

**MANUFACTURING IN THE  
POLYMER, PLASTIC AND  
RUBBER INDUSTRIES**



# A guide on how to use this Industry Pack

## Resource for teachers and students

**This industry pack is a resource designed to support the Manufacturing Careers Short Course. It connects classroom lesson plans, assessment tasks and the Manufacturing Matters website: [manufacturingmatters.com.au](http://manufacturingmatters.com.au).**

### COVER PAGE

Identifies the main manufacturing industry explored in this pack. Each industry pack is assigned an alphanumeric code, such as M4, to assist in identifying the industry pathway pack in various printed and digital outputs. There are 14 pathways in total.

» Use to identify workplaces or industries of interest for Assessment 1.

### PAGE 1

Provides an overview of the specific manufacturing industry. It briefly explains where the industry operates and provides a basic understanding of relevant industry subject matter. **Supports Lesson 1 & 3.**

» Use to identify key interests or targeted questions for Assessment 1.

### PAGE 2

Features images and descriptions of the manufacturing industry. These examples support further independent research by providing clear visual references for inspiration. **Supports Lesson 1 & 3.**

» Use to direct independent research to prepare targeted questions for Assessment 1.

### PAGE 3

A career story offers real-life insight into an individual working in the manufacturing industry. It highlights variability in career pathways and offers real-world context of roles and progression within the sector. **Supports Lesson 3.**

» Use for Assessment 1 & Assessment 2 to understand pathways and core skills, attributes and knowledge.

### PAGE 4

Includes:

- A map of Queensland to prompt a guided Google Maps research activity into where manufacturing industries are located.
- Industry specific search strings to assist further independent research into the industry.
- Links to job search platforms to research employment opportunities in the industry in Queensland.

**Supports Lessons 8 to 13 & 16.**

» Use for Assessment 1 & Assessment 2 to identify local industries and support independent research into job skills, attributes and knowledge gathering search terms.

### PAGE 5

Provides an overview of educational training pathways and connects to the Career Bullseye highlighting roles at various Levels on the following page. **Supports Lessons 16 & 17.**

» Use for Assessment 2 to understand pathways into specific roles.

### PAGE 6

An interactive Career Bullseye indicates roles within the industry at various Level (1 – 4) and allows for quick cross-industry comparisons on flexible career pathways. **Supports Lessons 1 & 3.**

» Use for Assessment 2 to understand pathways into specific roles and cross-industry relevance.

### PAGE 7

Focuses on the first career pathway theme: **“Leading Teams”**.

Highlights the skills, qualities and attributes required for leadership roles and provides a list of examples to support further independent research. **Support Lessons 11, 18 & 19.**

**Note:** More detailed job descriptions are available on the Manufacturing Matters website. These may be made available as printed copies also.

**Note:** Additional videos are available to support this section exploring select “Leadership” and “On the Tools” occupations.

» Use for Assessment 2 to identify skills, attribute, knowledge and/or experience as pathways into specific roles in interested manufacturing industries.

### PAGE 8

Focuses on the second career pathway theme: **“On the Tools”**.

Highlights the skills, qualities and attributes required for hands-on roles and provides a list of examples to support further independent research. **Support Lessons 2, 6, 11.**

**Note:** More detailed job descriptions are available on the Manufacturing Matters website. These may be made available as printed copies also.

**Note:** Additional videos are available to support this section exploring select “Leadership” and “On the Tools” occupations.

» Use for Assessment 2 to identify skills, attribute, knowledge and/or experience as pathways into specific roles in interested manufacturing industries.

### PAGE 9

Provides an overview of the Future of the Industry and how technology is changing it. The section highlights skills needed for the future and growing trends in the industry. **Supports Lessons 12 & 13.**

» Use to identify targeted questions for Assessment 1 and for Assessment 2 for planning careers pathways and future skills, attributes and knowledge.

### PAGE 10

Includes helpful online resources for further exploration of manufacturing industries. A matrix is provided that identifies all 14 core manufacturing industry pathways to discover!

» Use for Assessment 1 & Assessment 2 to expand independent research into pathways, core skills, attributes, and knowledge.

# Understanding the Polymer, Plastic and Rubber Industry in Queensland

The Polymers, Plastics and Rubber manufacturing industry in Queensland represents a significant component of Australia's manufacturing sector and domestic production capabilities. This sector combines advanced chemical processes with modern manufacturing technologies to serve both industrial and consumer markets.

## **POLYMER MANUFACTURING IN QUEENSLAND**

Queensland's polymer manufacturing sector integrates chemical engineering with advanced production technologies. In the industrial sector, manufacturers produce a comprehensive range of products including adhesives, protective coatings and specialised components for automotive and aerospace applications. Many manufacturers specialise in custom polymer formulations, with particular emphasis on weather-resistant coatings suited to Queensland's tropical and subtropical environments.

The commercial polymer sector serves diverse market segments including construction, healthcare and agriculture. Queensland manufacturers have developed particular expertise in producing polymers that meet the specific requirements of Australia's harsh climate conditions. This includes considerations for UV resistance and durability in coastal areas.

## **PLASTICS AND RUBBER MANUFACTURING IN QUEENSLAND**

The plastics and rubber manufacturing sector encompasses a broad range of specialised production activities. Plastic products form a substantial segment, with manufacturers producing packaging materials, plumbing components and specialised medical equipment suited to Queensland's healthcare sector. Many of these manufacturers have developed niche markets by focusing on products adapted to local conditions and requirements.

Specialised rubber manufacturing includes tyre production, industrial seals and conveyor systems for the mining sector. These subsectors often combine traditional manufacturing techniques with advanced technology, particularly in areas such as compression moulding and vulcanisation. Queensland's rubber manufacturing industry has evolved to incorporate automated systems while maintaining capabilities in traditional production methods.

## **Manufacturing Support Industries**

The industry is supported by a network of specialised facilities including chemical processing operations, recycling plants and quality testing laboratories. These support industries are crucial to the sector's success, providing essential services and materials. Raw material suppliers and additive manufacturers form an integral part of the supply chain, often developing custom solutions for specific manufacturing requirements.

## **Advanced Manufacturing Technologies**

Contemporary polymers, plastics and rubber manufacturing in Queensland relies heavily on advanced technologies. Automated mixing systems and computer-controlled reactors are now standard in most facilities. These technologies enable precise production methods while maintaining cost-effectiveness. Quality control systems and inventory management procedures have been developed to meet international standards while addressing local market needs.

## **Skills and Workforce**

The industry depends on a highly skilled workforce including chemical engineers, production supervisors and laboratory technicians. Machine operators and quality control specialists play crucial roles in maintaining product consistency and efficiency. The sector actively collaborates with training institutions to develop and maintain these essential skills.

## **Manufacturing Locations**

Manufacturing facilities are strategically positioned throughout Queensland, with significant concentrations in Brisbane's industrial precincts and regional manufacturing zones. The Gold Coast and Ipswich regions have developed specialised manufacturing capabilities, often focused on particular market segments or production techniques.

## **Sustainable Practices**

Sustainability has become increasingly important in the sector. Manufacturers are implementing recycling programs, energy-efficient processes and waste reduction initiatives. Water-based production systems are becoming standard, reflecting both environmental concerns and workplace safety requirements.

The industry provides significant employment opportunities and contributes to Queensland's domestic production while supporting related sectors such as mining, construction and healthcare industries.





Polymer-based granules ready for use in various plastic processing equipment.



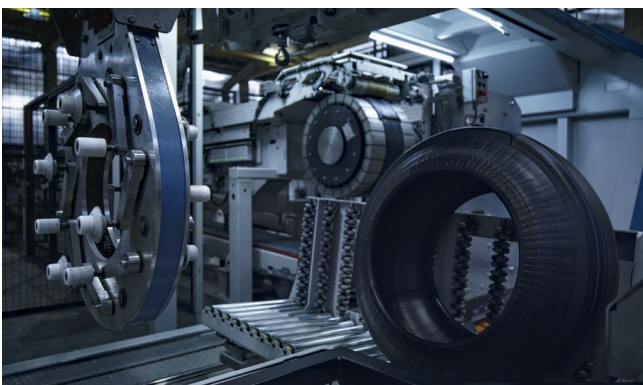
A materials engineer evaluating a polymer-based material for performance criteria.



A production technician guiding a rotational molding arm into a heating chamber.



Small injection molded plastic parts in a recovery bin for collection and inspection.



A fully automated tyre production line with heated shaping and forming elements.



Rubber material moving through a calendering process to form rubber sheet.

Images in this document have been supplied by Manufacturing Skills Queensland and industry partners. Additional images have been sourced through Adobe Stock or generated using Adobe and Google AI software. Design layout by Liveworm, Queensland College of Art and Design, Griffith University.

## Career Stories

### Plastics Manufacturing Director

I work as the Managing Director at plastics manufacturing company based in South East Queensland specializing in contract manufacturing of plastic injection-molded products in an automated and mass-production environment. Our operations involve producing molded components from polymer granules, which we source from local distributors or import as needed.

Polymers, plastics, and rubber are at the core of our industry, though we also contribute to sectors like medical, defence, consumer goods, agriculture, and IoT—the Internet of Things. Plastic is ubiquitous in modern life, and our manufacturing processes help transform polymers into essential products. For instance, our items are present in everyday activities—whether it's the screen door you open, medical devices you use, or even the reliable delivery of mail and parcels through partners like Australia Post.

Our industry is currently shaped by technological advancements, particularly in injection molding and automation. While 3D printing is gaining traction, its scalability and speed cannot yet rival injection molding. Innovations like the Tesla Giga Press, which applies similar principles for aluminium, highlight the growing influence of automation. In the future, I foresee disruptions in design and tooling, driven by AI and 3D printing.

The pathway to my role has been unconventional. I left school early to enter a trade and progressively moved through management roles while studying diplomas and, eventually, completing an MBA. My early exposure to technical trades in school—ranging from engineering to plastic fabrication—provided a solid foundation, although I initially had no knowledge of molding plastics.

My role now revolves around managing relationships, overseeing projects, and providing technical support to our manufacturing processes. A typical day might involve quoting new work, managing projects, and supporting our staff. While delegation can be challenging, it's rewarding to see the business grow with a strong reputation. Building industry-specific knowledge has taught me the intricacies of our manufacturing sector, while skills like problem-solving, leadership, and creative thinking have been crucial.

For students considering this field, I recommend studying general subjects like Accounting, Business, and Engineering, as well as applied subjects such as Engineering Skills and Industrial Technology Skills. My advice to a Year 10 student would be simple: Just start. Work out what you enjoy later. Manufacturing offers diverse opportunities for innovation, learning, and growth, and there's no better way to discover your path than by diving in.

***“The pathway to my role has been unconventional. I left school early to enter a trade and progressively moved through management roles while studying diplomas and, eventually, completing an MBA.”***



## Industry Map



### FINDING INDUSTRY NEAR YOU

Want to see what Industry is around you? Here's how to do it on Google Maps!

**Start by going to:**

[maps.google.com](https://maps.google.com)

**Quick tip:** Sign in if you want to save places for later!

Begin finding Pathways to Industry by typing what you're looking for using the knowledge you have, and include where you want to find it, for example:

**"plastic molding Gold Coast QLD"**

**For this specific industry here are some terms to try:**

- Polymer manufacturer/suppliers
- Polymer Processing
- Plastic Molding
- Plastic manufacturer/fabrication
- Polymer/Plastic Composites manufacturer
- Rubber products manufacturer
- Rubber processing/manufacturer

Use both "processing" and "manufacturing" terms

Include "industrial" for better results

Try "fabrication" and "molding" variations

### Some general search tips:

- Always include both "QLD" and "Queensland" in separate searches
- Add your postcode or "near me" to find stuff nearby
- Moving around the map? Click "search this area" to find new places
- Want to see how big a place is? Switch to Satellite View!
- Use Street View to get a closer look
- Found something interesting? Save it to your lists

Don't forget to check regular Google Search too! Sometimes you'll find different results there.

### EXTENDING YOUR INDUSTRY KNOWLEDGE ONLINE

Here are some useful web search queries to find out more about this industry:

- polymer processing innovations
- advanced moulding techniques
- composite material technology
- plastic recycling innovations
- rubber vulcanization methods
- biopolymer development
- additive polymer printing
- smart plastics technology
- elastomer engineering
- sustainable polymer solutions

### EXPLORING INDUSTRY PATHWAYS ONLINE

Search for manufacturing jobs in Queensland using platforms like Seek, Indeed, and LinkedIn. Filter results by location and experience level to find opportunities ranging from production line work to engineering roles. Use specific keywords like "advanced manufacturing careers" to discover industry trends and requirements.

[seek.com.au](https://seek.com.au)

[au.indeed.com](https://au.indeed.com)

[linkedin.com](https://linkedin.com)



## Industry Pathways

In Queensland, an industry training pathway blends secondary school education with hands-on vocational training, allowing students to gain practical skills and qualifications while completing their high school certificate.

These pathways often involve partnerships between schools, TAFEs (Technical and Further Education), and industry, providing students with apprenticeships, traineeships, or work experience in their chosen field.

This combination of classroom learning, and real-world experience gives students a head start in their careers and helps them transition smoothly into the workforce or further tertiary education.

### What does an industry training pathway look like?

The four education and training levels serve as a general guide and represent the most common educational and/or entry-level requirements for these roles.



#### LEVEL 1

Typically requires skills equivalent to the completion of Year 10, a Senior Secondary Certificate of Education, or a Certificate I or II. Australian Apprenticeships may be available at this level.



#### LEVEL 2

Typically requires skills equivalent to a Certificate III or IV, or at least three years of relevant experience. Australian Apprenticeships may also be available at this level.



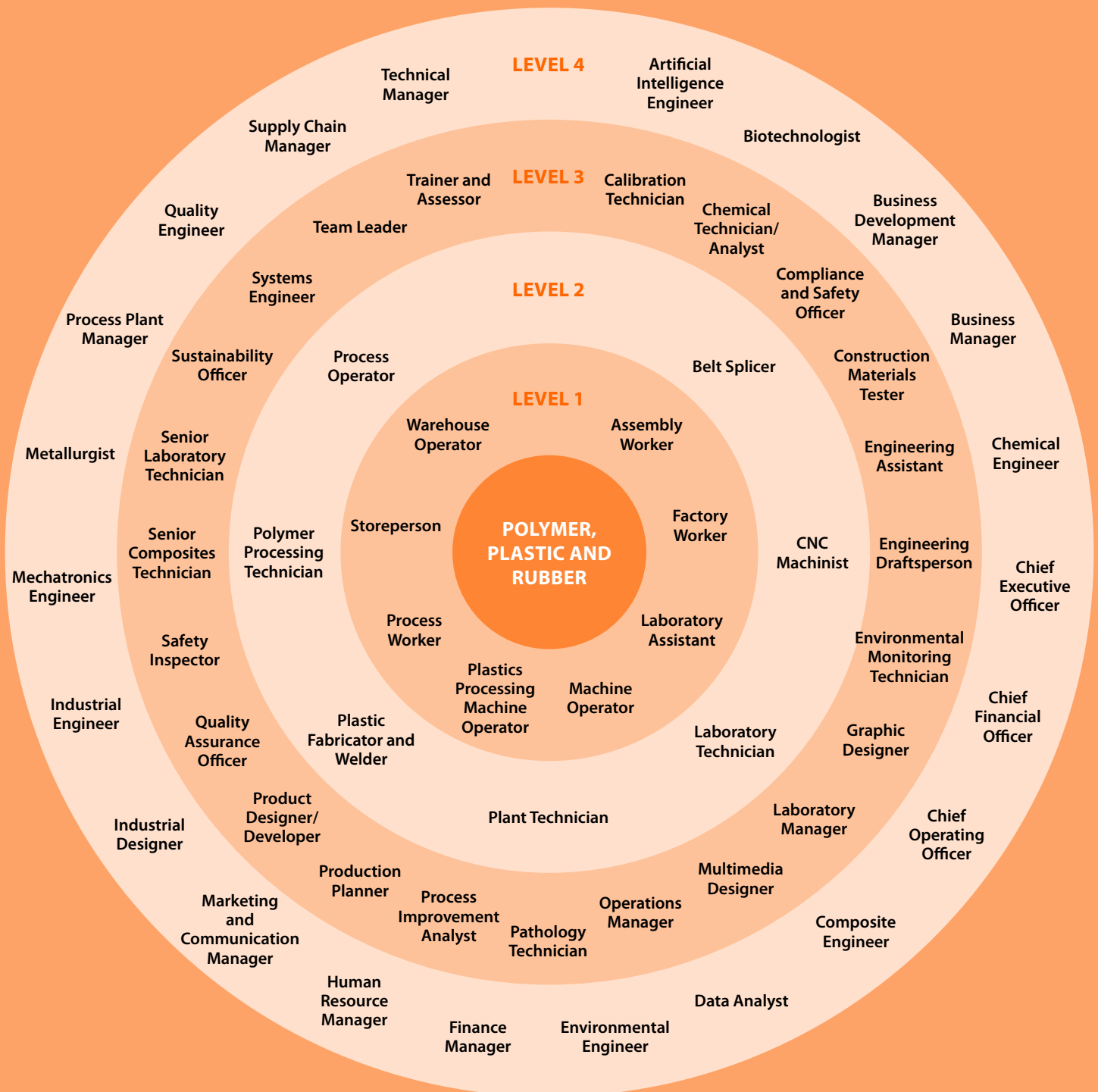
#### LEVEL 3

Typically demands a level of expertise equivalent to a Diploma or Advanced Diploma, often gained through TAFEs or Registered Training Organisations. Some universities also offer programs at this level.



#### LEVEL 4

Typically requires qualifications equivalent to a Bachelor's Degree or higher. This level of education is usually pursued at a university.



#### CORE INDUSTRIES

Aerospace and Defence  
Chemicals, Hydrocarbons and Refining  
Food and Beverage  
Furniture and Other Products  
Meat and Seafood Processing

General Manufacturing and Engineering  
Pharmaceutical and Medical Technology  
Polymers, Plastic and Rubber  
Printing and Graphic Arts

Pulp, Paper and Packaging  
Renewables  
Textiles, Clothing and Footwear  
Timber and Wood  
Transport Equipment and Machinery

#### SUPPORTING INDUSTRIES

Laboratory Operations  
Process Plant Operations  
Sustainable Operations

For further information, visit:

[manufacturingmatters.com.au/careers](http://manufacturingmatters.com.au/careers)



## Industry Pathways - Leading Teams



Leading a team is about more than just managing tasks; it's about inspiring, motivating, and guiding a group of individuals towards a shared goal. A good team leader fosters a collaborative and supportive environment where everyone feels valued and empowered to contribute their best.

### ROLE OF A TEAM LEADER

- **Setting a Vision:** Clearly define goals and objectives, and communicate them effectively to the team.
- **Providing Direction:** Guide the team's efforts, ensuring everyone understands their roles and responsibilities.
- **Motivating and Inspiring:** Encourage and support team members, recognising their achievements and fostering a positive work environment.
- **Facilitating Collaboration:** Promote teamwork, open communication, and constructive conflict resolution.
- **Delegating Effectively:** Assign tasks based on individual strengths and skills, empowering team members to take ownership.
- **Monitoring Progress:** Track the team's performance, providing feedback and making adjustments as needed.
- **Developing Individuals:** Support the growth and development of team members through mentoring, coaching, and training opportunities.

### QUALITIES AND ATTRIBUTES OF A GOOD TEAM LEADER

- **Strong Communication Skills:** Clearly and effectively convey information, actively listen to team members, and provide constructive feedback.
- **Integrity and Trustworthiness:** Act with honesty and ethical principles, building trust and respect among team members.

- **Emotional Intelligence:** Understand and manage their own emotions and those of others, fostering empathy and positive relationships.
- **Decisiveness:** Make informed and timely decisions, even in challenging situations.
- **Accountability:** Take responsibility for the team's performance, both successes and failures.
- **Problem-Solving Skills:** Identify and analyse challenges, develop creative solutions, and guide the team through obstacles.
- **Adaptability:** Adjust to changing circumstances, embrace new ideas, and remain flexible in their approach.

### JOB TITLE

Industry roles where qualities of leadership, effective communication and specialist knowledge are valued.

- Chief Executive Officer
- Chief Operating Officer
- Chief Financial Officer
- Laboratory Manager
- Process Plant Manager
- Technical Manager
- Supply Chain Manager
- Human Resource Manager
- Finance Manager
- Marketing and Communication Manager
- Business Manager
- Business Development Manager
- Operations Manager
- Team Leader
- Production Planner
- Safety Inspector

For further information, visit:

[manufacturingmatters.com.au/careers/](https://manufacturingmatters.com.au/careers/)

## Industry Pathways - On the Tools



Jobs involving hands-on work with technology are increasingly common, blending technical expertise with manual dexterity and problem-solving skills. These roles often involve building, repairing, installing, or maintaining technological equipment and systems.

### QUALITIES NEEDED FOR THESE ROLES:

- **Manual Dexterity:** Skilled and precise use of hands and tools to manipulate small components and perform intricate tasks.
- **Technical Knowledge:** Understanding of the technology they work with, including its principles, operation, and maintenance.
- **Problem-Solving Skills:** Ability to diagnose issues, identify solutions, and apply critical thinking to resolve technical challenges.
- **Attention to Detail:** Accuracy and precision in their work, ensuring that equipment is assembled and functioning correctly.
- **Patience and Persistence:** Ability to work through complex tasks methodically and remain focused, even when facing setbacks.
- **Communication Skills:** Clearly explain technical issues to colleagues or clients and work effectively in a team.
- **Physical Stamina:** May involve lifting, bending, and standing for extended periods.
- **Up-to-date Knowledge:** A willingness to learn and stay current with rapidly evolving technologies.
- **Adaptability:** Adjust to changing circumstances, embrace new ideas, and remain flexible in their approach.

### JOB TITLE

Industry roles that can be considered 'on the tools' which requires different levels of training and specialist knowledge.

- Industrial Engineer
- Industrial Designer
- Quality Engineer
- Additive Engineer
- Composite Engineer
- Environmental Engineer
- Senior Composites Technician
- Sustainability Officer
- Process Improvement Analyst
- Quality Assurance Officer
- Product Designer/Developer
- Engineering Draftsperson
- Engineering Assistant
- Calibration Technician
- Chemical Technician/Analyst
- Environmental Monitoring Technician
- Construction Materials Tester
- Systems Engineer
- Compliance and Safety Officer
- Process Operator
- Plastic Fabricator and Welder
- Polymer Processing Technician
- Belt Splicer
- Plant Technician
- Process Worker
- Factory Worker
- Storeperson
- Warehouse Operator
- Machine Operator
- Assembly Worker
- Plastics Processing Machine Operator
- CNC Machinist

For further information, visit:

[manufacturingmatters.com.au/careers/](https://manufacturingmatters.com.au/careers/)

## Future Industry



### FUTURE TRENDS AND INNOVATION

The future of Queensland's Polymers, Plastics and Rubber manufacturing industry aligns with Australia's national economic priorities, particularly in circular economy initiatives, digital transformation, and advanced materials development. These changes support the Future Made in Australia plan's goals of strengthening sovereign manufacturing capabilities and developing advanced skills.

#### KEY TRENDS INCLUDE:

**Smart Manufacturing:** Integration of artificial intelligence and Internet of Things (IoT) sensors in polymer processing, enabling real-time quality control and predictive maintenance. This includes advanced monitoring systems that optimise production parameters and improve product consistency.

**Sustainable Materials:** Development of bio-based polymers and recyclable composites, aligned with the growing demand for environmentally responsible materials. This includes biodegradable plastics and rubber alternatives manufactured from renewable resources.

**Advanced Processing Technologies:** Implementation of additive manufacturing and automated compounding systems in polymer processing, supported by industry-specific digital skills training programs.

**Circular Economy:** Adoption of closed-loop manufacturing processes, including advanced recycling technologies for plastics and rubber products, and waste-to-resource initiatives.

### FUTURE ROLES IN THE INDUSTRY

#### Leadership Roles:

- Circular Economy Director: Oversees recycling and sustainability initiatives
- Digital Operations Manager: Leads smart factory implementation

- Advanced Materials Manager: Coordinates new product development
- Skills Development Leader: Implements digital manufacturing training

#### Technical Roles:

- Polymer Technology Specialist: Maintains advanced processing equipment
- Digital Systems Technician: Programs automated manufacturing systems
- Bio-materials Specialist: Develops sustainable polymer alternatives
- Recycling Systems Engineer: Services material recovery facilities
- Industry 4.0 Trainer: Supports workforce digital transition

### FUTURE SKILLS FOCUS

Emerging skills requirements across all levels include:

- Digital literacy and data analysis
- Advanced recycling systems operation
- Sustainable manufacturing practices
- Bio-based materials handling
- Cross-disciplinary communication

These emerging roles emphasise the integration of digital technologies and circular economy principles. The industry offers new career pathways through technical training programs and micro-credentials, with particular focus on developing digital skills in traditional polymer processing roles.



## Other Resources

For further information, visit:

### MANUFACTURING MATTERS

[manufacturingmatters.com.au](http://manufacturingmatters.com.au)

### MANUFACTURING SKILLS QUEENSLAND

[msq.org.au](http://msq.org.au)

### QUEENSLAND STATE GOVERNMENT

Department of State Development, Infrastructure and Planning

[statedevelopment.qld.gov.au/industry/critical-industry-support/industry-roadmaps](http://statedevelopment.qld.gov.au/industry/critical-industry-support/industry-roadmaps)

Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

[nrm.mrd.qld.gov.au/manufacturing](http://nrm.mrd.qld.gov.au/manufacturing)

### BUSINESS QUEENSLAND

[business.qld.gov.au/industries](http://business.qld.gov.au/industries)

### REGIONAL DEVELOPMENT AUSTRALIA

[rdabrisbane.org.au](http://rdabrisbane.org.au)

### INDUSTRY ASSOCIATIONS

Plastics Industry Pipe Association of Australia – PIPA

[pipa.com.au](http://pipa.com.au)

Plastics Industry Manufacturers of Australia

[pima-org.net](http://pima-org.net)

Queensland Plastics Industry Training Committee

[plastics-itc.asn.au/about-qpitc](http://plastics-itc.asn.au/about-qpitc)

## Other Core Industries to Discover

Check out these other core manufacturing industries to understand the similarities and differences between them!

M1

M2

M3

M1 Aerospace and Defence

M4

M5

M6

M2 Chemicals, Hydrocarbons and Refining

M3 Food and Beverage

M4 Furniture and Other Products

M5 Meat and Seafood Processing

M6 General Manufacturing and Engineering

M7 Pharmaceutical and Medical Technology

**M8 Polymers, Plastic and Rubber**

M9 Printing and Graphic Arts

M10 Pulp, Paper and Packaging

M11 Renewables

M12 Textiles, Clothing and Footwear

M13 Timber and Wood

M14 Transport Equipment and Machinery

M13

M14