

MANUFACTURING IN THE TRANSPORT EQUIPMENT AND MACHINERY 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.

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 Transport Equipment and Machinery Industry in Queensland

The Transport, Equipment and Machinery manufacturing industry in Queensland represents a vital component of Australia's manufacturing capabilities, supporting crucial sectors including mining, agriculture, construction, and logistics. This sector combines advanced manufacturing technologies with specialised engineering expertise to serve both domestic and international markets.

TRANSPORT MANUFACTURING IN QUEENSLAND

Queensland's transport manufacturing sector integrates advanced engineering with modern production technologies. In the commercial transport sector, manufacturers produce a comprehensive range of vehicles including specialised freight systems, buses, and custom-designed transport solutions. Many manufacturers specialise in building and maintaining refrigerated transport systems, particularly important for Queensland's agricultural sector and food supply chain.

The marine vessel manufacturing sector serves diverse market segments including commercial fishing fleets, passenger ferries, and recreational boats. Queensland manufacturers have developed particular expertise in producing vessels that meet the specific requirements of tropical and subtropical environments, including considerations for corrosion resistance and durability in marine conditions.

EQUIPMENT AND MACHINERY MANUFACTURING IN QUEENSLAND

The equipment and machinery manufacturing sector encompasses a broad range of specialised production activities. Mining equipment forms a substantial segment, with manufacturers producing machinery adapted to Queensland's mining conditions, including excavators, drill rigs, and materials handling systems. Agricultural machinery manufacturing has developed significantly, reflecting Queensland's strong agricultural sector.

Specialised equipment manufacturing includes irrigation systems, refrigeration units, and custom-designed machinery for specific industrial applications. These subsectors combine advanced manufacturing techniques with innovative engineering solutions, particularly in areas such as precision agriculture and automated mining systems.

Manufacturing Support Industries

The industry is supported by a network of specialised facilities including metal fabrication workshops, precision engineering operations, and advanced testing facilities.

These support industries are crucial to the sector's success, providing essential services and components. Hydraulic system specialists and electronic control manufacturers form an integral part of the supply chain, often developing custom solutions for specific manufacturing requirements.

Advanced Manufacturing Technologies

Contemporary transport and machinery manufacturing in Queensland relies extensively on advanced technologies. Computer-Aided Design (CAD) systems, robotics, and automated production lines are now standard in most facilities. These technologies enable precise production methods while maintaining cost-effectiveness and quality standards. Sophisticated testing and quality control systems have been developed to meet international standards while addressing local industry requirements.

Skills and Workforce

The industry depends on a highly skilled workforce including mechanical engineers, fabricators, electricians, and robotics programmers. Production supervisors and quality control specialists play crucial roles in maintaining manufacturing standards and efficiency. The sector actively collaborates with TAFE Queensland and other 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 areas and regional manufacturing hubs. Townsville and Mackay have developed specialised capabilities in mining equipment manufacturing, while agricultural machinery production is strong in regional centres supporting farming communities.

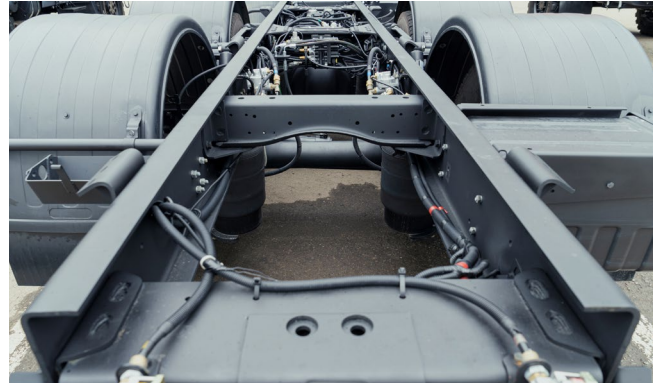
Sustainable Practices

Sustainability has become increasingly important in the sector. Manufacturers are implementing energy-efficient processes, recycling programs, and waste reduction initiatives. Electric vehicle component manufacturing is growing, reflecting both environmental concerns and changing market demands.

The industry provides significant employment opportunities and contributes to Queensland's manufacturing capabilities while supporting critical sectors such as mining, agriculture, and transport. nt industry sector.



A conveyor belt constructed for a concrete or mining operation to transport raw materials.



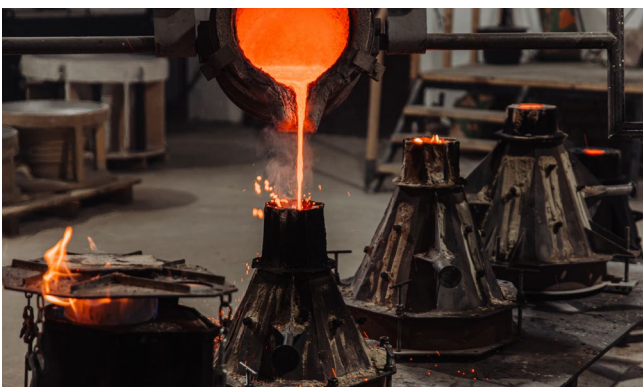
A truck chassis in a staged development for electrical wiring.



A centre pivot irrigation system for agricultural industry.



Computer Numerically Controlled (CNC) machining of machinery parts.



Molten metal at foundry being poured into a cast for equipment components.



A fabricated camper trailer built for transportation and leisure.

Career Stories

Managing Director

I serve as Managing Director at a manufacturing company based in Rocklea that specialises in refrigerated transport solutions. Our core business focuses on truck bodies, particularly refrigerated units, and we're primarily aligned with the transport and machinery sector, with additional involvement in metal manufacturing and engineering.

Our manufacturing operation is directly connected to the required resources for our industry. Students might encounter our products indirectly in their daily lives whenever cold goods are delivered. Looking ahead, electric vehicles (EVs) represent a significant technological trend that will likely transform our industry over the next 5-10 years.

My daily routine is variable. My journey to this position began with an apprenticeship that eventually led to ownership. I entered the industry as a manufacturing professional, drawn by my interest in engineering. I brought valuable manufacturing expertise to a field that was lacking it, and since then, I've acquired extensive knowledge about the niche area of refrigerated transport.

The key skills I've developed in my role include problem-solving, decision-making, and effective communication. Planning presents the greatest challenge in my position, while achieving success in product development brings the most satisfaction. Regarding industry factors, we maintain a neutral stance on gender diversity but strongly agree with commitments to ethnic and social diversity, net-zero emissions targets, and Sustainable Development Goals.

For students interested in pursuing a similar career path, I recommend focusing on several key general subjects: Business, Digital Solutions, Engineering, General Mathematics, Mathematics (General, Specialist or Methods), and Physics. Beneficial applied subjects include Building & Construction Skills, Business Studies, Engineering Skills, Essential Mathematics, Industrial Technology Skills, and Science in Practice.

My advice to Year 10 students considering a career in manufacturing is straightforward: "Learn early; be keen and hard working. It will take you places."

"My journey to this position began with an apprenticeship that eventually led to ownership."



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:

"machinery fabrication QLD"

For this specific industry here are some terms to try:

- Transport equipment engineering/fabrication/manufacture
- Machine equipment manufacture/engineering/fabrication
- Machine fabrication
- Machine design and engineering

Try variations using "fabricator" or "engineering" instead of "manufacturer"

Include "industrial" or "commercial" in searches

Add "facility" or "plant" for production sites

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:

- autonomous vehicle systems
- electric propulsion technology
- advanced manufacturing robotics
- smart machinery systems
- vehicle connectivity innovation
- powertrain technology
- lightweight materials
- predictive maintenance systems
- automated assembly lines
- electric vehicle battery tech

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.



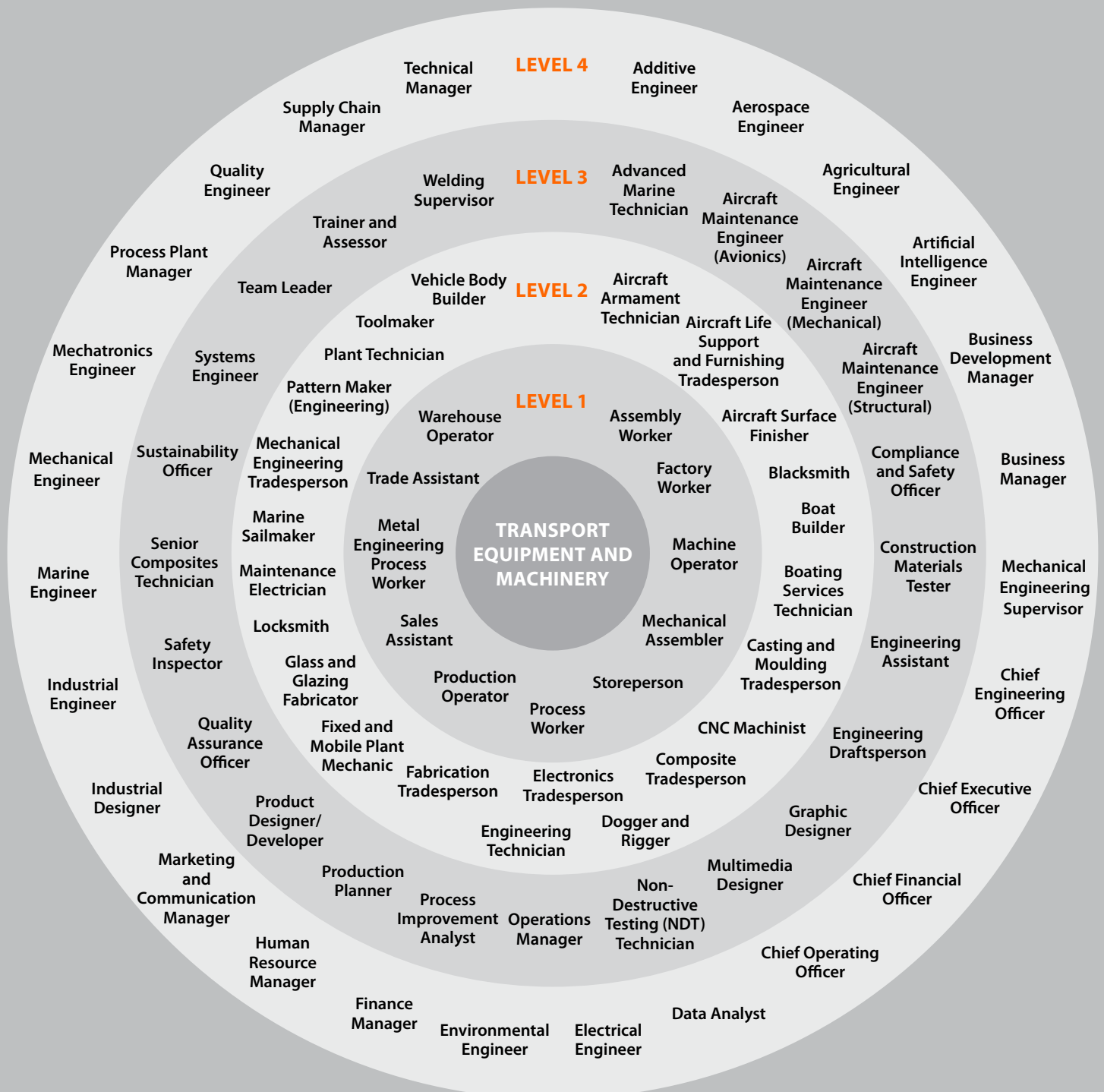
LEVEL 3

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
- Chief Engineering Officer
- Process Plant Manager
- Technical Manager
- Supply Chain Manager
- Human Resource Manager
- Finance Manager
- Marketing and Communication Manager
- Business Manager
- Business Development Manager
- Mechanical Engineering Supervisor
- Operations Manager
- Team Leader
- Production Planner
- Safety Inspector
- Welding Supervisor

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.

- Engineering Draftsperson
- Engineering Assistant
- Construction Materials Tester
- Non-Destructive Testing (NDT) Technician
- Systems Engineer
- Compliance and Safety Officer
- Mechanical Engineering Tradesperson
- Electronics Tradesperson
- Engineering Technician
- Boat Builder
- Locksmith
- Boating Services Technician
- Composite Tradesperson
- Fixed and Mobile Plant Mechanic
- Toolmaker
- Pattern Maker (Engineering)
- Casting and Moulding Tradesperson
- Fabrication Tradesperson
- CNC Machinist
- Aircraft Life Support and Furnishing Tradesperson
- Aircraft Surface Finisher
- Aircraft Armament Technician
- Surface Preparation and Coating Operator
- Glass and Glazing Fabricator
- Recreational Vehicle Serviceperson
- Recreational Vehicle Manufacturing Technician
- Vehicle Body Builder
- Marine Sailmaker
- Dogger and Rigger
- Maintenance Electrician
- Blacksmith
- Plant Technician

For further information, visit:

manufacturingmatters.com.au/careers/

Future Industry



FUTURE TRENDS AND INNOVATION

The future of Queensland's Transport Equipment and Machinery manufacturing industries aligns with Australia's national economic priorities, particularly in clean energy transformation and critical minerals processing. These changes support the Future Made in Australia plan's goals of creating new jobs, supporting businesses, increasing local manufacturing, and developing new skills.

KEY TRENDS INCLUDE:

Clean Energy Manufacturing: Expansion into manufacturing electric and hydrogen-powered vehicles, supported by New Energy Apprenticeships programs and solar technology integration.

Critical Minerals Equipment: Development of specialised machinery for extracting and processing minerals essential for clean energy, aligned with the Resourcing Australia's Prosperity initiative.

Advanced Manufacturing Technologies: Implementation of artificial intelligence, digital twins, and predictive maintenance systems in machinery production, supported by targeted training programs.

Sustainable Manufacturing: Adoption of solar power and energy-efficient manufacturing processes in transport and machinery production facilities.

FUTURE ROLES IN THE INDUSTRY

Leadership Roles:

- Clean Energy Production Manager: Oversees zero-emission vehicle manufacturing
- Critical Minerals Equipment Director: Leads mining machinery innovation
- Advanced Manufacturing Manager: Coordinates automated production systems

- Workforce Development Leader: Implements training and apprenticeship programs

Technical Roles:

- Clean Energy Systems Specialist: Maintains electric vehicle production lines
- Critical Minerals Processing Technician: Services specialised mining equipment
- Solar Manufacturing Specialist: Manages energy systems in production facilities
- Digital Systems Engineer: Programs automated manufacturing systems
- Apprenticeship Mentor: Supports new workers in technical roles

FUTURE SKILLS FOCUS

Emerging skills requirements across all levels include:

- Digital literacy and data analysis
- Automated systems operation
- Sustainable manufacturing practices
- Advanced material handling
- Cross-disciplinary communication

These emerging roles emphasise the integration of clean energy technologies and advanced manufacturing processes. The industry offers diverse opportunities through apprenticeship pathways and specialist training programs, with particular focus on increasing participation of women in manufacturing roles through initiatives like Building Women's Careers.

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

nrmrrd.qld.gov.au/manufacturing

BUSINESS QUEENSLAND

business.qld.gov.au/industries

REGIONAL DEVELOPMENT AUSTRALIA

rdabrisbane.org.au

QUEENSLAND TRUCKING ASSOCIATION LTD

qta.com.au

TRUCK MANUFACTURING IN SOUTH EAST QUEENSLAND

tiq.qld.gov.au

TRACTOR AND MACHINERY ASSOCIATION OF AUSTRALIA

tma.asn.au

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
M7	M8	M9	M3 Food and Beverage
M10	M11	M12	M4 Furniture and Other Products
M13	M14		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