MANUFACTURING SKILLS QUEENSLAND

M10

MANUFACTURING IN THE

PULP, PAPER AND PACKAGING INDUSTRIES

MANUFACTURING SKILLS QUEENSLAND

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.

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 Pulp, Paper and Packaging Industry in Queensland

The Pulp, Paper and Packaging manufacturing industry in Queensland represents a vital component of Australia's manufacturing sector and domestic production capabilities. This sector combines advanced manufacturing processes with sustainable practices to serve both commercial and consumer markets.

PULP MANUFACTURING IN QUEENSLAND

Queensland's pulp manufacturing sector integrates mechanical and chemical processing technologies to transform raw materials into pulp products. In the commercial sector, manufacturers produce a comprehensive range of products including raw pulp for paper mills, specialty pulp for hygiene products, and industrial-use pulp. Many manufacturers specialise in chemical pulping, which uses sodium hydroxide to dissolve lignin, producing stronger pulp suitable for high-quality paper production.

The mechanical pulping sector serves diverse market segments including newspaper production and packaging manufacturers. Queensland manufacturers have developed particular expertise in producing pulp that meets the specific requirements of Australia's tropical and subtropical environments. This includes considerations for moisture resistance and durability in humid conditions.

PAPER AND PACKAGING MANUFACTURING IN QUEENSLAND

The paper and packaging manufacturing sector encompasses a broad range of specialised production activities. Paper products form a substantial segment, with manufacturers producing writing and printing paper, newsprint, and glossy paper for magazines. Many of these manufacturers have developed niche markets by focusing on products adapted to local conditions and requirements.

Specialised packaging manufacturing includes corrugated cardboard production, food packaging, and custom packaging solutions. These subsectors often combine traditional manufacturing techniques with advanced technology, particularly in areas such as laser cutting and precision folding. Queensland's packaging industry has evolved to incorporate digital printing technology while maintaining capabilities in traditional packaging production.

Manufacturing Support Industries

The industry is supported by a network of specialised facilities including forestry operations, recycling plants, and chemical processing units. These support industries are crucial to the sector's success, providing essential services and materials. Water treatment facilities and environmental management systems form an integral part of the supply chain, often developing custom solutions for specific manufacturing requirements.

Advanced Manufacturing Technologies

Contemporary pulp, paper and packaging manufacturing in Queensland relies heavily on advanced technologies. Laser cutting machinery and precision control systems are now standard in most facilities. These technologies enable precise production methods while maintaining cost-effectiveness. Quality control systems and environmental 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, machine operators, environmental specialists, and laser cutting technicians. Production supervisors and quality control inspectors play crucial roles in maintaining quality 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 near managed forests, water sources, and urban recycling facilities. The industrial zones near ports and distribution centres 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 plantation forestry practices, water recycling processes, and waste reduction programs. Renewable energy systems are becoming standard, reflecting both environmental concerns and workplace efficiency requirements.

The industry provides significant employment opportunities and contributes to Queensland's domestic production while supporting related sectors such as forestry, printing, and retail industries.

Recycled paper and cardboard bales to use for pulping into sustainably produced materials and products.

Pulping mill to prepare wood chips and plant fibres for paper production.

Pulped paper products such as egg cartoons and protective packaging materials.

Paper roll production line to create uniform quality paper from pulp.

Laminated cardboard sheet production line with conveyor systems.

Automated cardboard box folding equipment to pre-assemble packaging.

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
Project Manager

I work in Project Management at a large packaging company. My role involves managing a range of Human Resource projects, primarily focused on recruitment. We operate across different areas of Brisbane including South Brisbane, Gibson Island, Yatala, Hemmant, Heathwood, and Carole Park.

Our company is primarily focused on the food and beverage sector, but we also work in meat and seafood processing, polymers and plastics, pulp and paper packaging, and renewables. We recycle and produce packaging including paper, cans, plastic bottles, and glass bottles. We also provide automation services, packaging equipment, and logistics services.

Students interact with our products every day through the packaging of items they consume. They'll see our trucks on the road, and the materials in their yellow bins will be processed by us. Our industry is evolving through continuous improvement and significant investment in factory automation, including automated guided vehicles (AGVs). We have R&D teams working with clients to develop new products, and client-facing teams helping to achieve objectives like reduced distribution costs and waste reduction.

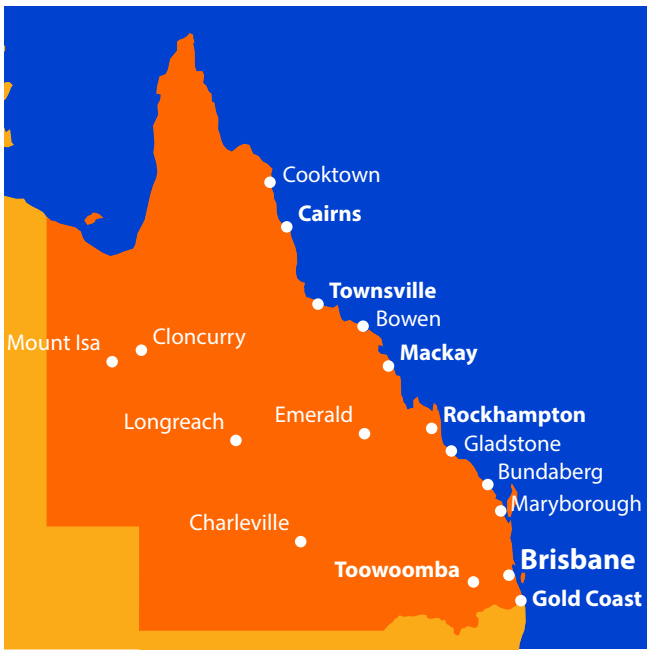
From a personal perspective, my background is quite varied. I have four academic qualifications in marketing and data analytics, and I've worked across finance, manufacturing, not-for-profit, educational, and management consulting sectors. When I left school, I joined a small company in a large role before moving to Australia with a business expanding here. My career path has been less traditional and more varied, typically navigating towards broader roles in smaller businesses and then larger ones.

My knowledge of manufacturing was limited when I started. I was hired for my ability to manage complex recruitment projects, which I'd done in other industries. I learned about manufacturing quickly, with my interest in detail helping me understand processes. The challenge of managing projects for staffing large greenfield factories attracted me to the role rather than manufacturing specifically.

For students considering this industry, I recommend finding opportunities to learn about manufacturing. There are often holiday work opportunities and helping relatives or friends who produce, or market products can be valuable. For those interested in trades, improving mechanical aptitude is important - whether working on cars or seeking opportunities to help others in paid or unpaid capacities.

"My knowledge of manufacturing was limited when I started. I was hired for my ability to manage complex recruitment projects, which I'd done in other industries."

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

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:

"pulp mill QLD"

For this specific industry here are some terms to try:

- Pulp Mill
- Paper Manufacturer/production industries
- Paper factory
- Cardboard manufacturer
- Packaging factory/manufacturer
- Packaging Engineering
- Paper Reprocessing

Add "industrial" or "commercial" to filter out retail shops

Use "mill," "plant," or "facility" for production sites

Include "manufacturing" or "processing" terms

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:

- advanced pulping technology
- smart packaging systems
- nanocellulose applications
- sustainable fibre processing
- intelligent packaging design
- barrier coating technology
- paper strength enhancement
- recycling process innovation
- active packaging systems

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

au.indeed.com

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

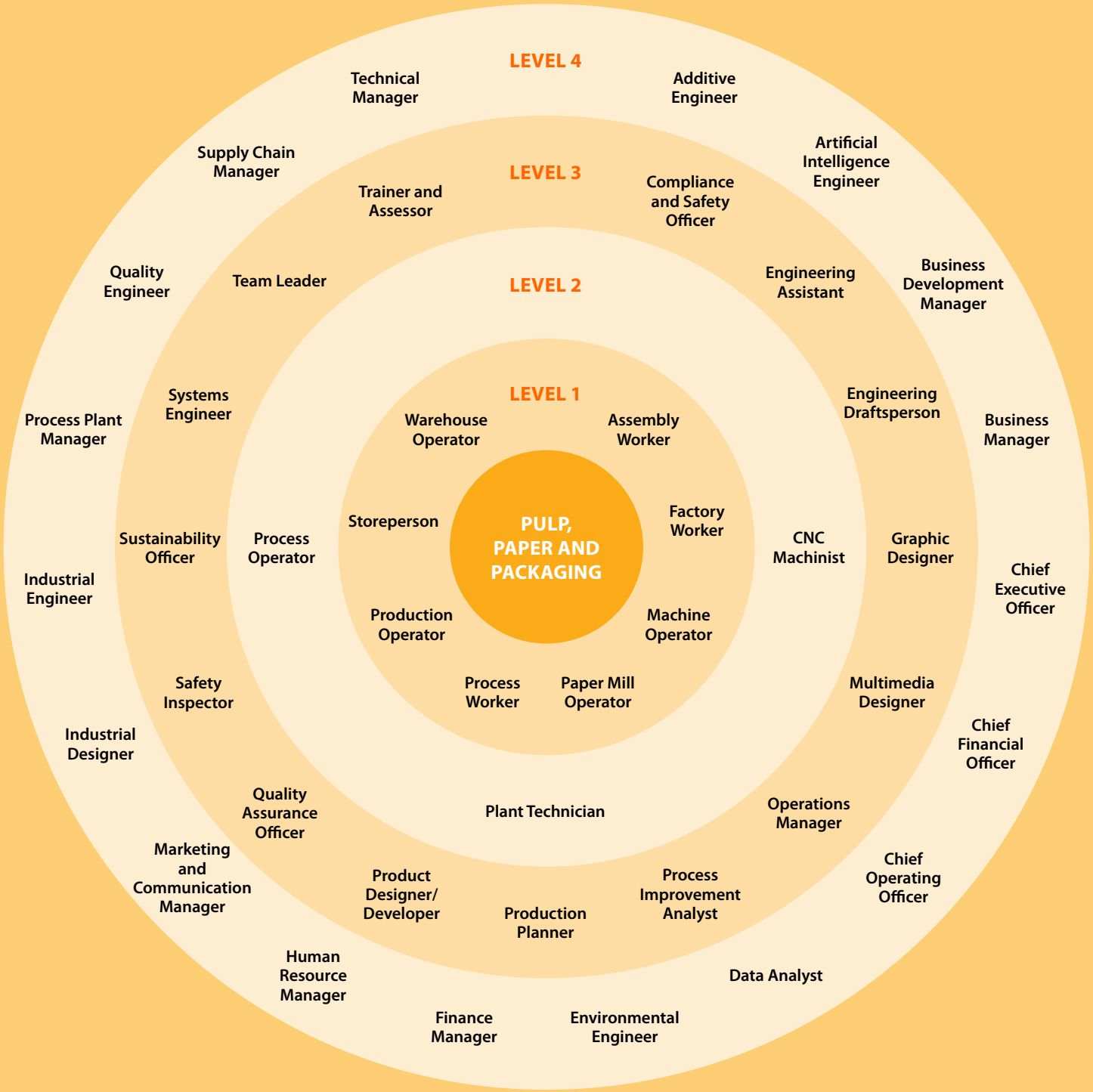
Typically requires skills equivalent to a Certificate III or IV, or at least three years of relevant experience. Australian Apprenticeships may also be available at this level.

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

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
- 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/

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
- Artificial Intelligence Engineer
- Additive Engineer
- Data Analyst
- Environmental Engineer
- Sustainability Officer
- Process Improvement Analyst
- Quality Assurance Officer
- Product Designer/Developer
- Engineering Draftsperson
- Engineering Assistant
- Systems Engineer
- Compliance and Safety Officer
- Graphic Designer
- Trainer and Assessor
- Multimedia Designer
- CNC Machinist
- Process Operator
- Plant Technician
- Process Worker
- Factory Worker
- Storeperson
- Warehouse Operator
- Machine Operator
- Assembly Worker
- Production Operator
- Paper Mill Operator

For further information, visit:

manufacturingmatters.com.au/careers/

Future Industry

FUTURE TRENDS AND INNOVATION

The future of Queensland's Pulp, Paper and Packaging manufacturing industry aligns with Australia's national economic priorities, particularly in circular economy practices, digital transformation, and sustainable 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:

Digital Manufacturing: Integration of artificial intelligence and Internet of Things (IoT) sensors in pulp processing and paper production, enabling real-time quality control and predictive maintenance. This includes advanced process control systems that optimise resource usage and improve product consistency.

Sustainable Materials: Development of new bio-based packaging materials and smart papers, aligned with the growing demand for environmentally responsible products. This includes biodegradable packaging solutions and papers with embedded digital technologies.

Advanced Processing Technologies: Implementation of robotics and automated handling systems in packaging production, supported by industry-specific digital skills training programs. This includes the integration of advanced vision systems for quality control.

Circular Manufacturing: Adoption of closed-loop manufacturing processes, including advanced recycling technologies, water purification systems, and waste-to-energy conversion facilities.

FUTURE ROLES IN THE INDUSTRY

Leadership Roles:

- Circular Economy Director: Oversees recycling and waste reduction initiatives
- Smart Factory Manager: Leads digital transformation implementation
- Sustainable Innovation Manager: Coordinates eco-friendly product development
- Workforce Development Leader: Implements digital manufacturing training

Technical Roles:

- Process Automation Specialist: Maintains advanced production systems
- Digital Systems Engineer: Programs smart manufacturing platforms
- Sustainable Materials Developer: Creates new eco-friendly products
- Robotics Systems Technician: Services automated packaging lines
- Industry 4.0 Implementation Specialist: Supports digital transition

FUTURE SKILLS FOCUS

Emerging skills requirements across all levels include:

- Digital systems operation and data analytics
- Automated production system management
- Circular economy principles and practices
- Bio-based materials handling
- Cross-functional collaboration

These emerging roles emphasise the integration of digital technologies and sustainable manufacturing processes. The industry offers new career pathways through technical training programs and micro-credentials, with particular focus on developing digital skills in traditional paper and packaging processing roles.

Other Resources

For further information, visit:

MANUFACTURING MATTERS

manufacturingmatters.com.au

MANUFACTURING SKILLS QUEENSLAND

msq.org.au

QUEENSLAND STATE GOVERNMENT

Department of State Development, Infrastructure and Planning

statedevelopment.qld.gov.au/industry/critical-industry-support/industry-roadmaps

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

nrmmrrd.qld.gov.au/manufacturing

BUSINESS QUEENSLAND

business.qld.gov.au/industries

REGIONAL DEVELOPMENT AUSTRALIA

rdabrisbane.org.au

INDUSTRY ASSOCIATIONS

The Australian Pulp and Paper Technical Association

appita.com

Australian Forest Products Association

ausfpa.com.au

Australian Sign & Graphic Association

signs.org.au

Other Core Industries to Discover

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

M1 Aerospace and Defence
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