

# Process Manufacturing Industry



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Department of  
Education  
and Training



## INDUSTRY AREA COVERAGE:

GROUP	CLASS	DESCRIPTION
<b>120</b>	-	<b>Oil and Gas Extraction</b>
	1200	Oil & Gas Extraction (Coverage of: Onshore and Offshore Plant Technicians, Control Room Technician, Team Leaders)
<b>251</b>	-	<b>Petroleum Refining</b>
	2510	Petroleum Refining (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
<b>252</b>	-	<b>Petroleum &amp; Coal Product Manufacturing n.e.c.</b>
	2520	Petroleum & Coal Product Manufacturing n.e.c. (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
<b>253</b>	-	<b>Basic Chemical Manufacturing</b>
	2531	Fertiliser Manufacturing (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
	2532	Industrial Gas Manufacturing (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
	2533	Synthetic Resin Manufacturing (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
	2534	Organic Industrial Chemical Manufacturing n.e.c. (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
	2535	Inorganic Industrial Chemical Manufacturing n.e.c. (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
<b>254</b>	-	<b>Other Chemical Product Manufacturing</b>
	2541	Explosive Manufacturing (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
	2542	Paint Manufacturing (Coverage of: Product Blender, Process Plant Operator, Team Leader)
	2544	Pesticide Manufacturing (Coverage of: Product Blender, Process Plant Operator, Team Leader)

	2545	Soap & Other Detergent Manufacturing (Coverage of: Product Blender, Process Plant Operator, Team Leader)
	2546	Cosmetic & Toiletry Preparation Manufacturing (Coverage of: Product Blender, Process Plant Operator, Team Leader)
	2549	Chemical Product Manufacturing n.e.c. (Coverage of: Process Plant Operator, Process Plant Technician, Control Room Technician, Team Leader, Process Plant Supervisor)
<b>255</b>	-	<b>Rubber Product Manufacturing</b>
	2551	Rubber Tyre Manufacturing (Coverage of: Tyre Retreader, Moulding Machine Operator, Production Team Leader, Quality Control)
	2559	Rubber Product Manufacturing n.e.c. (Coverage of: Belt Splicer, Rubber Liner, Hose Builder, Production Team Leader, Quality Control)
<b>256</b>	-	<b>Plastic Product Manufacturing</b>
	2561	Plastic Blow Moulded Product Manufacturing (Coverage of: Blow Moulding Machine Operator, Production Team Leader, Quality Control)
	2562	Plastic Extruded Product Manufacturing (Coverage of: Extrusion Machine Operator, Production Team Leader, Quality Control)
	2563	Plastic Bag & Film Manufacturing (Coverage of: Film Machine Operator, Production Team Leader, Quality Control)
	2564	Plastic Product Rigid Fibre Reinforced Manufacturing (Coverage of: Composites (Fibreglass) Operator, Production Team Leader, Quality Control)
	2565	Plastic Foam Product Manufacturing (Coverage of: Moulding Machine Operator, Production Team Leader, Quality Control)
	2566	Plastic Injection Moulded Product Manufacturing (Coverage of: Injection Moulding Machine Operator, Production Team Leader, Quality Control)
<b>261</b>	-	<b>Glass and Glass Product Manufacturing</b>
	2610	Glass & Glass Product Manufacturing (Coverage of: Glassware Maker, Glass Blower, Furnace/Kiln Operator, Glass Production Operator, Glass Fuser, Production Technician, Production Team Leader, Quality Control)
<b>262</b>	-	<b>Ceramic Manufacturing</b>
	2621	Clay Brick Manufacturing (Coverage of: Machine Operator, Furnace/Kiln Operator, Production Technician, Production Team Leader, Quality Control)

	2622	Ceramic Product Manufacturing (Coverage of: Machine Operator, Furnace/Kiln Operator, Mould Maker, Production Technician, Production Team Leader, Quality Control)
	2623	Ceramic Tile & Pipe Manufacturing (Coverage of: Machine Operator, Furnace/Kiln Operator, Mould Maker, Production Technician, Production Team Leader, Quality Control)
	2629	Ceramic Product Manufacturing n.e.c. (Coverage of: Machine Operator, Furnace/Kiln Operator, Mould Maker, Production Technician, Production Team Leader, Quality Control)
<b>263</b>	-	<b>Cement, Lime, Plaster and Concrete Product Manufacturing</b>
	2631	Cement & Lime Manufacturing (Coverage of: Cement Operator, , Furnace/Kiln Operator, Production Technician, Production Team Leader, Quality Control)
	2632	Plaster Product Manufacturing (Coverage of: Plasterer, Plaster Product Maker, Production Technician, Production Team Leader, Quality Control)
	2633	Concrete Slurry Manufacturing (Coverage of: Concrete Plant Operator, , Production Technician, Production Team Leader, Quality Control)
	2634	Concrete Pipe and Box Culvert Manufacturing (Coverage of: Concrete Plant Operator, , Production Technician, Production Team Leader, Quality Control)
	2635	Concrete Product Manufacturing n.e.c. (Coverage of: Concrete Plant Operator, , Production Technician, Production Team Leader, Quality Control)
<b>264</b>	-	<b>Non-Metallic Mineral Product Manufacturing n.e.c.</b>
	2640	Non-Metallic Mineral Product Manufacturing n.e.c. (mostly covered in the 261/262/263 sections)
<b>294</b>	-	<b>Other Manufacturing</b>
	2942	Toy and Sporting Good Manufacturing (Coverage of: Injection Moulding Machine Operator, Production Team Leader, Quality Control)

\* ANZSIC Group - Australian New Zealand Standard Industrial Classification Group  
 \*\* n.e.c. - not elsewhere classified

## STATE BODIES

- **Process Manufacturing Industry Training Council of WA INC.**



## NATIONAL BODIES

- **Manufacturing Skills Australia (MSA)** is the recognised national industry skills council with coverage for the manufacturing sector which includes process manufacturing.
- MSA represents over 75,000 manufacturing businesses employing almost one million Australians and is the source of information on skills and workforce development for the process manufacturing sector.
- MSA provides accurate industry intelligence to the Vocational Education and Training sector about current and future skill needs and training requirements through industry skills reports, and supports the development, implementation and continuous improvement of quality nationally recognised training products and services, including Training Packages.

## INDUSTRY ORGANISATIONS/ASSOCIATIONS

*This list is not exhaustive – a guide only.*

- Australian Mines and Metals Association
- Australian Petroleum Production and Exploration Association
- Australian Pre-mixed Concrete Association
- Australian Workers Union
- Clay and Brick Manufacturers Association
- Cement and Concrete Association of Australia
- Concrete Institute of Australia
- Concrete Pipe Association
- Concrete Masonry Association of Australia
- National Precast Concrete Association of Australia
- Cement Concrete and Aggregates Australia
- Federated Brick, Tile and Potters Union
- Institute of Refractory Engineers
- Liquor, Hospitality and Miscellaneous Workers Union
- National Association of Testing Authorities
- Plastics and Chemicals Industry Association
- Royal Australian Chemical Institute
- Scientific Glassblowers Society of Australian and New Zealand
- Surface Coatings Association of Australia
- Plastic Injection Moulders Association (PIMA)
- Australian Plastics and Rubber Institute INC. (APRI)
- Plastic Industry Pipe Association (PIPA)



- Plastics and Allied Industries Association of South Australia (PAIA)
- Society of Plastics Engineers Australia-New Zealand (SPE)
- Rubber Manufacturers Association of Australia
- Synthetic Organic Chemical Manufacturers Association (SOCMA)
- Vinyl Council of Australia
- Composites Australia
- Composites West
- The Packaging Council of Australia INC.
- Australian Pipeline Industry Association (APIA)
- Australian Institute of Petroleum

## WORKSAFE

For the Manufacturing sector, Worksafe identifies the following areas to be addressed in staff induction and training:

- Responsibilities of employers and employees - Duty of Care
- Hazard identification
- Manual handling
- Hazardous substances
- Noise
- Electricity
- Mechanical equipment
- Slips and trips
- Emergency evacuation procedures
- Resolving health and safety issues
- The right to refuse work

For occupational health and safety guidelines specifically for the manufacturing industry, please refer to <http://www.worksafe.wa.gov.au/newsite/worksafe/pages/manuindx0001.html>

Information on duty of care, please refer to <http://www.worksafe.wa.gov.au/newsite/worksafe/pages/wswalaws0003.html>

Information on hazardous substances – chemicals at work can be found at <http://www.worksafe.wa.gov.au/newsite/worksafe/pages/guidindx0003.html#Hazardous%20substances>

For Codes of Practice – Manual Handling, please refer to <http://www.worksafe.wa.gov.au/newsite/worksafe/pages/codemanh0001.html>

Information on electrical safety can be found at <http://www.worksafe.wa.gov.au/newsite/worksafe/pages/elecindx0002.html>



For Codes of Practice – Prevention of Falls at Workplaces (2004), please refer to <http://www.worksafe.wa.gov.au/newsite/worksafe/pages/codeslip0001.html>

Code of Practice for Managing Noise at Workplaces can be found at <http://www.worksafe.wa.gov.au/newsite/worksafe/pages/codenois0001.html>

### **ADDITIONAL LEGISLATION TO BE CONSIDERED - especially for the Oil and Gas Industry Sector**

Safety Legislation - Department of Industry and Resources

[http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum\\_Hazard\\_Facilities/Legislation\\_and\\_policy/overview.html](http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum_Hazard_Facilities/Legislation_and_policy/overview.html)

The Safety Case - Department of Industry and Resources

[http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum\\_Hazard\\_Facilities/Guidance\\_material\\_and\\_publications/The\\_safety\\_case.html](http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum_Hazard_Facilities/Guidance_material_and_publications/The_safety_case.html)

Major Hazard Facilities (MHFs) - Department of Industry and Resources

[http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum\\_Hazard\\_Facilities/Major\\_hazard\\_facilities/overview.html](http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum_Hazard_Facilities/Major_hazard_facilities/overview.html)

MHF Safety Assessment - Department of Industry and Resources

[http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum\\_Hazard\\_Facilities/Major\\_hazard\\_facilities/MHFs\\_in\\_WA.html](http://www.docep.wa.gov.au/ResourcesSafety/Sections/Petroleum_Hazard_Facilities/Major_hazard_facilities/MHFs_in_WA.html)

Safety Legislation – The National Offshore Petroleum Safety Authority (NOPSA)

<http://www.nopsa.gov.au/regs.asp>

### **TRAINING PACKAGES**

**This industry has coverage for the following Training Packages:**

PMA02 - Chemical, Hydrocarbons and Oil Refining

PMB01 - Plastics, Rubber and Cablemaking

PMC04 - Manufactured Mineral Products

PML04 - Laboratory Operations

**CHEMICAL, HYDROCARBONS AND OIL REFINING (PMA02)** - The Chemical, Hydrocarbons and Oil Refining Training Package covers three discrete areas of the Process Manufacturing Industry: Chemical, Hydrocarbons and Oil Refining. The Training Package has been designed to meet a variety of industry requirements and will promote flexible, comprehensive and integrated training, providing



new entrants and existing workers with skills and knowledge that are transferable across the industry. Nine qualifications have been identified within the Training Package starting at Certificate I to Advanced Diploma with specialist streams available at Certificate II and III in Chemical and Oil, Hydrocarbons – Extraction and Hydrocarbons – Transmission.

**Status** – Phase II Review with final consultation drafts expected in August 2006

<b>National Code</b>	<b>Qualification Name</b>
PMA10102	Certificate I in Process Plant Skills
PMA10202	Certificate I in Process Support
PMA20102	Certificate II in Process Plant Operations
PMA20202	Certificate II in Process Support
PMA30102	Certificate III in Process Plant Operations
PMA30202	Certificate III in Process Support
PMA40102	Certificate IV in Process Plant Technology
PMA50102	Diploma of Process Plant Technology
PMA60102	Advanced Diploma of Process Plant Technology

More information on the Chemical, Hydrocarbons and Oil Refining Training Package, its qualifications and units of competency can be found on the following website:

[http://www.ntis.gov.au/Default.aspx?/TrainingPackage/PMA02/volume/PMA02\\_1](http://www.ntis.gov.au/Default.aspx?/TrainingPackage/PMA02/volume/PMA02_1)

Implementation Guides for Training Packages can be found at the following website:-

<http://www.vetinfonet.det.wa.edu.au/Course/SearchTP.aspx?menu=1&menuitem=4>

## **INDUSTRY ORGANISATIONS/ASSOCIATIONS**

*This list is not exhaustive – a guide only.*

- Australian Mines and Metals Association
- Australian Petroleum Production and Exploration Association (APPEA)
- Australian Workers Union (AWU)
- National Union of Workers (NUW)
- Plastics and Chemicals Industry Association (PACIA)
- Australian Institute of Petroleum
- Australian Competitive Energy (ACE)
- Australian Pipeline Industry Association (APIA)
- The National Offshore Petroleum Safety Authority (NOPSA)
- Petroleum Industry Contractors Association (PICA)
- Australian National and Competency Employment Register (ANTCER)
- Surface Coatings Association of Australia

- Royal Australian Chemical Institute

## WORKFORCE ISSUES, CHARACTERISTICS, ACTIVITIES

- All sectors of the oil and gas industry tend to live on the cutting edge of technology and as such the skill levels of workers across all disciplines needs to be of the highest standards. More computer controlled systems are being used, remote operation is a way of life now, and smaller work teams are managing the operations of both upstream and downstream processes.
- The 'average' operator on an oil or gas installation is now a highly trained and multi-skilled worker who is able to be flexible, responsive and adaptive to changing work loads and conditions.
- The hydrocarbon, chemical and oil refining sectors are experiencing a surge in activity and have a high proportion of workers located regionally.
- Significant employment on a shift basis (making for training delivery issues).
- The Chemical and Oil sector: requirements to meet Mines and Worksafe regulations. Increasing computerisation, technological change, increases in number of Process Plant Operators.
- Hydrocarbons: Worksafe regulations (Safety Case) in areas of high pressure pumps, valves, with associated risks. Traditionally have trained Plant Operators in-house.
- Enterprises designated as Major Hazardous Facilities have increased regulatory requirements to meet. Significant increases in the demand for Incident Response and Management competency training has occurred since OMIR competencies have been endorsed.
- Increased skills shortages being recorded for chemical plant operators, pipeline operators, and hydrocarbons process plant operators.
- Though not condoned, it is a fact of operational life for oil companies that targeted recruiting of experienced workers is the industry practice; this is further compounded by the increasing numbers of projects requiring additional personnel from a diminishing pool of resources.
- A shortage of skilled labour has contributed to employers seeking alternative sources of employment including recruiting from overseas. The potential of this is limited by Commonwealth government categories of identified skilled migration
- The ageing workforce is a major issue currently affecting all sectors of the Hydrocarbons, Chemical and Oil Refining industry. The industry has an ageing workforce with the largest group of workers aged between 35-44 with a significant number of workers over 45 years of age. Based on Argus Research, the average age of workers in the upstream oil and gas industry is about 47-50 years, with 60% of the workforce over 45 years. Process Plant Operators within the petroleum sector and the downstream chemical and oil refining sectors are averaging close to 50 years. Of the total cohort, a significant portion of workers have indicated their intention to retire over the next 5 to 10 years.



- A shortage of skilled workers available for employment in the Oil and Gas industry has become a major problem that may have a negative impact on the ability of the industry to service the many major and subsidiary oil and gas and chemicals processing projects underway or planned in Western Australia.

The current skills shortages in these areas have arisen as a result of:

- Sustained industry growth particularly in the upstream oil and gas industry has translated into long term expansion of qualified, skilled employment demand in a rapidly escalating salary environment
- An ageing workforce with increasing numbers of highly skilled employees close to or reaching retirement age
- Record low unemployment levels resulting in increased competition for skilled workers
- A severe downturn in take up levels affecting engineering disciplines, process management and process operations

## **TRAINING ENVIRONMENT AND ISSUES**

- Increased technological advances in all areas of Process Manufacturing requiring on-going upskilling training.
- Skill shortage of process Plant Operators will require training to meet demand. The PMITC WA with support from the Australian Petroleum Production and Exploration Association (APPEA), the Kwinana Industry Education Partnership (KIEP) and endorsement from DET facilitated the introduction of a Certificate I VTE program through Challenger TAFE (ACCEPT) in early 2006 with the potential to convert to School Based Traineeships in the year 12 component of Certificate II Process Plant Operations.
- Some sophistication in enterprises in relation to workplace training structures, enterprise specific training and trainers.
- An increase in skills assessment and skills recognition for existing industry workers with the focus on skill sets rather than on the broad acquisition of qualifications.
- Implementing mentoring partnerships to facilitate the transfer of skills and corporate knowledge to new entrants and existing employees
- Identification and implementation of strategies to address the issue of the aging workforce.
- Need for provision of self paced Learning opportunities identified.
- There is a shortage of people with cargo handling and/or marine skills for recruiting to man the FSO and FPSO installations. As more FPSO vessels are being utilised this problem is being exacerbated.
- Development of advanced operator skills for existing workforce requires focused training in the following areas: information processing, data analysis, problem solving, decision making, project management, lead risk assessment, leadership skills.



- Training to support the increased focus on production efficiencies, quality and safety, health and environment considerations

## LICENSING OR REGULATORY REQUIREMENTS

No occupations in this industry sector require licences or need to meet regulatory requirements to perform their role. The only requirements for this sector are for enterprises to meet Worksafe, Department of Environmental Protection, NOPSA, Department of Minerals and Energy, and federal legislation concerning Major Hazardous Facilities and Safety Case standards.

<http://www.worksafe.wa.gov.au/newsite/worksafe/pages/manuindx0001.html>

## HIGH RISK TRAINING CONCERNS

Traditionally the majority of training has been performed in-house by use of Enterprise developed training programs and the shadowing of “experienced” workers. There are some issues with the quality of training outcomes, and there is a need to coordinate a consistent approach across all industries covered.

There are several RTOs registered in West Australia, however most of these only deliver selected competencies from the Training Package. Only ACEPT (Australian Centre for Energy and Process Training) can deliver whole programs up to Certificate IV. ACEPT, along with a few other RTOs, can also auspice Enterprise based training and assessment to higher qualification levels.

Continuing skills shortages will not be able to be met by adequately trained people unless Traineeships are taken up in increasing numbers in the next few years.

Moderation of assessment and learning resources poses a concern due to the geographical location of the majority of trainees - the South West College of TAFE (Bunbury), Perth (ACEPT) and Karratha (Woodside).

In 2005, the Training Accreditation Council received advice from the Process Manufacturing Industry Training Council about industry concerns with consistency in delivery of the Chemical Hydrocarbons and Oil Refining Training Package (PMA02) and anecdotal evidence suggesting some training being delivered was out of date.

Specifically, industry raised concerns about the risks to domestic and international training markets that could flow from poor quality training in this important industry area.

On the basis of this industry intelligence, the Office of the Training Accreditation Council audited 16 registered training organisation delivering training to the process manufacturing industry in Western Australia during 2005/06.

The audits identified that while there was a high level of compliance with the majority of the Australian Quality Training Framework standards audited, there was a high rate of non compliance with aspects of standard 8 (RTO assessments) and standard 9 (learning and assessment strategies).

As well as a range of good practice in the delivery of training to the process manufacturing industry, the audit identified issues with the number of registered training organisations not delivering process manufacturing training (although registered to do so) and the approach to delivering and assessing an



element within the PMA02 training package (PMAPER205A/04 – Rescue a person from a confined space).

Based on an analysis of the compliance and non compliance levels against each standard, seven management actions have been recommended to improve the quality of training delivered to the process manufacturing industry in Western Australia.

These actions include ongoing monitoring of registered training organisations who removed process manufacturing from their scope of delivery prior to the audit, conducting follow up audits for organisations considered high risk and working between government and industry to develop improved approaches and professional development to address issues with validation, moderation, learning and assessment strategies and assessments.

**PLASTICS, RUBBER AND CABLEMAKING TRAINING PACKAGE - (PMB01)** - The Training Package is designed to address the specific needs of three sectors of the Process Manufacturing industry:

1. Plastics,
2. Rubber, and
3. Cablemaking.

The Training Package has been designed to meet the different needs of the industry by including units of competency for the different production processes within each sector. The Package also acknowledges the commonalities of each sector and will provide flexible, comprehensive and integrated training for new entrants and existing workers. Twelve qualifications have been identified within the Training Package at Certificates I to Advanced Diploma level.

**Status** – Phase II Review was completed in June 2006 and final drafts are now available on the MSA website and open for consultation.

Please note that in West Australia the Cablemaking sector is no longer represented.

## QUALIFICATIONS

<b>National Code</b>	<b>Qualification Name</b>
PMB10101	<a href="#"><u>Certificate I in Plastics, Rubber and Cablemaking</u></a>
PMB20101	<a href="#"><u>Certificate II in Plastics</u></a>
PMB20201	<a href="#"><u>Certificate II in Rubber</u></a>
PMB20301	<a href="#"><u>Certificate II in Cablemaking</u></a>
PMB20401	<a href="#"><u>Certificate II in Process Manufacturing</u></a>
PMB30101	<a href="#"><u>Certificate III in Plastics</u></a>
PMB30201	<a href="#"><u>Certificate III in Rubber</u></a>
PMB30301	<a href="#"><u>Certificate III in Cablemaking</u></a>
PMB30401	<a href="#"><u>Certificate III in Process Manufacturing</u></a>
PMB40101	<a href="#"><u>Certificate IV in Polymer Technology</u></a>



PMB50101

[Diploma of Polymer Technology](#)

PMB60101

[Advanced Diploma of Polymer Technology](#)

The Composites Laminating (Fibreglass) Certificate III in Plastics Composites (PMB30101) was declared as a three year apprenticeship in late 2005 and registered by TAC for training delivery through Challenger TAFE (Henderson) in March 2006.

The Plastics, Rubber and Cablemaking industry sector is very diverse, coverage includes the following disciplines: in Plastics - blow moulding, calendaring, composites, compounding, extrusion, fabrication, film, injection moulding, polystyrene, polyurethane, rotational moulding, thermoforming and surface coating; in Rubber - extrusion, fabrication, injection moulding, polyurethane, belt splicing, rubber lining, tyre manufacture, tyre retreading and surface coating; in Cablemaking there are no manufacturers located in Western Australia.

Qualifications at the Certificate II and III levels may be streamed into the following areas, as appropriate:

- Blow Moulding
- Calendaring
- Composites
- Compounding
- Extrusion
- Fabrication
- Film
- Injection Moulding
- Polystyrene
- Polyurethane
- Rotational Moulding
- Thermoforming
- Belt Splicing
- Rubber Lining
- Tyre Manufacture
- Tyre Retreading
- Surface Coating

More information on the Plastics, Rubber and Cablemaking Training Package, its qualifications and units of competency can be found on the following website:

[http://www.ntis.gov.au/Default.aspx?/TrainingPackage/PMB01/volume/PMB01\\_1](http://www.ntis.gov.au/Default.aspx?/TrainingPackage/PMB01/volume/PMB01_1)

Implementation Kits for Training Packages can be found at the following website:-

<http://www.vetinfonet.det.wa.edu.au/Course/SearchTP.aspx?menu=1&menuItem=4>

## **INDUSTRY ORGANISATIONS/ASSOCIATIONS**

*This list is not exhaustive – a guide only.*

- Australian Workers Union (AMU)
- National Union of Workers (NUW)
- Liquor, Hospitality and Miscellaneous Workers Union (LHMWU)
- Plastics and Chemicals Industry Association (PACIA)
- Plastic Injection Moulders Association (PIMA)
- Australian Plastics and Rubber Institute INC. (APRI)
- Plastic Industry Pipe Association (PIPA)
- Plastics and Allied Industries Association of South Australia (PAIA)



- Society of Plastics Engineers Australia-New Zealand (SPE)
- Rubber Manufacturers Association of Australia
- Vinyl Council of Australia
- The Packaging Council of Australia
- Composites Australia
- Composites West

## **WORKFORCE ISSUES, CHARACTERISTICS, ACTIVITIES**


- Significant employment on a shift basis (making for training delivery issues).
- Plastics: Continual improvements in raw materials/resins for fibreglass, composites although the increasing cost of fuel has led to predictions of increasing costs of production.
- Rubber: Advances in products, changes in raw materials, health and safety training requirements.
- Reported shortages for extrusion welders, and a predicated shortage of skilled operators in the plastics sector.
- Industry wants better trained operators, able to work autonomously, perform their own high level of quality control, and be able to carry out their own problem solving and rectification. This will ultimately lead to more Research and Development opportunities for the more experienced workers, and potentially increased markets for the products and/or technologies.
- Injection moulded products demand is steadily increasing. Unless a better trained and skilled workforce is available to take up the opportunities to expand current markets, then work will be lost to overseas competitors.
- Competition from cheaper imported products means that the industry needs to work smarter if they are to remain competitive, and they need to train their workforce for them to achieve that. The outlook for the polymer industries is positive with increased export potential. There are mass product opportunities such as China's need for a steady supply of components, raw materials and resources and potential for identification of specialised niche opportunities.
- Achieving adequate up-skilling and remaining operationally internationally competitive while challenged by the growth of China's manufacturing capacity is providing employers with ongoing difficulties in recruiting and retaining workers. A shortage of skilled labour has contributed to employers seeking alternative sources of employment including recruiting from overseas.
- An ageing workforce profile in this industry sector linked with decreasing deployment of labour hire, limits the skill development of the work force, effective succession and transfer of skills from the skilled to the unskilled.



- The number of new entrants entering the overall polymer industry is relatively low with decreased student attraction being recorded across several sectors. The barriers include wages, career prospects, employment security, and ease of entry, image and status of industry, location, tasks involved and development opportunities.
- A current lack of the basic understanding of composites technology and work practices mean that many of the present workforce do not have the skills to adapt their work practices to suit different materials or processes.
- There are also many new raw materials being used other than the traditional fibreglass. Products such as aramid and carbon fibre are being used as new applications are found. This will mean new technologies and a better trained workforce will be needed to be able to adopt and apply these in the workplace.

## **TRAINING ENVIRONMENT AND ISSUES**

- Some sophistication in enterprises in relation to workplace training structures, enterprise specific training and trainers.
- An increase in skills assessment and skills recognition for existing industry workers with the focus on skill sets rather than on the broad acquisition of qualifications.
- As a direct result of the Composites Laminating (Fibreglass) Apprenticeship training program commencing delivery in April 2006 through Challenger TAFE (Henderson), a School Based Traineeship is one of several entry training level initiatives under consideration for 2007 that are designed to provide clear links and articulation with the new apprenticeship qualification.
- Identification of prospective candidates for workshop team leaders of the future need to be identified and nurtured to allow a smooth transition when the current crop leave. Carefully selected training profiles and programs such as proposed cadetships in the polymer sector will allow for succession planning, career progression and defined pathways to be implemented.
- Generalised employment trends are hard to define; with some sectors enjoying very low staff turnover (injection moulding) and other have extremely high turnover rates (composites). The rubber lining and belt splicing also has some high staff turnover rates in many locations. The industry intention is to try and reduce the high turnover rate areas by better training, improved industry work practices and recognition of the skills required to perform at a high level in the industry.
- Generally, the industry suffers from low esteem, with workers in these sectors being viewed as unskilled or semi-skilled and with little or no prospects of advancement or career development. The industry has attempted to address these issues with the establishment of Traineeships in Injection Moulding, Polystyrene and an apprenticeship in Composites Laminating to provide high quality entry level training for new employees, and also to have the existing workforce's current skills and competencies assessed against.

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- Competitive manufacturing training of senior operators and staff needs to be included in advanced training programs including export marketing, communications skills, management skills, project management and customer service skills. The proposed Amcor Australasia national rollout Certificate IV training program is evidence of this change implementation process.
  - Operators that have qualifications at the operator Certificate II and III levels need to extend their skill sets through access to specific units of competence and the incorporation of these units in Certificate IV, Diploma and Advanced Diploma qualifications.
  - Training environments and incentives that are more conducive to the culture of young people. Employers need to consider the impact of their work environments on young employees if enterprises are going to be able to attract and retain new workers

## LICENSING OR REGULATORY REQUIREMENTS

No occupations within the polymer industry sector require licences or need to meet regulatory requirements to perform their role. The only requirements for this sector are for enterprises to meet Worksafe and Department of Environmental Protection standards.

## HIGH RISK TRAINING CONCERNS

Much of the Industry is still unaware of the Training Package. Traditionally the majority of training has been by shadowing of “experienced” workers, and the quality of the skills learned varies widely.

There is one major public provider – Central TAFE (Subiaco) who is extremely active in Western Australia particularly in the metropolitan area and in the South West and one major enterprise RTO – Total Corrosion Control who provides training in the rubber sector. Industry requires training and assessment to be predominantly on-the-job due to the difficulties involved with; (a) shift workers, (b) continuous production lines, and (c) the costs incurred to replace off-the-job learners with casual staff.

There is a perception that these industries are “unskilled” and that “anyone can do them” which leads to a poor quality of recruit entering the industry, and many of these people have no desire to train or be trained. However, in the last two to three years there has been a decided increase in take up levels of training in this sector particularly at the Certificate II and III levels in plastics and rubber.

Employment practices are changing as companies “downsize”, outsource and use core/ temporary/ crisis staffing. Currently approximately 30% of the workforce is casual. There is an increased demand for migration of skilled operators, production managers and global business skills from other countries.

**MANUFACTURED MINERAL PRODUCTS – (PMC04)** - The Manufactured Mineral Products Training Package addresses the training needs of the cement, ceramics, clay, concrete, glass, premix concrete, asphalt, plasterboard, fibre cement, refractories and related products sectors of the process manufacturing industry. The Training Package has been designed to meet a variety of industry requirements and will promote flexible, comprehensive and integrated training, providing new entrants and existing workers with skills and knowledge that are transferable across each sector of the industry. Eight qualifications have been identified within the training package at Certificates I to Advanced Diploma level.



**Status – Endorsed**

## **QUALIFICATIONS**

<b>National Code</b>	<b>Qualification Name</b>
PMC10104	<a href="#"><u>Certificate I in Manufactured Mineral Products</u></a>
PMC20104	<a href="#"><u>Certificate II in Manufactured Mineral Products</u></a>
PMC20204	<a href="#"><u>Certificate II in Production Support</u></a>
PMC30104	<a href="#"><u>Certificate III in Manufactured Mineral Products</u></a>
PMC30204	<a href="#"><u>Certificate III in Production Support</u></a>
PMC40104	<a href="#"><u>Certificate IV in Manufactured Mineral Products</u></a>
PMC50104	<a href="#"><u>Diploma of Manufactured Mineral Products</u></a>
PMC60104	<a href="#"><u>Advanced Diploma of Manufactured Mineral Products</u></a>

Qualifications at the Certificate II and III levels may be streamed into the following areas, as appropriate:

- Cement
- Ceramics
- Glass,
- Clay products
- Concrete products
- Premix concrete
- Asphalt
- Plasterboard
- Fibre cement
- Refractories

More information on the Manufactured Mineral Products Training Package, its qualifications and units of competency can be found on the following website:

[http://www.ntis.gov.au/Default.aspx?TrainingPackage/PMC04/volume/PMC04\\_1](http://www.ntis.gov.au/Default.aspx?TrainingPackage/PMC04/volume/PMC04_1)

**NB.** In Western Australia, an Implementation Guide for Certificates 1-III was approved in September 2005 with plans to further develop the Implementation Guide to include Certificate IV, Diploma and Advanced Diploma in 2007.

Implementation Guides for Training Packages can be found at the following website:-

[http://www.vetinfonet.det.wa.edu.au/tp\\_upload/PMC04.PDF](http://www.vetinfonet.det.wa.edu.au/tp_upload/PMC04.PDF)

## **INDUSTRY ORGANISATIONS/ASSOCIATIONS**

*This list is not exhaustive – a guide only.*

- Australian Pre-mix Concrete Association
- Australian Precast Concrete Industry Association
- Australian Workers Union (AWU)
- Clay and Brick Manufacturers Association



- Cement and Concrete Association
- Concrete Institute of Australia
- Concrete Pipe Association of Australia
- Federated Brick, Tile and Potters Union
- Institute of Refractory Engineers
- Liquor, Hospitality and Miscellaneous Workers Union (LHMWU)
- The Institute of Quarrying Australia
- Concrete Masonry Association of Association
- Construction Material Processors Association
- Cement Concrete and Aggregates Australia

## **WORKFORCE ISSUES, CHARACTERISTICS, ACTIVITIES**

- Significant employment on a shift basis (making for training delivery issues).
- Significant proportion of concrete, cement and clay sectors are from non-English speaking backgrounds.
- Concrete products: Reliant on health of the building industry economy. Health and safety requirements especially for sub-contractors are an issue.
- The larger employers in the concrete industry tend to deliver their own training in-house; however there is strong support for the Training Package being the accepted standard for such training. Apart from these few large companies, the overall majority of businesses in the concrete industry are small and scattered around the State. This poses problems with developing structured training for relatively small numbers in each regional location.
- Large Installers in the Refractory industry are keen to have competency-based training programs. However, there is currently no public provider to deliver the training. It is hoped that a public provider may enter the market in the near future.
- The preferred mode of delivery for this industry group is utilising workplace-based training and assessment and workplace mentoring. This is especially important as firstly, the majority of training is delivered in-house and secondly, the widespread locations of the participating enterprises and worksites.
- Cost effective production is extremely important in this sector as export replacement is decreasing the demand for locally produced goods. Demand remains high for building resources supporting the local construction activity
- Clay and ceramics: brick and tile manufacturing dependent on building industry. Future plant mechanisation and expansion.



- Cement: Reliant on building industry economy. Health and safety requirements especially for sub-contractors are an issue.
- Clay and ceramics: Brick and tile manufacturing dependent on building industry. Future plant mechanisation and expansion.
- Cement: Reliant on building industry, desire for RPL for experienced, unqualified workers.
- Reported shortages for concrete manufacturing operators.
- A large number of employees in manufactured mineral products manufacturing have no qualification and would benefit greatly from Certificate II and III industry qualification training. Training plans should be developed to incorporate units from the Competitive Manufacturing Training Package at AQF levels 3 and 4.
- Operator skill training for new entrants with traineeship programs at Certificate II and III levels

## **TRAINING ENVIRONMENT AND ISSUES**

- Worksafe legislation requires all industries to have competent workers that perform the tasks they are allocated. Until now that level of competency has been assumed, rather than measured, and the Training Package is now being looked at as the benchmark for performance and competency.
- Apart from the precast concrete industry sector through the newly established SwanTAFE auspicing arrangement with Delta Corporation and the occasional individual enterprise, the Manufactured Mineral Products industry hasn't taken up the Training Package to any great extent. An Implementation Guide was not available until September 2005 and this partially explains the low take up levels. Further work needs to be done at an Industry Associations level to increase the uptake of training and to provide the opportunities for Traineeships to be established.
- Much of the industry is very labour intensive due to the processes used to manufacture many of the products, and that a lot of the tasks haven't yet been automated. In the case of Clay Brick manufacturing this is the opposite trend, with much of the process now being fully automated.
- Some sophistication in enterprises in relation to workplace training structures, enterprise specific training and trainers.
- An increase in skills assessment and skills recognition for existing industry workers with the focus on skill sets rather than on the broad acquisition of qualifications.
- Opportunities for VTE in school programs to articulate with Certificate I and II programs in Concrete Products manufacturing, Cement manufacturing, Clay and Ceramics manufacturing.



- Increasing demand for English language and literacy skill development requiring greater support for Workplace English Language and Literacy (WELL) Programs to support migrant workers and operators that need to increase skills to meet multi-skilling requirements

## LICENSING OR REGULATORY REQUIREMENTS

No occupations within the Manufacturing Minerals Products industry Process require licences or need to meet regulatory requirements to perform their role. The only requirements for this sector are for enterprises to meet Worksafe and Department of Environmental Protection standards.

## HIGH RISK TRAINING CONCERNS

Much of the Industry is still unaware of the Training Package. Traditionally the majority of training has been by shadowing of “experienced” workers, and the quality of the skills learned varies widely.

In some sectors, especially concrete, there is a lack of definition where ITAB responsibility of coverage lies between Process Manufacturing and Building & Construction.

The existence of some extremely thin training markets within the majority of the sectors covered by the Manufactured Mineral Products training package make any direct institutional training delivery unviable. Future training responses will mainly involve auspicing training arrangements and other flexible innovative modes of mentoring led work-based delivery and assessment.

**LABORATORY OPERATIONS TRAINING PACKAGE – (PML04)** - The Laboratory Operations Training Package is a cross-industry Package which includes a diverse group of technical and scientific occupations across many industry sectors including biological testing, biological and environmental testing, biotechnology, calibration, chemical testing, construction material testing, environmental monitoring, food testing, manufacturing testing, mineral assay, pathology testing and scientific glassblowing.

The training package is designed to address the training needs of laboratory personnel working in five broad occupational categories which include:

1. laboratory supervisors, senior technical officers, technical specialists
2. technical officers
3. technical assistants
4. laboratory assistants
5. sampler/testers.

The range of qualifications covered by the Laboratory Operations Training Package are at Certificate III to Advanced Diploma.

**Status** – Endorsed



## QUALIFICATIONS

National Code	Qualification Name
PML20104	<a href="#">Certificate II in Sampling and Measurement</a>
PML30104	<a href="#">Certificate III in Laboratory Skills</a>
PML40104	<a href="#">Certificate IV in Laboratory Techniques</a>
PML50104	<a href="#">Diploma of Laboratory Technology</a>
PML60104	<a href="#">Advanced Diploma of Laboratory Operations</a>

Qualifications at the Diploma level may be streamed into the following areas, as appropriate:

- Process Manufacturing Testing
- Pathology Testing
- Biological and Environmental Testing
- Food Testing

More information on the Laboratory Operations Training Package, its qualifications and units of competency can be found on the following website:

[http://www.ntis.gov.au/Default.aspx?/TrainingPackage/PML04/volume/PML04\\_1](http://www.ntis.gov.au/Default.aspx?/TrainingPackage/PML04/volume/PML04_1)

Implementation Guides for Training Packages can be found at the following website:-

[http://www.vetinfonet.det.wa.edu.au/tp\\_upload/PML04.PDF](http://www.vetinfonet.det.wa.edu.au/tp_upload/PML04.PDF)

## INDUSTRY ORGANISATIONS/ASSOCIATIONS

*This list is not exhaustive – a guide only.*

- National Association of Testing Authorities (NATA)
- Scientific Glassblowers Society of Australian and New Zealand
- Liquor, Hospitality and Miscellaneous Workers Union (LHMWU)

## WORKFORCE ISSUES, CHARACTERISTICS, ACTIVITIES

- Significant employment on a shift basis (making for training delivery issues).
- The main issue for this sector is the recruitment of well trained staff for the larger batch operation testing companies. Tertiary trained applicants are not attracted to this kind of work and there exists many openings for VET training personnel to fill those roles.
- Other issues for this sector include; the rapid rate of change in technological development and innovation and, the changes to legislation particularly in the areas of environmental and medical testing. Keeping up with the changes in technology and legislative requirements can prove difficult, even for the most sophisticated and well resourced laboratory.



- The undercutting of costs against competitors in order to just get work is proving to be an issue for the industry. Some smaller operations are chasing work at the expense of compromising quality.
- With more and more accountability being placed on industry to meet exacting product specifications and environmental standards the need for fast, accurate, reliable laboratory testing is becoming more apparent.
- Many companies employ their own laboratory staff, who were traditionally drawn from University trained graduates. Nowadays there is a requirement to have non-tertiary trained people to perform continuous routine testing and analysis, using more sophisticated hardware and software systems.
- Many laboratories have NATA (National Association of Testing Authorities) accreditation which requires them to be able to demonstrate a high level of competence of their staff. This ultimately leads to higher qualified staff, doing more complex testing and data analysis.
- In some areas, such as mineral assaying, the numbers of testing staff has declined due to the closure of company laboratories in favour of contracting out the services to assaying companies who specialise in these areas, and can perform the testing and analysis for a fraction of the cost that a company laboratory could do it for.
- Environmental legislation placed on many industries has seen a proliferation of associated testing groups formed, and given the current thrust of Government policies the industry sees this as a continuing growth area. It is hoped that growth may also be continued due to the mining and minerals boom, and also the influx of new companies on the Burrup Peninsular taking advantage of the oil and gas discoveries.
- There is more of a shift to laboratory work being focussed on Quality Assurance (QA) and Quality Control (QC) roles, as more of the routine sample testing is being automated to some extent.
- The development of laboratory skills are essential in support of developing, maintaining and monitoring quality production. The continued access to these skills at a Certificate IV and Diploma level are important to all manufacturing industries.
- 40% of enrolments in laboratory skills qualifications are accessed to achieve addition qualifications and skills to address the changing skill needs of enterprises. This is reflected in the increased requirements for quality control and optimisation in an environment of increased technology and rapid production.

## **TRAINING ENVIRONMENT AND ISSUES**

- Some sophistication in enterprises in relation to workplace training structures, enterprise specific training and trainers.
- The PML04 training package gives greater definition to qualifications for the Mineral Assaying, Biotechnology and Environmental streams. There is expected to be an increase in demand for the Certificate III in Laboratory Skills, the Certificate IV in Laboratory Techniques, and the Diploma of



Laboratory Technology. In PML04 there is a new Certificate II qualification outcome in Sampling and Testing which saw the creation of a Certificate II traineeship registered in February 2006.

- Planning is also underway to introduce a School Based Traineeship, Certificate II Sampling and Measurement in 2007 to support the newly registered qualification from the Laboratory Operations Training Package.
- Delivery of training and assessment is carried out in a simulated workplace environment, using the high quality laboratories available within the TAFE colleges. Work based training and assessment is carried out where applicable, generally more for existing worker Skills Recognition processes.
- Some of the identified industry-based laboratory training has the potential to be employment based, such as the current practice at Western Geotechnics with the rest being accessed through general delivery of training.
- An increase in skills assessment and skills recognition for existing industry workers with the focus on skill sets rather than on the broad acquisition of qualifications.
- Need for provision of self paced Learning opportunities identified.

## **LICENSING OR REGULATORY REQUIREMENTS**

As this is a cross-industry Training Package it is possible that workers may be subject to a vast variety and number of both State and Federal legislation and regulations. Individuals within their industry sectors must acquaint themselves with their relevant industry requirements. This sector will be required to meet their Worksafe and Department of Environmental Protection regulations and standards.

## **HIGH RISK TRAINING CONCERNS**

No identified “hot topics” have been reported.