MEM15005B	Select and control inspection processes and procedures	MEM05
MEM15007B	Conduct product and/or process capability studies	MEM05
MEM15008B	Perform advanced statistical quality control	MEM05
MEM15010B	Perform laboratory procedures	MEM05
MEM15011B	Exercise external quality assurance	MEM05
MEM15012B	Maintain/supervise the application of quality procedures	MEM05
MEM15024A	Apply quality procedures	MEM05
MEM16002C	Conduct formal interviews and negotiations	MEM05
MEM16003B	Provide advanced customer service	MEM05
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	MEM05
MEM16006A	Organise and communicate information	MEM05
MEM16006A	Organise and communicate information	MEM05
MEM16007A	Work with others in a manufacturing, engineering or related environment	MEM05
MEM16008A	Interact with computing technology	MEM05
MEM16010A	Write reports	MEM05
MEM16011A	Communicate with individuals and small groups	MEM05
MEM16012A	Interpret technical specifications and manuals	MEM05
MEM16013A	Operate in a self-directed team	MEM05
MEM17001B	Assist in development and deliver training in the workplace	MEM05
MEM17003A	Assist in the provision of on the job training	MEM05
MEM18001C	Use hand tools	MEM05
MEM18002B	Use power tools/hand held operations	MEM05
MEM18003C	Use tools for precision work	MEM05
MEM18006B	Repair and fit engineering components	TBA
MEM18010C	Perform equipment condition monitoring and recording	MEM05

MEM18016B	Analyse plant and equipment condition monitoring results	MEM05
MEM18038B	Maintain wheels and tyres	MEM05
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	MEM05
MEM18055B	Dismantle, replace and assemble engineering components	MEM05
MEM22001A	Perform engineering activities	MEM05
MEM22002A	Manage self in the engineering environment	MEM05
MEM22003A	Manage engineering resources	MEM05
MEM22004A	Manage engineering projects	MEM05
MEM22005A	Manage engineering operations	MEM05
MEM22006A	Source and estimate materials	MEM05
MEM22007A	Manage environmental effects of engineering activities	MEM05
MEM22008A	Manage change and technical development	MEM05
MEM22009A	Manage technical sales and promotion	MEM05
MEM23001A	Apply advanced mathematical techniques in a manufacturing engineering or related environment	MEM05
MEM23002A	Apply calculus in engineering situations	MEM05
MEM23003A	Operate and program computers and/or controllers in engineering situations	MEM05
MEM23041A	Apply basic scientific principles and techniques in mechanical engineering situations	MEM05
MEM23051A	Apply basic electro and control scientific principles and techniques in mechanical and manufacturing engineering situations	MEM05
MEM23061A	Select and test mechanical engineering materials	MEM05
MEM23062A	Select and test mechatronic engineering materials	MEM05
MEM23071A	Select and apply mechanical engineering methods, processes and construction techniques	MEM05
MEM23072A	Select and apply mechatronic engineering methods, processes and construction techniques	MEM05
MEM23081A	Apply scientific principles and techniques in mechanical engineering situations	MEM05
MEM23082A	Apply scientific principles and techniques in mechatronic engineering situations	MEM05
MEM23083A	Apply industrial engineering principles and techniques in	MEM05

	competitive manufacturing engineering situations	
MEM23091A	Apply mechanical system design principles and techniques in mechanical engineering situations	MEM05
MEM23092A	Apply automated systems principles and techniques in engineering situations	MEM05
MEM23093A	Apply plant and process design principles and techniques in engineering situations	MEM05
MEM23094A	Apply maintenance systems principles and techniques in engineering situations	MEM05
MEM24001B	Perform basic penetrant testing	MEM05
MEM24002B	Perform penetrant testing	MEM05
MEM24003B	Perform basic magnetic particle testing	MEM05
MEM24004B	Perform magnetic particle testing	MEM05
MEM24005B	Perform basic eddy current testing	MEM05
MEM24006B	Perform eddy current testing	MEM05
MEM24007B	Perform ultrasonic thickness testing	MEM05
MEM24008B	Perform ultrasonic testing	MEM05
MEM24009B	Perform basic radiographic testing	MEM05
MEM24010B	Perform radiographic testing	MEM05
MEM24011B	Establish non-destructive tests	MEM05
MEM24012B	Apply metallurgy principles	TBA
MEM30001A	Use computer aided drafting systems to produce basic engineering drawings	MEM05
MEM30002A	Produce basic engineering graphics	MEM05
MEM30003A	Produce detailed engineering drawings	MEM05
MEM30004A	Use CAD to create and display 3D models	MEM05
MEM30005A	Calculate force systems within simple beam structures	MEM05
MEM30006A	Calculate stresses in simple structures	MEM05
MEM30007A	Select common engineering materials	MEM05
MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications	MEM05
MEM30009A	Contribute to the design of basic mechanical systems	MEM05
MEM30010A	Set up basic hydraulic circuits	MEM05
MEM30011A	Set up basic pneumatic circuits	MEM05

MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	MEM05
MEM30013A	Assist in the preparation of a basic workplace layout	MEM05
MEM30014A	Apply basic just in time systems to the reduction of waste	MEM05
MEM30015A	Develop recommendations for basic set up time improvements	MEM05
MEM30016A	Assist in the analysis of a supply chain	MEM05
MEM30017A	Use basic preventative maintenance techniques and tools	MEM05
MEM30018A	Undertake basic process planning	MEM05
MEM30019A	Use resource planning software systems in manufacturing	MEM05
MEM30020A	Develop and manage a plan for a simple manufacturing related project	MEM05
MEM30021A	Prepare a simple production schedule	MEM05
MEM30022A	Undertake supervised procurement activities	MEM05
MEM30023A	Prepare a simple cost estimate for a manufactured product	MEM05
MEM30024A	Participate in quality assurance techniques	MEM05
MEM30025A	Analyse a simple electrical system circuit	MEM05
MEM30027A	Prepare basic programs for programmable logic controllers	MEM05
MEM30028A	Assist in sales of technical products/systems	MEM05
MSL913001A	Communicate with other people	MSL09
MSL913002A	Plan and conduct laboratory/field work	MSL09
MSL922001A	Record and present data	MSL09
MSL933001A	Maintain the laboratory/field workplace fit for purpose	MSL09
MSL933002A	Contribute to the achievement of quality objectives	MSL09
MSL933003A	Apply critical control point requirements	MSL09
MSL934001A	Contribute to the ongoing development of HACCP plans	MSL09
MSL934002A	Apply quality system and continuous improvement processes	MSL09
MSL943001A	Work safely with instruments that emit ionising radiation	MSL09
MSL943002A	Participate in laboratory/field workplace safety	MSL09
MSL952001A	Collect routine site samples	MSL09
MSL952002A	Handle and transport samples or equipment	MSL09
MSL953001A	Receive and prepare samples for testing	MSL09

MSL954001A	Obtain representative samples in accordance with sampling plan	MSL09
MSL963001A	Operate basic handblowing equipment	MSL09
MSL963002A	Repair glass apparatus using simple glassblowing equipment	MSL09
MSL973001A	Perform basic tests	MSL09
MSL973002A	Prepare working solutions	MSL09
MSL973003A	Prepare culture media	MSL09
MSL973004A	Perform aseptic techniques	MSL09
MSL973005A	Assist with fieldwork	MSL09
MSL973006A	Prepare trial batches for evaluation	MSL09
MSL973007A	Perform microscopic examination	MSL09
MSL973012A	Assist with geotechnical site investigations	MSL09
MSL974001A	Prepare, standardise and use solutions	MSL09
MSL974002A	Conduct geotechnical site investigations	MSL09
MSL974003A	Perform chemical tests and procedures	MSL09
MSL974005A	Perform physical tests	MSL09
MSL974010A	Perform mechanical tests	MSL09
MSL975016A	Perform complex tests to measure engineering properties of materials	MSL09
PMAOHS310A	Investigate incidents	PMA02
PMAOPS101B	Read dials and indicators	PMA02
PMAOPS350A	Match and adjust colour	PMA02
PMAOPS450A	Solve colour problems	PMA02
PMAOPS550A	Develop a colour formulation	PMA02
PMAOPS600B	Modify plant	PMA02
PMASUP420A	Minimise environmental impact of process	PMA02
PMASUP520A	Review procedures to minimise environmental impact of process	PMA02
PMASUP540A	Analyse equipment performance	PMA02
PMBFIN201C	Finish products and components	PMB07
PMBFIN205C	Hand decorate products	PMB07
PMBHAN103C	Shift materials safely by hand	PMB07
PMBPREP205C	Assemble materials and equipment for production	PMB07

PMBPREP206C	Prepare materials to formulae	PMB07
PMBPREP301C	Set up and prepare for production	PMB07
PMBPREP303C	Set up equipment for continuous operation	PMB07
PMBPREP304C	Set a die	PMB07
PMBPREP305B	Change extrusion die and setup	PMB07
PMBPROD221B	Operate rotational moulding equipment	PMB07
PMBPROD235C	Use materials and process knowledge to complete work operations	PMB07
PMBPROD236C	Operate hand held air/power equipment for production processes	PMB07
PMBPROD240C	Cut materials	PMB07
PMBPROD241C	Lay up rubber lining or lag pulleys	PMB07
PMBPROD242A	Bond polymers to surfaces	PMB07
PMBPROD248C	Prepare surfaces for coating	PMB07
PMBPROD265C	Operate portable vulcanising equipment	PMB07
PMBPROD321B	Produce rotational moulded products	PMB07
PMBPROD323C	Produce powder coated products	PMB07
PMBPROD375B	Vulcanise products using an autoclave	PMB07
PMBPROD430B	Trial a new die/tool	PMB07
PMBPROD431B	Trial a new, advanced or complex mould	PMB07
PMBTECH301B	Use material and process knowledge to solve problems	PMB07
PMBTECH302A	Modify existing compounds	PMB07
PMBTECH303A	Make minor modifications to products	PMB07
PMBTECH401B	Predict polymer properties and characteristics	PMB07
PMBTECH402B	Set advanced or complex dies	PMB07
PMBTECH406A	Diagnose production equipment problems	PMB07
PMBTECH501B	Analyse equipment performance	PMB07
PMBTECH502B	Review and analyse production trials and specify retrials	PMB07
PMBTECH503B	Determine rheology and output of plastics materials from processing equipment	PMB07
PMBTECH504B	Determine heat transfer loads for processing equipment	PMB07
PMBTECH505B	Choose polymer materials for an application	PMB07
PMBTECH506B	Analyse the design of products and tools	PMB07

PMBTECH507A	Develop fibre composite products using cored-laminate techniques	PMB01
PMBTECH508A	Develop a new compound	PMB07
PMBTECH509A	Modify an existing product	PMB07
PMBTECH510A	Analyse failure in polymeric materials	PMB07
PMBTECH601B	Develop a new product	PMB07
PMBTECH602B	Develop a new die or tool	PMB07
PMBTECH603B	Design structural/mechanical polymer components	PMB07
PSPGOV408A	Value diversity	PSP04
RIIOHS204A	Work safely at heights	RII09
RIIRIS201A	Conduct local risk control	RII09
SIRXCCS001A	Apply point-of-sale handling procedures	SIR07
SIRXINV004A	Buy merchandise	SIR07
SIRXMER002A	Coordinate merchandise presentation	SIR07
SIRXMER004A	Manage merchandise and store presentation	SIR07
SIRXRSK001A	Minimise theft	SIR07
SIRXRSK002A	Maintain store security	SIR07
SIRXSLS002A	Advise on products and services	SIR07
SITXMGT006A	Establish and conduct business relationships	SIT07
SITXMPR001A	Coordinate production of brochures and marketing materials	SIT07
SITXMPR002A	Create a promotional display or stand	SIT07
SITXMPR004A	Coordinate marketing activities	SIT07
TAADEL301B	Provide training through instruction and demonstration of work skills	TBA
TAEASS401A	Plan assessment activities and processes	TAE10
TAEASS402A	Assess competence	TAE10
TAEASS403A	Participate in assessment validation	TAE10
TAEDEL301A	Provide work skill instruction	TAE10
TLID1007C	Operate a forklift	TLI07
UEGNSG604A	Fill gas cylinders	UEG06
UEPMNT420A	Perform Electrical/Electronic Drafting	UEP06

Mapping to Previous Training Package

Mapping to Previous Training Package

MSA07 Manufacturing Training Package – summary mapping

Mapping of MSA07v6 qualifications to MSA07v5.1

MSA07v5.1		MSA07v6		
Code	**Title**	**Code**	**Title**	**Rela**
MSA10107	Certificate I in Manufacturing (Pathways)	MSA10107	Certificate I in Manufacturing (Pathways)	No c
MSA10207	Certificate I in Process Manufacturing	MSA10207	Certificate I in Process Manufacturing	No c
MSA20107	Certificate II in Process Manufacturing	MSA20107	Certificate II in Process Manufacturing	Susta impc
MSA20208	Certificate II in Manufacturing Technology	MSA20208	Certificate II in Manufacturing Technology	Flex equi
		MSA20510	Certificate II in Recreational Vehicle Service and Repair	New
		MSA20610	Certificate II in Recreational Vehicle Manufacture	New
MSA21108	Certificate II in Competitive Manufacturing	MSA21108	Certificate II in Competitive Manufacturing	No c
MSA30107	Certificate III in Process Manufacturing	MSA30107	Certificate III in Process Manufacturing	Susta impc
MSA30208	Certificate III in Manufacturing Technology	MSA30208	Certificate III in Manufacturing Technology	Susta extra flexi equi
MSA30309	Certificate III in Surface Preparation and Coating Application	MSA30309	Certificate III in Surface Preparation and Coating Application	Two upda
		MSA30510	Certificate III in Recreational Vehicle Service and Repair	New

		MSA30610	Certificate III in Recreational Vehicle Manufacture	New
		MSA30710	Certificate III in Recreational Vehicle and Accessories Retailing	New
MSA31108	Certificate III in Competitive Manufacturing	MSA31108	Certificate III in Competitive Manufacturing	No c
MSA40108	Certificate IV in Manufacturing Technology	MSA40108	Certificate IV in Manufacturing Technology	Susta extra unit requ bank
		MSA40510	Certificate IV in Recreational Vehicles	New
		MSA40710	Certificate IV in Recreational Vehicle and Accessories Retailing	New
MSA41108	Certificate IV in Competitive Manufacturing	MSA41108	Certificate IV in Competitive Manufacturing	No c
MSA50108	Diploma of Manufacturing Technology	MSA50108	Diploma of Manufacturing Technology	Susta extra flexi equi
		MSA50510	Diploma of Recreational Vehicles	New
MSA51108	Diploma of Competitive Manufacturing	MSA51108	Diploma of Competitive Manufacturing	Rew Equi
MSA60108	Advanced Diploma of Manufacturing Technology	MSA60108	Advanced Diploma of Manufacturing Technology	One for f
MSA61108	Advanced Diploma of Competitive Manufacturing	MSA61108	Advanced Diploma of Competitive Manufacturing	Rew Equi
MSA71109	Vocational Graduate Certificate in Competitive Manufacturing	MSA71109	Vocational Graduate Certificate in Competitive Manufacturing	One flexi
MSA81109	Vocational Graduate Diploma of Competitive Manufacturing	MSA81109	Vocational Graduate Diploma of Competitive Manufacturing	One flexi

MSA07v6 – additional units of competency

New units in MSA07v6

Unit Code	Title
MSAPMWJ201A	Use high pressure water jetting equipment
MSAPMWJ301A	Operate a high pressure water jetting system
MSAPMOPS601A	Design equipment and system modifications
MSARVG201A	Tow a recreational vehicle safely
MSARVS201A	Install LP gas systems in a recreational vehicle
MSARVS202A	Repair/service LP gas systems in a recreational vehicle
MSARVS301A	Develop and update caravan industry knowledge
MSARVS401A	Assess and quote to service a recreational vehicle
MSARVT201A	Apply technical knowledge of recreational vehicle manufacturing to work activities

Additional imported units

Unit Code	Title
AUM3003B	Document designs
AUM8012B	Prepare and document quotation
AUM8081B	Apply trim to components
AURA354616A	Determine legal aspects of an automotive service and repair contract
AURA454516A	Determine retail rates for work
AURC252327A	Identify, clarify and resolve problems
AURC270421A	Establish relations with customers
AURC341903A	Apply relevant finance, leasing and insurance contracts/policies

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Unit Code	Title
AURC361101A	Adapt work processes to new technologies
AURC362721A	Establish customer requirements of a complex nature
AURC362807A	Build customer relations
AURC363337A	Maintain business image
AURC365722A	Estimate complex jobs
AURC463238A	Manage complex customer issues
AURC465349A	Prepare written repair quotation
AURC561614A	Contribute to business improvement
AURE218670A	Service, maintain or replace batteries
AURE218708A	Carry out repairs to single electrical circuits
AURE220140A	Manufacture and repair wiring harness/looms
AURE311666A	Repair electric braking systems
AURS238127A	Identify and select automotive parts and products
AURS238150A	Present stock and sales area
AURS241303A	Apply sales procedures
AURS241608A	Carry out cash and/or credit/funds transfer transactions
AURS241769A	Sell product(s)
AURS241803A	Apply legal requirements relating to product sales
AURS242621A	Promote products and services
AURS252290A	Process customer complaints
AURS338103A	Apply automotive parts interpretation process
AURT210170A	Inspect and service braking systems
AURT216170A	Inspect and service suspension systems
AURT217865A	Remove and refit wheel hubs and associated brake components

Unit Code	Title
AURT365508A	Carry out vehicle safety/roadworthy inspection
AURT577620A	Develop and document specifications and procedures
AURT577727A	Identify and calculate total costs of work
AURV226965A	Remove and replace/fit protector mouldings, transfers and decals
AURV230449A	Apply paint touchup techniques
AURV324866A	Repair fibreglass/composite material components
AURV328366A	Repair chassis/frame and associated components
AURV331423CA	Fabricate and install canvas products
AURV331423DA	Fabricate and install frame structures
AURV331423GA	Fabricate and install canopies and curtains
AURV334031A	Install side windows
AURV365356A	Read and interpret vehicle body repair estimation/quotation
AURV465116A	Determine vehicle body damage and recommend repair procedures
BSBCUS501A	Manage quality customer service
BSBFIM501A	Manage budgets and financial plans
MEM03003B	Perform sheet and plate assembly
MEM05005B	Carry out mechanical cutting
MEM05050B	Perform routine gas metal arc welding
MEM05052A	Apply safe welding practices
MEM07015B	Set computer controlled machines/processes
MEM07024B	Operate and monitor machine/process
MEM07028B	Operate computer controlled machines/processes
MEM09010C	Create 3D models using computer aided design system
MEM10002B	Terminate and connect electrical wiring

Unit Code	Title
MEM11017B	Organise and lead stocktakes
MEM12002B	Perform electrical/electronic measurement
MEM12006C	Mark off/out (general engineering)
MEM16003B	Provide advanced customer service
MEM18038B	Maintain wheels and tyres
MEM18045A	Fault find/repair electrical equipment/components up to 250 volts single phase supply
PMBPROD221B	Operate rotational moulding equipment
PMBPROD321B	Produce rotational moulded products
PSPGOV408A	Value diversity
SIRXCCS001A	Apply point-of-sale handling procedures
SIRXINV004A	Buy merchandise
SIRXMER002A	Coordinate merchandise presentation
SIRXMER004A	Manage merchandise and store presentation
SIRXRSK001A	Minimise theft
SIRXRSK002A	Maintain store security
SIRXSLS002A	Advise on products and services
SITXMGT006A	Establish and conduct business relationships
SITXMPR001A	Coordinate the production of brochures and marketing materials
SITXMPR002A	Create a promotional display or stand
SITXMPR004A	Coordinate marketing activities
TAEASS401A	Plan assessment activities and processes
TAEASS402A	Assess competence
TAEASS403A	Participate in assessment validation

Unit Code	Title
TAEDEL301A	Provide work skill instruction
UEGNSG604A	Fill gas cylinders
UTENES209B	Attach flexible cords and plugs to electrical equipment to 250 volt supply

Changes to imported units

	Superseded unit		Replacement unit in MSA07v6	Comment
MNMC205A	Conduct local risk assessment	RIIRIS201A	Conduct local risk control	Equivalent
MNMG237A	Work safely at heights	RIIOHS204A	Work safely at heights	Equivalent
LMTEMGN06A	Design equipment and system modifications	MSAPMOPS601A	Design equipment and system modifications	Unit deleted and not replaced – new unit equivalent
LMTPDHL06A	Manage product development projects			Unit deleted and not replaced – removed from Manufacturing Technology qualifications.

Mapping of Recreational Vehicle units and qualifications to previous THC04 Training Package

MSA07v6 Recreational Vehicle qualifications – mapping to THC04 qualifications

MSA07v6	THC04

Code	Title	Code	Title
		THC20304	Certificate II in Recreational Vehicle and Accessories Retailing
		THC40104	Certificate IV in Recreational Vehicle Manufacturing
		THC40204	Certificate IV in Recreational Vehicle Servicing
MSA20510	Certificate II in Recreational Vehicle Service and Repair	THC20204	Certificate II in Recreational Vehicle Servicing
MSA20610	Certificate II in Recreational Vehicle Manufacture	THC20104	Certificate II in Recreational Vehicle Manufacturing
MSA30510	Certificate III in Recreational Vehicle Service and Repair	THC30204	Certificate III in Recreational Vehicle Servicing
MSA30610	Certificate III in Recreational Vehicle Manufacture	THC30104	Certificate III in Recreational Vehicle Manufacturing
MSA30710	Certificate III in Recreational Vehicle and Accessories Retailing	THC30304	Certificate III in Recreational Vehicle and Accessories Retailing
MSA40510	Certificate IV in Recreational Vehicles		
MSA40710	Certificate IV in Recreational Vehicle and Accessories Retailing	THC40304	Certificate IV in Recreational Vehicle and Accessories Retailing
MSA50510	Diploma of Recreational Vehicles	THC50104	Diploma of Recreational Vehicle Manufacturing

MSA07v6 Recreational Vehicle Units of Competency, with prerequisite requirements – mapping to THC04 units

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
AUM3003B	Document designs			
AUM8012B	Prepare and document quotation			
AUM8081B	Apply trim to components			Previously covered in T MAN08B, MAN09B
AURA354616A	Determine legal aspects of an automotive service and repair contract			
AURA454516A	Determine retail rates for work			
AURC252327A	Identify, clarify and resolve problems			
AURC270421A	Establish relations with customers			Previously covered in V
AURC341903A	Apply relevant finance, leasing and insurance contracts/policies			
AURC361101A	Adapt work processes to new technologies			
AURC362721A	Establish customer requirements of a complex nature			
AURC362807A	Build customer relations			
AURC363337A	Maintain business image			
AURC365722A	Estimate complex jobs			
AURC463238A	Manage complex customer issues			
AURC465349A	Prepare written repair quotation			

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
AURC561614A	Contribute to business improvement			
AURE218670A	Service, maintain or replace batteries			
AURE218708A	Carry out repairs to single electrical circuits			Previously covered in T THCSER04B
AURE220140A	Manufacture and repair wiring harness/looms			Previously covered in T THCMAN04B, THCSE
AURE311666A	Repair electric braking systems			Previously covered in T THCSER10A
AURS238127A	Identify and select automotive parts and products			
AURS238150A	Present stock and sales area			
AURS241303A	Apply sales procedures			
AURS241608A	Carry out cash and/or credit/funds transfer transactions			
AURS241769A	Sell product(s)			Previously covered in W WRRS1B
AURS241803A	Apply legal requirements relating to product sales		THHGLE20 B	Develop and maintain th knowledge required for compliance
AURS242621A	Promote products and services		WRRS1B	Sell products and servic
AURS252290A	Process customer complaints			
AURS338103A	Apply automotive parts interpretation process			
AURT210170A	Inspect and service braking systems			Previously covered in T THCSER10A
AURT216170A	Inspect and service suspension			Previously covered in T

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
	systems			THCSER10A
AURT217865A	Remove and refit wheel hubs and associated brake components			Previously covered in T THCSER10A
AURT365508A	Carry out vehicle safety/roadworthy inspection			
AURT577620A	Develop and document specifications and procedures			
AURT577727A	Identify and calculate total costs of work			
AURV226965A	Remove and replace/fit protector mouldings, transfers and decals			Previously covered in T SER06B, SER08B, SEF
AURV230449A	Apply paint touchup techniques			Previously covered in T SER06B, SER08B, SEF
AURV324866A	Repair fibreglass/composite material components			
AURV328366A	Repair chassis/frame and associated components		THCSER01 B	Repair/service a recreat chassis
AURV331423C A	Fabricate and install canvas products			
AURV331423D A	Fabricate and install frame structures			
AURV331423G A	Fabricate and install canopies and curtains			
AURV334031A	Install side windows			Previously covered in T
AURV365356A	Read and interpret vehicle body repair estimation/quotation			
AURV465116A	Determine vehicle body damage and recommend repair procedures			
BSBCUS501A	Manage quality customer service		THHGLE11 B	Manage quality custom

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
BSBFIM501A	Manage budgets and financial plans		THHGLE13 B	Manage finances within
MEM03001B	Perform manual production assembly			Previously covered in T MAN03B, MAN06B, M MAN08B, MAN10A
MEM03003B	Perform sheet and plate assembly	MEM18001C MEM18002B		
MEM03006B	Set assembly stations	MEM03001B MEM18001C		
MEM05005B	Carry out mechanical cutting	MEM12023A MEM18001C	THCSTS07 A	Carry out mechanised c
MEM05012C	Perform routine manual metal arc welding		MEM05012 B	Perform routine manual welding
MEM05050B	Perform routine gas metal arc welding		MEM05050 A	Perform routine gas met
MEM05052A	Apply safe welding practices			
MEM07015B	Set computer controlled machines/processes	MEM07024B MEM07028B MEM09002B MEM12023A MEM18001C		
MEM07024B	Operate and monitor machine/process			Previously covered in T THCSER09B, THCSTS
MEM07028B	Operate computer controlled machines/processes	MEM07024B		
MEM09002B	Interpret technical drawing			Previously covered in T MAN10A, THCSER02 SER06B, SER07B, SEF THCSTS05A
MEM09003B	Prepare basic engineering drawing	MEM09002B		
MEM09009C	Create 2D drawings using	MEM09002B		

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
	computer aided design system	MEM16008A		
MEM09010C	Create 3D models using computer aided design system	MEM09002B MEM16008A MEM09009C		
MEM10002B	Terminate and connect electrical wiring	MEM09002B MEM12002B MEM18001C		
MEM11007B	Administer inventory procedures			Previously covered in T
MEM11010B	Operate mobile load shifting equipment			
MEM11011B	Undertake manual handling			
MEM11012B	Purchase materials			Previously covered in T
MEM11017B	Organise and lead stocktakes	MEM11007B		Previously covered in T
MEM12002B	Perform electrical/electronic measurement			
MEM12006C	Mark off/out (general engineering)	MEM09002B MEM12023A		Previously covered in T MAN03B, MAN09B, T SER03B, SER08B
MEM12023A	Perform engineering measurements		THCSTS04 A	Carry out measurements
MEM13002B	Undertake occupational health and safety activities in the workplace			previously covered in T GLE04B
MEM13010A	Supervise occupational health and safety in an industrial work environment	MEM13002B		Previously covered in T
MEM14001B	Schedule material deliveries			Previously covered in T
MEM14002B	Undertake basic process planning			Previously covered in T

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
MEM14003B	Undertake basic production scheduling			Previously covered in T
MEM14004A	Plan to undertake a routine task			Previously covered in T
MEM15002A	Apply quality systems			
MEM15004B	Perform inspection			
MEM15005B	Select and control inspection processes and procedures	MEM15004B		
MEM15024A	Apply quality procedures		THCGQA01 B	Apply quality standards
MEM16002C	Conduct formal interviews and negotiations			
MEM16003B	Provide advanced customer service			
MEM16006A	Organise and communicate information		THHGGA03 B	Source and present info
MEM16008A	Interact with computing technology		THHGGA02 B	Perform office procedu
MEM16009A	Research and analyse engineering information	MEM16006A MEM16012A		
MEM16012A	Interpret technical specifications and manuals			
MEM18001C	Use hand tools			Previously covered in T MAN03B, MAN06B, M MAN08B, MAN09B, M THCSER02B, SER03B SER07B, SER08B, SEF THCSTS02A
MEM18002B	Use power tools/hand held operations			Previously covered in T MAN03B, MAN06B, M MAN08B, MAN09B, M

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MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
				THCSER02B, THCSTS
MEM18038B	Maintain wheels and tyres	MEM18001C		Previously covered in T SER10A
MEM18045A	Fault find/repair electrical equipment/components up to 250 volts single phase supply	MEM09002B MEM10002B MEM12002B MEM12023A MEM18001C MEM18002B		
MEM22006A	Source and estimate materials	MEM16006A		Previously covered in T
MEM30013A	Assist in the preparation of a basic workplace layout			
MSACMC411 A	Lead a competitive manufacturing team			
MSACMS201A	Sustain process improvements			
MSACMS401A	Ensure process improvements are sustained			
MSACMT221A	Apply Just in Time (JIT) procedures			
MSACMT240A	Apply 5S procedures in a manufacturing environment			
MSACMT280A	Undertake root cause analysis			
MSACMT281A	Contribute to the application of a proactive maintenance strategy			
MSACMT421A	Facilitate a Just in Time (JIT) system			
MSACMT440A	Lead 5S in a manufacturing environment			
MSACMT441A	Facilitate continuous improvement			

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
	in manufacturing			
MSACMT451A	Mistake proof a production process			
MSACMT452A	Apply statistics to processes in manufacturing			
MSACMT482A	Assist in implementing a proactive maintenance strategy			
MSACMT641A	Implement a continuous improvement system			
MSACMT675A	Facilitate the development of a new product	MSACMT452A		Previously covered in T
MSACMT681A	Develop a proactive maintenance strategy			
MSAENV272B	Participate in environmentally sustainable work practices			
MSAENV472B	Implement and monitor environmentally sustainable work practices			
MSAENV672B	Develop workplace policy and procedures for environmental sustainability			
MSAPMOHS200A	Work safely		THHCOR03 B	Follow health safety an procedures
MSAPMOHS220A	Provide initial First Aid response		THHGHS03 B	Provide first aid
MSAPMOPS101A	Make measurements			
MSAPMOPS212A	Use enterprise computers or data systems			Previously covered in B CMN305A
MSAPMSUP100A	Apply workplace procedures		THHGLE01 B	Monitor work operation

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
MSAPMSUP101A	Clean workplace or equipment			Previously covered in T THCSTS02A, STS03A
MSAPMSUP102A	Communicate in the workplace			Previously covered in T
MSAPMSUP106A	Work in a team			Previously covered in T
MSAPMSUP200A	Achieve work outcomes			
MSAPMSUP210A	Process and record information			
MSAPMSUP280A	Manage conflict at work		THHGCS03B	Deal with conflict situat
MSAPMSUP291A	Participate in continuous improvement			
MSAPMSUP383A	Facilitate a team			Previously covered in T
MSAPMSUP390A	Use structured problem solving tools			
MSAPMSUP400A	Develop and monitor quality systems			
MSARVG201A	Tow a recreational vehicle safely		THCGHS09B	Tow a recreational vehi
MSARVS201A	Install LP gas systems in a recreational vehicle		THCMAN05B	Install LP gas systems i vehicle
MSARVS202A	Repair/service LP gas systems in a recreational vehicle		THCSER05B	Repair/service LP gas s recreational vehicle
MSARVS301A	Develop and update caravan industry knowledge		THCCORO4B	Develop & update carav knowledge
MSARVS401A	Assess and quote to service a recreational vehicle		THCSER11A	Assess and quote the jo
MSARVT201A	Apply technical knowledge of		THCSTS01	Apply technical knowle

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
	recreational vehicle manufacturing to work activities		A	recreational vehicle ma... work activities
PMBPROD221B	Operate rotational moulding equipment			
PMBPROD321B	Produce rotational moulded products	PMBPROD221B		
PSPGOV408A	Value diversity		THHGLE09B	Manage workplace dive...
SIRXCCS001A	Apply point-of-sale handling procedures		WRRCS2B	Apply point of sale han...
SIRXINV004A	Buy merchandise		WRR14B	Buy merchandise
SIRXMER002A	Coordinate merchandise presentation		WRRM3B	Co-ordinate merchandis...
SIRXMER004A	Manage merchandise and store presentation		WRR01B	Manage merchandising presentation
SIRXRSK001A	Minimise theft		WRRLP2B	Minimise theft
SIRXRSK002A	Maintain store security			
SIRXSLS002A	Advise on products and services		WRRS2B	Advise on products and...
SITXMGT006A	Establish and conduct business relationships			
SITXMPR001A	Coordinate the production of brochures and marketing materials		THTSMA01B	Co-ordinate the product... and marketing materials
SITXMPR002A	Create a promotional display or stand			Previously covered in T... THTSMA02B
SITXMPR004A	Coordinate marketing activities			
TAEASS401A	Plan assessment activities and processes			
TAEASS402A	Assess competence			

MSA07 Unit Code	Title	Prerequisites	THC04 Unit Code	Title
TAEASS403A	Participate in assessment validation	TAEASS402A		
TAEDEL301A	Provide work skill instruction		THHGTR01B	Coach others in job skil
TLID1007C	Operate a forklift			
UEGNSG604A	Fill gas cylinders			
UTENES209B	Attach flexible cords and plugs to electrical equipment to 250 volt supply		UTENES209B	Attach flexible cords an electrical equipment to

THC04 to MSA07v6

THC04 Unit Code	Title	MSA07 Unit Code	Title
BSBADM408A	Process financial reports		
BSBCMN108A	Develop keyboard skills		
BSBCMN205A	Use business technology		

THC04 Unit Code	Title	MSA07 Unit Code	Title
BSBCMN213A	Produce simple word processed documents	MSAPMOPS212A	Use enterprise computers or da
BSBCMN305A	Create and use databases	MSAPMOPS212A	Use enterprise computers or da
BSBCMN306A	Produce business documents		
BSBEBUS302A	Use and maintain electronic mail system		
BSBEBUS403A	Communicate electronically		
BSZ404A	Train small groups		
MEM5.12AB	Perform routine manual metal arc welding	MEM05012C	Perform routine manual metal welding
MEM5.50AA	Perform routine gas metal arc welding	MEM05050B	Perform routine gas metal arc
THCCOR05B	Plan & organise daily work	MEM14004A MSAPMSUP101A	Plan to undertake a routine tas Clean workplace or equipment
THCCORO4B	Develop & update caravan industry knowledge	MSARVS001A	Develop and update caravan in knowledge
THCGHS06B	Meet occupational health and safety requirements associated with electrical work		
THCGHS09B	Tow a recreational vehicle safely	MSARVG201A	Tow a recreational vehicle saf
THCGQA01B	Apply quality standards and procedures	MEM15024A	Apply quality procedures
THCMAN02B	Build the floor for a recreational vehicle		

THC04 Unit Code	Title	MSA07 Unit Code	Title
THCMAN03B	Construct and install the walls and roof for a recreational vehicle		
THCMAN04B	Install 12/24 volt DC cabling in a recreational vehicle	AURE220140A	Manufacture and repair wiring harness/looms
THCMAN05B	Install LP gas systems in a recreational vehicle	MSARVS201A	Install LP gas systems in a rec: vehicle
THCMAN06B	Install furniture and appliances within a recreational vehicle		
THCMAN07B	Install and connect the water system within a recreational vehicle		
THCMAN08B	Sheet, glaze and finish a recreational vehicle		
THCMAN09B	Build furniture for a recreational vehicle		
THCMAN10A	Assess and carry out non-structural modifications to the chassis of a recreational vehicle		
THCRET01B	Plan and construct an outdoor marketing display	SITXMPR002A	Create a promotional display c

THC04 Unit Code	Title	MSA07 Unit Code	Title
THCSER01B	Repair/service a recreational vehicle chassis		
THCSER02B	Replace floor coverings in a recreational vehicle		
THCSER03B	Repair walls and roof of a recreational vehicle		
THCSER04B	Repair/replace 12/24 volt DC electrical cabling within a recreational vehicle		
THCSER05B	Repair/service LP gas systems in a recreational vehicle	MSARVS202A	Repair/service LP gas systems recreational vehicle
THCSER06B	Remove and re-install furniture and appliances in a recreational vehicle		
THCSER07B	Service, repair water system in a recreational vehicle	MEM09002B MEM18001C	Interpret technical drawing Use hand tools
THCSER08B	Replace damaged sheeting & glazing of a recreational vehicle	MEM09002B MEM12006C MEM18001C AURV226965A	Interpret technical drawing Mark off/out (general engineer Use hand tools Remove and replace/fit protect mouldings, transfers and decal
THCSER09B	Repair/replace furniture in a recreational vehicle		

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THC04 Unit Code	Title	MSA07 Unit Code	Title
THCSER10A	Repair or service running gear for a recreational vehicle		
THCSER11A	Assess and quote the job	MSARVS401A	Assess and quote to service a recreational vehicle
THCSTS01A	Apply technical knowledge of recreational vehicle manufacturing to work activities	MSARVT201A	Apply technical knowledge of recreational vehicle manufactu work activities
THCSTS02A	Use hand and power tools		
THCSTS03A	Use small plant and equipment		
THCSTS04A	Carry out measurements and calculations	MEM12023A	Perform engineering measurer
THCSTS05A	Read and interpret plans and drawings for a recreational vehicle	MEM09002B	Interpret technical drawing
THCSTS07A	Carry out mechanised cutting	MEM05005B	Carry out mechanical cutting
THHCOR01B	Work with colleagues and customers		
THHCOR03B	Follow health safety and security procedures	MSAPMOHS200A	Work safely
THHGCS03B	Deal with conflict situations	MSAPMSUP280A	Manage conflict at work
THHGFA02B	Maintain financial records		

THC04 Unit Code	Title	MSA07 Unit Code	Title
THHGFA06B	Interpret financial information		
THHGGA01B	Communicate on the telephone		
THHGGA02B	Perform office procedures	MEM16008A	Interact with computing techno
THHGGA03B	Source and present information	MEM16006A	Organise and communicate inf
THHGGA06B	Receive and store stock	MEM14001B MEM11007B	Schedule material deliveries Administer inventory procedu
THHGGA10B	Monitor and obtain materials and services		
THHGHS03B	Provide first aid	MSAPMOHS220 A	Provide initial First Aid respor
THHGLE01B	Monitor work operations	MSAPMSUP100 A	Apply workplace procedures
THHGLE02B	Implement workplace health, safety and security procedures		
THHGLE03B	Develop and implement operational plans	MEM14002B MEM14003B MSACMT675A	Undertake basic process plann Undertake basic production sc Facilitate the development of a product
THHGLE04B	Establish and maintain a safe and secure workplace	MEM13002B	Undertake occupational health activities in the workplace
THHGLE05B	Roster staff		
THHGLE06B	Monitor staff performance		
THHGLE08B	Lead and manage people	MSAPMSUP383 A	Facilitate a team
THHGLE09B	Manage workplace diversity	PSPGOV408A	Value diversity
THHGLE11B	Manage quality customer service	BSBCUS501A	Manage quality customer serv

THC04 Unit Code	Title	MSA07 Unit Code	Title
THHGLE13B	Manage finances within a budget	BSBFIM501A	Manage budgets and financial
THHGLE14B	Prepare and monitor budgets		
THHGLE20B	Develop and maintain the legal knowledge required for business compliance	AURS241803A	Apply legal requirements relat product sales
THHGTR01B	Coach others in job skills	TAEDEL301A	Provide work skill instruction
THTSMA01B	Co-ordinate the production of brochures and marketing materials	SITXMPR001A	Coordinate the production of b and marketing materials
THTSMA02B	Create a promotional display/stand	SITXMPR002A	Create a promotional display o
UTENES209B	Attach flexible cords and plugs to electrical equipment to 250 volt supply	UTENES209B	Attach flexible cords and plug electrical equipment to 250 vo
WRR01B	Manage merchandising and store presentation	SIRXMER004A	Manage merchandise and store presentation
WRR14B	Buy merchandise	SIRXINV004A	Buy merchandise
WRRCS2B	Apply point of sale handling procedures	SIRXCCS001A	Apply point-of-sale handling p
WRRLP2B	Minimise theft	SIRXRSK001A	Minimise theft
WRRM1B	Merchandise products	AURS241769A	Sell product(s)
WRRM3B	Co-ordinate merchandise presentation	SIRXMER002A	Coordinate merchandise prese
WRRS1B	Sell products and services		
WRRS2B	Advise on products and services	SIRXSLS002A	Advise on products and servic

MSA07 – mapping of qualifications (previous versions)

MSA07v5.1 - flexibility changes

MSA07v5.1		MSA07v5		
Code	**Title**	**Code**	**Title**	**Rela**
MSA10107	Certificate I in Manufacturing (Pathways)	MSA10107	Certificate I in Manufacturing (Pathways)	Equi
MSA10207	Certificate I in Process Manufacturing	MSA10207	Certificate I in Process Manufacturing	Equi
MSA20107	Certificate II in Process Manufacturing	MSA20107	Certificate II in Process Manufacturing	Equi upda
MSA20208	Certificate II in Manufacturing Technology	MSA20208	Certificate II in Manufacturing Technology	No c
MSA21108	Certificate II in Competitive Manufacturing	MSA21108	Certificate II in Competitive Manufacturing	Equi susta
MSA30107	Certificate III in Process Manufacturing	MSA30107	Certificate III in Process Manufacturing	Equi susta
MSA30208	Certificate III in Manufacturing Technology	MSA30208	Certificate III in Manufacturing Technology	Equi labo
MSA30309	Certificate III in Surface Preparation and Coating Application	MSA30309	Certificate III in Surface Preparation and Coating Application	Equi upda
MSA31108	Certificate III in Competitive Manufacturing	MSA31108	Certificate III in Competitive Manufacturing	Equi upda
MSA40108	Certificate IV in Manufacturing Technology	MSA40108	Certificate IV in Manufacturing Technology	Equi labo
MSA41108	Certificate IV in Competitive Manufacturing	MSA41108	Certificate IV in Competitive Manufacturing	Equi upda
MSA50108	Diploma of Manufacturing Technology	MSA50108	Diploma of Manufacturing Technology	Equi labo
MSA51108	Diploma of Competitive Manufacturing	MSA51108	Diploma of Competitive Manufacturing	Equi

MSA60108	Advanced Diploma of Manufacturing Technology	MSA60108	Advanced Diploma of Manufacturing Technology	Equi... labo...
MSA61108	Advanced Diploma of Competitive Manufacturing	MSA61108	Advanced Diploma of Competitive Manufacturing	Equi...
MSA71109	Vocational Graduate Certificate in Competitive Manufacturing	MSA71109	Vocational Graduate Certificate in Competitive Manufacturing	Equi...
MSA81109	Vocational Graduate Diploma of Competitive Manufacturing	MSA81109	Vocational Graduate Diploma of Competitive Manufacturing	Equi...

MSA07v5 – new qualification

MSA07v5		MSA07v4	
Code	**Title**	**Code**	**Title**
MSA30309	MSA30309 Certificate III in Surface Preparation and Coating Application.		

MSA07v4 – new qualifications

MSA07v4		MSA07v3.1	
Code	**Title**	**Code**	**Title**
MSA71109	Vocational Graduate Certificate in Competitive Manufacturing		
MSA81109	Vocational Graduate Diploma of Competitive Manufacturing		

MSA07v3.1 – mapping of changes to qualifications in MSA07v3

MSA07v3.1		MSA07v3	
Code	**Title**	**Code**	**Title**

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MSA10107	Certificate I in Manufacturing (Pathways)	MSA10107	Certificate I in Manufacturing (Pathways)
MSA20107	Certificate II in Process Manufacturing	MSA20107	Certificate II in Process Manufacturin
MSA20208	Certificate II in Manufacturing Technology	MSA20208	Certificate II in Manufacturing Technology
MSA30208	Certificate III in Manufacturing Technology	MSA30208	Certificate III in Manufacturing Technology
MSA40108	Certificate IV in Manufacturing Technology	MSA40108	Certificate IV in Manufacturing Technology
MSA50108	Diploma of Manufacturing Technology	MSA50108	Diploma of Manufacturing Technolo
MSA60108	Advanced Diploma of Manufacturing Technology	MSA60108	Advanced Diploma of Manufacturing Technology

Mapping of MSA07v3 qualifications to MSA07v2

MSA07v3		MSA07v2	
Code	**Title**	**Code**	**Title**
	Pathways/School Certificates		
MSA10107	Certificate I in Manufacturing (Pathways)	MSA10107	Certificate I in Manufacturing (Pathways)
MSA20208	Certificate II in Manufacturing Technology		
	Process Manufacturing		
MSA10207	Certificate I in Process Manufacturing	MSA10207	Certificate I in Process Manufacturing

MSA07v3		MSA07v2	
Code	**Title**	**Code**	**Title**
MSA20107	Certificate II in Process Manufacturing	MSA20107	Certificate II in Process Manufacturing
MSA30107	Certificate III in Process Manufacturing	MSA30107	Certificate III in Process Manufacturing
	Technology Cadetship qualifications		
MSA30208	Certificate III in Manufacturing Technology		
MSA40108	Certificate IV in Manufacturing Technology		
MSA50108	Diploma of Manufacturing Technology		
MSA60108	Advanced Diploma of Manufacturing Technology		
	Competitive Manufacturing		
MSA21108	Certificate II in Competitive Manufacturing		
MSA31108	Certificate III in Competitive Manufacturing		
MSA41108	Certificate IV in Competitive Manufacturing		

MSA07v3		MSA07v2	
Code	**Title**	**Code**	**Title**
MSA51108	Diploma of Competitive Manufacturing		
MSA61108	Advanced Diploma of Competitive Manufacturing		

Mapping of MCM04v3 qualifications to MSA07v3

Code	**Title**	**Code**	**Title**
MCM20105	Certificate II in Manufacturing Technology	MSA20208	Certificate II in Manufacturing Technology
MCM20205	Certificate II in Competitive Manufacturing	MSA21108	Certificate II in Competitive Manufacturing
MCM30104	Certificate III in Competitive Manufacturing	MSA31108	Certificate III in Competitive Manufacturing
MCM30204	Certificate III in Manufacturing Technology	MSA30208	Certificate III in Manufacturing Technology
MCM40104	Certificate IV in Competitive Manufacturing	MSA41108	Certificate IV in Competitive Manufacturing
MCM40204	Certificate IV in Manufacturing Technology	MSA40108	Certificate IV in Manufacturing Technology
MCM50104	Diploma of Competitive Manufacturing	MSA51108	Diploma of Competitive Manufacturing
MCM60104	Advanced Diploma of Competitive Manufacturing	MSA61108	Advanced Diploma of Competitive Manufacturing

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MSA07 – mapping of units of competency (previous versions)

MSA075v.1 – mapping of changes to units in MSA07v5

MSA07 Version 5.1		MSA07 Version 5	
Unit code	**Unit title**	**Unit code**	**Unit title**
MSAENV272B	Participate in environmentally sustainable work practices	MSAENV272A	Participate in environmentally sustainable work practices
MSAENV472B	Implement and monitor environmentally sustainable work practices	MSAENV472A	Implement and monitor environmentally sustainable wor[k] practices
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	MSAENV672A	Develop workplace policy and procedures for environmental sustainability
MSAPMPER200C	Work in accordance with an issued permit	MSAPMPER200B	Work in accordance with an issu[ed] permit.
MSAPMPER202A	Observe permit work	MSAPMPER202A	Observe permit work
MSAPMPER205C	Enter confined space	MSAPMPER205B	Enter confined space
MSAPMPER300C	Issue work permits	MSAPMPER300B	Issue work permits
MSAPMPER400A	Coordinate permit process	MSAPMPER400A	Coordinate permit process
MSL913001A	Communicate with other people	PMLCOM300B	Communicate with other people
MSL922001A	Record and present data	PMLDATA200A	Record and present data
MSL933001A	Maintain the laboratory/field workplace fit for purpose	PMLMAIN300B	Maintain the laboratory fit for purpose
MSL943001A	Work safely with instruments that emit ionising radiation	PMLOHS301B	Work safely with instruments tha[t] emit ionising radiation
MSL943002A	Participate in laboratory/field	PMLOHS302A	Participate in laboratory/field

	workplace safety		workplace safety
MSL913002A	Plan and conduct laboratory/field work	PMLORG301A	Plan and conduct laboratory/field work
MSL933002A	Contribute to the achievement of quality objectives	PMLQUAL300B	Contribute to the achievement of quality objectives
MSL933003A	Apply critical control point requirements	PMLQUAL301B	Apply critical control point requirements
MSL934001A	Contribute to the ongoing development of HACCP plans	PMLQUAL400B	Contribute to the ongoing development of HACCP plans
MSL934002A	Apply quality system and continuous improvement processes	PMLQUAL401B	Apply quality system and continu... improvement processes
MSL952001A	Collect routine site samples	PMLSAMP200A	Collect routine site samples
MSL952002A	Handle and transport samples or equipment	PMLSAMP201A	Handle and transport samples or equipment
MSL953001A	Receive and prepare samples for testing	PMLSAMP302A	Receive and prepare samples for testing
MSL954001A	Obtain representative samples in accordance with sampling plan	PMLSAMP400B	Obtain representative samples in accordance with sampling plan
MSL963001A	Operate basic handblowing equipment	PMLSCIG300B	Operate basic handblowing equipment
MSL963002A	Repair glass apparatus using simple glassblowing equipment	PMLSCIG301B	Repair glass apparatus using sim... glassblowing equipment
MSL973001A	Perform basic tests	PMLTEST300B	Perform basic tests
MSL973002A	Prepare working solutions	PMLTEST303B	Prepare working solutions
MSL973003A	Prepare culture media	PMLTEST304B	Prepare culture media
MSL973004A	Perform aseptic techniques	PMLTEST305B	Perform aseptic techniques
MSL973005A	Assist with fieldwork	PMLTEST306B	Assist with fieldwork
MSL973006A	Prepare trial batches for evaluation	PMLTEST307B	Prepare trial batches for evaluati...
MSL973007A	Perform microscopic examination	PMLTEST308A	Perform microscopic examinatio...
MSL973012A	Assist with geotechnical site	PMLTEST403B	Assist with geotechnical site

	investigations		investigations
MSL974001A	Prepare, standardise and use solutions	PMLTEST402B	Prepare, standardise and use solutions
MSL974002A	Conduct geotechnical site investigations		
MSL974003A	Perform chemical tests and procedures	PMLTEST404A	Perform chemical tests and procedures
MSL974005A	Perform physical tests	PMLTEST406A	Perform physical tests
MSL974010A	Perform mechanical tests	PMLTEST411A	Perform mechanical tests
MSL975016A	Perform complex tests to measure engineering properties of materials	PMLTEST520A	Perform complex tests to measur engineering properties of materia

MSA07v5 – new units of competency

Unit code	Unit title
	Surface preparation and coating application
MSAPMOPS201A	Cut polymer materials
MSAPMOPS202A	Fabricate polymer materials
MSAPMOPS301A	Treat corrosion
	Trade Measurement
MSATMINS301A	Inspect a range of simple measures
MSATMINS302A	Inspect a range of simple measuring instruments
MSATMINS401A	Inspect a range of weighing instruments
MSATMINS402A	Inspect a range of liquid measuring instruments using volume measures
MSATMINS403A	Inspect a range of trading practices
MSATMINS404A	Inspect a range of pre-packaged products
MSATMINS501A	Inspect a range of complex measuring instruments

MSATMREF301A	Use and maintain reference standards
MSATMVER301A	Verify simple measures
MSATMVER302A	Verify a simple measuring instruments
MSATMVER401A	Verify a limited weighing instrument
MSATMVER402A	Verify a liquid measuring instrument using volume measures
MSATMVER403A	Verify inspector's class reference standards
MSATMVER501A	Verify a complex measuring instrument

MSA07v5 Additional imported units

MEM07001B	Perform operational maintenance of machines/equipment
MEM08002C	Pre-treat work for subsequent surface coating
MEM08007B	Control surface finish production and finished product quality
MEM08011B	Prepare surfaces using solvents and/or mechanical means
MEM08012B	Prepare surfaces by abrasive blasting (basic)
MEM08013B	Prepare surfaces by abrasive blasting (advanced)
MEM08014B	Apply protective coatings (basic)
MEM08015B	Apply protective coatings (advanced)
MEM08016B	Control blast coating by-products, materials and emissions
MEM11001C	Erect/dismantle scaffolding and equipment
MEM11002C	Erect/dismantle complex scaffolding and equipment
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment
MEM11004B	Undertake dogging
MEM11010B	Operate mobile load shifting equipment
MEM11011B	Undertake manual handling

MEM11012B	Purchase materials
MEM11016B	Order materials
MEM11021B	Perform advanced operation of load shifting equipment
MEM11022B	Operate fixed/moveable load shifting equipment
MEM12001B	Use comparison and basic measuring devices
MEM13001B	Perform emergency first aid
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16002C	Conduct formal interviews and negotiations
MEM16011A	Communicate with individuals and small groups
MEM16013A	Operate in a self directed team
MEM17001B	Assist in the development and delivery of training in the workplace
MEM17003A	Assist in the provision of on the job training
MNMG237A	Work safely at heights
PMBPROD241C	Lay up rubber lining or lag pulleys
PMBPROD242A	Bond polymers to surfaces
PMBPROD248C	Prepare surfaces for coating
PMBPROD265C	Operate portable vulcanising equipment
PMBPROD323C	Produce powder coated products
PMBPROD375B	Vulcanise products using an autoclave

MSA07v4 – new units of competency for Competitive Manufacturing Vocational Graduate qualifications

| **Code** | **Title** |

MSACMG700A	Review continuous improvement processes
MSACMG701A	Prepare for and implement change
MSACMG702A	Review manufacturing practice tools and techniques
MSACMG703A	Analyse process changes
MSACMG704A	Facilitate improvements in the internal value chain
MSACMG705A	Undertake a qualitative review of a process change
MSACMG706A	Build relationships between teams in a manufacturing environment
MSACMG707A	Respond to a major non-conformance
MSACMG708A	Capture learning from daily activities in a manufacturing organisation
MSACMG709A	Facilitate improvements in the external value chain
MSACMG710A	Improve visual management in the workplace
MSACMG711A	Manage benchmarking studies
MSACMG712A	Lead a problem solving process to determine and solve root cause
MSACMG800A	Analyse data for relevance to organisational learning
MSACMG801A	Develop the competitive manufacturing approach
MSACMG802A	Audit the use of competitive tools
MSACMG803A	Develop models of future state manufacturing practice
MSACMG804A	Develop the value chain
MSACMG805A	Develop the learning processes of the manufacturing organisation
MSACMG806A	Develop and refine systems for continuous improvement in manufacturing organisatio
MSACMG807A	Develop problem solving capability of a manufacturing organisation

MSA07v3.1 – new units of competency for structural steel detailing specialisation

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MSATSD301A	Interpret architectural and engineering design specifications for structural steel detailin
MSATSD302A	Detail bolts and welds for structural steelwork connections
MSATSD501A	Detail standardised structural connections
MSATSD502A	Detail structural steel members
MSATSD503A	Incorporate structural steel detailing into fabrication and construction project managem
MSATSD504A	Detail ancillary steelwork
MEM05051A	Select welding processes
MEM09006B	Perform advanced engineering detail drafting
MEM09009C	Create 2D drawings using computer aided design system
MEM09011B	Apply basic engineering design concepts
MEM09021B	Interpret and produce curved 3 dimensional shapes
MEM13002B	Undertake occupational health and safety activities in the workplace
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities
MEM16012A	Interpret technical specifications and manuals

Mapping of units in MSA07v2 to MSA07v3

Certificate I (Pathways) and Process Manufacturing Units

MSA07 Version 2		MSA07 Version 3	
Unit code	**Unit title**	**Unit code**	**Unit title**
MSA units			

MSAENV272A	Participate in environmentally sustainable work practices	MSAENV272A	Participate in environmentally sustainable work practices
MSAENV472A	Implement and monitor environmentally sustainable work practices	MSAENV472A	Implement and monitor environmentally sustainable w practices
MSAENV672A	Develop workplace policy and procedures for sustainability	MSAENV672A	Develop workplace policy and procedures for sustainability
MSAPCI101A	Adapt to work requirements in industry	MSAPCI101A	Adapt to work requirements in industry
MSAPCI102A	Apply effective work practices	MSAPCI102A	Apply effective work practices
MSAPCI103A	Demonstrate care and apply safe practices at work	MSAPCI103A	Demonstrate care and apply sa practices at work
MSAPMOHS100A	Follow OHS procedures	MSAPMOHS100A	Follow OHS procedures
MSAPMOHS110A	Follow emergency response procedures	MSAPMOHS110A	Follow emergency response procedures
MSAPMOHS200A	Work safely	MSAPMOHS200A	Work safely
MSAPMOHS205A	Control minor incidents	MSAPMOHS205A	Control minor incidents
MSAPMOHS210A	Undertake first response to non-fire incidents	MSAPMOHS210B	Undertake first response to no incidents
MSAPMOHS212A	Undertake first response to fire incidents	MSAPMOHS212A	Undertake first response to fir incidents
MSAPMOHS216A	Operate breathing apparatus	MSAPMOHS216A	Operate breathing apparatus
MSAPMOHS217A	Gas test atmospheres	MSAPMOHS217A	Gas test atmospheres
MSAPMOHS220A	Provide initial first aid response	MSAPMOHS220A	Provide initial first aid respons
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	MSAPMOHS300A	Facilitate the implementation of for a work group
MSAPMOHS40	Contribute to OHS management system	MSAPMOHS400	Contribute to OHS manageme

0A		A	system
MSAPMOHS401A	Assess risk	MSAPMOHS401A	Assess risk
MSAPMOHS503A	Maintain the workplace OHS management system	MSAPMOHS503A	Maintain the workplace OHS management system
MSAPMOHS510A	Manage risk	MSAPMOHS510A	Manage risk
MSAPMOHS601A	Establish workplace OHS management system	MSAPMOHS601A	Establish workplace OHS management system
MSAPMOPS100A	Use equipment	MSAPMOPS100A	Use equipment
MSAPMOPS101A	Make measurements	MSAPMOPS101A	Make measurements
MSAPMOPS102A	Perform tasks to support production	MSAPMOPS102A	Perform tasks to support produ
MSAPMOPS200A	Operate equipment	MSAPMOPS200A	Operate equipment
MSAPMOPS212A	Use enterprise computers or data systems	MSAPMOPS212A	Use enterprise computers or da systems
MSAPMOPS244A	Layout and cut materials	MSAPMOPS244A	Layout and cut materials
MSAPMOPS363A	Organise on site work	MSAPMOPS363A	Organise on site work
MSAPMOPS400A	Optimise process/plant area	MSAPMOPS400A	Optimise process/plant area
MSAPMOPS401A	Trial new process or product	MSAPMOPS401A	Trial new process or product
MSAPMOPS404A	Co-ordinate maintenance	MSAPMOPS404A	Co-ordinate maintenance
MSAPMOPS405A	Identify problems in fluid power system	MSAPMOPS405A	Identify problems in fluid pow system
MSAPMOPS406A	Identify problems in electronic control systems	MSAPMOPS406A	Identify problems in electronic control systems

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MSAPMPER200A	Work in accordance with an issued permit	MSAPMPER200B	Work in accordance with an is permit
MSAPMPER201A	Monitor and control work permits	MSAPMPER201A	Monitor and control work peri
		MSAPMPER202A	Observe permit work
MSAPMPER205A	Enter confined space	MSAPMPER205B	Enter confined space
MSAPMPER300A	Issue work permits	MSAPMPER300B	Issue work permits
MSAPMPER302A	Issue work permits (hot work/confined space)		
		MSAPMPER400A	Coordinate permit process
MSAPMSUP100A	Apply workplace procedures	MSAPMSUP100A	Apply workplace procedures
MSAPMSUP101A	Clean workplace or equipment	MSAPMSUP101A	Clean workplace or equipmen
MSAPMSUP102A	Communicate in the workplace	MSAPMSUP102A	Communicate in the workplac
MSAPMSUP106A	Work in a team	MSAPMSUP106A	Work in a team
MSAPMSUP172A	Identify and minimise environmental hazards	MSAPMSUP172A	Identify and minimise environ hazards
MSAPMSUP200A	Achieve work outcomes	MSAPMSUP200A	Achieve work outcomes
MSAPMSUP201A	Receive or despatch goods	MSAPMSUP201A	Receive or despatch goods
MSAPMSUP204A	Pack products or materials	MSAPMSUP204A	Pack products or materials
MSAPMSUP205A	Transfer loads	MSAPMSUP205A	Transfer loads

MSAPMSUP210A	Process and record information	MSAPMSUP210A	Process and record informatio
MSAPMSUP230A	Monitor process operations	MSAPMSUP230A	Monitor process operations
MSAPMSUP240A	Undertake minor maintenance	MSAPMSUP240A	Undertake minor maintenance
MSAPMSUP273A	Handle goods	MSAPMSUP273A	Handle goods
MSAPMSUP280A	Manage conflict at work	MSAPMSUP280A	Manage conflict at work
MSAPMSUP291A	Participate in continuous improvement	MSAPMSUP291A	Participate in continuous improvement
MSAPMSUP292A	Sample and test materials and product	MSAPMSUP292A	Sample and test materials and
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP300A	Identify and implement opport to maximise production efficie
MSAPMSUP301A	Apply HACCP to the workplace	MSAPMSUP301A	Apply HACCP to the workpla
MSAPMSUP303A	Identify equipment faults	MSAPMSUP303A	Identify equipment faults
MSAPMSUP309A	Maintain and organise workplace records	MSAPMSUP309A	Maintain and organise workpl records
MSAPMSUP310A	Contribute to development of plant documentation	MSAPMSUP310A	Contribute to development of documentation
MSAPMSUP330A	Develop and adjust a production schedule	MSAPMSUP330A	Develop and adjust a producti schedule
MSAPMSUP382A	Provide coaching/mentoring in the workplace	MSAPMSUP382A	Provide coaching/mentoring ir workplace
MSAPMSUP383A	Facilitate a team	MSAPMSUP383A	Facilitate a team
MSAPMSUP390A	Use structured problem solving tools	MSAPMSUP390A	Use structured problem solvin
MSAPMSUP40	Develop and monitor quality systems	MSAPMSUP400	Develop and monitor quality s

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Imported units			
Unit code	**Unit title**	**Unit code**	**Unit title**
FPICOT2206A	Cross cut materials with a hand-held chainsaw	FPICOT2206A	Cross cut materials with a han chainsaw
LMFFM1002A	Operate basic woodworking machines	LMFFM1002B	Operate basic woodworking machines
LMFFM2001A	Use furniture making sector hand and power tools	LMFFM2001B	Use furniture making sector ha power tools
LMFFM2002A	Assemble furnishing components	LMFFM2002B	Assemble furnishing compone
LMFFM2003A	Select and apply hardware	LMFFM2003B	Select and apply hardware
LMFFM2005A	Join solid timber	LMFFM2005B	Join solid timber
LMFSF1001A	Produce basic soft furnishings accessories	LMFSF1001B	Produce basic soft furnishings accessories
LMFSF2001A	Cut single layer fabrics	LMFSF2001B	Cut single layer fabrics
LMTCL2001A	Use a sewing machine	LMTCL2001B	Use a sewing machine
LMTCL2003A	Identify fibres and fabrics	LMTCL2003B	Identify fibres and fabrics
LMTCL2006A	Press work	LMTCL2006B	Press work
LMTCL2007A	Lay up, mark and cut uncomplicated fabrics and lays	LMTCL2007B	Lay up, mark and cut uncompl fabrics and lays
LMTCL2008A	Finish garment production	LMTCL2008B	Finish garment production
LMTPRGN15A	Coordinate work of team/section	LMTGN2008B	Coordinate work of team or se
MCMP296A	Make a small furniture item from timber	MSAPII296A	Make a small furniture item fr timber
MCMP297A	Make an object from cloth using an existing pattern	MSAPCII297A	Make an object from cloth usi existing pattern
MCMP298A	Make an object from metal	MSAPCII298A	Make an object from metal
MCMP299A	Make an object from plastic	MSAPCII299A	Make an object from plastic

MCMS201A	Sustain process improvements	MSACMS201A	Sustain process improvements
MCMT220A	Apply quick changeover procedures	MSACMT220A	Apply quick changeover proce
MCMT221A	Apply Just in Time (JIT) procedures	MSACMT221A	Apply Just in Time (JIT) proc
MCMT230A	Apply cost factors to work practices	MSACMT230A	Apply cost factors to work pra
MCMT240A	Apply 5S procedures in a manufacturing environment	MSACMT240A	Apply 5S procedures in a manufacturing environment
MCMT250A	Monitor process capability	MSACMT250A	Monitor process capability
MCMT251A	Apply quality standards	MSACMT251A	Apply quality standards
MCMT260A	Use planning software systems in manufacturing	MSACMT260A	Use planning software system manufacturing
MCMT280A	Undertake root cause analysis	MSACMT280A	Undertake root cause analysis
MEM03001B	Perform manual production assembly	MEM03001B	Perform manual production as
MEM03006B	Set assembly stations	MEM03006B	Set assembly stations
MEM05007C	Perform manual heating and thermal cutting	MEM05007C	Perform manual heating and th cutting
MEM05012C	Perform routine manual metal arc welding	MEM05012C	Perform routine manual metal welding
MEM09002B	Interpret technical drawing	MEM09002B	Interpret technical drawing
MEM09003B	Prepare basic engineering drawing	MEM09003B	Prepare basic engineering draw
MEM11005B	Pick and process order	MEM11005B	Pick and process order
MEM11006B	Perform production packaging	MEM11006B	Perform production packaging
MEM11007B	Administer inventory procedures	MEM11007B	Administer inventory procedu
MEM12023A	Perform engineering measurements	MEM12023A	Perform engineering measurem
MEM13003B	Work safely with industrial chemicals and materials	MEM13003B	Work safely with industrial ch and materials
MEM15001B	Perform basic statistical quality control	MEM15001B	Perform basic statistical qualit control
MEM15003B	Use improvement processes in team	MEM15003B	Use improvement processes in

	activities		activities
MEM15004B	Perform inspection	MEM15004B	Perform inspection
MEM16006A	Organise and communicate information	MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment	MEM16007A	Work with others in a manufa... engineering or related environ...
MEM16008A	Interact with computing technology	MEM16008A	Interact with computing techn...
MEM18001C	Use hand tools	MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations	MEM18002B	Use power tools/hand held op...
PMBFIN201C	Finish products and components	PMBFIN201C	Finish products and componer...
PMBFIN205C	Hand decorate products	PMBFIN205C	Hand decorate products
PMBHAN103C	Shift materials safely by hand	PMBHAN103C	Shift materials safely by hand
PMBPREP205C	Assemble materials and equipment for production	PMBPREP205C	Assemble materials and equip... for production
PMBPREP206C	Prepare materials to formulae	PMBPREP206C	Prepare materials to formulae
PMBPROD236 C	Operate hand held air/power equipment for production processes	PMBPROD236C	Operate hand held air/power equipment for production pro...
PMBPROD240 C	Cut materials	PMBPROD240C	Cut materials
PMLTEST300B	Perform basic tests	PMLTEST300B	Perform basic tests
TAADEL301A	Provide training through instruction and demonstration of work skills	TAADEL301B	Provide training through instru... and demonstration of work ski...
TDTD1097B	Operate a forklift	TLID1007C	Operate a forklift

Mapping of MCM04 units of competency to units in MSA07v3 and 3.1

Note that the previous MCM04 units have been recoded as MSACM and that Key Competencies have been replaced with Employability Skills. Unless noted otherwise in the 'comments' column, all units are equivalent to the previous units.

	MCM04v3 units		**MSA07v3 units**

	MCM04v3 units		MSA07v3 units
Unit code	**Unit title**	**Unit Code**	**Unit title**
AUM4003A	Interpret customer requirements	AUM4003A	Interpret customer requirement
FDFOPTSD2A	Work in a socially diverse environment	FDFOPTSD2A	Work in a socially diverse environment
LMTPDTX04A	Contribute to the development of products or processes	LMTGN4016A	Contribute to the development products or processes
LMTPRGN05A	Participate in product engineering	LMTGN4002A	Participate in product engineer
MCMC210A	Manage the impact of change on own work	MSACMC210A	Manage the impact of change own work
MCMC410A	Lead change in a manufacturing environment	MSACMC410A	Lead change in a manufacturing environment
MCMC411A	Lead a competitive manufacturing team	MSACMC411A	Lead a competitive manufactur team
MCMC413A	Lead team culture improvement	MSACMC413A	Lead team culture improvemen
MCMC610A	Manage relationships with non-customer external organisations	MSACMC610A	Manage relationships with non customer external organisation
MCMC611A	Manage people relationships	MSACMC611A	Manage people relationships
MCMC612A	Manage workplace learning	MSACMC612A	Manage workplace learning
MCMC613A	Facilitate holistic culture improvement in a manufacturing enterprise	MSACMC613A	Facilitate holistic culture improvement in a manufacturin enterprise
MCMC614A	Develop a communications strategy to support production	MSACMC614A	Develop a communications stra to support production
MCMO290A	Work safely in manufacturing	MSAPMOHS100A	Follow OHS procedures
MCMP295A	Operate manufacturing equipment	MSAPCII295A	Operate manufacturing equipm
MCMP296A	Make a small furniture item from	MSAPCII296A	Make a small furniture item fro

	MCM04v3 units		MSA07v3 units
	timber		timber
MCMP297A	Make an object from cloth using an existing pattern	MSAPCII297A	Make an object from cloth usin existing pattern
MCMP298A	Make an object from metal	MSAPCII298A	Make an object from metal
MCMP299A	Make an object from plastic	MSAPCII299A	Make an object from plastic
MCMS200A	Apply competitive manufacturing practices	MSACMS200A	Apply competitive manufactur practices
MCMS201A	Sustain process improvements	MSACMS201A	Sustain process improvements
MCMS400A	Implement a competitive manufacturing system	MSACMS400A	Implement a competitive manufacturing system
MCMS401A	Ensure process improvements are sustained	MSACMS401A	Ensure process improvements sustained
MCMS405A	Lead a manufacturing team using a balanced score card approach	MSACMS405A	Lead a manufacturing team usi balanced score card approach
MCMS600A	Develop a competitive manufacturing system	MSACMS600A	Develop a competitive manufacturing system
MCMS601A	Analyse and map a value chain	MSACMS601A	Analyse and map a value chain
MCMS602A	Manage a value chain	MSACMS602A	Manage a value chain
MCMS603A	Develop manufacturing related business plans	MSACMS603A	Develop manufacturing related business plans
MCMS604A	Manage competitive manufacturing processes in a jobbing shop environment	MSACMS604A	Manage competitive manufactu processes in a jobbing shop environment
MCMS605A	Develop a balanced score card for use in competitive manufacturing	MSACMS605A	Develop a balanced score card use in competitive manufacturi
MCMS606A	Introduce competitive manufacturing to a small or medium enterprise	MSACMS606A	Introduce competitive manufac to a small or medium enterprise

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	MCM04v3 units		**MSA07v3 units**
MCMT220A	Apply quick changeover procedures	MSACMT220A	Apply quick changeover proce
MCMT221A	Apply Just in Time (JIT) procedures	MSACMT221A	Apply Just in Time (JIT) proce
MCMT230A	Apply cost factors to work practices	MSACMT230A	Apply cost factors to work prac
MCMT231A	Interpret product costs in terms of customer requirements	MSACMT231A	Interpret product costs in terms customer requirements
MCMT240A	Apply 5S procedures in a manufacturing environment	MSACMT240A	Apply 5S procedures in a manufacturing environment
MCMT250A	Monitor process capability	MSACMT250A	Monitor process capability
MCMT251A	Apply quality standards	MSACMT251A	Apply quality standards
MCMT260A	Use planning software systems in manufacturing	MSACMT260A	Use planning software systems manufacturing
MCMT261A	Use SCADA systems in manufacturing	MSACMT261A	Use SCADA systems in manufacturing
MCMT270A	Use sustainable energy practices	MSACMT270A	Use sustainable energy practice
MCMT271A	Use sustainable environmental practices	MSACMT271A	Use sustainable environmental practices
MCMT280A	Undertake root cause analysis	MSACMT280A	Undertake root cause analysis
MCMT281A	Contribute to the application of a proactive maintenance strategy	MSACMT281A	Contribute to the application of proactive maintenance strategy
MCMT421A	Facilitate a Just in Time (JIT) system	MSACMT421A	Facilitate a Just in Time (JIT) system
MCMT423A	Monitor a manufacturing levelled pull system	MSACMT423A	Monitor a manufacturing level pull system
MCMT430A	Improve cost factors in work practices	MSACMT430A	Improve cost factors in work practices

	MCM04v3 units		**MSA07v3 units**
MCMT432A	Analyse manual handling processes	MSACMT432A	Analyse manual handling proce
MCMT440A	Lead 5S in a manufacturing environment	MSACMT440A	Lead 5S in a manufacturing environment
MCMT441A	Facilitate continuous improvement in manufacturing	MSACMT441A	Facilitate continuous improvem in manufacturing
MCMT450A	Undertake process capability improvements	MSACMT450A	Undertake process capability improvements
MCMT451A	Mistake proof a production process	MSACMT451A	Mistake proof a production pro
MCMT452A	Apply statistics to processes in manufacturing	MSACMT452A	Apply statistics to processes in manufacturing
MCMT453A	Use six sigma techniques	MSACMT453A	Use six sigma techniques
MCMT460A	Facilitate the use of planning software systems in manufacturing	MSACMT460A	Facilitate the use of planning software systems in manufactu
MCMT461A	Facilitate SCADA systems in a manufacturing team or work area	MSACMT461A	Facilitate SCADA systems in a manufacturing team or work ar
MCMT481A	Undertake proactive maintenance analyses	MSACMT481A	Undertake proactive maintenan analyses
MCMT482A	Assist in implementing a proactive maintenance strategy	MSACMT482A	Assist in implementing a proac maintenance strategy
MCMT483A	Support proactive maintenance	MSACMT483A	Support proactive maintenance
MCMT620A	Develop quick changeover procedures	MSACMT620A	Develop quick changeover procedures
MCMT621A	Develop a Just in Time (JIT) system	MSACMT621A	Develop a Just in Time (JIT) sy
MCMT622A	Design a process layout	MSACMT622A	Design a process layout
MCMT623A	Develop a levelled pull system of manufacturing	MSACMT623A	Develop a levelled pull system manufacturing

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	MCM04v3 units		MSA07v3 units
MCMT630A	Optimise cost of product	MSACMT630A	Optimise cost of product
MCMT631A	Undertake value analysis of product costs in terms of customer requirements	MSACMT631A	Undertake value analysis of pro costs in terms of customer requirements
MCMT632A	Analyse cost implications of maintenance strategy	MSACMT632A	Analyse cost implications of maintenance strategy
MCMT640A	Manage 5S system in a manufacturing environment	MSACMT640A	Manage 5S system in a manufacturing environment
MCMT641A	Implement a continuous improvement system	MSACMT641A	Implement a continuous improvement system
MCMT650A	Determine and improve process capability	MSACMT650A	Determine and improve proces capability
MCMT652A	Design an experiment	MSACMT652A	Design an experiment
MCMT653A	Apply six sigma to process control and improvement	MSACMT653A	Apply six sigma to process cor and improvement
MCMT660A	Develop the application of enterprise systems in manufacturing	MSACMT660A	Develop the application of ente systems in manufacturing
MCMT661A	Determine and establish information collection requirements and processes	MSACMT661A	Determine and establish inform collection requirements and processes
MCMT662A	Develop a documentation control strategy for a manufacturing enterprise	MSACMT662A	Develop a documentation contr strategy for a manufacturing enterprise
MCMT670A	Develop and manage sustainable energy practices	MSACMT670A	Develop and manage sustainab energy practices
MCMT671A	Develop and manage sustainable environmental practices	MSACMT671A	Develop and manage sustainab environmental practices
MCMT675A	Facilitate the development of a new product	MSACMT675A	Facilitate the development of a product
MCMT681A	Develop a proactive maintenance strategy	MSACMT681A	Develop a proactive maintenan strategy

	MCM04v3 units		**MSA07v3 units**
MCMT682A	Adapt a proactive maintenance strategy to the process manufacturing sector	MSACMT682A	Adapt a proactive maintenance strategy to the process manufacturing sector
MCMT683A	Adapt a proactive maintenance strategy for a seasonal or cyclical manufacturing operation	MSACMT683A	Adapt a proactive maintenance strategy for a seasonal or cyclical manufacturing operation
MEM12024A	Perform computations	MEM12024A	Perform computations
MEM15001B	Perform basic statistical quality control	MEM15001B	Perform basic statistical quality control
MEM16006A	Organise and communicate information	MEM16006A	Organise and communicate information
MEM16008A	Interact with computing technology	MEM16008A	Interact with computing technology
MEM30010A	Set up basic hydraulic circuits	MEM30010A	Set up basic hydraulic circuits
MEM30011A	Set up basic pneumatic circuits	MEM30011A	Set up basic pneumatic circuits
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	MEM30012A	Apply mathematical techniques manufacturing engineering or related environment
MEM30013A	Assist in the preparation of a basic workplace layout	MEM30013A	Assist in the preparation of a basic workplace layout
MEM30014A	Apply basic just in time systems to the reduction of waste	MEM30014A	Apply basic just in time systems the reduction of waste
MEM30015A	Develop recommendations for basic set up time improvements	MEM30015A	Develop recommendations for set up time improvements
MEM30016A	Assist in the analysis of a supply chain	MEM30016A	Assist in the analysis of a supply chain
MEM30017A	Use basic preventative maintenance techniques and tools	MEM30017A	Use basic preventative maintenance techniques and tools
MEM30018A	Undertake basic process planning	MEM30018A	Undertake basic process planning
MEM30019A	Use resource planning software systems in manufacturing	MEM30019A	Use resource planning software systems in manufacturing
MEM30001A	Use computer aided drafting systems	MEM30001A	Use computer aided drafting systems

	MCM04v3 units		MSA07v3 units
	to produce basic engineering drawings		to produce basic engineering drawings
MEM30020A	Develop and manage a plan for a simple manufacturing related project	MEM30020A	Develop and manage a plan for simple manufacturing related p
MEM30021A	Prepare a simple production schedule	MEM30021A	Prepare a simple production schedule
MEM30022A	Undertake supervised procurement activities	MEM30022A	Undertake supervised procurem activities
MEM30023A	Prepare a simple cost estimate for a manufactured product	MEM30023A	Prepare a simple cost estimate manufactured product
MEM30024A	Participate in quality assurance techniques	MEM30024A	Participate in quality assurance techniques
MEM30025A	Analyse a simple electrical system circuit	MEM30025A	Analyse a simple electrical sys circuit
MEM30002A	Produce basic engineering graphics	MEM30002A	Produce basic engineering grap
MEM30003A	Produce detailed engineering drawings	MEM30003A	Produce detailed engineering drawings
MEM30004A	Use CAD to create and display 3D models	MEM30004A	Use CAD to create and display models
MEM30005A	Calculate force systems within simple beam structures	MEM30005A	Calculate force systems within simple beam structures
MEM30006A	Calculate stresses in simple structures	MEM30006A	Calculate stresses in simple structures
MEM30007A	Select common engineering materials	MEM30007A	Select common engineering materials
MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications	MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications
MEM30009A	Contribute to the design of basic mechanical systems	MEM30009A	Contribute to the design of bas mechanical systems
PMASUP390A	Use structured problem solving tools	MSAPMSUP390 A	Use structured problem solving

	MCM04v3 units		**MSA07v3 units**
PMLCOM300B	Communicate with other people	PMLCOM300B	Communicate with other peopl
PMLDATA200A	Record and present data	PMLDATA200A	Record and present data
PMLMAIN300B	Maintain the laboratory fit for purpose	PMLMAIN300B	Maintain the laboratory fit for purpose
PMLOHS301B	Work safely with instruments that emit ionising radiation	PMLOHS301B	Work safely with instruments t emit ionising radiation
PMLOHS302A	Participate in laboratory/field workplace safety	PMLOHS302A	Participate in laboratory/field workplace safety
PMLORG301A	Plan and conduct laboratory/field work	PMLORG301A	Plan and conduct laboratory/fie work
PMLQUAL300B	Contribute to the achievement of quality objectives	PMLQUAL300B	Contribute to the achievement quality objectives
PMLQUAL301B	Apply critical control point requirements	PMLQUAL301B	Apply critical control point requirements
PMLQUAL400B	Contribute to the ongoing development of HACCP plans	PMLQUAL400B	Contribute to the ongoing development of HACCP plans
PMLQUAL401B	Apply quality system and continuous improvement processes	PMLQUAL401B	Apply quality system and continuous improvement proce
PMLSAMP200A	Collect routine site samples	PMLSAMP200A	Collect routine site samples
PMLSAMP201A	Handle and transport samples or equipment	PMLSAMP201A	Handle and transport samples o equipment
PMLSAMP302A	Receive and prepare samples for testing	PMLSAMP302A	Receive and prepare samples fo testing
PMLSAMP400B	Obtain representative samples in accordance with sampling plan	PMLSAMP400B	Obtain representative samples accordance with sampling plan
PMLSCIG300B	Operate basic handblowing equipment	PMLSCIG300B	Operate basic handblowing equipment
PMLSCIG301B	Repair glass apparatus using simple glassblowing equipment	PMLSCIG301B	Repair glass apparatus using si glassblowing equipment

	MCM04v3 units		MSA07v3 units
PMLTEST300B	Perform basic tests	PMLTEST300B	Perform basic tests
PMLTEST303B	Prepare working solutions	PMLTEST303B	Prepare working solutions
PMLTEST304B	Prepare culture media	PMLTEST304B	Prepare culture media
PMLTEST305B	Perform aseptic techniques	PMLTEST305B	Perform aseptic techniques
PMLTEST306B	Assist with fieldwork	PMLTEST306B	Assist with fieldwork
PMLTEST307B	Prepare trial batches for evaluation	PMLTEST307B	Prepare trial batches for evalua
PMLTEST308A	Perform microscopic examination	PMLTEST308A	Perform microscopic examinat
PMLTEST402B	Prepare, standardise and use solutions	PMLTEST402B	Prepare, standardise and use solutions
PMLTEST403B	Assist with geotechnical site investigations	PMLTEST403B	Assist with geotechnical site investigations
PMLTEST404A	Perform chemical tests and procedures	PMLTEST404A	Perform chemical tests and procedures
UTPNEG147A	Perform electrical/electronic drafting	UEPMNT420A	Perform electrical/electronic dr
			New units for Metallurgy and Polymer Technology specialis streams
		LMTEMGN06A	Design equipment and system modifications
		LMTGN5004A	Manage installation and commissioning of equipment a systems
		LMTPDHL06A	Manage product development projects
		MEM06003C	Carry out heat treatment
		MEM09002B	Interpret technical drawing
		MEM09003B	Prepare basic engineering draw

	MCM04v3 units		MSA07v3 units
		MEM09004B	Perform electrical/electronic de drafting
		MEM09005B	Perform basic engineering deta drafting
		MEM09141A	Represent mechanical engineer designs
		MEM09142A	Represent mechatronic enginee designs
		MEM09151A	Apply computer aided modelin data management techniques to mechanical engineering design
		MEM09152A	Apply computer aided modelin data management techniques to mechatronic engineering desig
		MEM12003B	Perform precision mechanical measurement
		MEM12005B	Calibrate measuring equipment
		MEM12022B	Program coordinate measuring machine (advanced)
		MEM12023A	Perform engineering measurem
		MEM12024A	Perform computations
		MEM12025A	Use graphical techniques and perform simple statistical computations
		MEM13002B	Undertake occupational health safety activities in the workpla
		MEM13003A	Work safely with industrial chemicals and materials
		MEM13004B	Work safely with molten metals/glass
		MEM13010A	Supervise occupational health safety in an industrial work

	MCM04v3 units		MSA07v3 units
			environment
		MEM13013B	Work safely with ionising radia
		MEM14001B	Schedule material deliveries
		MEM14002B	Undertake basic process planni
		MEM14003B	Undertake basic production scheduling
		MEM14005A	Plan a complete activity
		MEM14061A	Plan and design mechanical engineering projects
		MEM14062A	Plan and design mechatronic engineering projects
		MEM14063A	Plan and design manufacturing engineering projects
		MEM14064A	Plan and design maintenance engineering projects
		MEM14081A	Apply mechanical engineering fundamentals to support design development of projects
		MEM14082A	Apply mechatronics fundamen support design and developmen engineering projects
		MEM15004B	Perform inspection
		MEM15005B	Select and control inspection processes and procedures
		MEM15007B	Conduct product and/or proces capability studies
		MEM15008B	Perform advanced statistical qu control
		MEM15010B	Perform laboratory procedures
		MEM15011B	Exercise external quality contro

	MCM04v3 units		MSA07v3 units
		MEM15012B	Maintain/supervise application quality procedures
		MEM16010A	Write reports
		MEM18001C	Use hand tools
		MEM18002B	Use power tools/hand held operations
		MEM18003C	Use tools for precision work
		MEM18006B	Repair and fit engineering components
		MEM18010C	Perform equipment condition monitoring and recording
		MEM18016	Analyse plant/equipment condi monitoring results
		MEM18055B	Dismantle, replace and assemb engineering components
		MEM22001A	Perform engineering activities
		MEM22002A	Manage self in the engineering environment
		MEM22003A	Manage engineering resources
		MEM22004A	Manage engineering projects
		MEM22005A	Manage engineering operations
		MEM22006A	Source and estimate materials
		MEM22007A	Manage environmental effects engineering activities
		MEM22008A	Manage change and technical development
		MEM22009A	Manage technical sales and promotion
		MEM23001A	Apply advanced mathematical

	MCM04v3 units		**MSA07v3 units**
			techniques in a manufacturing engineering or related environm
		MEM23002A	Apply calculus in engineering situations
		MEM23003A	Operate and program computer and/or controllers in engineerin situations
		MEM23041A	Apply basic scientific principle techniques in mechanical engineering situations
		MEM23051A	Apply basic electro and contro scientific principles and technic in mechanical and manufacturi engineering situations
		MEM23061A	Select and test mechanical engineering materials
		MEM23062A	Select and test mechatronic engineering materials
		MEM23071A	Select and apply mechanical engineering methods, processe construction techniques
		MEM23072A	Select and apply mechatronic engineering methods, processe construction techniques
		MEM23081A	Apply scientific principles and techniques in mechanical engineering situations
		MEM23082A	Apply scientific principles and techniques in mechatronic engineering situations
		MEM23083A	Apply industrial engineering principles and techniques in manufacturing engineering situations
		MEM23091A	Apply mechanical system desi

	MCM04v3 units		MSA07v3 units
			principles and techniques in mechanical engineering situatio
		MEM23092A	Apply automated systems princ and techniques in engineering situations
		MEM23093A	Apply plant and process desigr principles and techniques in engineering situations
		MEM23094A	Apply maintenance systems principles and techniques in engineering situations
		MEM24001B	Perform basic penetrant testing
		MEM24002B	Perform penetrant testing
		MEM24003B	Perform basic magnetic particl testing
		MEM24004B	Perform magnetic particle testi
		MEM24005B	Perform basic eddy current test
		MEM24006B	Perform eddy current testing
		MEM24007B	Perform ultrasonic thickness te
		MEM24008B	Perform ultrasonic testing
		MEM24009B	Perform basic radiographic test
		MEM24010B	Perform radiographic testing
		MEM24011B	Establish non destructive tests
		MEM24012B	Apply metallurgy principles
		MEM30027A	Prepare basic programs for programmable logic controllers
		MEM30028A	Assist in sales of technical products/systems
		MSACMC410A	Lead change in a manufacturin

	MCM04v3 units		MSA07v3 units
			environment
		MSACMC610A	Manage relationships with non customer external organisation
		MSACMC611A	Manage people relationships
		MSACMC612A	Manage workplace learning
		MSACMS400A	Implement a competitive manufacturing system
		MSACMS600A	Develop a competitive manufacturing system
		MSACMS601A	Analyse and map a value chain
		MSACMS602A	Manage a value chain
		MSACMS603A	Develop manufacturing related business plans
		MSACMS604A	Manage competitive manufactu processes in a jobbing shop environment
		MSACMT421A	Facilitate a Just in Time (JIT) system
		MSACMT440A	Lead 5S in a manufacturing environment
		MSACMT450A	Undertake process capability improvements
		MSACMT451A	Mistake proof a production pro
		MSACMT452A	Apply statistics to processes in manufacturing
		MSACMT460A	Facilitate the use of planning software systems in manufactu
		MSACMT461A	Facilitate SCADA systems iin manufacturing team or work ar
		MSACMT481A	Undertake proactive maintenan

	MCM04v3 units		MSA07v3 units
			analyses
		MSACMT482A	Assist in implementing a proac maintenance strategy
		MSACMT620A	Develop quick changeover procedures
		MSACMT621A	Develop a Just in Time (JIT) sy
		MSACMT622A	Design a process layout
		MSACMT623A	Develop a leveled pull system manufacturing
		MSACMT630A	Optimise cost of product
		MSACMT631A	Undertake value analysis of pr costs in terms of customer requirements
		MSACMT640A	Manage 5S system in a manufacturing environment
		MSACMT650A	Determine and improve proces capability
		MSACMT660A	Develop the application of ente systems in manufacturing
		MSACMT661A	Determine and establish inform collection requirements and processes
		MSACMT670A	Develop and manage sustainab energy practices
		MSACMT671A	Develop and manage sustainab environmental practices
		MSACMT675A	Facilitate the development of a product
		MSACMT681A	Develop a proactive maintenan strategy
		MSACMT683A	Adapt a proactive maintenance

	MCM04v3 units		MSA07v3 units
			strategy
		MSAENV272A	Participate in environmentally sustainable work practices
		MSAENV472A	Implement and monitor environmentally sustainable work practices
		MSAENV672A	Develop workplace policy and procedures for sustainability
		MSAPMOHS200A	Work safely
		MSAPMOHS300A	Facilitate the implementation of OHS for a work group
		MSAPMOHS400A	Contribute to workplace OHS management system
		MSAPMOHS401A	Assess risk
		MSAPMOHS510A	Manage risk
		MSAPMOPS101A	Make measurements
		MSAPMOPS400A	Optimise process/plant area
		MSAPMOPS401A	Trial new process or product
		MSAPMSUP100A	Apply workplace procedures
		MSAPMSUP102A	Communicate in the workplace
		MSAPMSUP200A	Implement production efficiencies
		MSAPMSUP210A	Process and record information

	MCM04v3 units		MSA07v3 units
		MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies
		MSAPMSUP303A	Identify equipment faults
		MSAPMSUP330A	Develop and adjust a productio schedule
		MSAPMSUP390A	Use structured problem solving
		MSATCM301A	Test the mechanical properties materials
		MSATCM302A	Monitor basic ferrous melting casting processes
		MSATCM303A	Monitor basic non-ferrous mel and casting processes
		MSATCM304A	Interpret basic binary phase diagrams
		MSATCM305A	Demonstrate basic knowledge casting operations
		MSATCM401A	Prepare and examine metallog samples
		MSATCM402A	Monitor and test sands, cores a moulds
		MSATCM403A	Evaluate mould design and gat
		MSATCM404A	Undertake and interpret results chemical analysis on metal san
		MSATCM405A	Determine and supervise heat treatment of metal
		MSATCM406A	Apply basic chemistry principl metallurgy
		MSATCM501A	Calculate and predict chemical outcomes in metallurgical situa

	MCM04v3 units		MSA07v3 units
		MSATCM502A	Identify and describe equipment mineral and chemical processing plants
		MSATCM503A	Recommend a refractory for an application
		MSATCM504A	Select metal forming process
		MSATCM505A	Select metal joining process
		MSATCM506A	Monitor blast furnace operation
		MSATCM507A	Monitor primary steel making process
		MSATCM508A	Monitor secondary steelmaking operations
		MSATCM509A	Recommend ferrous and non ferrous metals or alloys for an application
		MSATCM510A	Apply metallurgical principles techniques in welding and other thermal processes
		MSATCM511A	Apply metallurgy principles and practice to determine metal forming and shaping processes
		MSATCM512A	Apply metallurgy principles and practice to optimise furnace operation
		MSATCM513A	Plan and complete metallurgical projects
		MSATCM514A	Select surface treatment method metallic components or products
		MSATCM515A	Analyse metallurgical failures of components and recommend preventative measures
		MSATCM516A	Select non metallic materials for engineering applications manufacturing, engineering and

	MCM04v3 units		MSA07v3 units
			structural
		MSATCM517A	Determine corrosion prevention strategies for metal and alloys
		MSATCM518A	Interpret complex binary phase diagrams
		PMAOHS310B	Investigate incidents
		PMAOPS101C	Read dials and indicators
		PMAOPS350B	Match and adjust colour
		PMAOPS450B	Solve colour problems
		PMAOPS550B	Develop a colour formulation
		PMAOPS600C	Modify plant
		PMASUP420B	Minimise environmental impact of process
		PMASUP520B	Review procedures to minimise environmental impact of process
		PMASUP540B	Analyse equipment performance
		PMBPREP206C	Prepare materials to formulae
		PMBPREP301C	Set up and prepare for production
		PMBPREP303C	Set up equipment for continuous production
		PMBPREP304C	Set a die
		PMBPREP305B	Change extrusion die and calibration setup
		PMBPROD235C	Use materials and process knowledge to complete work operations
		PMBPROD430B	Trial a new die/tool
		PMBPROD431B	Trial a new, advanced or complex mould

	MCM04v3 units		MSA07v3 units
		PMBTECH301B	Use material and process know to solve problems
		PMBTECH302A	Modify existing compounds
		PMBTECH303A	Make minor modifications to products
		PMBTECH401B	Predict polymer properties and characteristics
		PMBTECH402B	Set up and remove complex die
		PMBTECH406A	Diagnose production equipmen problems
		PMBTECH501B	Analyse equipment performanc
		PMBTECH502B	Review and analyse productior and specify re-trials
		PMBTECH503B	Determine rheology and output plastics materials from process equipment
		PMBTECH504B	Determine heat transfer loads f processing equipment
		PMBTECH505B	Choose polymer materials for application
		PMBTECH506B	Analyse the design of products tools
		PMBTECH507A	Develop fibre composite produ using cored laminate technique
		PMBTECH508A	Develop a new compound
		PMBTECH509A	Modify an existing product
		PMBTECH510A	Analyse failure in polymeric materials
		PMBTECH601B	Develop a new product
		PMBTECH602B	Develop a new die or tool

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	MCM04v3 units		MSA07v3 units
		PMBTECH603B	Design structural/mechanical polymeric components
		PMLCAL400A	Perform standard calibrations
		PMLTEST406A	Perform physical tests
		PMLTEST411A	Perform mechanical tests
		PMLTEST520A	Perform complex tests to meas engineering properties of mater
			New units for Structural Stee Detailing specialist stream
		MSATSD301A	Interpret architectural and engineering design specificatio structural steel detailing
		MSATSD302A	Detail bolts and welds for struc steelwork connections
		MSATSD501A	Detail standardised structural connections
		MSATSD502A	Detail structural steel members
		MSATSD503A	Incorporate structural steel deta into fabrication and constructio project management
		MSATSD504A	Detail ancillary steelwork
		MEM05051A	Select welding processes
		MEM09006B	Perform advanced engineering drafting
		MEM09009C	Create 2D drawings using com aided design system
		MEM09011B	Apply basic engineering design concepts

	MCM04v3 units		**MSA07v3 units**
		MEM09021B	Interpret and produce curved 3 dimensional shapes
		MEM13002B	Undertake occupational health safety activities in the workpla
		MEM13014A	Apply principles of occupation health and safety in the work environment
		MEM14004A	Plan to undertake a routine tas
		MEM16005A	Operate as a team member to conduct manufacturing, engine or related activities
		MEM16012A	Interpret technical specification manuals

List of all units in MSA07v5, with their prerequisite requirements

Units in MSA07v3.1		**Prerequisite Units**
Unit code	**Unit title**	**Unit code**
AUM4003A	Interpret customer requirements	
FDFOPTSD2A	Work in a socially diverse environment	
FPICOT2206A	Cross cut materials with a hand-held chainsaw	
LMFFM1002A	Operate basic woodworking machines	
LMFFM2001A	Use furniture making sector hand and power tools	
LMFFM2002A	Assemble furnishing components	
LMFFM2003A	Select and apply hardware	
LMFFM2005A	Join solid timber	
LMFSF1001A	Produce basic soft furnishings accessories	

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
LMFSF2001A	Cut single layer fabrics	
LMTCL2001B	Use a sewing machine	
LMTCL2003B	Identify fibres and fabrics	
LMTCL2006B	Press work	
LMTCL2007B	Lay up, mark and cut uncomplicated fabrics and lays	
LMTCL2008B	Finish garment production	
LMTEMGN06A	Design equipment and system modifications	
LMTGN2008B	Coordinate work of team/section	
LMTGN5004A	Manage installation and commissioning of equipment and systems	
LMTPDHL06A	Manage product development projects	
LMTPDTX04A	Contribute to the development of products or processes	
LMTPRGN05A	Participate in product engineering	
MEM03001B	Perform manual production assembly	
MEM03006B	Set assembly stations	
MEM05007C	Perform manual heating and thermal cutting	
MEM05012C	Perform routine manual metal arc welding	
MEM05051A	Select welding processes	
MEM06003C	Carry out heat treatment	
MEM07001B	Perform operational maintenance of machines/equipment	MEM18001C
MEM08002C	Pre-treat work for subsequent surface coating	MEM13003B
MEM08007B	Control surface finish production and finished product quality	

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
MEM08011B	Prepare surfaces using solvents and/or mechanical means	MEM13003B, MEM18001C, MEM18002B
MEM08012B	Prepare surfaces by abrasive blasting (basic)	MEM08016B, MEM13003B
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	MEM08012B, MEM08016B, MEM13003B
MEM08014B	Apply protective coatings (basic)	MEM13003B
MEM08015B	Apply protective coatings (advanced)	MEM08014B, MEM13003B
MEM08016B	Control blast coating by-products, materials and emissions	MEM13003B
MEM09002B	Interpret technical drawing	
MEM09003B	Prepare basic engineering drawing	MEM09002B
MEM09004B	Perform electrical/electronic detail drafting	MEM09002B, MEM09003B
MEM09005B	Perform basic engineering detail drafting	MEM09002B, MEM09003B
MEM09006B	Perform advanced engineering detail drafting	MEM09002B, MEM09003B, MEM09005B
MEM09009C	Create 2D drawings using computer aided design system	MEM09002B, MEM16008A
MEM09011B	Apply basic engineering design concepts	MEM09002B
MEM09021B	Interpret and produce curved 3 dimensional shapes	
MEM09141A	Represent mechanical engineering designs	MEM16008A, MEM30007A, MEM30012A

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MEM09142A	Represent mechatronic engineering designs	MEM16008A, MEM30007A, MEM30012A
MEM09151A	Apply computer aided modeling and data management techniques to mechanical engineering designs	MEM09141A, MEM16008A, MEM30007A, MEM30012A
MEM09152A	Apply computer aided modeling and data management techniques to mechatronic engineering designs	MEM09142A, MEM16008A, MEM30007A, MEM30012A
MEM11001C	Erect/dismantle scaffolding and equipment	MEM18001C
MEM11002C	Erect/dismantle complex scaffolding and equipment	MEM11001C, MEM18001C
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment	MEM11001C, MEM11002C, MEM18001C
MEM11004B	Undertake dogging	MEM18001C
MEM11005B	Pick and process order	
MEM11006B	Perform production packaging	
MEM11007B	Administer inventory procedures	
MEM11010B	Operate mobile load shifting equipment	
MEM11011B	Undertake manual handling	
MEM11012B	Purchase materials	
MEM11016B	Order materials	
MEM11021B	Perform advanced operation of load shifting equipment	MEM11010B
MEM11022B	Operate fixed/moveable load shifting equipment	
MEM12001B	Use comparison and basic measuring devices	

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
MEM12003B	Perform precision mechanical measurement	
MEM12005B	Calibrate measuring equipment	MEM12003B, MEM12023A
MEM12022B	Program coordinate measuring machine (advanced)	
MEM12023A	Perform engineering measurements	
MEM12024A	Perform computations	
MEM12025A	Use graphical techniques and perform simple statistical computations	MEM12024A
MEM13001B	Perform emergency first aid	
MEM13002B	Undertake occupational health and safety activities in the workplace	
MEM13003B	Work safely with industrial chemicals and materials	
MEM13004B	Work safely with molten metals/glass	
MEM13010A	Supervise occupational health and safety in an industrial work environment	MEM13002B
MEM13013B	Work safely with ionising radiation	
MEM13014A	Apply principles of occupational health and safety in the work environment	
MEM14001B	Schedule material deliveries	
MEM14002B	Undertake basic process planning	
MEM14003B	Undertake basic production scheduling	
MEM14004A	Plan to undertake a routine task	
MEM14005A	Plan a complete activity	
MEM14061A	Plan and design mechanical engineering projects	MEM14081A, MEM16008A, MEM23041A, MEM23051A,

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Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
		MEM23061A, MEM23071A, MEM23081A, MEM23091A, MEM30012A
MEM14062A	Plan and design mechatronic engineering projects	MEM14082A, MEM16008A, MEM23041A, MEM23051A, MEM23062A, MEM23072A, MEM23082A, MEM23092A, MEM30012A
MEM14063A	Plan and design manufacturing engineering projects	MEM1408!A, MEM16008A, MEM23041A, MEM23051A, MEM23061A, MEM23071A, MEM23083A, MEM23093A, MEM30012A
MEM14064A	Plan and design maintenance engineering projects	MEM14082A, MEM16008A, MEM23041A, MEM23051A, MEM23062A, MEM23072A, MEM23082A, MEM23094A, MEM30012A
MEM14081A	Apply mechanical engineering fundamentals to support design and development of projects	MEM16008A, MEM23041A, MEM23051A, MEM30012A
MEM14082A	Apply mechatronics fundamentals to support design and development of engineering projects	MEM16008A, MEM23041A, MEM23051A,

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
		MEM30012A
MEM15001B	Perform basic statistical quality control	
MEM15002A	Apply quality systems	
MEM15003B	Use improvement processes in team activities	MEM16007A
MEM15004B	Perform inspection	
MEM15005B	Select and control inspection processes and procedures	
MEM15007B	Conduct product and/or process capability studies	MEM12024A, MEM12025A, MEM15001B, MEM15008B
MEM15008B	Perform advanced statistical quality control	MEM12024A, MEM12025A, MEM15001B
MEM15010B	Perform laboratory procedures	
MEM15011B	Exercise external quality control	MEM15004B, MEM15005B
MEM15012B	Maintain/supervise application of quality procedures	MEM12024A, MEM12025A, MEM15001B
MEM15024A	Apply quality procedures	
MEM16002C	Conduct formal interviews and negotiations	
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	
MEM16006A	Organise and communicate information	
MEM16007A	Work with others in a manufacturing, engineering or related environment	
MEM16008A	Interact with computing technology	

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MEM16010A	Write reports	MEM14005A
MEM16011A	Communicate with individuals and small groups	MEM16006A
MEM16012A	Interpret technical specifications and manuals	
MEM16013A	Operate in a self directed team	MEM16007A
MEM17001B	Assist in the development and delivery of training in the workplace	
MEM17003A	Assist in the provision of on the job training	
MEM18001C	Use hand tools	
MEM18002B	Use power tools/hand held operations	
MEM18003C	Use tools for precision work	
MEM18006B	Repair and fit engineering components	
MEM18010C	Perform equipment condition monitoring and recording	
MEM18016B	Analyse plant/equipment condition monitoring results	MEM09002B, MEM12003B, MEM12023A, MEM12024A, MEM12025A, MEM18001C, MEM18002B, MEM18003C, MEM18006B, MEM18010C, MEM18055B
MEM18055B	Dismantle, replace and assemble engineering components	
MEM22001A	Perform engineering activities	
MEM22002A	Manage self in the engineering environment	MEM16006A
MEM22003A	Manage engineering resources	MEM16006A

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MEM22004A	Manage engineering projects	MEM16006A
MEM22005A	Manage engineering operations	MEM16006A
MEM22006A	Source and estimate materials	MEM16006A
MEM22007A	Manage environmental effects of engineering activities	MEM16006A
MEM22008A	Manage change and technical development	MEM16006A
MEM22009A	Manage technical sales and promotion	MEM16006A
MEM23001A	Apply advanced mathematical techniques in a manufacturing engineering or related environment	
MEM23002A	Apply calculus in engineering situations	MEM30012A
MEM23003A	Operate and program computers and/or controllers in engineering situations	MEM16008A
MEM23041A	Apply basic scientific principles and techniques in mechanical engineering situations	
MEM23051A	Apply basic electro and control scientific principles and techniques in mechanical and manufacturing engineering situations	
MEM23061A	Select and test mechanical engineering materials	
MEM23062A	Select and test mechatronic engineering materials	
MEM23071A	Select and apply mechanical engineering methods, processes and construction techniques	
MEM23072A	Select and apply mechatronic engineering methods, processes and construction techniques	
MEM23081A	Apply scientific principles and techniques in mechanical engineering situations	MEM23041A, MEM23051A
MEM23082A	Apply scientific principles and techniques in mechatronic engineering situations	MEM23041A, MEM23051A
MEM23083A	Apply industrial engineering principles and techniques	MEM23041A,

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
	in manufacturing engineering situations	MEM23051A
MEM23091A	Apply mechanical system design principles and techniques in mechanical engineering situations	MEM23041A, MEM23051A
MEM23092A	Apply automated systems principles and techniques in engineering situations	MEM23041A, MEM23051A
MEM23093A	Apply plant and process design principles and techniques in engineering situations	MEM23041A, MEM23051A
MEM23094A	Apply maintenance systems principles and techniques in engineering situations	MEM23041A, MEM23051A
MEM24001B	Perform basic penetrant testing	MEM18001C
MEM24002B	Perform penetrant testing	MEM18001C
MEM24003B	Perform basic magnetic particle testing	MEM18001C
MEM24004B	Perform magnetic particle testing	MEM18001C, MEM24012B
MEM24005B	Perform basic eddy current testing	MEM18001C, MEM24012B
MEM24006B	Perform eddy current testing	MEM18001C, MEM24012B
MEM24007B	Perform ultrasonic thickness testing	MEM18001C
MEM24008B	Perform ultrasonic testing	MEM18001C, MEM24012B
MEM24009B	Perform basic radiographic testing	MEM18001C, MEM13013B
MEM24010B	Perform radiographic testing	MEM18001C, MEM13013B, MEM24012B
MEM24011B	Establish non destructive tests	MEM12013B, MEM16010A, MEM18001C, MEM24002B,

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
		MEM24004B, MEM24006B, MEM24010B, MEM24012B
MEM24012B	Apply metallurgy principles	
MEM30001A	Use computer aided drafting systems to produce basic engineering drawings	MEM16006A, MEM16008A
MEM30002A	Produce basic engineering graphics	MEM16006A, MEM16008A
MEM30003A	Produce detailed engineering drawings	MEM16006A, MEM16008A MEM30001A, MEM3002A
MEM30004A	Use CAD to create and display 3D models	MEM16008A, MEM30001A
MEM30005A	Calculate force systems within simple beam structures	MEM30012A
MEM30006A	Calculate stresses in simple structures	MEM30012A
MEM30007A	Select common engineering materials	
MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications	
MEM30009A	Contribute to the design of basic mechanical systems	MEM16008A, MEM30002A, MEM30003A
MEM30010A	Set up basic hydraulic circuits	
MEM30011A	Set up basic pneumatic circuits	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	
MEM30013A	Assist in the preparation of a basic workplace layout	
MEM30014A	Apply basic just in time systems to the reduction of	

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
	waste	
MEM30015A	Develop recommendations for basic set up time improvements	
MEM30016A	Assist in the analysis of a supply chain	
MEM30017A	Use basic preventative maintenance techniques and tools	
MEM30018A	Undertake basic process planning	
MEM30019A	Use resource planning software systems in manufacturing	MEM16008A
MEM30020A	Develop and manage a plan for a simple manufacturing related project	
MEM30021A	Prepare a simple production schedule	
MEM30022A	Undertake supervised procurement activities	
MEM30023A	Prepare a simple cost estimate for a manufactured product	
MEM30024A	Participate in quality assurance techniques	MEM15001B
MEM30025A	Analyse a simple electrical system circuit	MEM12024A
MEM30027A	Prepare basic programs for programmable logic controllers	
MEM30028A	Assist in sales of technical products/systems	
MNMC205A	Conduct local risk assessment	
MNMG237A	Work safely at heights	
MSACMC210A	Manage the impact of change on own work	
MSACMC410A	Lead change in a manufacturing environment	
MSACMC411A	Lead a competitive manufacturing team	
MSACMC413A	Lead team culture improvement	

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
MSACMC610A	Manage relationships with non-customer external organisations	
MSACMC611A	Manage people relationships	
MSACMC612A	Manage workplace learning	
MSACMC613A	Facilitate holistic culture improvement in a manufacturing enterprise	
MSACMC614A	Develop a communications strategy to support production	
MSACMG700A	Review continuous improvement processes	
MSACMG701A	Prepare for and implement change	
MSACMG702A	Review manufacturing practice tools and techniques	
MSACMG703A	Analyse process changes	
MSACMG704A	Facilitate improvements in the value chain	
MSACMG705A	Undertake a qualitative review of a process change	
MSACMG706A	Build relationships between teams in a manufacturing environment	
MSACMG707A	Respond to a major non-conformance	
MSACMG708A	Capture learning from daily activities in a manufacturing organisation	
MSACMG709A	Facilitate improvements in the external value chain	
MSACMG710A	Improve visual management in the workplace	
MSACMG711A	Manage benchmarking studies	
MSACMG712A	Lead a problem solving process to determine and solve root cause	
MSACMG800A	Analyse data for relevance to organisational learning	

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
MSACMG801A	Develop the competitive manufacturing approach	
MSACMG802A	Audit the use of competitive tools	
MSACMG803A	Develop models of future state manufacturing practice	
MSACMG804A	Develop the value chain	
MSACMG805A	Develop the learning processes of the manufacturing organisation	
MSACMG806A	Develop and refine systems for continuous improvement in manufacturing organisations	
MSACMG807A	Develop problem solving capability of a manufacturing organisation	
MSACMS200A	Apply competitive manufacturing practices	
MSACMS201A	Sustain process improvements	
MSACMS400A	Implement a competitive manufacturing system	
MSACMS401A	Ensure process improvements are sustained	
MSACMS405A	Lead a manufacturing team using a balanced score card approach	
MSACMS600A	Develop a competitive manufacturing system	
MSACMS601A	Analyse and map a value chain	MSACMT631A
MSACMS602A	Manage a value chain	MSACMS601A, MSACMT631A
MSACMS603A	Develop manufacturing related business plans	
MSACMS604A	Manage competitive manufacturing processes in a jobbing shop environment	MSACMT280A, MSACMS601A, MSACMT631A
MSACMS605A	Develop a balanced score card for use in competitive manufacturing	MSACMT280A, MSACMS601A, MSACMT631A

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Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSACMS606A	Introduce competitive manufacturing to a small or medium enterprise	
MSACMT220A	Apply quick changeover procedures	
MSACMT221A	Apply Just in Time (JIT) procedures	
MSACMT230A	Apply cost factors to work practices	
MSACMT231A	Interpret product costs in terms of customer requirements	
MSACMT240A	Apply 5S procedures in a manufacturing environment	
MSACMT250A	Monitor process capability	
MSACMT251A	Apply quality standards	
MSACMT260A	Use planning software systems in manufacturing	
MSACMT261A	Use SCADA systems in manufacturing	
MSACMT270A	Use sustainable energy practices	
MSACMT271A	Use sustainable environmental practices	
MSACMT280A	Undertake root cause analysis	
MSACMT281A	Contribute to the application of a proactive maintenance strategy	
MSACMT421A	Facilitate a Just in Time (JIT) system	
MSACMT423A	Monitor a manufacturing levelled pull system	
MSACMT430A	Improve cost factors in work practices	
MSACMT432A	Analyse manual handling processes	
MSACMT440A	Lead 5S in a manufacturing environment	
MSACMT441A	Facilitate continuous improvement in manufacturing	
MSACMT450A	Undertake process capability improvements	MSACMT452A

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSACMT451A	Mistake proof a production process	
MSACMT452A	Apply statistics to processes in manufacturing	
MSACMT453A	Use six sigma techniques	MSACMT452A
MSACMT460A	Facilitate the use of planning software systems in manufacturing	MSACMT260A
MSACMT461A	Facilitate SCADA systems in a manufacturing team or work area	MSACMT261A
MSACMT481A	Undertake proactive maintenance analyses	
MSACMT482A	Assist in implementing a proactive maintenance strategy	
MSACMT483A	Support proactive maintenance	
MSACMT620A	Develop quick changeover procedures	
MSACMT621A	Develop a Just in Time (JIT) system	MSACMC410A
MSACMT622A	Design a process layout	
MSACMT623A	Develop a levelled pull system of manufacturing	
MSACMT630A	Optimise cost of product	MSACMT631A
MSACMT631A	Undertake value analysis of product costs in terms of customer requirements	MSACMT230A
MSACMT632A	Analyse cost implications of maintenance strategy	
MSACMT640A	Manage 5S system in a manufacturing environment	
MSACMT641A	Implement a continuous improvement system	
MSACMT650A	Determine and improve process capability	MSACMT452A
MSACMT652A	Design an experiment	MSACMT452A
MSACMT653A	Apply six sigma to process control and improvement	MSACMT452A

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSACMT660A	Develop the application of enterprise systems in manufacturing	
MSACMT661A	Determine and establish information collection requirements and processes	
MSACMT662A	Develop a documentation control strategy for a manufacturing enterprise	
MSACMT670A	Develop and manage sustainable energy practices	
MSACMT671A	Develop and manage sustainable environmental practices	
MSACMT675A	Facilitate the development of a new product	MSACMT452A
MSACMT681A	Develop a proactive maintenance strategy	
MSACMT682A	Adapt a proactive maintenance strategy to the process manufacturing sector	MSACMT681A
MSACMT683A	Adapt a proactive maintenance strategy for a seasonal or cyclical manufacturing operation	MSACMT681A
MSAENV272A	Participate in environmentally sustainable work practices	
MSAENV472A	Implement and monitor environmentally sustainable work practices	
MSAENV672A	Develop workplace policy and procedures for sustainability	
MSAPCI101A	Adapt to work requirements in industry	
MSAPCI102A	Apply effective work practices	
MSAPCI103A	Demonstrate care and apply safe practices at work	
MSAPCII295A	Operate manufacturing equipment	
MSAPCII296A	Make a small furniture item from timber	
MSAPCII297A	Make an object from cloth using an existing pattern	

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSAPCII298A	Make an object from metal	
MSAPCII299A	Make an object from plastic	
MSAPMOHS100 A	Follow OHS procedures	
MSAPMOHS110 A	Follow emergency response procedures	
MSAPMOHS200 A	Work safely	
MSAPMOHS205 A	Control minor incidents	
MSAPMOHS210B	Undertake first response to non-fire incidents	
MSAPMOHS212 A	Undertake first response to fire incidents	
MSAPMOHS216 A	Operate breathing apparatus	
MSAPMOHS217 A	Gas test atmospheres	
MSAPMOHS220 A	Provide initial first aid response	
MSAPMOHS300 A	Facilitate the implementation of OHS for a work group	MSAPMOHS20 0A
MSAPMOHS400 A	Contribute to OHS management system	MSAPMOHS30 0A
MSAPMOHS401 A	Assess risk	
MSAPMOHS503 A	Maintain the workplace OHS management system	
MSAPMOHS510 A	Manage risk	MSAPMOHS40 1A

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSAPMOHS601A	Establish workplace OHS management system	MSAPMOHS503A
MSAPMOPS100A	Use equipment	
MSAPMOPS101A	Make measurements	
MSAPMOPS102A	Perform tasks to support production	
MSAPMOPS200A	Operate equipment	
MSAPMOPS201A	Cut polymer materials	
MSAPMOPS202A	Fabricate polymer materials	
MSAPMOPS212A	Use enterprise computers or data systems	
MSAPMOPS244A	Layout and cut materials	
MSAPMOPS301A	Treat corrosion	
MSAPMOPS363A	Organise on site work	
MSAPMOPS400A	Optimise process/plant area	MSAPMSUP390A
MSAPMOPS401A	Trial new process or product	
MSAPMOPS404A	Co-ordinate maintenance	
MSAPMOPS405A	Identify problems in fluid power system	
MSAPMOPS406A	Identify problems in electronic control systems	
MSAPMPER200B	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	MSAPMPER200B
MSAPMPER205B	Enter confined space	MSAPMPER200B

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSAPMPER300B	Issue work permits	MNMC205A
MSAPMPER400A	Coordinate permit process	MSAPMPER300B
MSAPMSUP100A	Apply workplace procedures	
MSAPMSUP101A	Clean workplace or equipment	
MSAPMSUP102A	Communicate in the workplace	
MSAPMSUP106A	Work in a team	
MSAPMSUP172A	Identify and minimise environmental hazards	
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP201A	Receive or despatch goods	
MSAPMSUP204A	Pack products or materials	
MSAPMSUP205A	Transfer loads	
MSAPMSUP210A	Process and record information	
MSAPMSUP230A	Monitor process operations	
MSAPMSUP240A	Undertake minor maintenance	
MSAPMSUP273A	Handle goods	
MSAPMSUP280A	Manage conflict at work	
MSAPMSUP291A	Participate in continuous improvement	
MSAPMSUP292A	Sample and test materials and product	
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP200A
MSAPMSUP301A	Apply HACCP to the workplace	
MSAPMSUP303A	Identify equipment faults	

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSAPMSUP309A	Maintain and organise workplace records	
MSAPMSUP310A	Contribute to development of plant documentation	
MSAPMSUP330A	Develop and adjust a production schedule	
MSAPMSUP382A	Provide coaching/mentoring in the workplace	
MSAPMSUP383A	Facilitate a team	
MSAPMSUP390A	Use structured problem solving tools	
MSAPMSUP400A	Develop and monitor quality systems	
MSATCM301A	Test the mechanical properties of materials	
MSATCM302A	Monitor basic ferrous melting and casting processes	
MSATCM303A	Monitor basic non-ferrous melting and casting processes	
MSATCM304A	Interpret basic binary phase diagrams	
MSATCM305A	Demonstrate basic knowledge of casting operations	
MSATCM401A	Prepare and examine metallographic samples	MSATCM304A
MSATCM402A	Monitor and test sands, cores and moulds	
MSATCM403A	Evaluate mould design and gating	MSATCM304A, MSATCM305A
MSATCM404A	Undertake and interpret results of chemical analysis on metal samples	
MSATCM405A	Determine and supervise heat treatment of metal	MSATCM304A, MEM06003C
MSATCM406A	Apply basic chemistry principles to metallurgy	
MSATCM501A	Calculate and predict chemical outcomes in metallurgical situations	MSATCM406A
MSATCM502A	Identify and describe equipment for mineral and	MSATCM304A,

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
	chemical processing plants	MSATCM406A
MSATCM503A	Recommend a refractory for an application	
MSATCM504A	Select metal forming process	MEM09002B, MSATCM501A, MEM30007A
MSATCM505A	Select metal joining process	MEM09002B, MSATCM406A, MEM30007A
MSATCM506A	Monitor blast furnace operations	MSATCM304A, MSATCM406A, MSATCM501A
MSATCM507A	Monitor primary steel making process	MSATCM304A, MSATCM406A, MSATCM501A
MSATCM508A	Monitor secondary steelmaking operations	MSATCM301A, MSATCM304A, MSATCM503A
MSATCM509A	Recommend ferrous and non ferrous metals or alloys for an application	MSATCM304A
MSATCM510A	Apply metallurgical principles and techniques in welding and other thermal processes	MSATCM505A
MSATCM511A	Apply metallurgy principles and practice to determine metal forming and shaping processes	
MSATCM512A	Apply metallurgy principles and practice to optimise furnace operation	
MSATCM513A	Plan and complete metallurgical projects	MEM16008A, MEM23061A, MEM23071A, MEM30012A, MSATCM509A, MSATCM510A, MSATCM405A

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
MSATCM514A	Select surface treatment methods for metallic components or products	
MSATCM515A	Analyse metallurgical failures of components and recommend preventative measures	MSATCM406A, MSATCM401A
MSATCM516A	Select non metallic materials for engineering applications manufacturing, engineering and structural	
MSATCM517A	Determine corrosion prevention strategies for metal and alloys	
MSATCM518A	Interpret complex binary phase diagrams	MSATCM304A
MSATCS301A	Interpret architectural and engineering design specifications for structural steel detailing	MEM09002B
MSATCS302A	Detail bolts and welds for structural steelwork connections	MEM09002B, MEM05051A, MSATCS301A
MSATCS501A	Detail standardised structural connections	MEM09002B, MEM05051A, MSATCS301A
MSATCS502A	Detail structural steel members	MEM09002B, MSATCS301A
MSATCS503A	Incorporate structural steel detailing into fabrication and construction project management	
MSATCS504A	Detail ancillary steelwork	MEM09002B, MSATCS301A
MSATMINS301A	Inspect a range of simple measures	MSATMREF301A (co-requisite)
MSATMINS302A	Inspect a range of simple measuring instruments	MSATMREF301A (co-requisite)
MSATMINS401A	Inspect a range of weighing instruments	MSATMREF301A (co-requisite)

Units in MSA07v3.1		Prerequisite Units
Unit code	**Unit title**	**Unit code**
MSATMINS402A	Inspect a range of liquid measuring instruments using volume measures	MSATMREF301A (co-requisite)
MSATMINS403A	Inspect a range of trading practices	MSATMREF301A (co-requisite)
MSATMINS404A	Inspect a range of pre-packaged products	MSATMREF301A (co-requisite)
MSATMINS501A	Inspect a range of complex measuring instruments	MSATMREF301A (co-requisite)
MSATMREF301A	Use and maintain reference standards	
MSATMVER301A	Verify simple measures	MSATMREF301A (co-requisite)
MSATMVER302A	Verify a simple measuring instruments	MSATMREF301A (co-requisite)
MSATMVER401A	Verify a limited weighing instrument	MSATMREF301A (co-requisite)
MSATMVER402A	Verify a liquid measuring instrument using volume measures	MSATMREF301A (co-requisite)
MSATMVER403A	Verify inspector's class reference standards	MSATMREF301A (co-requisite)
MSATMVER501A	Verify a complex measuring instrument	MSATMREF301A (co-requisite)
PMAOHS310A	Investigate incidents	
PMAOPS101B	Read dials and indicators	
PMAOPS350A	Match and adjust colour	
PMAOPS450A	Solve colour problems	
PMAOPS550A	Develop a colour formulation	PMAOPS350A, PMAOPS450A
PMAOPS600B	Modify plant	

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
PMASUP420A	Minimise environmental impact of process	
PMASUP520A	Review procedures to minimise environmental impact of processes	
PMASUP540A	Analyse equipment performance	
PMBFIN201C	Finish products and components	
PMBFIN205C	Hand decorate products	
PMBHAN103C	Shift materials safely by hand	
PMBPREP205C	Assemble materials and equipment for production	
PMBPREP206C	Prepare materials to formulae	
PMBPREP301C	Set up and prepare for production	
PMBPREP303C	Set up equipment for continuous production	
PMBPREP304C	Set a die	
PMBPREP305B	Change extrusion die and calibration setup	
PMBPROD235C	Use materials and process knowledge to complete work operations	
PMBPROD236C	Operate hand held air/power equipment for production processes	
PMBPROD240C	Cut materials	
PMBPROD241C	Lay up rubber lining or lag pulleys	
PMBPROD242A	Bond polymers to surfaces	
PMBPROD248C	Prepare surfaces for coating	
PMBPROD265C	Operate portable vulcanising equipment	
PMBPROD323C	Produce powder coated products	
PMBPROD375B	Vulcanise products using an autoclave	

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
PMBPROD430B	Trial a new die/tool	
PMBPROD431B	Trial a new, advanced or complex mould	
PMBTECH301B	Use material and process knowledge to solve problems	
PMBTECH302A	Modify existing compounds	
PMBTECH303A	Make minor modifications to products	
PMBTECH401B	Predict polymer properties and characteristics	
PMBTECH402B	Set up and remove complex dies	
PMBTECH406A	Diagnose production equipment problems	
PMBTECH501B	Analyse equipment performance	
PMBTECH502B	Review and analyse production trials and specify re-trials	
PMBTECH503B	Determine rheology and output of plastics materials from processing equipment	
PMBTECH504B	Determine heat transfer loads for processing equipment	
PMBTECH505B	Choose polymer materials for an application	
PMBTECH506B	Analyse the design of products and tools	
PMBTECH507A	Develop fibre composite products using cored laminate techniques	
PMBTECH508A	Develop a new compound	
PMBTECH509A	Modify an existing product	
PMBTECH510A	Analyse failure in polymeric materials	
PMBTECH601B	Develop a new product	
PMBTECH602B	Develop a new die or tool	
PMBTECH603B	Design structural/mechanical polymeric components	

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Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
PMLCAL400A	Perform standard calibrations	
PMLCOM300B	Communicate with other people	
PMLDATA200A	Record and present data	
PMLMAIN300B	Maintain the laboratory fit for purpose	
PMLOHS301B	Work safely with instruments that emit ionising radiation	
PMLOHS302A	Participate in laboratory/field workplace safety	
PMLORG301A	Plan and conduct laboratory/field work	
PMLQUAL300B	Contribute to the achievement of quality objectives	
PMLQUAL301B	Apply critical control point requirements	
PMLQUAL400B	Contribute to the ongoing development of HACCP plans	
PMLQUAL401B	Apply quality system and continuous improvement processes	
PMLSAMP200A	Collect routine site samples	
PMLSAMP201A	Handle and transport samples or equipment	
PMLSAMP302A	Receive and prepare samples for testing	
PMLSAMP400B	Obtain representative samples in accordance with sampling plan	
PMLSCIG300B	Operate basic handblowing equipment	
PMLSCIG301B	Repair glass apparatus using simple glassblowing equipment	
PMLTEST300B	Perform basic tests	
PMLTEST303B	Prepare working solutions	
PMLTEST304B	Prepare culture media	

Units in MSA07v3.1		Prerequisite Units
Unit code	Unit title	Unit code
PMLTEST305B	Perform aseptic techniques	
PMLTEST306B	Assist with fieldwork	
PMLTEST307B	Prepare trial batches for evaluation	
PMLTEST308A	Perform microscopic examination	
PMLTEST402B	Prepare, standardise and use solutions	
PMLTEST403B	Assist with geotechnical site investigations	
PMLTEST404A	Perform chemical tests and procedures	
PMLTEST406A	Perform physical tests	
PMLTEST411A	Perform mechanical tests	
PMLTEST520A	Perform complex tests to measure engineering properties of materials	PMLTEST411A
TAADEL301B	Provide training through instruction and demonstration of work skills	
TLID1007C	Operate a forklift	
UTPNEG147A	Perform electrical/electronic drafting	

Overview

What is a Training Package?

A Training Package is an integrated set of nationally endorsed competency standards, assessment guidelines and Australian Qualifications Framework (AQF) qualifications for a specific industry, industry sector or enterprise.
Each Training Package:

- provides a consistent and reliable set of components for training, recognising and assessing peoples skills, and may also have optional support materials
- enables nationally recognised qualifications to be awarded through direct assessment of workplace competencies
- encourages the development and delivery of flexible training which suits individual and industry requirements
- encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

How do Training Packages fit within the National Skills Framework?

The National Skills Framework applies nationally, is endorsed by the Ministerial Council for Vocational and Technical Education, and comprises the Australian Quality Training Framework 2010 (AQTF 2010), and Training Packages endorsed by the National Quality Council (NQC).

How are Training Packages developed?

Training Packages are developed by Industry Skills Councils or enterprises to meet the identified training needs of specific industries or industry sectors. To gain national endorsement of Training Packages, developers must provide evidence of extensive research, consultation and support within the industry area or enterprise.

How do Training Packages encourage flexibility?

Training Packages describe the skills and knowledge needed to perform effectively in the workplace without prescribing how people should be trained.

Training Packages acknowledge that people can achieve vocational competency in many ways by emphasising what the learner can do, not how or where they learned to do it. For example, some experienced workers might be able to demonstrate competency against the units of competency, and even gain a qualification, without completing a formal training program.

With Training Packages, assessment and training may be conducted at the workplace, off-the-job, at a training organisation, during regular work, or through work experience, work placement, work simulation or any combination of these.

Who can deliver and assess using Training Packages?

Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualifications or specific units of competency on its scope of registration, or that works in partnership with another RTO, as specified in the AQTF 2010.

Training Package Components

Training Packages are made up of mandatory components endorsed by the NQC, and optional support materials.

Training Package Endorsed Components

The nationally endorsed components include the Competency Standards, Assessment Guidelines and Qualifications Framework. These form the basis of training and assessment in the Training Package and, as such, they must be used.
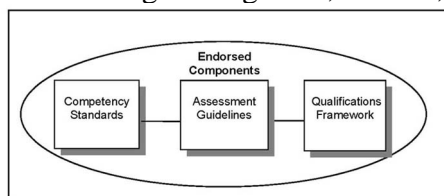
Competency Standards

Each unit of competency identifies a discrete workplace requirement and includes the knowledge and skills that underpin competency as well as language, literacy and numeracy; and occupational health and safety requirements. The units of competency must be adhered to in training and assessment to ensure consistency of outcomes.

Assessment Guidelines

The Assessment Guidelines provide an industry framework to ensure all assessments meet industry needs and nationally agreed standards as expressed in the Training Package and the AQTF 2010. The Assessment Guidelines must be followed to ensure the integrity of assessment leading to nationally recognised qualifications.

Qualifications Framework

Each Training Package provides details of those units of competency that must be achieved to award AQF qualifications. The rules around which units of competency can be combined to make up a valid AQF qualification in the Training Package are referred to as the 'packaging rules'. The packaging rules must be followed to ensure the integrity of nationally recognised qualifications issued.

Training Package Support Materials

The endorsed components of Training Packages are complemented and supported by optional support materials that provide for choice in the design of training and assessment to meet the needs of industry and learners.

Training Package support materials can relate to single or multiple units of competency, an industry sector, a qualification or the whole Training Package. They tend to fall into one or more of the categories illustrated below.
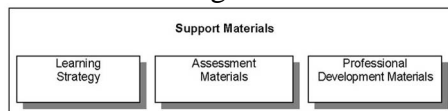
Training Package support materials are produced by a range of stakeholders such as RTOs, individual trainers and assessors, private and commercial developers and Government agencies.

Training Package, Qualification and Unit of Competency Codes

There are agreed conventions for the national codes used for Training Packages and their components. Always use the correct codes, exactly as they appear in the Training Package, **and with the code always before the title**.

Training Package Codes

Each Training Package has a unique five-character national code assigned when the Training Package is endorsed, for example XYZ08. The first three characters are letters identifying the Training Package industry coverage and the last two characters are numbers identifying the year of endorsement.

Qualification Codes

Within each Training Package, each qualification has a unique eight-character code, for example XYZ10108. Qualification codes are developed as follows:

- the first three letters identify the Training Package;
- the first number identifies the qualification level (noting that, in the qualification titles themselves, arabic numbers are **not** used);
- the next two numbers identify the position in the sequence of the qualification at that level; and
- the last two numbers identify the year in which the qualification was endorsed. (Where qualifications are added after the initial Training Package endorsement, the last two numbers may differ from other Training Package qualifications as they identify the year in which those particular qualifications were endorsed.)

Unit of Competency Codes
Within each Training Package, each unit of competency has a unique code. Unit of competency codes are assigned when the Training Package is endorsed, or when new units of competency are added to an existing endorsed Training Package. Unit codes are developed as follows:

- a typical code is made up of 12 characters, normally a mixture of uppercase letters and numbers, as in MSACMC210A:
- the first three characters signify the Training Package – MSA07 – in the above example and up to eight characters, relating to an industry sector, function or skill area, follow;
- the last character is always a letter and identifies the unit of competency version. An 'A' at the end of the code indicates that this is the original unit of competency. 'B', or another incremented version identifier means that minor changes have been made. Typically this would mean that wording has changed in the range statement or evidence guide, providing clearer intent; and
- where changes are made that alter the outcome, a new code is assigned and the title is changed.

Training Package, Qualification and Unit of Competency Titles

There are agreed conventions for titling Training Packages and their components. Always use the correct titles, exactly as they appear in the Training Package, and with the code always placed before the title.

Training Package Titles
The title of each endorsed Training Package is unique and relates the Training Packages broad industry coverage.

Qualification Titles
The title of each endorsed Training Package qualification is unique. Qualification titles use the following sequence:

- first, the qualification is identified as either Certificate I, Certificate II, Certificate III, Certificate IV, Diploma, Advanced Diploma, Vocational Graduate Certificate, or Vocational Graduate Diploma;
- this is followed by the words 'in' for Certificates I to IV, and 'of' for Diploma, Advanced Diploma, Vocational Graduate Certificate and Vocational Graduate Diploma;
- then, the industry descriptor, for example Telecommunications; and
- then, if applicable, the occupational or functional stream in brackets, for example (Computer Systems).

For example: MSA10107 Certificate I in Manufacturing (Pathways)
Unit of Competency Titles

Each unit of competency title is unique. Unit of competency titles describe the competency outcome concisely, and are written in sentence case.
For example: MSACMC210A Manage the impact of change on own work

Introduction to the Manufacturing Training Package (MSA07) Training Package

This Training Package has been developed as a significant step in the process of Training Package rationalisation work being undertaken by Manufacturing Skills Australia. There was an identified need for a 'whole of manufacturing' approach to many of the qualifications and units of competency contained in some of the manufacturing sector Training Packages.

Version 1

Certificate I in Manufacturing (Pathways)

The first qualification and units of competency to populate this new Training Package was the MSA10107 Certificate 1 in Manufacturing (Pathways). This will be followed closely by more units of competency and qualifications that will be applicable across all of manufacturing.

Refer to the Appendices attached to this Training Package for information on development of this certificate.

Version 2

Process Manufacturing Certificates

The process manufacturing certificates have been developed for use by the industry sectors covered by the following Training Packages:
PMA02 Chemical, Hydrocarbons and Oil Refining Training Package
PMB07 Plastics, Rubber and Cablemaking Training Package
PMC04 Manufactured Mineral Products Training Package.

In the recently completed review of the Plastics, Rubber and Cablemaking Training Package it was determined that the production support certificates in PMA, PMB and PMC should be rationalised to increase flexibility and recognition across all of process manufacturing.

In keeping with the high market penetration of the Certificates in Process Manufacturing in PMB01, this title has been maintained for the common certificates. The certificates have been generalised and recoded for inclusion on MSA07 and as such, will be available across all of process manufacturing. This makes the elective units from PMA, PMB and PMC all available for selection in a Certificate in Process Manufacturing.

Other generic units

In addition to the generic support units developed for the Process Manufacturing Certificates, it has been recognised that there would be significant benefits to be gained from rationalising other units in PMA, PMB and PMC. A range of units have been developed for inclusion in MSA07, not aligned to any MSA qualifications at this time. These units are intended to be used as imported electives in the Certificates IV, Diplomas and Advanced Diplomas in PMA, PMB and PMC.

Refer to the Appendices for more details on development of the above certificates.

Version 3

MCM04 qualifications, new specialist streams for Technology Cadetship qualifications

Relocation of the MCM units and qualifications to MSA07 is the first step in a major rationalisation plan which will eventually see all the units and qualifications from the nine manufacturing Training Packages under the one framework. The changes are summarised below.

9) The Competitive Manufacturing and Manufacturing Technology qualifications and units of competency have been recoded as MSA units and qualifications.

10) The Competitive Manufacturing qualifications have been revised to incorporate units of competency covering sustainability skills and to include Employability Skills Summaries.

11) All existing MCM units have been updated to replace Key Competencies with Employability Skills.

12) The MSAPMPER units and one MSAPMOHS unit have been revised as part of the current review of the Chemical, Hydrocarbons & Oil Refining Training Package.

13) MSA07v2 qualifications (MSA10107, MSA10207, MSA20107 and MSA30107) updated with recoded MCM units, revised MSAPMPER units and updated LMT and LMF units.

14) Addition of new metallurgy and polymer streams for the existing Certificate III in Manufacturing Technology.

15) Addition of new polymer stream for the existing Certificate IV in Manufacturing Technology.

16) Addition of Diploma and Advanced Diploma of Manufacturing Technology (metallurgy and polymer streams).

Full details on development of the Competitive Manufacturing qualifications and the new streams are included in the Appendices.

Version 3.1

New specialist stream for structural steel detailing in Technology Cadetship qualifications.

Six new units of competency for structural detailing and additional imported units have been added to the Manufacturing Technology qualifications to facilitate training of new entrants to this industry. Details of this development are included in the Appendices.

Version 4

Competitive Manufacturing Vocational Graduate qualifications

The need for development of Vocational Graduate qualifications in Competitive Manufacturing was identified by MSA in 2007 in response to requests for more in depth training and professional development for individuals who already had some skills or training in Competitive Manufacturing practices.

The following new qualifications are included in MSA07v4:

MSA71109 Vocational Graduate Certificate in Competitive Manufacturing
MSA81109 Vocational Graduate Diploma of Competitive Manufacturing

More information on this development is included in the Appendices.

Version 5

Certificate III in Surface Preparation and Coating Application

The surface preparation and protective coating application industry sector approached Manufacturing Skills Australia (MSA) in 2008 regarding the lack of a qualification for people working in this sector. MSA, the national Industry Skills Council with coverage of this area, responded to this concern by establishing a project in 2008 to 'research existing units and develop units of competency to cover blast cleaning and coating'.

This research project identified a significant number of relevant units of competency and the need for at least one new unit of competency to cover the skill needs of this sector. As a result of this research, it also became clear that to fully respond to the industry's need, a new qualification was required, utilising existing units in MEM05 and PMB07 and the proposed new unit(s).

Further research and consultation with the industry, the industry association and relevant RTOs identified that the appropriate level of qualification was AQF 3. MSA supported the findings and contracted Kevin Hummel, Total Training and Performance Solutions to develop the new units and packaging rules for a new Certificate III in Surface Preparation and Coating Application.

More information on this development is included in the Appendices.

Trade Measurement units and Skill Sets

In 2008, Manufacturing Skills Australia (MSA) contracted Ivan Johnstone, CIT Solutions, to undertake a scoping project to determine the scope of change required to update the Laboratory Operations Training Package (PML04). It was identified in that scoping project that because of changes to the regulatory environment for Australia's trade measurement system, there was a need to update/redevelop existing units of competency in MEM05 and/or develop new units to meet the needs of the National Measurement Institute (NMI).

- NMI is a Division of the Commonwealth Department of Innovation, Industry, Science and Research. The Institute is responsible for Australia's units and standards of measurement through the development and maintenance of standards of measurement, reference materials and reference techniques. The Institute has a wide variety of professional and technical staff who provide calibration, measurement, analysis, pattern approval testing and training services.

More information on this development is included in the Appendices.

Version 6

Recreational Vehicle qualifications

The recreational vehicle qualifications started with THC99 under the Tourism and Hospitality National Industry Training Advisory Board. This was revised to THC04 with minimal changes. With the merger of national ITABs into the ten Industry Skills Councils, THC04 came under the jurisdiction of the Service Industries Skills Councils. As the bulk of the use of these qualifications was in the fields of manufacture, service and repairs, it was realised that the recreational vehicle industry would be better served by bringing its qualifications under the coverage of the Manufacturing Industry Skills Council (Manufacturing Skills Australia – MSA). They have revised the qualifications and their associated units of competency and brought them into line with the current requirements and aligned them with similar manufacturing, service and repair qualifications.

This sector typically manufacture, repair and service recreational vehicles as required.
Recreational vehicles include:
motor homes
caravans
camper trailers
slide-ons, and
fifth wheelers

Recreational vehicles may be made from a frame (timber, aluminium or steel) and skin (aluminium or fibre composite) or a manufactured wall panel or some other technology. They are typically mounted on a steel chassis. Fittings are typically timber/particle board but may be any other suitable material.

More information on this development is included in the appendices.

Introduction to the Industry

Introduction to the Industry

The manufacturing industry

The manufacturing industry's contribution to Australia's gross domestic product (GDP) has been falling in percentage terms since the early 1960s as other industries have risen in prominence. Despite this it is still the second largest segment of the Australian economy. In 2005–06, the industry had a gross industry product of $96 billion, exports of $75 billion and employed 1 052 000 persons. Manufacturing is a major contributor to the state economies of South Australia, Victoria, Tasmania and New South Wales.

The scope of 'manufacturing' occupations covers a broad spectrum. The skills profile of the manufacturing industry covers production workers, tradespeople, technicians and associate professionals as well as professionals. These are applied in the range of manufacturing from simply transformed to elaborately transformed materials.

Qualification Framework

The Australian Qualifications Framework

What is the Australian Qualifications Framework?
A brief overview of the Australian Qualifications Framework (AQF) follows. For a full explanation of the AQF, see the *AQF Implementation Handbook*.
http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf
The AQF provides a comprehensive, nationally consistent framework for all qualifications in post-compulsory education and training in Australia. In the vocational education and training (VET) sector it assists national consistency for all trainees, learners, employers and providers by enabling national recognition of qualifications and Statements of Attainment.
Training Package qualifications in the VET sector must comply with the titles and guidelines of the AQF. Endorsed Training Packages provide a unique title for each AQF qualification which must always be reproduced accurately.
Qualifications
Training Packages can incorporate the following eight AQF qualifications.

- Certificate I in ...
- Certificate II in ...
- Certificate III in ...
- Certificate IV in ...
- Diploma of ...
- Advanced Diploma of ...
- Vocational Graduate Certificate of ...
- Vocational Graduate Diploma of ...

On completion of the requirements defined in the Training Package, a Registered Training Organisation (RTO) may issue a nationally recognised AQF qualification. Issuance of AQF qualifications must comply with the advice provided in the *AQF Implementation Handbook* and the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

Statement of Attainment
A Statement of Attainment is issued by a Registered Training Organisation when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). Issuance of Statements of Attainment must comply with the advice provided in the current *AQF Implementation Handbook* and the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

Under the AQTF 2010, RTOs must recognise the achievement of competencies as recorded on a qualification or Statement of Attainment issued by other RTOs. Given this, recognised competencies can progressively build towards a full AQF qualification.

AQF Guidelines and Learning Outcomes
The *AQF Implementation Handbook* provides a comprehensive guideline for each AQF qualification. A summary of the learning outcome characteristics and their distinguishing features for each VET related AQF qualification is provided below.

Certificate I

Characteristics of Learning Outcomes
Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities most of which may be routine and predictable.
Applications may include a variety of employment related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group.
Distinguishing Features of Learning Outcomes
Do the competencies enable an individual with this qualification to:

- demonstrate knowledge by recall in a narrow range of areas;
- demonstrate basic practical skills, such as the use of relevant tools;
- perform a sequence of routine tasks given clear direction

receive and pass on messages/information.

Certificate II

Characteristics of Learning Outcomes
Breadth, depth and complexity of knowledge and skills would prepare a person to perform in a range of varied activities or knowledge application where there is a clearly defined range of contexts in which the choice of actions required is usually clear and there is limited complexity in the range of operations to be applied.

Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes.

Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate basic operational knowledge in a moderate range of areas;
- apply a defined range of skills;
- apply known solutions to a limited range of predictable problems;
- perform a range of tasks where choice between a limited range of options is required;
- assess and record information from varied sources;

take limited responsibility for own outputs in work and learning.

Certificate III

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover selecting, adapting and transferring skills and knowledge to new environments and providing technical advice and some leadership in resolution of specified problems. This would be applied across a range of roles in a variety of contexts with some complexity in the extent and choice of options available.

Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the section of equipment, services or contingency measures and within known time constraints.

Applications may involve some responsibility for others. Participation in teams including group or team co-ordination may be involved.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate some relevant theoretical knowledge
- apply a range of well-developed skills
- apply known solutions to a variety of predictable problems
- perform processes that require a range of well-developed skills where some discretion and judgement is required
- interpret available information, using discretion and judgement
- take responsibility for own outputs in work and learning

take limited responsibility for the output of others.

Certificate IV

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance are involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others.

Distinguishing Features of Learning Outcomes
Do the competencies enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts
- apply solutions to a defined range of unpredictable problems
- identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas
- identify, analyse and evaluate information from a variety of sources
- take responsibility for own outputs in relation to specified quality standards

take limited responsibility for the quantity and quality of the output of others.

Diploma

Characteristics of Learning Outcomes
Breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and co-ordination.

The self directed application of knowledge and skills, with substantial depth in some areas where judgment is required in planning and selecting appropriate equipment, services and techniques for self and others.

Applications involve participation in development of strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team co-ordination may be involved.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes
Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas
- analyse and plan approaches to technical problems or management requirements
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations
- evaluate information, using it to forecast for planning or research purposes
- take responsibility for own outputs in relation to broad quantity and quality parameters

take some responsibility for the achievement of group outcomes.

Advanced Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity involving analysis, design, planning, execution and evaluation across a range of technical and/or management functions including development of new criteria or applications or knowledge or procedures.

The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved.

Applications involve significant judgement in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of specialised knowledge with depth in some areas
- analyse, diagnose, design and execute judgements across a broad range of technical or management functions
- generate ideas through the analysis of information and concepts at an abstract level
- demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills
- demonstrate accountability for personal outputs within broad parameters

demonstrate accountability for personal and group outcomes within broad parameters.

Vocational Graduate Certificate

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth and complexity involving the initiation, analysis, design, planning, execution and evaluation of technical and management functions in highly varied and highly specialised contexts.
- Applications involve making significant, high-level, independent judgements in major broad or planning, design, operational, technical and management functions in highly varied and specialised contexts. They may include responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major broad or technical and management functions in highly varied and highly specialised contexts.
- Generate and evaluate ideas through the analysis of information and concepts at an abstract level.
- Demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills in complex contexts.
- Demonstrate responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

Vocational Graduate Diploma
Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth, depth and complexity involving the initiation, analysis, design, planning, execution and evaluation of major functions, both broad and highly specialised, in highly varied and highly specialised contexts.
- Further specialisation within a systematic and coherent body of knowledge.
- Applications involve making high-level, fully independent, complex judgements in broad planning, design, operational, technical and management functions in highly varied and highly specialised contexts. They may include full responsibility and accountability for all aspects of work and functions of others, including planning, budgeting and strategy development.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and highly specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major functions, both broad and within highly varied and highly specialised contexts.
- Generate and evaluate complex ideas through the analysis of information and concepts at an abstract level.
- Demonstrate an expert command of wide-ranging, highly specialised, technical, creative or conceptual skills in complex and highly specialised or varied contexts.
- Demonstrate full responsibility and accountability for personal outputs.
- Demonstrate full responsibility and accountability for all aspects of the work or functions of others, including planning, budgeting and strategy.
-

Qualification Pathways

Qualification Pathways

Qualifications in MSA07

The new Manufacturing Training Package was initially developed to include all qualifications across the manufacturing industries as the existing manufacturing Training Packages are rationalized. Information on some of the qualifications available in MSA07 follows.

Pathways qualifications

MSA10107 Certificate I in Manufacturing (Pathways)

The Certificate I in Manufacturing (Pathways) is a cross-manufacturing certificate, utilizing elective units from a range of MSA Training Packages. The packaging rules for MSA10107 are based on the agreed Pathways qualification model:

- three core Pathways units
- one industry/technical unit* to be chosen from a bank of units imported from MCM04
- balance of units from a bank of elective units imported from other MSA Training Packages.

*Note that the industry/technical units coded "MSAPII" are designed for use only in a Pathways qualification or skills set. They should not be used in other qualifications as replacements for units that have direct job outcomes.

There is significant support from a range of manufacturing industries for the Pathways Certificate I. The certificate has been reviewed and approved by MSA's industry advisory committees, whose members represent:

- textiles, clothing, footwear and furniture
- process manufacturing
- metal and engineering.

The Certificate I in Manufacturing (Pathways) provides a generic, cross manufacturing

Qualification Pathways

Certificate I designed to:

- develop both employability and technical skills
- allow for selection of competency standards from a range of manufacturing Training Packages
- encourage collaborative delivery and assessment approaches\
- map to existing qualifications
- include opportunities for recognition against existing qualifications
- provide a clear pathway into other Training Package qualifications and/or employment.

The Pathways Certificate I also responds to the need to:

- provide pathways for those whom access to formal vocational education and training has been limited
- ensure consistency with existing Certificate I qualifications
- ensure that employment related solutions are encouraged throughout the structure of the qualifications and that guideline materials provided are in alignment with licensing boundaries
- make employability and generic skills 'front and centre' in the development of qualifications
- provide opportunities for new pedagogical approaches and for local input.

It is expected that as manufacturing Training Packages are reviewed and/or updated, this certificate will replace a number of existing Certificates I.

MSA20208 Certificate II in Manufacturing Technology

This qualification was developed and endorsed in the Competitive Manufacturing Training Package. It applies to a learning and assessment environment where access to normal production operations is not available. A typical environment will be for application in a VET in Schools program or other simulated or trial manufacturing environment where a high degree of supervision exists. The units are suitable for delivery in a school environment and for schools to contextualize the units to local manufacturing industry activities.

Process Manufacturing qualifications

Process Manufacturing Certificates I, II and III

The three Process Manufacturing Certificates (or production support certificates) cater for people working in the manufacturing industry and filling vital production support roles, but who may not have the opportunity to develop competence in sufficient technical units of competency related directly to producing products.

These certificates have been developed for inclusion in the Manufacturing Training Package (MSA07) as common certificates for use across the three process manufacturing Training

Qualification Pathways

Packages:

• Chemical, Hydrocarbons and Oil Refining Training Package (PMA)

• Plastics, Rubber and Cablemaking Training Package (PMB)

• Manufactured Mineral Products Training Package (PMC).

The packaging rules for these certificates allow for the importation of electives from PMA, PMB and PMC. Registered Training Organisations should refer to the National Training Information Service (www.ntis.gov.au) to access units of competency from these packages.

Competitive Manufacturing qualifications

General Comments

The Competitive Manufacturing qualifications were developed as a collaborative response from Australia's manufacturing Industry Advisory Bodies to assist manufacturing industry improve manufacturing practice through the development of innovative vocational education and training (VET) qualifications and units of competency. Full details on this development are in the Appendices to MSA07.

As the Competitive Manufacturing qualifications complement manufacturing Training Packages, provision is made in the qualifications for the importation of relevant sector specific units of competency into CM qualifications. It is also expected that CM units of competency will be imported into existing manufacturing Training Packages when they are reviewed, or under continuous improvement provisions. Not all CM units of competency may be appropriate for any given sector.

Due to the nature of CM, it is expected that most delivery and assessment will be done in partnership with an enterprise, or group of enterprises, which are embarking on competitive manufacturing. A project style of delivery is envisaged for many units of competency.

It may be appropriate to grant recognition of prior learning (RPL) for certain FMI units depending on the amount and type of contextualisation applied to the FMI unit. As the equivalence will depend on the contextualisation applied, it is not possible to give general advice at this stage.

Companies embarking on competitive/lean manufacturing will frequently choose different starting points, and often different names to describe what they are doing. This Training Package allows for these differences in approach and relevant units of competency should be selected to match the starting point and the strategies being adopted.

Where sector specific competencies are required, these should be imported from the relevant sector specific Training Package. Relevant units at the same level or at an AQF level one up or one below the selected CM qualification should be chosen.

Qualification Pathways

Using the CM units

The CM units have been written with the intention that they be used in a number of contexts. The units have been packaged into specific Competitive Manufacturing qualifications. These are appropriate for individuals and enterprises where the need for generic manufacturing practice skills is dominant over the need for specific technical skills. The requirements for Competitive Manufacturing qualifications are detailed in the packaging rules for each qualification.

The units are also intended to be imported into sector specific Training Packages and qualifications. This would be appropriate where the need for sector specific and/or technical skills is dominant, but there is also a need for generic manufacturing practice skills. The requirements for these sector specific qualifications will be contained in their respective Training Packages and Qualifications Frameworks.

It is expected that many personnel in manufacturing will have some need of the manufacturing practice skills defined by the Competitive Manufacturing units of competency. Their importation into manufacturing Training Packages is encouraged. Imported units should show the original code number and unit title.

Qualification Pathways for Competitive Manufacturing – AQF II to VI

The diagram below represents a model of the available qualifications and pathways. Details are in the packaging rules for each qualification. Contact Manufacturing Skills Australia {www.mskills.com.au} for further details.

Qualification Pathways
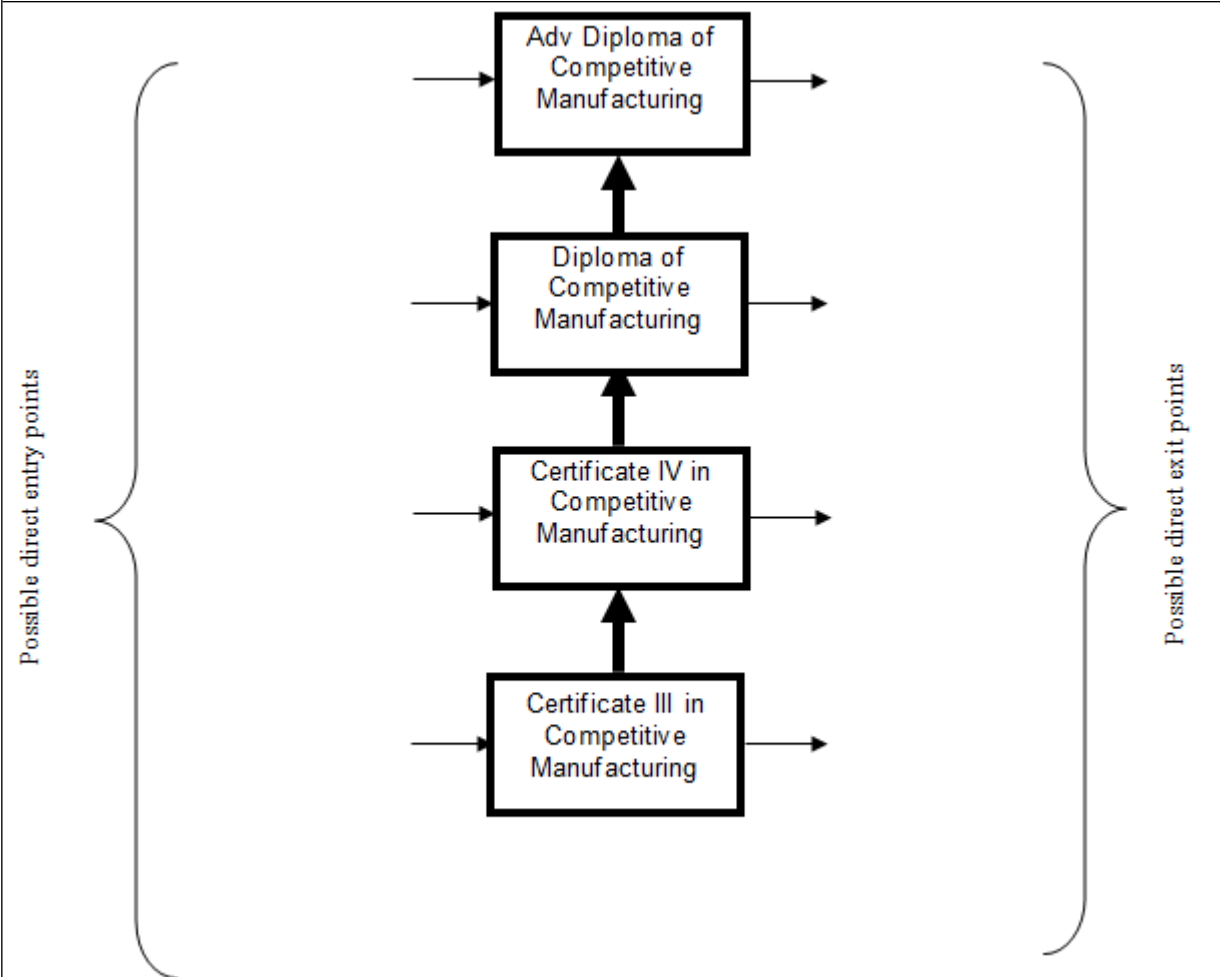
Competitive Manufacturing Vocational Graduate qualifications

The addition of these new qualifications will enable a professional development pathway to be offered for individuals who have prior experience or training in competitive manufacturing.

Industry priorities addressed in the new Vocational Graduate qualifications are to provide additional development of skills and knowledge in competitive manufacturing practices for individuals who have prior training or industry experience in competitive manufacturing. This need for additional skill is usually apparent after an enterprise has completed initial implementation of a competitive manufacturing system such as lean manufacturing and needs to progress implantation of the system to a higher level of performance beyond that achieved from the initial implementation.

Development of the Vocational Graduate Competitive Manufacturing qualifications is also a response to industry advice that not all needs for increased competency in competitive manufacturing skills is related to promotion of an individual to a position of increased responsibility. As stated in the previous paragraph the demand for increased skill and

Qualification Pathways

knowledge can also be related to the stage of an enterprise's implementation of a competitive manufacturing system

The Vocational Graduate Competitive Manufacturing qualifications also meet the industry need for in depth competitive manufacturing training in skills associated with establishing workforce understanding and participation in competitive manufacturing and for advanced value chain skills.

The new Vocational Graduate Competitive Manufacturing qualifications now offer a choice of two levels of professional development for individuals seeking to extend their knowledge of and skills in competitive manufacturing systems. Unlike the existing endorsed AQF II – VI Competitive Manufacturing qualifications they do not have assumptions that the candidate will be working at a particular level in industry (e.g. supervisor or manager). For this reason they are likely to be seen as ideal training for change agents and other expert resource people in competitive manufacturing as well as offering further skill development to any one with previous competitive manufacturing training or experience.

Consultations also indicated that the project based nature of many of the units and the lower but more intense nature of the qualifications may attract more senior and experienced personnel to the qualifications compared to the existing Diploma and Advanced Diploma of Competitive Manufacturing which are designed as high level entry level qualifications to competitive manufacturing.

Manufacturing Technology Qualifications

In August 2003 the Australian Industry Group with funding assistance from ANTA established a Manufacturing Technician Training Initiative project known colloquially as the Technology Cadetship Project. The aim of the project was to develop and promote more efficient pathways for school leavers to enter technical occupations in manufacturing industry. One of the key objectives was to establish entry level qualifications linked to on and off the job training in a cadetship arrangement. The term Technology Cadetship was developed to differentiate the level of training from that commonly found in apprenticeships and traineeships although the principle of combined off and on the training and mutual obligation of employer and employee is the same.

General Advice – Technology Cadetship arrangements

These qualifications may be delivered as part of a cadetship contract of training often called a Technology Cadetship. The units listed for all these qualifications are taken from a number of existing Training Packages. These units have been examined for suitability in a cadetship environment and repackaged to suit entry level technology based training in manufacturing.

Structure of Technology Cadetships

The Technology Cadetship related qualifications are very flexible qualifications with a minimum number of core units and specialisations that maximise flexibility. The electives have been chosen to give entry and operational skills in a wide range of manufacturing

Qualification Pathways

technology application areas. Each qualification consists of specialist options. Each stream indicates the units that may be taken in that particular specialisation. It is intended at a later date to add additional units and streams to the qualifications.

Manufacturing Technology specialist streams
The streams available in the Manufacturing Technology qualifications offer a significant choice of electives. In MSA07v3.1, the streams available are:

Certificate III in Manufacturing Technology

- CAD/Drafting
- Manufacturing Operations
- Laboratory Operations
- Technical Officer
- Polymer Technology
- Metallurgy
- Structural Steel Detailing

Certificate IV in Manufacturing Technology

- CAD/Drafting
- Manufacturing Operations
- Laboratory Operations
- Technical Officer
- Polymer Technology

Diploma and Advanced Diplomas of Manufacturing Technology

- Polymer Technology
- Metallurgy
- Structural Steel Detailing

Reference to these specialisations may be included on any qualification statement that is issued. This could be achieved by adding the pathway descriptor below the formal title of the qualification as shown in example 1 or by an additional sentence as shown in example 2 below.
Example 1
Certificate III in Manufacturing Technology
Manufacturing Operations
Example 2
Certificate III in Manufacturing Technology
Achieved through the Manufacturing Operations specialisation

It should also be noted that a person holding the Metal and Engineering Training Package

Qualification Pathways

Certificate III in Engineering – Technician will satisfy all of the requirements for a Certificate III in Manufacturing Technology, and with an additional five units of competency from the particular stream chosen will satisfy the requirements for a Certificate IV in Manufacturing Technology.

Qualification Pathways for Manufacturing Technology

The diagram below represents a model of the qualifications and pathways. Details are in the packaging rules for each qualification. Contact Manufacturing Skills Australia {www.mskills.com.au} for further details.

The polymer technology pathway is intended for people who plan to become polymer technicians, and who are not currently working as operators in the polymer industries. It is recommended that those who have already achieved a Certificate II from the Plastics, Rubber and Cablemaking Training Package would be better served by completing the Certificate III in Polymer Processing.
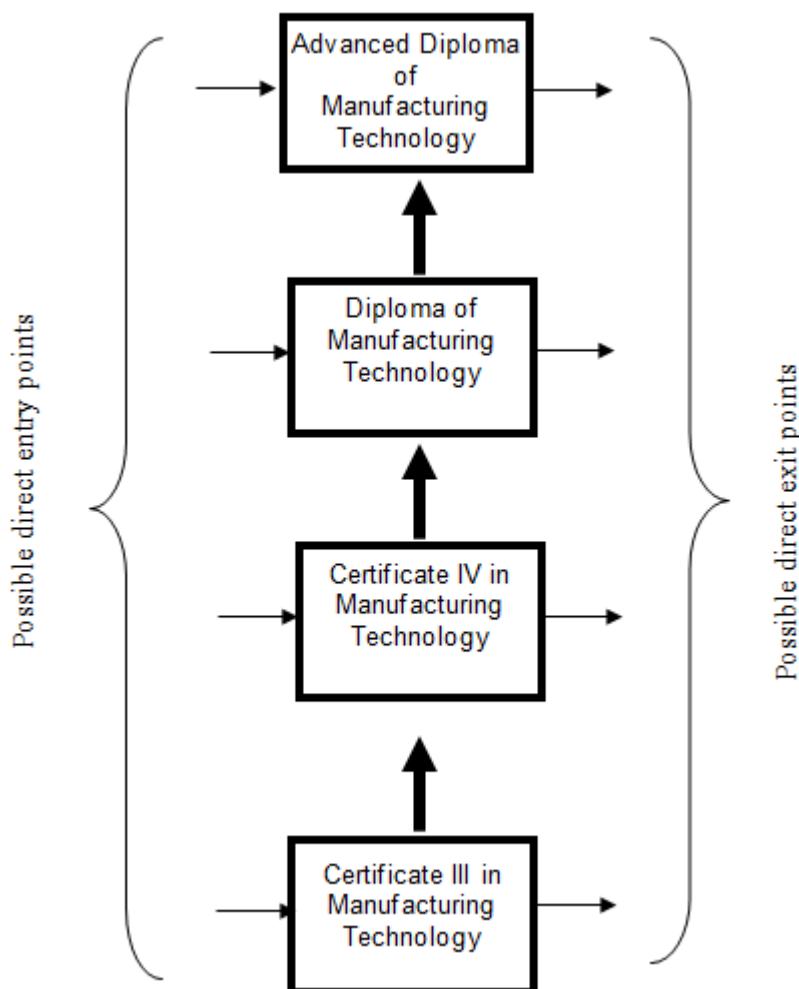
Qualification Pathways

Apprenticeships

The Process Manufacturing and Competitive Manufacturing qualifications within this Training Package are potential New Apprenticeships. However these qualifications have been developed primarily for existing manufacturing workers, especially those working as or likely to become team leaders. For this reason existing worker New Apprenticeships may be more appropriate than application to school leavers.

VET in Schools

The delivery and assessment of competencies aligned to AQF 2 under this Training Package in appropriately designed VET in schools programs is encouraged. However, due to the requirements to demonstrate competency, it would be difficult for a school to assess and award the Competitive Manufacturing qualifications except in close partnership with an appropriate organisation from the industry. The AQTF rules are the overriding requirements in this regard.

The Certificate II in Manufacturing Technology has been developed specifically for use as a VET in schools program.

Prerequisites

Some units of competency have stated prerequisites (these have been kept to a minimum). In any approved training scheme, it is expected that competency will be attained in the prerequisite units before it is attained in the unit having the prerequisites. Imported units of competency may also have prerequisites which should be observed. In this situation a unit with two prerequisites will be counted as three units towards the qualification once competency has been attained in all units.

In an assessment of existing competency, it is possible to assess the unit and its prerequisites together as an integrated assessment. In this situation as well, a unit with two prerequisites will be counted as three units towards the qualification once competency has been attained in all units.

Note that the achievement of prerequisite competencies will be recognised for the award of the qualification, regardless of the method by which the participant has gained the competencies (e.g. prior learning and/or experience). A person entering at AQF 3 and proceeding through the qualifications in an orderly manner might be expected to be assessed on the prerequisites. A person entering at a higher AQF level might expect to be able to demonstrate their competence in the prerequisite in any of a number of ways, including an assessment integrated with the higher unit. RTOs developing formal learning pathways may find the prerequisite trail useful in designing a hierarchical learning program, or they may choose to integrate the prerequisite unit into the higher level unit for purposes of delivery and assessment, or some other approach.

Skill Sets in this Training Package

Skill Sets

Definition

Skill sets are defined as single units of competency, or combinations of units of competency from an endorsed Training Package, which link to a licence or regulatory requirement, or defined industry need.

Wording on Statements of Attainment

Skill sets are a way of publicly identifying logical groupings of units of competency which meet an identified need or industry outcome. Skill sets are not qualifications.

Where skill sets are identified in a Training Package, the Statement of Attainment can set out the competencies a person has achieved in a way that is consistent and clear for employers and others. This is done by including the wording "these competencies meet [insert skill set title or identified industry area] need" on the Statement of Attainment. This wording applies only to skill sets that are formally identified as such in the endorsed Training Package. See the 2010 edition of the AQF Implementation Handbook for advice on wording on Statements of Attainment.

http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf

Skill Sets in this Training Package

Trade Measurement Skill Sets

Responsibility for trade measurement matters will transfer to the Commonwealth on 1 July, 2010. The National Measurement Institute (NMI) has the responsibility of administering the national trade measurement legislation which encourages and promotes accurate measurement in the sale of goods.

Currently, there are approximately 100 trade measurement inspectors who undertake trade measurement activities that can be categorised into five distinct work functions including:

- instrument verification
- pre-packaged products
- trading practices
- licensing
- investigations.

In addition to the inspectors, there are approximately 2000 verifiers who work under a servicing licence to verify measuring instruments and measures used in trade measurement. The principal occupations of verifiers are fitters, mechanics, quality assurance technicians, instrument manufacturers or importers and software developers. Verification of measuring instruments only represents about 10% of their core functions and they spend the majority (90%) of their time repairing, commissioning, manufacturing or selling measuring instruments. Verification involves testing instruments using National Test Procedures to ensure they consistently measure within requirements. Instruments that pass these tests are marked to indicate they are suitable for trade use.

Trade measuring instruments vary greatly in design and complexity. Examples include, shop scales, petrol pumps, weighbridges, machines for measuring length, LPG bulk flowmetering systems, rail weighbridges, high flow rate fuel measuring systems and belt weighers. To address this diversity, the industry and the National Measurement Institute have supported the development of five (5) Skill Sets for Trade Measurement Verification. These are:

- Trade Measurement Verification (Simple Measure)
- Trade Measurement Verification (Simple Measuring Instrument)
- Trade Measurement Verification (Limited Weighing Instrument)
- Trade Measurement Verification (Liquid Measuring Instrument Using Volume Measures)
- Trade Measurement Verification (Complex Measuring Instrument).

Each Skill Set consists of two (2) units that cover the competency requirements of conducting verification tests for the specific class of trade measuring instrument listed in the title.

Skill Sets in this Training Package

From 2010, verifiers will need to achieve the relevant Skill Set before being eligible to work as a verifier under a trade measurement servicing licence.

- **Skill Set: Trade Measurement Verification (Simple Measure)**
- **Skill Set: Trade Measurement Verification (Simple Measuring Instrument)**
- **Skill Set: Trade Measurement Verification (Limited Weighing Instrument)**
- **Skill Set: Trade Measurement Verification (Liquid Measuring Instrument Using Volume Measures)**
- **Skill Set: Trade Measurement Verification (Complex Measuring Instrument)**

High Pressure Water Jetting Skill Sets

Industry has supported the creation of a range of Skill Sets to assist with meeting the competency needs of a developing sector.

Some job roles in some sectors of the industry do require a licence, however, there is no overall industry requirement for this and so no Skill Set associated with licensing has been developed. The industry manages the competency requirements of its workforce to ensure compliance with a vast web of regulatory requirements. The Skill Sets below have been developed in consultation with the industry and are based on logical clusters of units which meet critical industry needs.
These Skill Sets consist of clusters of competencies which are commonly practiced together. They reflect an industry-wide need to be able to recognise that a person can undertake these defined roles.

- **Skill Set: High pressure water jetting operator**
- **Skill Set: High pressure water jetting assistant**
- **Skill Set: Confined space work team**

Employability Skills

Employability Skills replacing Key Competency information from 2006

In May 2005, the approach to incorporate Employability Skills within Training Package qualifications and units of competency was endorsed. As a result, from 2006 Employability Skills will progressively replace Key Competency information in Training Packages.
Background to Employability Skills
Employability Skills are also sometimes referred to as generic skills, capabilities or Key Competencies. The Employability Skills discussed here build on the Mayer Committee's Key Competencies, which were developed in 1992 and attempted to describe generic competencies for effective participation in work.

The Business Council of Australia (BCA) and the Australian Chamber of Commerce and Industry (ACCI), produced the *Employability Skills for the Future* report in 2002 in consultation with other peak employer bodies and with funding provided by the Department of Education, Science and Training (DEST) and the Australian National Training Authority (ANTA). Officially released by Dr Nelson (Minister for Education, Science and Training) on 23 May 2002, copies of the report are available from the DEST website at: http://www.dest.gov.au/archive/ty/publications/employability_skills/index.htm.
The report indicated that business and industry now require a broader range of skills than the Mayer Key Competencies Framework and featured an Employability Skills Framework identifying eight Employability Skills*:
• communication
• teamwork
• problem solving
• initiative and enterprise
• planning and organising
• self-management
• learning
• technology.
The report demonstrated how Employability Skills can be further described for particular occupational and industry contexts by sets of facets. The facets listed in the report are the aspects of the Employability Skills that the sample of employers surveyed identified as being important work skills. These facets were seen by employers as being dependent both in their nature and priority on an enterprise's business activity.
*Personal attributes that contribute to employability were also identified in the report but are not part of the Employability Skills Framework.
Employability Skills Framework
The following table contains the Employability Skills facets identified in the report *Employability Skills for the Future*.

Skill	**Facets** Aspects of the skill that employers identify as important. The nature and application of these facets will vary depending on industry and job type.
Communication that contributes to productive	• listening and understanding • speaking clearly and directly
and harmonious relations across employees and customers	• writing to the needs of the audience • negotiating responsively • reading independently • empathising • using numeracy effectively • understanding the needs of internal and external customers • persuading effectively • establishing and using networks • being assertive • sharing information

	• speaking and writing in languages other than English
Teamwork that contributes to productive working relationships and outcomes	• working across different ages irrespective of gender, race, religion or political persuasion • working as an individual and as a member of a team • knowing how to define a role as part of the team • applying teamwork to a range of situations e.g. futures planning and crisis problem solving • identifying the strengths of team members • coaching and mentoring skills, including giving feedback
Problem solving that contributes to productive outcomes	• developing creative, innovative and practical solutions • showing independence and initiative in identifying and solving problems • solving problems in teams • applying a range of strategies to problem solving • using mathematics, including budgeting and financial management to solve problems • applying problem-solving strategies across a range of areas • testing assumptions, taking into account the context of data and circumstances • resolving customer concerns in relation to complex project issues
Initiative and enterprise that contribute to innovative outcomes	• adapting to new situations • developing a strategic, creative and long-term vision • being creative • identifying opportunities not obvious to others • translating ideas into action • generating a range of options • initiating innovative solutions
Planning and organising that contribute to long and short-term strategic planning	• managing time and priorities - setting time lines, coordinating tasks for self and with others • being resourceful • taking initiative and making decisions • adapting resource allocations to cope with contingencies • establishing clear project goals and deliverables • allocating people and other resources to tasks • planning the use of resources, including time management • participating in continuous improvement and planning processes • developing a vision and a proactive plan to accompany it
	• predicting - weighing up risk, evaluating alternatives and applying evaluation criteria • collecting, analysing and organising information • understanding basic business systems and their relationships
Self-management that contributes to employee	• having a personal vision and goals • evaluating and monitoring own performance

satisfaction and growth	• having knowledge and confidence in own ideas and visions • articulating own ideas and visions • taking responsibility
Learning that contributes to ongoing improvement and expansion in employee and company operations and outcomes	• managing own learning • contributing to the learning community at the workplace • using a range of mediums to learn - mentoring, peer support and networking, IT and courses • applying learning to technical issues (e.g. learning about products) and people issues (e.g. interpersonal and cultural aspects of work) • having enthusiasm for ongoing learning • being willing to learn in any setting - on and off the job • being open to new ideas and techniques • being prepared to invest time and effort in learning new skills • acknowledging the need to learn in order to accommodate change
Technology that contributes to the effective carrying out of tasks	• having a range of basic IT skills • applying IT as a management tool • using IT to organise data • being willing to learn new IT skills • having the OHS knowledge to apply technology • having the appropriate physical capacity

Employability Skills Summary

An Employability Skills Summary exists for each qualification. Summaries provide a lens through which to view Employability Skills at the qualification level and capture the key aspects or facets of the Employability Skills that are important to the job roles covered by the qualification. Summaries are designed to assist trainers and assessors to identify and include important industry application of Employability Skills in learning and assessment strategies. The following is important information for trainers and assessors about Employability Skills Summaries.

• Employability Skills Summaries provide examples of how each skill is applicable to the job roles covered by the qualification.

• Employability Skills Summaries contain general information about industry context which is further explained as measurable outcomes of performance in the units of competency in each qualification.

• The detail in each Employability Skills Summary will vary depending on the range of job roles covered by the qualification in question.

• Employability Skills Summaries are not exhaustive lists of qualification requirements or checklists of performance (which are separate assessment tools that should be designed by trainers and assessors after analysis at the unit level).

• Employability Skills Summaries contain information that may also assist in building learners' understanding of industry and workplace expectations.

Industry Requirements for Employability Skills
This is a technology based industry and a key role of manufacturing personnel is the solving of problems. They are expected to operate in both permanent and *ad hoc* teams as required. The communication of key safety, health, environmental and procedural/operational information to other personnel is a vital requirement.

Competency Standards

What is competency?

The broad concept of industry competency concerns the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry, industry sector or enterprise.

Competency covers all aspects of workplace performance and involves performing individual tasks; managing a range of different tasks; responding to contingencies or breakdowns; and, dealing with the responsibilities of the workplace, including working with others. Workplace competency requires the ability to apply relevant skills, knowledge and attitudes consistently over time and in the required workplace situations and environments. In line with this concept of competency Training Packages focus on what is expected of a competent individual in the workplace as an outcome of learning, rather than focussing on the learning process itself.

Competency standards in Training Packages are determined by industry to meet identified industry skill needs. Competency standards are made up of a number of units of competency each of which describes a key function or role in a particular job function or occupation. Each unit of competency within a Training Package is linked to one or more AQF qualifications.

Contextualisation of Units of Competency by RTOs

Registered Training Organisation (RTOs) may contextualise units of competency to reflect local outcomes required. Contextualisation could involve additions or amendments to the unit of competency to suit particular delivery methods, learner profiles, specific enterprise equipment requirements, or to otherwise meet local needs. However, the integrity of the overall intended outcome of the unit of competency must be maintained.

Any contextualisation of units of competency in this endorsed Training Package must be within the bounds of the following advice. In contextualising units of competency, RTOs:

• must not remove or add to the number and content of elements and performance criteria

• may add specific industry terminology to performance criteria where this does not distort or narrow the competency outcomes

• may make amendments and additions to the range statement as long as such changes do not diminish the breadth of application of the competency and reduce its portability, and/or

• may add detail to the evidence guide in areas such as the critical aspects of evidence or resources and infrastructure required where these expand the breadth of the competency but do not limit its use.

Components of Units of Competency

The components of units of competency are summarised below, in the order in which they appear in each unit of competency.

Unit Title

The unit title is a succinct statement of the outcome of the unit of competency. Each unit of competency title is unique, both within and across Training Packages.

Unit Descriptor

The unit descriptor broadly communicates the content of the unit of competency and the skill area it addresses. Where units of competency have been contextualised from units of competency from other endorsed Training Packages, summary information is provided. There may also be a brief second paragraph that describes its relationship with other units of competency, and any licensing requirements.

Employability Skills statement

A standard Employability Skills statement appears in each unit of competency. This statement directs trainers and assessors to consider the information contained in the Employability Skills Summary in which the unit of competency is packaged.

Prerequisite Units (optional)

If there are any units of competency that must be completed before the unit, these will be listed.

Application of the Unit

This sub-section fleshes out the unit of competency's scope, purpose and operation in different contexts, for example, by showing how it applies in the workplace.

Competency Field (Optional)

The competency field either reflects the way the units of competency are categorised in the Training Package or denotes the industry sector, specialisation or function. It is an optional component of the unit of competency.

Sector (optional)

The industry sector is a further categorisation of the competency field and identifies the next classification, for example an elective or supervision field.

Elements of Competency

The elements of competency are the basic building blocks of the unit of competency. They describe in terms of outcomes the significant functions and tasks that make up the competency.

Performance Criteria

The performance criteria specify the required performance in relevant tasks, roles, skills and in the applied knowledge that enables competent performance. They are usually written in passive voice. Critical terms or phrases may be written in bold italics and then defined in range statement, in the order of their appearance in the performance criteria.

Required Skills and Knowledge

The essential skills and knowledge are either identified separately or combined. Knowledge identifies what a person needs to know to perform the work in an informed and effective manner. Skills describe the application of knowledge to situations where understanding is converted into a workplace outcome.

Range Statement

The range statement provides a context for the unit of competency, describing 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. As applicable, the meanings of key terms used in the performance criteria will also be explained in the range statement.

Evidence Guide

The evidence guide is critical in assessment as it provides information to the Registered Training Organisation (RTO) and assessor about how the described competency may be demonstrated. The evidence guide does this by providing a range of evidence for the assessor to make determinations, and by providing the assessment context. The evidence guide describes:

• conditions under which competency must be assessed including variables such as the assessment environment or necessary equipment

• relationships with the assessment of any other units of competency

• suitable methodologies for conducting assessment including the potential for workplace simulation

• resource implications, for example access to particular equipment, infrastructure or situations

• how consistency in performance can be assessed over time, various contexts and with a range of evidence, and expectations at the AQF qualification level involved

Employability Skills in units of competency

The detail and application of Employability Skills facets will vary according to the job-role requirements of each industry. In developing Training Packages, industry stakeholders are consulted to identify appropriate facets of Employability Skills which are incorporated into the relevant units of competency and qualifications.

Employability Skills are not a discrete requirement contained in units of competency (as was the case with Key Competencies). Employability Skills are specifically expressed in the context of the work outcomes described in units of competency and will appear in elements, performance criteria, range statements and evidence guides. As a result, users of Training Packages are required to review the entire unit of competency in order to accurately determine Employability Skills requirements.

How Employability Skills relate to the Key Competencies

The eight nationally agreed Employability Skills now replace the seven Key Competencies in Training Packages. Trainers and assessors who have used Training Packages prior to the introduction of Employability Skills may find the following comparison useful.

Employability Skills	**Mayer Key Competencies**
Communication	Communicating ideas and information
Teamwork	Working with others and in teams
Problem solving	Solving problems Using mathematical ideas and techniques
Initiative and enterprise	
Planning and organising	Collecting, analysing and organising information

	Planning and organising activities
Self-management	
Learning	
Technology	Using technology

When analysing the above table it is important to consider the relationship and natural overlap of Employability Skills. For example, using technology may involve communication skills and combine the understanding of mathematical concepts.

Explicitly embedding Employability Skills in units of competency

This Training Package seeks to ensure that industry-endorsed Employability Skills are explicitly embedded in units of competency. The application of each skill and the level of detail included in each part of the unit will vary according to industry requirements and the nature of the unit of competency.

Employability Skills must be both explicit and embedded within units of competency. This means that Employability Skills will be:

• embedded in units of competency as part of the other performance requirements that make up the competency as a whole

• explicitly described within units of competency to enable Training Packages users to identify accurately the performance requirements of each unit with regards to Employability Skills.

This Training Package also seeks to ensure that Employability Skills are well-defined and written into units of competency so that they are apparent, clear and can be delivered and assessed as an essential component of unit work outcomes.

The following table contains examples of embedded Employability Skills for each component of a unit of competency. Please note that in the examples below the bracketed skills are provided only for clarification and will not be present in units of competency within this Training Package.

Example Employability Skills unit

Unit component	Example of embedded Employability Skill
Unit Title	Optimise process/plant area (initiative and enterprise, problem solving, technology)
Unit Descriptor	This competency covers the ability to optimise the process performance of a complete plant area. It includes ensuring that production systems comply with Health, Safety and Environment (HSE) requirements, that process, plant and equipment utilisation is planned and carried out, and that problems

	are solved to fully meet operational needs and ensure that production of finished goods meets customer requirements. (Self management, technology, initiative and enterprise, planning and organising, problem solving)
Element	Coordinate corrective and/or optimisation action plan (Teamwork, planning and organising, communication)
Performance Criteria	Develop optimisation plan taking account of hazards identified and HSE implications and communicate to appropriate personnel. (Initiative and enterprise, learning,
	communication, technology, problem solving, self management, teamwork)
Range Statement	This unit describes the work conducted by senior operators, team leaders or front line managers who optimise process systems as part of their work function. It includes all items of equipment and unit operations which form part of the production process of a complete area. (Teamwork, learning, problem solving, self management, technology)
Required Skills and Knowledge	Optimising process systems requires application of detailed operational and process knowledge to address issues (Learning, planning and organising, problem solving)
Evidence Guide	While the technician is expected to take a lead technical role, and to demonstrate competence as defined above, optimisation is rarely undertaken by an individual alone and liaison with all relevant stakeholders is an expected part of this competency. (Technology, learning, communication,

teamwork)

Competency Standards - Industry Contextualisation

MSA07 – General advice for contextualisation

Competency units may, and in some cases should, be contextualised to the sub-sector and type of work environment involved. Contextualisation which:

- replaces general directions with enterprise specific needs
- replaces generic equipment/process names with enterprise specific names
- replaces general processes/specifications with enterprise specific needs

is allowed and encouraged, provided the contextualised unit is of similar level and rigour to the original competency unit.

Note that contextualising cannot be used to generate an additional competency which is closely related to an existing competency. Contextualisation can only be used to generate an alternative competency for qualifications purposes.

Contextualisation may only be done if it does not significantly change the level and rigour or change the application of the unit. Contextualisation may be done within the required knowledge, range of variables and the evidence guide. Lists in these sections should be regarded as indicative lists unless otherwise stated.

Note also that contextualisation of the elements or performance criteria is not permitted. As a minimum, the contextualised unit should:

- be of similar level and rigour
- be of a similar breadth, complexity and size
- be relevant to the industry sector and the enterprise
- not reduce the health, safety or environmental requirements
- retain the original unit code and title.

Importing units from other Training Packages

Competency units may be imported from another endorsed Training Package to customise a qualification. These imported units may be used to replace the maximum number of imported units that are identified in the packaging rules. The use of imported units is allowed if:

- they are from an endorsed Training Package and are packaged at the same AQF certificate level (the original unit title and code number must be retained)
- they are appropriate to the needs of the enterprise
- any prerequisites and co-requisites specified in the original unit and any specific assessment requirements in the host Training Package are also observed.

Exporting units to other Training Packages

Manufacturing Skills Australia encourages other industries and ISCs to access the units of competency in this Training Package which might be appropriate to their needs. These competencies may be used provided:

- the original unit code and title are retained
- they are only contextualised to the extent permitted above
- any specified prerequisites and co-requisites and any specific assessment requirements in the host Training Package are observed

Manufacturing Skills Australia is advised of the specific competencies to be used to facilitate ongoing communication in the event of an update.

Appendices

MSA07 Manufacturing Training Package Appendices

Appendix 1: MSA10107 Certificate I in Manufacturing (Pathways)

Appendix 2: Process Manufacturing Certificates and generic manufacturing units

Appendix 3: Background to the Competitive Manufacturing Qualifications

Appendix 4: Technology Cadetship – metallurgy and polymer technology streams

Appendix 5: Technology Cadetship – structural steel detailing stream

Appendix 6: Competitive Manufacturing Vocational Graduate qualifications

Appendix 7: MSA30309 Certificate III in Surface Coating Preparation and Application

Appendix 8: Trade Measurement units and Skill Sets

Appendix 9: Recreational Vehicle qualifications

Appendix 1
Development of MSA10107 Certificate I in Manufacturing (Pathways)

Research

The Certificate I in *Industry* (Pathways) developed out of research commissioned by the Australian National Training Authority and undertaken by Ratio Pty Ltd over the past three years. Initial research identified that a range of stakeholders considered that a mechanism was needed to:

- explicitly address Employability Skills as described in the report, *Employability Skills For the Future*, BCA/ACCI, 2002
- create pathways into further study, school continuation and/or employment for those for whom traditional pathways were not sufficient or accessible
- assist potential employees in making more informed choices about careers.

Phase One: 2002-2003

In summary, this stage of the research established two main points.

- Across the country a wide range of existing courses and programs sought to address these issues for equity groups which are not part of an industry Training Package and therefore the Australian Qualification Framework (AQF). They focused on the needs of the learners without providing the industry focus or achieving a nationally recognised qualification.
- Current Certificate I qualifications within Training Packages were largely generalist qualifications nestled in higher level qualifications which addressed some of the Employability Skills, but lacked a focus on technical skills. With some exceptions, they were not held in high regard by industry or RTOs.

This research recommended that a qualification be developed which is:

- a recognised qualification in a Training Package
- flexible across Training Packages
- delivered in a work context through one or more meaningful work activities.

It was anticipated that such a qualification would provide a bridge between learner needs and industry need.

Phase Two: 2004-2005

The consultants, with the support of the State and Territory Training Authorities (STAs) and an industry reference group, worked with three Industry Skills Councils (ISCs) to develop a consistent yet customisable qualification.

The ISCs involved were:

  Agri-Food Industry Skills Council

  Manufacturing Skills Australia (MSA)

  TDT Australia (Transport and Logistics).

Pathways qualification model

The qualification model developed was characterised by the following units of competency and structure.

- One core industry unit – this reflects a core industry activity or function and should be delivered as such, with a defined beginning, middle and end. This unit ensures that the qualification has a practical hands-on focus and provides an understanding of the industry.
- Three pathway units – these specifically address the Employability Skills and ideally should be delivered by clustering the units around the core industry unit.
- Two technical units – these provide the underpinning skills and knowledge for the core industry unit and provide articulation into higher industry qualifications.
- Up to three units from any Training Package – these provide the flexibility to cater to the needs of different learner groups, different employers and different contexts. For example, language and literacy units, units from other Training Packages or higher level units from Training Packages from within the same ISC.

Phase Three: 2005-2006

In this latest phase of the research the consultants were contracted to conduct a trial of the Pathways Certificate with a range of target groups in a range of contexts.

It was considered important to ensure that the qualification:

- was sound in structure and content so that it would be adopted across industry and valued by industry and the community
- was able to be implemented by the range of RTOs
- created meaningful pathways for the learners
- provided explicit learning in the Employability Skills.

Stakeholder consultations

Throughout the trial period there were ongoing consultations and discussions with the participating ISCs and STAs. Meetings with representatives from the relevant sections of the state training and education departments were organised to correspond with the site visits in each state.

Participating RTOs and programs delivered

The trial deliberately set out to sample a range of RTO types across different states. The following RTOs participated.

State	Industry	RTO Type	Name
Victoria	Transport	Private	Banksia Consulting
New South Wales	Transport	TAFE School partnership	Hunter Institute of TAFE, Glendale Campus
Tasmania	Transport	Community owned not-for-profit Job Network provider	STEPS Education and Training Solutions
Tasmania	Agri-Food	TAFE	TAFE Tasmania, Launceston

Western Australia	Agri-Food	Residential Provider for youth at risk	Great Southern TAFE, Gnowangerup
Queensland	Agri-Food	TAFE	Brisbane TAFE
South Australia	Manufacturing	Industry/TAFE School partnership	TAFE SA Regency campus/Schefenacker Vision Systems*
South Australia	Manufacturing	TAFE	TAFE SA, Port Adelaide Campus
These RTOs are participating from February 2006 to be completed by June 2006			
Western Australia	Manufacturing	TAFE/School partner ship	Challenger TAFE with Warnbro High School
Northern Territory	Agri-Food	School	Taminmin High School, Humpty Doo

(*This trial was undertaken with Schefenacker Vision Systems providing industry experience for participants.)

Other consultations and presentations included:

- Equity advisors from each State and Territory
- CEOs of all of the ISCs
- Boards of Studies – Australian Curriculum Assessment and Certification Authority (ACACA), Victorian Curriculum and Assessment Authority (VCAA)
- Australian Chamber of Commerce and Industry (ACCI)
- TAFE NSW International Centre for VET Teaching and Learning (ICVET)
- 2005 Connecting Access Workshop through TAFE NSW in Sydney
- Brian Cramond from DFEEST SA presented to the Australian Vocational Education Training Research Association (AVETRA)
- Andrew Nicholson from the trial site at Great Southern TAFE in WA presented to the Teen Teachers Forum.

Trial outcomes
The Pathways Certificate is a viable qualification within the Training Package framework. In terms of Training Package qualifications the Pathways Certificate is unique. It:

- is an industry-based qualification, but is not specific to one job outcome
- is preparatory, but combines a practical work activity
- explicitly addresses Employability Skills and technical skills
- is sufficiently flexible to address local needs, yet it has a common across industry structure
- has unique pathways units, but uses Training Package units thereby providing some articulation
- can be used for workforce entry and re-entry, or induction
- provides for participants needs but focuses on work readiness within one particular industry
- focuses on a pathway and the destination.

Because it is practical, work-based and industry-focused it is compatible with Training Package qualifications and is consistent with the AQF. It also is a very useful tool for industries to attract potential employees and give them credit into higher qualifications.

However, it is different in that it provides work readiness as opposed to job readiness, requires a particular training methodology, and is applicable across Training Packages within an ISC; therefore it requires a special status within Training Packages.

Each of the three trialed qualifications, ie the three qualifications covering Agri-Food, Manufacturing and Transport, shares the same structure, qualifications framework and pathways units. These aspects of the qualification have been thoroughly tested and endorsed by trainers, coordinators, ISC personnel and other industry personnel. Consistency in these matters is important for maintaining the quality, achieving the outcomes and marketing and branding.

Following conditional endorsement of the trialed qualifications, it was recommended that each of the 3 ISCs submit a Certificate I (Pathways) qualification for final endorsement, utilizing the three core Pathways units and drawing on industry specific units of competency from current Training Packages.

Appendix 2
Development of the Process Manufacturing Certificates and generic manufacturing units

In Phase 1 of the review of the Plastics, Rubber and Cablemaking Training Package (PMB01), the production support certificates in PMA, PMB and PMC were reviewed to determine commonalities and potential for rationalisation. The review determined that, as there were minimal differences between the existing certificates, there would be considerable benefits to both industry and RTOs if the mandatory units and the production support certificates were generalised, for use across all three packages.

It was agreed that this work would be undertaken as part of the review of PMB01 and that the common certificates would be developed for inclusion in the Manufacturing Training Package (MSA07). These certificates will be available for use across the three process manufacturing Training Packages.

The existing production support certificates in PMB01 have not been carried forward to PMB07. As part of the current review of PMA and maintenance of PMC, it is intended that the production support certificates in these packages will also be replaced by the MSA Process Manufacturing certificates.

As part of the re-development work, Certificate III in Process Manufacturing has been reviewed to bring it into line with AQF descriptors. To address this need, which was identified by industry, RTOs and Government stakeholders, the mandatory (core) units have been altered and a requirement to attain competency in a minimum number of Certificate III units has been maintained. The focus of this certificate remains on addressing training needs of people whose job roles support the production process.

In addition, it was also recognised that there was significant duplication in the support units currently available at Certificates IV, Diplomas and Advanced Diplomas in PMA, PMB and PMC. A range of rationalised support units has been developed for use across the three packages. These units will be endorsed as free electives in MSA07, not aligned to any MSA qualifications at this time, but available for importation to PMA, PMB and PMC.

This project has been overseen by the PMB Project Reference Group and the Process Manufacturing Industry Advisory Committee. Consultations were undertaken in conjunction with the review of PMB01 and have involved the State/Territory ITAB and RTO networks.

Membership of the Project Reference Group

Organisation	Nominee	Representing
PACIA NSW	Stephen Holland	Plastics
Viscount Plastics (Australia) P/L	Ian Kidd	Plastics industry
National Union of Workers	Julie Warren	Union
Assoc of Rotational Moulders A'sia	Leisa Donlan	Rotational moulding
Ai Group	John Quick	Plastics
Buchanan Advanced Composites	Norm Watt	Composites
TAFE NSW – MECATCC	Kim Peterson	Public provider – NSW
Kangan Batman Institute	Bill Rees	Public provider – Vic
Newskills Ltd	Stephen de Rozairo	Private provider – Vic
Applied Training Solutions	Carlo Lauricella	Private provider – NSW
OTTE	John Scott	State Government

Members of Process Manufacturing Industry Advisory Committee

Member	Organisation	Representing
David Graham	Huntsman Chemical Co (MSA Director)	PACIA (plastics and chemicals)
Doug Stevens	National Union of Workers (MSA Director)	NUW (plastics)
Julie Warren	National Union of Workers	NUW (plastics)
Brian Tobin	Readymix Beenleigh Quarry	Concrete Products (premix)
John Turton	Cement, Concrete and Aggregates Australia	CCAA (cement and concrete)
Don Sanders	Australian Petroleum Production and Exploration Assn Ltd	APPEA (hydrocarbons)
Leisa Donlan	Assoc of Rotational Moulders Australasia	ARMA (plastics)
Alan Bugg	Huntsman Chemical Co Aust Ltd	AWU (chemical)
Vince Lloyd	Qenos	AWU (chemical)
Chris Nail	Foseco Pty Ltd	Manufactured Mineral Products (Refractories)
Norm Watt	Buchanan Advanced Composites	Composites Australia

Appendix 3
Background to the Competitive Manufacturing qualifications

The Competitive Manufacturing Training Package was developed by the Competitive Manufacturing Initiative (CMI).

Overview of the CMI

The Competitive Manufacturing Initiative (CMI) was a collaborative response from Australia's Manufacturing Industry Training Advisory Bodies (ITABs) to assist manufacturing industry improve manufacturing practice through the development of innovative vocational education and training (VET) qualifications and units of competency. The CMI development process was funded by ANTA. The original scoping project for the CMI was majority funded by industry.

The following ITABs formed the Project Management Group for the initial development of the Competitive Manufacturing Training Package.

- **Automotive Training Australia** which covered:
  - passenger vehicles
  - trucks
  - bus and trailer manufacturing
  - most coach and body building
  - vehicle repair, service and retail
  - automotive after market, and
  - some component manufacturing.
- **Light Manufacturing Training Australia** which covered:
  - the textile clothing, footwear and leather industries. and
  - the furnishing industry.
- **Manufacturing Learning Australia** which covered process manufacturing industries such as:
  - chemical
  - hydrocarbons
  - oil
  - plastics
  - rubber
  - cablemaking
  - cement
  - clay
  - ceramic
  - concrete
  - refractories
  - plaster, and
  - fibre board.
- **Manufacturing Engineering and Related Services ITAB** which covered:
  - metal and engineering related manufacturing
  - heavy engineering
  - maintenance
  - aerospace, and
  - boating.
- **National Food Industry Training Council** which covered:
  - food and beverage
  - pharmaceutical, and
  - tobacco processing and manufacturing.

MERS ITAB acted as the secretariat for the development of Competitive Manufacturing. However, users should now contact Manufacturing Skills Australia (MSA), the national Industry Skills Council that covers manufacturing to seek specific advice relevant to their area. Contact MSA on telephone (02) 9955 5500 or at www.mskills.com.au. The CMI website should also be checked for information and advice at www.cmi.org.au.

Industry coverage

The Competitive Manufacturing qualifications cover all of the manufacturing industry. At the 2001 census, the manufacturing industry employed 1,010,179 persons or 12% of the entire workforce. Manufacturing is the biggest sector in terms of contribution to gross domestic product where it contributes 13 % of the total product[1] and is also the sector with the highest value added contributing 12% of the total value added[2] to the economy. The Australian Bureau of Statistics notes[3] that 'Manufacturing contributed more to Australian production than any other industry'.

1 Manufacturing Industry Australia, 1999-2000, ABS, 8221.0
2 Australian System of National Accounts, 2002-2003, ABS, 5204.0
3 Manufacturing Industry Australia, 1999-2000, ABS 8221.0

The CM qualifications are complementary to qualifications in existing Training Packages covering specific manufacturing sectors. These sector specific Training Packages cover the knowledge and skills specifically required by those sectors. The CM qualifications cover knowledge and skills associated with manufacturing practices and systems which are common across manufacturing sectors.

Development of the Competitive Manufacturing qualifications

This project originated out of discussions within the Board of the Foundation for Australian Manufacturing Education (FAME) and the initial scoping study was financially supported by FAME, Australian Business Ltd and ANTA. Support for the project's aims and objectives was also given by the Australian Manufacturing Centre (AMC) and the Australian Industry Group. This scoping project found that there was a bias in the then existing Training Packages of specific technical skills and insufficient coverage of the skills needed to manage, supervise and implement system skills needed in modern manufacturing. The scoping report identified a need for the development of units of competency in manufacturing practice, and possibly also qualifications in manufacturing practice.

The CMI Stage 2 project:

- investigated the scope of skills to be included in the CMI
- developed a marketing strategy and established a CMI website
- established a formal cooperative mechanism amongst the manufacturing ITABs
- established a brand and logo based on the title Competitive Manufacturing Initiative (CMI).

The CMI Stage 3 project then developed and validated a number of units of competency and qualifications. The development and validation was done by consulting industry generally and also by the use of industry experts. Care was taken through this process to ensure there was representation of each industry sector and type of manufacturing process. The use of competitive manufacturing practices is variable across the manufacturing sector, and one of the aims of developing this Training Package is to make training in these skills more widely available, so helping industry operate more effectively in a competitive environment. Initial consultation therefore focussed more on identified leaders in this area while validation focused more on the broader manufacturing industry.

Consultations undertaken as part of CMI Stage 2 and confirmed in Stage 3 indicated that the CM qualifications and units would represent new content for many RTOs and that many of the skills could only be taught and assessed in a workplace environment. CMI Stage 3 therefore included a process to allow early identification of delivery issues through a trial site process. Five trial sites were selected to cover both a number of states and also each major industry sector. The trial sites used[4] the draft CM units to map the draft units to current delivery and to validate the units and to determine any delivery issues. The trial sites were:

[4] As the units were not endorsed at this stage there were some practical limitations on the 'use' of these units.

- Goulburn Ovens Institute of TAFE – Shepparton Campus
- Hunter Institute of Technology
- Onkaparinga Institute of TAFE
- Swinburne University – VET Division
- Western Sydney Institute of TAFE – Mt Druitt Campus

The Technology Cadetships

In August 2003 the Australian Industry Group with funding assistance from ANTA established a Manufacturing Technician Training Initiative project known colloquially as the Technology Cadetship Project. The aim of the project was to develop and promote more efficient pathways for school leavers to enter technical occupations in manufacturing industry. One of the key objectives was to establish entry level qualifications linked to on and off the job training in a cadetship arrangement.

The origin of the project was partly Australian Industry Group work on the National Industry Skills Initiative as well as comments and concerns by Ai Group members that pathways for the development of technician level skills in manufacturing were inefficient and generally took too long to be attractive to either enterprises or young people.

The Ai Group Manufacturing Technician Training Initiative included activities in a number of areas that were broader than a normal Training Package development project. These areas were:

Identification and/or development of appropriate content in existing and/or new Training Packages;

Marketing of technician level contract of employment arrangements to employers, young people, industry and the community generally;

Establishment of appropriate employment arrangements;

Establishing arrangements for the approval of contracts of employment by State Training Agencies

Establishment of appropriate funding arrangements for both mainstream training delivery and employer financial incentives;

Marketing of actual placements to Ai Group members and other employers.

While the Australian Industry Group conducted much of the content research and development for this submission, both the Ai Group and ANTA realised that Ai Group would not be able to put forward the new qualifications for endorsement under current policy arrangements.

The Australian Industry Group was consulted on the development of the Competitive Manufacturing Training Package and decided that the CM was the most appropriate body to take over on a longer term basis the future content development of the Technology Cadetship and responsibility for endorsement of the work done to date. The CMI ITABs and Ai Group also agreed that the qualifications and units for the Technology Cadetship should be part of the responsibilities of the Manufacturing Industry Skills Council once it was established.

The Manufacturing Industry Skills Council has now been established and it is anticipated that the Competitive Manufacturing Initiative will continue to exist as a sub committee function in the Manufacturing Skills Council and that arrangements will be made for on going participation of the Agri-Foods Skills Council and for automotive industry representation.

The term Technology Cadetship was developed to differentiate the level of training from that commonly found in apprenticeships and traineeships although the principle of combined off and on the training and mutual obligation of employer and employee is the same.

Appendix 4
MSA07v3 Manufacturing Technology qualifications – metallurgy and polymer technology specialist streams

The previous Certificate III in Manufacturing Technology and the Certificate IV in Manufacturing Technology provided four specialist streams. These were:

- CAD/drafting
- Manufacturing operations
- Technical Officer
- Laboratory operations

The new polymer technology stream will provide new specialisations within both qualifications. The metallurgy stream will provide a specialisation within the Certificate III. Industry advises there is no work outcome at Certificate IV.

In addition, metallurgy and polymer technology specialist streams have been developed at the Diploma and Advanced Diploma levels, hence two new qualifications (Diploma and Advanced Diploma in Manufacturing Technology) are also part of this endorsement submission. These are the first streams for the Diploma and Advanced Diploma qualification levels to be completed. Other industry specialisations for these qualifications are under development by Manufacturing Skills Australia (MSA).

Background to the Technology Cadetships

The new streams, like all existing streams for the Certificate III and IV in Manufacturing Technology, have been developed to be undertaken as part of an entry level qualification linked to on and off the job training in a cadetship arrangement known colloquially as a *technology cadetship*. The term *technology cadetship* was developed to differentiate the level of training from that commonly found in apprenticeships and traineeships, although the principle of combined off and on the job training, a formal contract of training and mutual obligation of employer and employee is the same. As in apprenticeships and traineeships the qualifications have a separate title from that used for the cadetship.

Employment arrangements for students of the metallurgy or polymer technology specialisations can vary according to the circumstances of each student. It is anticipated that most students will be undertaking a technology cadetship which will be supported by Award, enterprise agreement or Australian Workplace Agreement employment arrangements. A special Award for the employment of Technology Cadets was created by consent between the Australian Industry Group, the Engineering Employers Association South Australia, the Australian Manufacturing Workers Union and the Australian Workers Union. This Award is known as the *Manufacturing And Associated Industries – Skills Development - Wages And Conditions Award 2004*.

Project Management
Development of the metallurgy and polymer technology streams was part of a broader project known as the Competitive Manufacturing Initiative (CMI) Stage 5. This project included development of additional specialisations for the Technology Cadetships as well as development of a new school subject in manufacturing studies for higher achieving year 11 and 12 school students.

CMI Stage 5 was conducted under the oversight of the Strategic Manufacturing Initiatives Industry Advisory Committee of the Manufacturing Skills Australia Board.

Strategic Manufacturing Initiatives IAC membership

Ian Curry MSA Director	National Projects Officer Australian Manufacturing Worker's Union
David Graham MSA Director	Learning & Development Manager Huntsman Chemical Company
Michael Grogan MSA Director	Chief Executive Officer Sutton Tools
Martin Lewis MSA Alternate Director	Chief Executive Officer Furnishing Industry Association of Australia
Megan Lilly MSA Director	Associate Director – Education & Training Australian Industry Group
Matt Murphy	Communications, Electrical, Plumbing Union

MSA Director	

Day to day supervision of the CMI Stage 5 project was delegated to Bob Paton CEO and Sue Woodward Deputy CEO of MSA.

Richard Jenkins and Associates were contracted to undertake this work. Consultants who worked on the project were Richard Jenkins, Kevin Hummel and Kerrie Clarke.

Metallurgy stream

Metallurgists can be degree qualified or have qualifications issued through the vocational training and education sector. Metallurgists work across manufacturing in a number of sectors and roles. Sectors include:

- processing of ores and refining and smelting of metals;
- foundries;
- diecasting;
- steel making
- fabrication and welding of structures;
- metal protection and corrosion control.

Metallurgists are involved in the specification and supervision of the processing of metallic ores as well as metal smelting, refining, melting, pouring, joining, fabricating and finishing processes. Metallurgists working in the mining and processing of metallic ores are often called primary metallurgists while metallurgists specifying and supervising producing metal or metal products are often called industrial or secondary metallurgists. Primary metallurgists generally though not exclusively are degree qualified while secondary metallurgists can be either VTE or degree qualified. Because of the low demand for VTE primary metallurgists this pathway and submission concentrates on skills required for secondary metallurgists.

The metallurgy stream development process involved:

- initial separate approaches by the Australian Foundry Institute and Central TAFE in Western Australia to MSA for the development of metallurgy qualifications. After considering these requests MSA decided that the best approach would be to develop qualifications and units of competency as part of the Manufacturing Technology qualifications allied with the Technology Cadetship initiative as this would allow the widest coverage across manufacturing and also facilitate entry level training. It was also envisaged that the metallurgy units of competency that were to be developed would be imported into the Metal and Engineering Training Package after endorsement to enhance the range of electives available in the Diploma of Engineering –Technical and Advanced Diploma of Engineering qualifications in that Training Package.

- consultation with enterprises, industry organisations and RTOs to confirm support for the proposed stream. Consultations were both face to face and by telephone.

- a review of existing endorsed units of competency for relevance to the metallurgy stream. While a range of units relevant to metallurgy were identified, these were mostly of a supporting nature. The review found that most metallurgy related skills would need to be covered by new units of competency.

- visits to foundries in several States and to steelmaking plants in Newcastle and Wollongong to meet with metallurgists and to observe first hand their duties and work environment

- development of draft units of competency and a specialist stream qualification structure within the existing manufacturing technology qualifications. Employability skills were embedded in all new units of competency.

- preparation and distribution of first, second and final drafts for industry and RTO comment and review.

Consultations

The development of the metallurgy units and associated units of competence involved substantial industry and RTO contributions. Special mention needs to be made of the support and assistance provided by the Australian Foundry Institute, Central TAFE in Perth, Hunter Institute of Technology and Bluescope Steel.

The Australian Foundry Institute delegated its Queensland Branch to form a sub–committee especially to liaise with and assist the project consultant. This sub-committee facilitated access to workplaces and met with the project consultant numerous times to provide technical information and to review drafts.

Central TAFE in Western Australia and the Hunter Institute of Technology in Newcastle provided full access to their current State accredited metallurgy qualifications and hosted several visits by the project consultant. Central TAFE also conducted surveys of WA industry to obtain comments on the draft pathway and units of competence.

Bluescope Steel provided access on a commercial in confidence basis to several internal DACUM analyses and job descriptions for metallurgists. As well Bluescope hosted several plant visits by the project consultants.

Drafts of the metallurgy stream and units of competence were distributed to major enterprises, industry associations, relevant unions, major RTOs and State ITAB contacts. Besides the general distribution to the above organisations, a range of selected individuals in each organisation were also contacted.

Many of these organisations also passed on the drafts through their own networks. For example the Australian Industry Group advised that the drafts had been distributed to their network of industry training advisors who in turn distributed them to interested members. A list of individuals contacted directly for consultations and/or distribution of draft pathways and units follows.

Megan Lilly, Australian Industry Group (plus all Ai Group Training Advisers)
Ian Curry, AMWU
Margie John, SA TAFE
Deb Doherty, Office of Post-Compulsory Education & Training, Tasmania
Remy Jayasekere, Central TAFE, WA
Bruce Wilson, Central TAFE, WA
Stephen Davies, NSW TAFE MEC&T Curriculum Centre
Paul Kennett, Manufacturing and Engineering Skills Advisory Body of Victoria
Sue Fraser, EEASA Group Training SA
Simon Kay, Toowoomba Metal Technologies
Richard Bozza, Toowoomba Metal Technologies
Michael Wright, Bradken Runcorn Foundry Queensland
Greg Newton, Bradken Runcorn Foundry Queensland
Stojan Lemut, Bradken Henderson Foundry Western Australia
Craig Lee, Bradken Henderson Foundry Western Australia
John Elliot, White Industries Dalby Queensland
Bob Murray, Wear Tech Foundry Queensland
John Walter, Investment Castings Queensland
Rod Brown, Austcast Queensland
Michael Lee, CAST CRC Melbourne
Chris Shaw, Queensland Railways Redbank Foundry
Ken Nicholl, Hunter Institute of Technology
Karen Humphreys, Hunter Institute of Technology
Scott Orpin, OneSteel Newcastle
Steve Dowey, Surface Technology Coatings and Suttons Tools Melbourne
Derry Doyle, Surface Technology Coatings and Suttons Tools Melbourne
Phillip Rouse, BlueScope Steel Port Kembla
Stephen Irving, BlueScope Steel Port Kembla
Max Voight, PAC Foundry Pty Ltd, Queensland
John Cawley, Swinburne University Centre for New Manufacturing
Brad Walsh, Dickinson's Metallurgical Supplies, South Australia
Shelley Smailes, METS CSSN Portfolio Officer, WA TAFE
Marty Burgess, Illawarra Institute of TAFE NSW
David Tiller, Australian Industry Group NSW
Ewan O'Leary, Weir Minerals Sydney

In addition to the above direct consultations the Australian Foundry Institute distributed draft copies of the units and qualifications to their members in all States and Territories. Support for the drafts was received from each Branch of the AFI.

There was substantial enthusiasm and support for the development and endorsement of the metallurgy pathway from all individuals and organisations consulted.

Polymer technology stream

The polymer technology stream covers technician level skills required by the plastics, rubber and cablemaking industries. **These industries employ a**pproximately 48,000 people and consist of:

- plastics - including injection moulding, blow moulding, blown film, rotational moulding, fabrication, composites, compounding and reclamation, extrusion and thermoforming

- rubber - including belt splicing, extrusion, rubber lining, tyre building and tyre retreading

- cablemaking - including power transmission and communication cables.

The Polymer Technology stream is intended for people who plan to become polymer technicians, and who are not currently working as operators in the polymer industries. It is recommended that those who have already achieved a Certificate II from the Plastics, Rubber and Cablemaking Training Package would be better served by completing the Certificate III in Polymer Processing.

The polymer technology stream development process used the same basic processes for development as was used for the development of the existing endorsed specialist streams. This involved:

- initial consultation with industry and RTO to re-confirm support for the proposed pathway. Initial support had been identified in the Technology Cadetship Expansion Scoping Study report by MSA in April 2005.

- review of existing endorsed units for relevance to the polymer technology stream.

- identification of gaps and writing of new units of competency to meet these gaps

- development of a specialist stream for the existing manufacturing technology qualifications

- preparation of first, second and final drafts for industry and RTO comment and review.

The early consultations indicted continuing support and enthusiasm for the development of a polymer technology stream for Technology Cadetship related qualifications.

After confirming continuing support, currently endorsed units were evaluated for relevance to the proposed polymer technology stream. The two main Training Packages examined were the Plastics, Rubber & Cablemaking Training Package (PMB01) and the Competitive Manufacturing Training Package (MCM04). This examination revealed that most units required for the stream were already endorsed. A need for six new polymer technology units was identified. In addition there was support for incorporation of three generic sustainability units because of the importance of environmental and sustainability issues to the plastics, rubber and cablemaking industries.

Discussions were also held with MSA staff and consultants involved in the review of the Plastics, Rubber & Cablemaking Training Package (PMB01) to ensure that there was co-ordination between the two projects. New units developed as part of the polymer technology pathway have been coded as PMB units and have been incorporated into PMB07 which was endorsed on 16/11/07.

Consultations
Drafts of the polymer technology stream and units of competence were distributed to major enterprises, industry associations, relevant unions, State Training Authorities, major RTOs and State ITAB contacts. Besides the general distribution to the above organisations, a range of selected individuals in each organisation were also contacted.

Many of these organisations also passed on the drafts through their own networks. For example the Australian Industry Group advised that the drafts had been distributed to their network of industry training advisors who in turn distributed them to interested members. A list of individuals contacted for consultations and/or distribution of draft pathways and units follows.

Alistair Martin, Vinidex WA
Ian Kidd, Viscount Plastics, Perth
Stephen Holland, Plastics and Chemicals Industries Association (PACIA)
Leisa Donlan, Association of Rotational Moulders Australia, Brisbane
Gary Rayner, Schefenacker Vision Systems
Roger Cater, Plastics and Rubber Technical Educational Centre (PARTEC) Qld
Barry De Sylva, PARTEC, Brisbane
Sue Fraser, EEASA Group Training SA
Megan Lilly, Australian Industry Group (plus all Ai Group Training Advisers)
Ian Curry, AMWU
Doug Stevens, National Union of Workers
Julie Warren, National Union of Workers
Margie Johns, SA TAFE
Deb Doherty, Office of Post-Compulsory Education & Training, Tasmania
Larry Taylor, TAFE Tasmania
Peter Ebel, Central TAFE, WA
Graham Walsh, JAG Assignments (VET consultant in Tasmania)
David McIntee, Northern Group Training Company, Tasmania
Kim Peterson, NSW TAFE MEC&T Curriculum Centre
Leslie Faulstone, NSW TAFE
Stephen Dawkins, NSW TAFE

Peter Harper, NSW TAFE
Bill Brees, Kangan Batman Institute of TAFE
John Molenaar, Manufacturing and Engineering Skills Advisory Body of Victoria
Stephen De Rozairo, Newskills (RTO) Melbourne,
Carlo Lauricella, Applied Training Solutions (RTO), Sydney,
John Quick, AiGroup, Sydney
John Scott, OTTE, Melbourne,
Trevor Lange, Curriculum Maintenance Manager, Chisholm Institute of TAFE

Appendix 5
MSA07v3.1 – Manufacturing Technology - new structural steel detailing specialist stream

Project background

Structural steel detailing involves taking a design for a steel structure such as a steel framed building prepared by an engineer or architect and transforming it into a series of complete working drawings and erection diagrams for use by steel fabricators and builders. In preparing the drawings steel detailers are often required to liaise with engineers, architects, design draftspersons, fabricators and builders. The steel detailer is required to create drawings for all components of a steel structure including all welded and bolted connections. The work of the steel detailer is critical as they produce all the detailed instructions that enable both fabrication and construction to occur. Structural steel detailing enterprises are usually small with a range from single person businesses to 15-20 employees. There are a small number of larger structural steel detailing enterprises and an unknown number structural steel detailers also work for large builders and fabricators.

Structural steel detailing has been covered by a single specialist unit in the Metal and Engineering Training Package for approximately ten years since the first endorsement of MEM98. However as shortages of steel detailers became more apparent, industry dissatisfaction with this minimal coverage grew and MSA was approached on a sporadic basis by different enterprises and state steel detailing associations for greater coverage of steel detailing skills.

In February 2007 Manufacturing Skills Australia was approached by the Australian Steel Institute (ASI) with an offer to co-ordinate a national input and participation in the development of Training Package based qualifications in structural steel detailing. MSA accepted this offer and an industry based Steering Committee was formed chaired by an ASI senior officer. Richard Jenkins and Associates was also engaged at this time to undertake the research and development of the appropriate qualifications.

Meeting industry needs

Initial industry consultations indicated that there was significant industry interest in developing qualifications that could be used to attract young people into steel detailing as well as support training for people who were currently in employment but looking to change careers and train in steel detailing. It was decided that industry requirements could best be met through developing a structural steel detailing specialist stream in the existing Manufacturing Technology qualifications in the Manufacturing Training Package. This would allow training to be linked Technology Cadetships and to apply across all of MSA's coverage. This decision was supported by the Steering Committee, industry associations and the AMWU which is the relevant union.

The new units and qualifications have full support of the industry. During the course of development, pre-existing State based Steel Detailing Institutes combined to form a national federation called the Australian Institute of Steel Detailing. The AISD and all State Institutes have indicated support for the draft specialist stream and units of competence. The development of the new specialist stream is also consistent with the MSA aim identified in the MSA Environmental Scan to to lift overall educational achievement levels in areas of MSA coverage.

Development has drawn on the experience and expertise of the Australian Steel Institute, industry and RTOs to make sure that the proposed specialist stream will meet training and assessment requirements well into the future.

Project management

The project was managed by Manufacturing Skills Australia and overseen by a seven person industry based Steering Committee. Apart from an ASI nominee, other members represented industry in NSW, Victoria and Tasmania, South Australia, Queensland, and Western Australia.

The Steering Committee's functions were to:

- oversee and advise on consultation processes
- provide advice on underpinning knowledge and technical content
- act as a technical advisory group in the development of new units of competency
- assist with the resolution of any issues.

The Steering Committee members are listed below.

Name	Organisation	Representing
Peter Hisco (Chair)	Fiddlistics Pty. Ltd.	Victorian Institute of Steel Detailers
Chris Velovski	EDC. Pty. Ltd.	NSW Institute of Steel Detailers
Clayton Roxborough	SteelCad Drafting Pty. Ltd.	Queensland Institute of Steel Detailers

Neil Creek	Australian Steel Institute	Australian Steel Institute
James Galdes	Ironworks Steel Detailing	Victorian Institute of Steel Detailers
John Lyons	PDC Consultants	WA Association of Engineering Drafting Services
Greg Hammer	Australian Steel Detailers	Association of Independent Structural Draftsmen of SA

Consultation and validation processes

Consultations were undertaken nationally, involving face to face meetings, targeted email distribution of drafts to stakeholders (including members of the State industry associations, the AMWU, RTOs, State/Territory ITBs, STAs and individual enterprises) and wider distribution via the MSA website and the MSkills email update. Individual consultations with both enterprises were also conducted to confirm content and approach. Consultations were also undertaken with a range of RTOs in each State that were considered likely to be interested in delivery of structural steel detailing. While all RTOs consulted were supportive of the drafts, because of the small and highly specialised nature of structural steel detailing not all were interested in delivery.

Following a period of public comment, final drafts were developed, distributed by email and made available for a sign-off period on the MSA website. The qualifications and units of competency now being submitted have the full support of industry and interested RTOs.

Many people made time from their work commitments to participate in this project especially the members of the Steering Committee and John Leworthy from the VISD who also provided technical input. Without their expertise and input, the project would not have been able to achieve its objectives and this is gratefully acknowledged.

Structural steel detailing – consultation list

Development of the structural steel detailing specialist stream and associated units of competency involved substantial industry and RTO contributions. This included input from the following people.

Name	Organisation
Peter Hisco (Chair)	Fiddlistics Pty. Ltd.
Chris Velovski	EDC. Pty. Ltd.
Clayton Roxborough	SteelCad Drafting Pty. Ltd.
Neil Creek	Australian Steel Institute

Name	Organisation
James Galdes	Ironworks Steel Detailing
John Lyons	PDC Consultants
Greg Hammer	Australian Steel Detailers
Ian Curry	AMWU
Anne Donellan	AMWU
Ian Anderson	RMB Metalwork
Ian Cairns	Australian Steel Institute
Lorraine Conetta	Bayside Drafting
David White	Box Hill Institute
John Leworthy	Steelcode Detailing
Dean Beaumont	Global Drafting Corporation
Stuart Mattingley	Box Hill Institute
Ricky Hains	PlanIT Design
John Neal	Warradale Drafting Service P/L
Philip Scrivener	Scrivener Drafting Australia Pty Ltd
Norm Batterham	NB Drafting
Craig Beams,	Beamarr Structural Steel Detailing Pty Ltd
John Robinson	Sole trader WA
Mark Selby	Amalgamated Drafting
Terry Bownes	Amalgamated Drafting
Fraser Nelson	MECAT Curriculum Centre. NSW TAFE
Stephen Davies	MECAT Curriculum Centre NSW TAFE
Klaus Bienert	Box Hill Institute of TAFE
Glen Miller	GFC Industries Pty Ltd (Steel Fabricator)

Name	Organisation
Greg Schofield	Greg Schofield & Associates
Basil Morin	Global Drafting corporation
Robert Squires	TAFE Tasmania
Ian McDonald	Challenger TAFE
Greg Guppy	Challenger TAFE
Werner Lausberg	Adelaide North Institute of TAFE
Emmanuel Evangelidis	Victoria University
David Zanich	Central TAFE
Phil Grafton	Siegraft Drafting

The final drafts of the new units and qualifications were validated and signed off by all major stakeholders (both industry and RTOs) with no outstanding or unresolved issues. Validation and acceptance of final drafts was undertaken by email.

Formal support (letters/emails) has been provided by:

- AMWU
- Robert Squires TAFE Tasmania
- MECAT NSW TAFE
- Victoria University
- Klaus Bienert CMM Victoria
- Challenger TAFE
- Australian Institute of Steel Detailers
- Queensland Institute of Steel Detailing
- NSW Institute of Steel Detailing
- Victorian Institute of Steel Detailing (The Victorian Institute also covers steel detailers working in Tasmania)
- Association of Independent Structural Draftsmen of SA
- WA Association of Engineering Drafting Services
- Australian Steel Institute
-

Appendix 6
Development of Competitive Manufacturing Vocational Graduate qualifications

The need for development of Vocational Graduate qualifications in Competitive Manufacturing was identified by MSA in 2007 in response to requests for more in depth training and professional development for individuals who already had some skills or training in Competitive Manufacturing practices. MSA appointed Richard Jenkins & Associates to undertake the development of the qualifications with the project commencing in April 2007.

The MSA decision to provide professional development as the target approach for the graduate qualifications meant that it was also appropriate to shift the skill level of the new units of competency further towards the leading edge of competitive manufacturing practice. Identifying this leading edge was undertaken through desk research, individual consultation with enterprises and through a full day workshop with senior industry practitioners and one RTO representative who had very recent senior management experience in private industry in lean manufacturing.

The desk research and the industry workshop identified that the skills focus in the vocational graduate qualifications should not be on providing initial training in the competitive manufacturing "tools" such as Just in Time, 5S, preventative maintenance etc, whether at implementation (AQF III/IV) or initial system design (AQF V /VI). It was felt that these skills were already adequately covered in the existing Competitive Manufacturing qualifications. Rather it was felt that the emphasis should be on providing the skills for a practitioner to assist an enterprise to take existing competitive manufacturing systems to even higher levels of performance. This approach was seen to be consistent with:

- the professional development philosophy established by MSA for the Vocational Graduate qualifications in Competitive Manufacturing; and with
- industry need for the highest level of skills required to take existing enterprise performance to higher levels to address intractable problems.

Based on the advice of the workshop participants it was decided that the emphasis in the Vocational Graduate qualifications should be mostly focused in two areas:

- skills associated with improving workplace understanding and implementation of competitive manufacturing practices;
- skills associated with improving the performance of a value chain as distinct from a focus just within an enterprise.

The above approach was confirmed during both rounds of consultations with no dissenting views being received.

Industry priorities addressed in the new components of the MSA07 Training Package Training Package are to provide additional development of skills and knowledge in competitive manufacturing practices for individuals who have prior training or industry experience in competitive manufacturing. This need for additional skill is usually apparent after an enterprise has completed initial implementation of a competitive manufacturing system such as lean manufacturing and needs to progress implantation of the system to a higher level of performance beyond that achieved from the initial implementation.

The development of the Vocational Graduate Competitive Manufacturing qualifications also is also a response to industry advice that not all needs for increased competency in competitive manufacturing skills is related to promotion of an individual to a position of increased responsibility. As stated in the previous paragraph the demand for increased skill and knowledge can also be related to the stage of an enterprise's implementation of a competitive manufacturing system

The Vocational Graduate Competitive Manufacturing qualifications also meet the industry need for in depth competitive manufacturing training in skills associated with establishing workforce understanding and participation in competitive manufacturing and for advanced value chain skills.

Meeting industry needs

The existing Competitive Manufacturing qualifications as they provide formal training and recognition for skills that have long been implemented in industry under various manufacturing practice approaches such as lean manufacturing, agile manufacturing, six sigma, total productive maintenance, etc. The current qualifications cover competitive manufacturing skills across the AQF II – AQF VI range and target training for operators, tradespersons, technicians, team leaders, supervisors and managers.

As implementation of the current qualifications proceeded it became recognised that while they provided a pathway for skills development to match promotion through a supervisory pathway, they did not provide as good an opportunity for someone who was already familiar with competitive manufacturing and who wanted to increase their skills and knowledge from their current level without changing their position within the enterprise.

The qualifications now being submitted for endorsement meet this need. They also meet the need of industry in that the early gains made from the implementation of competitive manufacturing practices are often the "low hanging fruit" of obvious errors and waste, and greater skill and knowledge is needed to sustain early gains and to achieve even higher performance levels.

Specifically based on the advice of the workshop and consultations, industry needs identified and addressed in this project focused on the following key skill areas:

- culture
  - achieving a consistent approach to all of the business (i.e. the value chain)
  - problem recognition and resolution (including the customer's problems)
  - establishing a learning organisation
- relationships
  - internal relationships with employees e.g. trust, consensus decision making
  - external relationships with value chain members
  - developing the capability of people

The new components presented for endorsement have been developed and validated extensively with industry and RTO representatives. This includes representation from enterprises, industry associations, unions, and RTOs from around Australia.

Project management

Because this project has application across all of manufacturing it was directly overseen by the MSA Board. Advice from an industry technical advisory group made up of technical experts in competitive manufacturing practices was also sought at different stages.

The individuals and enterprises/organisations represented on the MSA Board are set out in the following table:

Name	Enterprise/Organisation
Megan Lilly	Associate Director, Education & Training Australian Industry Group
Ian Curry	National Projects Officer Australian Manufacturing Workers Union
Sam Wood	National Vice President Australian Workers Union
David Graham	Operations Learning & Development Manager Huntsman Chemical Co Australia Ltd
Doug Stevens	Central Branch Secretary National Union of Workers

Michael Brown	General Manager, Heavy Maintenance Qantas Airways
David Hoare	General Manager Sealy of Australia
Michael Grogan	Chief Executive Officer Sutton Tools Pty Ltd
Michael O'Neill	National Secretary TCFU
Jo-Ann Kellock	Executive Director TFIA
Les Chegwidden	Manager Human Resources Viridian CSR

Consultation and validation processes

This project was conducted in two stages. An initial investigation stage was conducted to examine current research and Training Package components and included the initial scoping workshop. This was followed by an implementation stage involving widespread consultation and industry visits, development and validation of two drafts and preparation of a final draft for endorsement.

Consultations were undertaken nationally and involved face to face meetings and targeted email distribution of drafts to enterprises, industry associations, unions, RTOs, State/Territory ITABs, and STAs. Wider distribution was achieved via the MSA website and their regular email newsletter.

Following each period of public comment, amendments were made and drafts circulated for acceptance.

The following people were involved in the development process and the value of their expertise and input is gratefully acknowledged.

Name	Organisation
Keith Cowlishaw	Ex - General Manager Rocklea Spinning Mills Currently Head of School of Fashion and Textiles RMIT Melbourne
Professor David Ben-Tovim	Flinders Medical Centre
Dr. Ross Bensley	Organisation Development Manager

Name	Organisation
	Schefenacker Vision Systems Australia
David Hind	Retired CEO, BOC Australia & Chair of Skills Tasmania
Aimee Allen	President - Strip and Plate, Port Kembla Steelworks Bluescope Steel
Rod Snashall	Slabmaking Process Control Manager, Port Kembla Steelworks Bluescope Steel
Michael Brown	General Manager, Heavy Maintenance and Technical Training QANTAS (Melbourne)
Jorge Marquesini	CEO Volvo Trucks Australia
Barry McCarthy	Learning and Development, Toyota Australia
Tari Shabat	Toyota Australia
Ray Clark	Corporate Learning and Development Associate Ford Australia
Julie Eastman	Corporate Learning and Development Manager Ford Australia
Michael Grogan	CEO, Sutton Tools Australia
Anne Donellan	Technical, Supervisory and Administrative Division Australian Manufacturing Workers' Union
Ian Curry	Australian Manufacturing Workers' Union
Steve Gunn	CEO, Blundstone Australia Pty Ltd
David Hoare	General Manager, Sealy of Australia
Doug Stevens	Central Branch Secretary, National Union of Workers
Michael Littlechild	Automotive Training Australia
Anne Ford	TAFE NSW - Western Sydney Institute
David Tiller	Australian Industry Group
Bob Carter	General Manager, Improve group
Terry Richards	CEO, Australian College of Training

Name	Organisation
Joe Husidic	Wiseman Institute of Applied Learning
Allan McCracken	Forest Industries Training and Education Council (NZ)
Jennis Lawrence	Competenz New Zealand
Eric Salonen Richard Lindner	Manufacturing Skills QLD
Derek Cupp	Manufacturing Industry Skills Advisory Council (SA)
Jillian Dielesen	Light Manufacturing ITC (WA)
Archie Wright	MITAC (NT)
Les Hewett	Efficiency Works
Deb Doherty	Skills Tasmania
Steve Ghost	Skills Tech Australia (QLD)
Elizabeth Owers	DFEEST (SA)
Pauline Hart	MECAT TAFE NSW
David McCourt	TAFE NSW Riverina Institute
David Zanich	Central TAFE WA
Karen Humphreys	Hunter Institute of Technology (NSW)
Sandy Powell	Goulburn Ovens Institute of TAFE
Carlo de Martinis	Swinburne University – TAFE Division
Nick Proferes	TAFE SA
Kerry Dickson	TexSkill
Martin Lewis	FIAA Ltd.
Geoff Adams	QLD Department of Tourism, Regional Development and Industry
Paul Kennett	Manufacturing and Engineering Skills Advisory Board (MESAB) Victoria

Name	Organisation
Robert Miley	Department of Economic Development, Tasmania
Werner Lausberg	TAFE SA

Appendix 7
Development of MSA30309 Certificate III in Surface Preparation and Coating Application

This new qualification meets an industry need to have qualified operators who can suitably prepare surfaces and apply the required protective coating. There currently exist qualifications for vehicle painters and painters and decorators, but there is no qualification in this sector for a job with arguably more technical requirements.

The CSIRO estimates the cost of corrosion in Australia to be around $13 billion per year. The major role for this sector is the control of corrosion and so, the reduction of this significant cost. Protective coatings need to be applied to much of public infrastructure (e.g. bridges, pipelines), some modes of transport (e.g. ships, submarines), and many large public and private structures (e.g. hydrocarbon, chemical plants, off shore oil/gas platforms). All these items need to have their surfaces prepared correctly before beginning to apply the appropriate coating. Time between preparation and application is often critical to the overall success of the final product. The industry sought an appropriate qualification to provide common and adequate base level skills across Australasia as a fundamental way of achieving better quality.

The increasingly technical nature of the protective coating and the need to undertake both adequate preparation and surface preparation safely and in an environmentally friendly manner has increased the need for this particular qualification. These technological advances have increased the life of the item, and the period between maintenance and the overall life. However, as surface preparation and coating becomes more technical, the ability to perform both correctly becomes more critical if the intended protection is to be achieved.

As much of this work is done 'on site' with routine only supervision, it is essential that the qualification equips the operator for this degree of independent operation.

Project management

MSA's Process Manufacturing Board Sub-committee oversaw the development process with significant technical assistance being provided by the Australasian Corrosion Association (ACA) Technical Coatings Technical Group (TCTG).

The individuals and enterprises/organisations represented on the Process Manufacturing Board Sub-committee are set out in the following table:

Name	Enterprise/organisation

Les Chegwidden, Chair replaced by David Graham	Pilkington/Veridian Glass Huntsman Chemicals
Bob Paton or Barbara Wallace	MSA CEO MSA QA Manager
Julie Keddie	MSA Industry Coordinator
John Maraz	MSA Industry Coordinator
Robert McRuvie	DTRDI, Queensland
Alexsander Stanojevic	AiGroup
Richard Lindner	MSQ
Heather Yerbury	Boral Concrete & Quarries Country (QLD/NT)
Dr. Geoffrey Will	School of Physical Sciences, Queensland University of Technology
Kerryn Caulfield	Composites Australia
Marina Williams/Sam Wood	AWU

Consultation and validation processes

Consultations during the development and validation process were undertaken with the ACA and with RTOs already working in the field or intending to offer this qualification.

The following individuals and organisations participated in the development process. The great value of their expertise and input is gratefully acknowledged.

Name		**Organisation**	**State**
Mark	Arundell	SkillsTech (TAFE)	Qld
Ron	Baker		WA
Fikry	Barouky	Saudi Aramco	
Ron	Berry	Altex Coatings Limited	NZ
Ben	Biddle	Wattyl Protective & Marine Coatings	Qld

Name		Organisation	State
Alan	Buckley	Technical Pacific Pty Ltd	NSW
Phillip	Coleman	TAFE NSW	NSW
John	Cooper	Prostrip	NSW
Geoff	Coward	McElligott Partners Pty Ltd	Vic
Bill	Doherty	TAFE NSW	NSW
Mark	Dromgool	KTA Tator	Vic
Warren	Easterbrook	Glendale TAFE	NSW
Jan	Evensen	Jotun Norway	
Sam	Formosa	TAFE NSW	NSW
Todd	Fotheringham	CTI Consultants Pty Ltd	NSW
Rob	Francis		
Ian	Glover	Corrotek	WA
Peter	Haberecht	MATENV	
Michael	Hambrook	APMF	NSW
Shannon	Heath		WA
Harold D	Hilton	Atlas MTT LLC	
Brian	Johnson	TAFE NSW	NSW
Jeremy	Knight	TAFE NSW	NSW
Kenneth	Lofhelm	PCCP	Vic
Willie	Mandeno	OPUS	NZ
Bill	McEwan	CTI Consultants Pty Ltd	NSW
John	Moffatt	Biolab Industrial	NZ
Roy	Orr	Peerless Industrial Systems	WA
Michael	Porter	Barry Bros	Vic

Manufacturing Skills Australia

Name		Organisation	State
Ted	Riding	Jotun Australia	
Fred	Salome	CTI Consultants Pty Ltd	NSW
Washington	Sanchez	Biolab Industrial	NZ
Mark	Schilling	CPI	
Brad	Shaw	East Gippsland TAFE	Vic
Stuart	Smith	Melbourne Water	Vic
Ben	Solomon	Sunshine Powder Coatings	Qld
Ian	Squire	TAFE NSW	NSW
Nick	Subotsch	Peerless Industrial Systems	Vic
Morris	Thor	TAFE NSW	NSW
Ben	Veldhuis	TAFE NSW	NSW
Ian	Vickery	TAFE NSW	NSW
Kevin	Walker	EXITO	NZ
Dean	Wall	Australasian Corrosion Association	Tas
Geoff	White	Maunsell/AECOM	Qld
Heather	Yerbury	Boral Resources (Qld) Pty Ltd	Qld
Mark	Weston	Incospec & Assoc	SA
Derek	Cupp	MISAC	SA

In addition, Geoff White, Chair TCTG, ACA, presented the findings to the ACA annual conference. The list of recipients is not known to this project but the response was positive.

The final drafts of the new units and qualification have been validated and signed off by all major stakeholders (both industry and RTOs) with no outstanding or unresolved issues. Validation and acceptance of final drafts was undertaken by email. A separate face-to-face validation meeting was held with RTOs intending to offer this qualification (included in the list above), in particular to check on possible implementation issues. They also signed off with no unresolved issues.

Clear and full support for endorsement of the new qualification and units has been provided by all stakeholders.

Appendix 8
Development of Trade Measurement units and Skill Sets

Responsibility for Australia's trade measurement system is currently shared between the Commonwealth, States and Territories. By 2010, responsibility will transfer to the Commonwealth and in preparation for that, NMI wished to establish a nationally consistent training and skills recognition system that is competency based with qualifications (or Skill Sets) that align with the job roles of trade measurement and fair trading personnel. In particular they focused on the competency needs of Verifiers, Inspectors and Senior Inspectors.

MSA contracted Ivan Johnstone (CIT Solutions Pty Ltd) to undertake this work which included reviewing the suite of trade measurement units in MEM05. The eight MEM units in question (MEM15015-15022) are listed as specialist elective units within MEM40105 Certificate IV in Engineering. Research indicated they were not being used outside the Qld Office of Fair Trading regulatory environment, who have provided written support for the changes. The level of change proposed to the units to support the new regulatory environment that will be in place in 2010 was significant and resulted in development of 14 new units of competency.

The new units will not be aligned to any qualifications, but will be available for use in defined Skill Sets in MSA07 and for importation to proposed new qualifications under development by Government Skills Australia.

Project management

This development has been overseen by MSA's Laboratory Operations Board Sub-committee with significant technical assistance provided by NMI staff and committees.

The individuals and enterprises/organisations represented on the Board Sub-committee are set out in the following table:

Name	Enterprise/organisation
David Graham	Huntsman Chemicals
Duncan Jones	Science Industry Australia
Gail Silman	Ai Group
Ian Curry	AMWU
Kim Peterson	TAFE NSW
Marian Haire	National Measurement Instutute

Bob Paton	MSA CEO
Barbara Wallace	MSA QA Manager

Consultation and validation

Consultations during the development and validation process were undertaken with the following key trade measurement personnel from all jurisdictions throughout Australia. The great value of their expertise and input is gratefully acknowledged.

Name		**Organisation**	**State**
Marion	Haire	National Measurement Institute (NMI) Sydney	NSW
Ian	Bentley	National Measurement Institute (NMI) Sydney	NSW
Mathew	Foot	National Measurement Institute (NMI) Sydney	NSW
Anne	Galvin	National Measurement Institute (NMI) Sydney	NSW
Ron	Begg	National Measurement Institute (NMI) Canberra	ACT
Darryl	Hines	Trade Measurement QLD, Fair Trading	QLD
Ron	Plummer	Trade Measurement & Standards, Justice	TAS
Les	Anderson	Trade Measurement	NT
Lindsay	Tegart	Trade Measurement, Fair Trading	NSW
Russell	Jackson	Trade Measurement, Consumer Affairs	VIC
Doug	Berry	Trading Standards Branch	WA
Tony	Blefari	Trade Measurement, Fair Trading	SA
Grant	Fuller	Trade Measurement, Fair Trading	ACT
Olga	Ford	Office of Fair Trading	NSW
Lynn	Greenwood	Government Skills Australia	SA

The final drafts of the new units and Skill Sets have been validated and signed off by all major stakeholders with no outstanding or unresolved issues. Validation and acceptance of final drafts was via a workshop and email.

Marian Haire (NMI's national Training and Technology Transfer Manager with responsibility for coordination of training and recognition/assessment using the new units and Skill Sets) has signed off with no unresolved issues.

Appendix 9
Development of the Recreational Vehicle qualifications in MSA07v6

The recreational vehicle qualifications were originally included in THC99 under the Tourism and Hospitality National Industry Training Advisory Board. In 2004, the qualifications were revised, with minimal changes.

With the merger of national ITABs into the ten Industry Skills Councils, THC04 came under the jurisdiction of the Service Industries Skills Councils. As the needs of the recreational vehicle manufacture, service and repair sectors relate to manufacturing and engineering, the sector determined their qualification needs would be more appropriate under the coverage of the Manufacturing Industry Skills Council.

Manufacturing Skills Australia (MSA) undertook to review and update the qualifications and their associated units of competency to bring them into line with current industry needs and with similar manufacturing, service and repair qualifications.

Kevin Hummel of Total Training and Performance Solutions (TaPS) was commissioned to undertake a Scoping Study in 2009. The Scoping Study Report noted that:

- users of THC04 felt it was somewhat inflexible and thus causing some difficulties
- to increase flexibility job based units of competency should be replaced by skills based units of competency (and this may require an adjustment to the qualification packaging rules)
- where there are relevant units of competency which are used by other industry sectors, they should be used in preference to RV specific units covering the same area, unless there are RV specific contexts which they cannot meet
- units and skills sets covering restricted licence requirements should be imported where appropriate
- relevant Competitive Manufacturing units should be included as elective units, while still requiring a sufficient technical core.

MSA supported the findings and contracted TaPS to undertake the agreed changes. Further industry consultations were undertaken prior to developing a detailed specification for the new units of competence and new qualification.

Meeting industry needs

The major industry drivers for the improvements to this package are outlined below:

- RTOs currently servicing this sector support a restructuring of the qualification to make it more flexible and believe they can adapt their existing resources fairly readily. They also see a restructure as possibly making it easier to use suitable resources from other sectors.

- Industry supports increased access to training and resources and is concerned that a sufficient broad base of skills be maintained to allow for both flexibility in workforce deployment and also for portability of skills across the sector.

- This is a sector which is growing and which has wide regional coverage. It is highly concentrated in terms of manufacturing, but with a broad range of smaller manufacturers. Service and repair (and sales) tends to be many small and medium businesses, often with a formal relationship with a manufacturer. This does not prevent them from servicing/repairing any other RV.

Project management

The project was overseen by an MSA Board Sub-Committee made up of major stakeholders. The terms of reference were to:

- assist in the identification of stakeholders to be consulted for the project
- identify and assist in the resolution of industry issues in relation to strategic objectives of MSA's projects
- provide industry input and advice on:
    - industrial issues
    - training and assessment issues
    - priority areas for industry skills development
    - appropriate methods for collection, collation and consolidation of industry information
    - validity of the content of project outcomes
- provide feedback on MSA's development work undertaken for the area covered
- exchange information as appropriate between MSA, industry and other relevant professional groups covered
- provide feedback on the project development work for the area of interest
- make recommendations to the MSA Board on acceptance of the product of the project..

The individuals and enterprises/organisations represented on the MSA Board Sub-Committee are set out in the following table:

Name	Enterprise/organisation
Graham Attwood (Chair)	RMax
Kerryn Caulfield	Composites Australia
Richard Lindner	Manufacturing Skills Queensland
Alex Stanojevic	Ai Group
Heather Yerbury	Boral Concrete Products

Ian Booth	Australasian Corrosion Association
Sam Wood	AWU

Consultation and validation processes

Consultations during the development and validation process were undertaken with:

- technical experts from the relevant sub-sector or specialty area of expertise
- representatives of RTOs who already offer current qualifications and/or are intending to offer the qualification.

Consultation was largely by use of CAJA, face-to-face and email with expert input sought and obtained for the specific needs of the project.

Drafts of all units of competence and qualifications were then posted on the MSA website for validation and stakeholders were advised by email about how to access the site and provide feedback. This included industry stakeholders listed on the MSA database, State industry advisory bodies, and State Training Authorities.

This feedback was used to further refine the units and qualifications. In some cases, the feedback received and the units involved were reviewed again by technical experts prior to final editing.

The following individuals and organisations were involved in the development process. The great value of their expertise and input is gratefully acknowledged.

First Name	Second Name	Organisation	State
Maree	Saggers	7th St Caravans	NSW
Gary	Mitchell	ACR caravan repairs	NSW
Alan	Mcdonald	Aerodynamic developments	NSW
Jim	Massey`	Australian Motor Homes Pty Ltd	NSW
Rod	Payten	Camden Caravans	NSW
Jane	McCorkell	Caravan Camping Industry Association	NSW
David	Carlon	Carlon Caravans	NSW
The	Manager	Chapmans Coromal Caravans Nowra	NSW
Robert	Hare	CIL Insurances - Caravan Insurance Leaders	NSW

Narelle		Classic Caravan & Trailer Repairs	NSW
Brian	Fletcher	Classic Caravan and Trailer Repairs	NSW
The	Manager	Coromal Caravans Central Coast	NSW
Russell	Wood	Cub Campers	NSW
Cesar	Tabet	Dan's Caravans	NSW
Peter	Hands	Express Campers	NSW
Alison	Wood	Five Star Campers	NSW
Grant	Brierly	Frontline Campervans	NSW
Alan	Fulcher	Fulcher's Caravans	NSW
Igor	Muriti	I & D Industries	NSW
Peter	Blanshard	Institute of Automotive Mechanical Engineers	NSW
Damian	Charleson	Jayco Newcastle	NSW
David	Carrick	Jayco Sydney	NSW
Ian	Durance	Kimberley Kampers	NSW
Ron	Borton	Kimberly Kampers	NSW
Rick	Martin	Kimberly Kampers	NSW
Rod	Coles	Millard Caravans	NSW
Gary	Willer	Millard Caravans	NSW
Chris	Parish	MSA	NSW
The	Manager	Opalite Caravans	NSW
Stephen	Edwards	Parravans Caravan World	NSW
Mark	Fawcett	South Western Sydney Institute of TAFE, Wetherill Park College	NSW
Keith	Harrison	Suncamper	NSW
Mike	Rowe	Suncamper	NSW

Russell	Bale	SWSI TAFE	NSW
Thor	Morris	TAFE NSW SWSI	NSW
Rob	Surdonic	The Caravan Company Pty Ltd	NSW
Michael	Lord	Trakka Pty Ltd	NSW
David	Wallis	Trakka Pty Ltd	NSW
Deborah	Joyce	Transport and Logistics Industry Skills Council	NSW
Daryl	Buckingham	Ultimate Campers	NSW
Faye	Watson	Watson's Caravans & RVs Coffs Harbour	NSW
Kris	Watson	Watsons Caravans and RVs	NSW
Adam	Watson	Watsons Caravans Coffs Harbour	NSW
Shane	Martin	Watsons Caravans Port Macquarie	NSW
Glen	Anderson	Wetherill Park TAFE	NSW
Trevor	Smith	Wetherill Park TAFE	NSW
Bruce	Binns	Winnebago Industries	NSW
Jodie	Harris	Winnebago Industries	NSW
Barry	Baillie		NSW
Bob	Browne		NSW
Nicola	Burridge		NSW
Barry	Cramond	TEATAC (NT) Inc	NT
Paul	Bridge		Qld
Barry	Barker	Arrow Caravans and Towbars	Qld
Graham	Best	Best's Caravan Services	Qld
Greta	Best	Best's Caravan Services	Qld
Jim	Carnavas	Brisbane Camperland	Qld
Joshua	Carnavas	Brisbane Camperland - Jayco	Qld

Brendan	Saggers	Brisbane RV's	Qld
Merv	Flynn	Caravan Repair Centre	Qld
Garry	Bushell	Caravan Trade and Industries Association Queensland	Qld
Ron	Chapman	Caravanning Queensland	Qld
Mark	Glencross	City Caravan Centre	Qld
The	Manager	Classic RTM	Qld
Bill	Connor	Coromal Caravans Sunshine Coast	Qld
Warren	Wheelock	Coromal Caravans Sunshine Coast	Qld
Nick	Oliver	Cutloose RV	Qld
Brett	Wright	CVIAQ	Qld
Kirk	Straughen	Department of Transport and Main Roads	Qld
The	Manager	Desert Edge Trailers	Qld
The	Manager	Dreamland Trailers	Qld
The	Manager	Dryden Trailers	Qld
Paul	Dawes	Gold Coast Caravan Sales	Qld
The	Manager	Golf Caravans	Qld
Stewart	Cameron	Hinterland Outdoors	Qld
Brendan	Kerr	Jayco Townsville	Qld
The	Manager	Kamparoo	Qld
Jan	McNeil	Kedron Caravans	Qld
Gary	Kratzmann	Kratzmann Caravans	Qld
Greg	Wetkin	Lifestyle RVs	Qld
Ken	Vaughan	Limit Seeker Camper Trailers	Qld
Erik	Salonen	Manufacturing Skills Qld	Qld
Gary	Smiley	Manufacturing Skills Queensland	Qld

Brendon	Beckett	Morayfield State High School	Qld
The	Manager	Paradise Motorhomes	Qld
Kevin	Bluhdorn	Skills Tech Australia	Qld
Peter	Donaldson	Skills Tech Australia	Qld
Gordon	Elledge	Skills Tech Australia	Qld
Scott	Ovenden	Skills Tech Australia	Qld
Trevor	Scott	Skills Tech Australia	Qld
The	Manager	Sunland Caravans	Qld
Jeffrey	Hockam	Sunshine Coast Institute of TAFE	Qld
Bede	O'Brien	Sunshine Coast TAFE	Qld
The	Manager	Swagman Motorhomes	Qld
The	Manager	Tavlor Motorhomes	Qld
Michael	Ritzau	Adventura Caravans	SA
Frank	Tabone	Adventure Campers	SA
Stuart	Livingstone	CCIA SA	SA
Gareth	Handshin	Challenge Campertrailers	SA
Dario	Priori	Dario Caravans	SA
Chris	Barrett	Dario Caravans and Repairs	SA
Cheryl	Bald	DFEEST	SA
Leonie	Cooke	DFEEST	SA
Sherelee	Rose	DFEEST	SA
Rob	Heaslip	Heaslip Campers	SA
Derek	Cupp	Manufacturing Industry Skills Advisory Council	SA
Mike	Griggs	Mike Griggs Caravan Service Centre	SA
Rhonda	Tunks	MISAC (Manufacturing Industry Skills Advisory	SA

		Council SA Inc)	
Renae	Balckshaw	TAFE SA	SA
Anna	Papzoglov	TAFE SA	SA
Ron	Williams	TAFEsa	SA
Margaret	Collings	tafeSA Noarlunga Campus	SA
Anne	Urquhart	AMWU	Tas
The	Manager	Caravan Industry Australia (Tasmania)	Tas
Phillip	Canning	Discovery Holiday Park Strahan	Tas
Danny	Gower	Island Motor Camper Conversions	Tas
David	O'Byrne	Liquor, Hospitality and Miscellaneous Union	Tas
Debra	Doherty	Skills Tasmania	Tas
Tim	McLaren	Stanley Caravan and Tourist Park	Tas
The	Manager	Tasmania National Parks Association	Tas
David	Gutteridge	Tasmanian Polytechnic	Tas
Rod	Mason	Tasmanian Skills Institute	Tas
Frank	Hussey	Tourism Tasmania	Tas
Stephen	Farley	Treasure Island Caravan Parks	Tas
Ken	Dorsey	Workforce Development	Tas
Trevor	Eastman		Vic
Mark		Aussie Wide Caravans	Vic
Greg	Walsh	Automotive Training Victoria	Vic
Darren	French	Avan Caravans	Vic
The	Manager	Billabong Custom Caravans	Vic
Peter	Wright	Caravan Industry Assoc. Victorian Trades Division	Vic
The	Manager	Caria Caravans	Vic

Manufacturing Skills Australia

Andre		Chisholm TAFE	Vic
Noel	Sutcliffe	Chisholm TAFE	Vic
Ron	Wylde	Chisholm TAFE	Vic
The	Manager	Concept Caravans	Vic
The	Manager	Davsher Campers and Caravans	Vic
The	Manager	Designer Vans	Vic
Luke	Behncke	DIIRD	Vic
The	Manager	Dreamhaven Caravans	Vic
The	Manager	Driftaway Caravans	Vic
The	Manager	Eagle Caravans	Vic
Darren	French	Evernew Caravans	Vic
Neville	Watson	Ford Motor Company of Australia	Vic
The	Manager	Galaxy Caravans	Vic
The	Manager	Goldstream RV	Vic
Chris	Riley	Jayco	Vic
Daniel	McDonald	Jayco (training)	Vic
The	Manager	Jurgens Caravans	Vic
Diana	McGowan	Kangan Institute of TAFE	Vic
Phil	Murphy	Kangan Institute of TAFE	Vic
Vince	Panozzo	Kangan Institute of TAFE	Vic
Bill	Reece	Kangan Institute of TAFE	Vic
Wayne	Walter	Kangan Institute of TAFE	Vic
The	Manager	Kingdom Caravans	Vic
The	Manager	La Vista Caravans	Vic
Michael	Waterson	Lumen Australia	Vic

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The	Manager	Majestic Caravans	Vic
Alex	Bernhardt	Manufacturing and Engineering Skills Advisory Body (MESAB)	Vic
Peter	May	May West Caravans	Vic
Gordon	Wilson	May West Caravans	Vic
The	Manager	Montana Caravans	Vic
Gerry	van Oosterom	NMIT Epping Campus	Vic
Ian	Roberts	NMIT, Building & Construction	Vic
The	Manager	Nova Caravans	Vic
The	Manager	Olympic Caravans	Vic
The	Manager	Paramount Caravans	Vic
Colin	Young	Recreational Vehicle Manufacturers Association of Australia Inc.	Vic
The	Manager	Regal Caravans	Vic
Mary	Holmes	Resource Education and Training Pty Ltd	Vic
Faye	Milroy	Resource Education and Training Pty Ltd	Vic
The	Manager	Retreat Caravans	Vic
The	Manager	Roadstar Caravans Pty.Ltd.	Vic
The	Manager	Roma Caravans	Vic
The	Manager	Royal Flair	Vic
Robert	Funda	RVMAA	Vic
The	Manager	Spaceland Industries	Vic
Phil	Savory	Stockman Products	Vic
The	Manager	Sunliner Recreational Vehicles	Vic
Joe	Markovich	Supreme Caravans	Vic
The	Manager	Track Trailer	Vic

The	Manager	Trailblazers RV	Vic
The	Manager	Trakmaster	Vic
The	Manager	Traveller Caravans	Vic
The	Manager	Truelux 5th Wheel	Vic
John	Kyriakidis	Vanguard Caravans	Vic
Helen	Constanza	Windsor Caravans	Vic
The	Manager	Wirr-away Motorhomes	Vic
Peter	Hancock	Workplace Learning Initiatives	Vic
Stuart	Loly	Workplace Learning Initiatives	Vic
The	Manager	A1 Caravans	WA
The	Manager	Caravan and RVs Superstore	WA
The	Manager	Caravanland	WA
Pat	Strahan	Combined Industry Associations	WA
Lubor	Hebik	Coromal Caravans	WA
Ida	Yee	Coromal Caravans	WA
Brad	van Hement	Coronel	WA
David	Hill	Elross Caravans	WA
Dave	Hicks	Engineering and Automotive Training Council Inc (EATC)	WA
Mark	Harper	Engineering and Automotive Training Council Inc (WA)	WA
The	Manager	Freedom caravans	WA
The	Manager	George Day Caravans	WA
Lyle	Barrett	IAME	WA
The	Manager	Mandurah Caravan & RV Centre	WA
Dennis	Baker	Polytechnic West	WA

Colin	Russell	Swan TAFE	WA
The	Manager	Trailstar Caravans	WA

Clear and full support for endorsement of the revised Training Package has been provided by all industry and RTO stakeholders.

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