

CHEMICALS, PLASTICS, & HYDROCARBONS

Chemicals, plastics and hydrocarbons provide us with products that play a vital role in our everyday lives: plastics, paints and inks, soaps, detergents and cosmetics for a start. Then there are glues and resins, plastic car components, hoses, fibre optic cable, industrial gases, aviation fuel, fertilisers and pesticides, synthetic rubber, explosives and even surfboards...

Would you like to work in a growing area that provides innovative and safe products that are essential to modern living?

You might develop more efficient fuels, recycle plastics, or develop new life saving drugs. You could build maxi yachts or wind turbines from composite materials, make important new agricultural products or develop exciting new cosmetics. There are many opportunities for careers as Chemical Engineers, Chemists, Polymer Technicians, Plant Operators and Materials Scientists.

This area is highly research oriented and rapidly changing, and technicians and technologists skilled in advanced manufacturing operations are in demand.



David Golder

"In my working life, I started as an apprentice electrician, mainly in big manufacturing sites. I started here as the shift electrician and I learned a fair bit about the process and the plant. The opportunity arose as a team leader and I applied for the job and now I've been working as the team leader for the past two years.

It's great working in the recycling industry, because when you start work, you know that you're doing something very positive for the environment..."

Production Team Leader @ VisyPak

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CHEMICALS, PLASTICS & HYDROCARBONS

CHEMICAL PRODUCTS

We use chemicals to preserve, colour and flavour the food we eat and in producing the appliances and furnishings in our homes and offices. We use them in medicines, cosmetics, cleaning agents and the dyes and paints that create the colours around us.

Chemical manufacturing starts with simple raw materials such as crude oil or gas, common salt, sulphur or starch, and results in products such as paints, inks, soaps, detergents, resins, fertilisers, pesticides, synthetic rubber, plastic resins, explosives and additives for other products.

There are opportunities for Operators, Samplers and Testers, Laboratory Assistants, Technical Officers, Chemical Engineers and Design Engineers to build a great career in Chemicals.



The world is full of whacky things...

How about:

- synthetic wine closures (we call them plastic corks)
- packaging and display trays that look, feel and function like plastic trays except they're from renewable resources (corn starch), are compostable and dissolve in water (also you can eat them, but don't)
- photoluminescent pigments and products (they glow in the dark)

WEIRD SCIENCE

If you have an interest in science and chemistry and want a career in a globally competitive, innovative environment, then Chemical Products could be an excellent start for you.

Relevant qualifications that could lead to a job in this area are to be found in the Chemical Hydrocarbons & Oil Refining Training Package ([see the Qualifications InfoSheet](#)).

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PLASTICS



Almost everything we use in daily life, both in the home and in industry, contains plastic components and this is an exciting, growing sector to work in. Plastic bottles, telephones, TVs, radios, computers, furniture, utensils, cars, toys, even synthetics in clothing - all are heavily reliant on plastics.

Because of its unique qualities, such as versatility, durability, fire-resistance and light weight, plastic is replacing many materials used in construction and manufacture.

You could work on the manufacture of domestic and industrial products with applications as diverse as drainage, plumbing, agriculture, aquaculture, gardening, automotive, medical, and packaging to name but a few.

You could develop skills in plastic injection moulding, extrusion and blow moulding or



The SKOONA MOOVA (schooner mover)...

- is not a Scandinavian boat transporter
- is manufactured in Australia
- is a reusable, foldaway, pocket-sized, one-handed drinks carrier that carries up to 4 drinks
- is perfect at the footy and environmentally sensible (less cardboard trays thrown away)...
- was an Australia Post Small Business Awards Finalist and is now exported to the UK and US

Cheers

WHOSE SHOUT?

you could work in design, modelling, tool management or production. You could also develop or improve environmentally responsible recycling programs. There are jobs available for Plastics Technicians, Chemical Engineers, Design Engineers and Materials Scientists.

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COMPOSITES



Many sectors of manufacturing need lightweight, high strength materials, and today this can be satisfied by the use of 'composites' – the combining of non-metals (like glass fibre and carbon) using chemical processes to create materials that are much stronger than the constituent parts. The Composites sector is innovative and rapidly expanding, and its applications seems only limited by our imagination.

The marine industry is the largest user of composites, particularly fibreglass: surfboards, small powerboats, yachts, large cruisers, and even the hulls and superstructure of modern warships all use composites. Racing car bodies are carbon or fibreglass composites, as are a new generation of trains being developed. Many aircraft components are also now made from composites to decrease weight and hence cost of operation. Composite bridges are even being developed, with almost no ongoing maintenance requirements.



Sydney's McConaghy Boats used the latest in composite technology, carbon fibre over Nomax honeycomb, to build the 2005 Sydney Hobart winner 'Wild Oats XI'.

Wagners in Toowoomba, Queensland are manufacturing a fibre composite semi-trailer weighing 25% less than a conventional semi.

A new multi-million dollar high-tech aviation manufacturing facility to be built in South-East Queensland will manufacture fibre composite components for the Australian Defence Force's Tiger and Troop Lift helicopters...

LIGHT'N'STRONG

Composites can provide you a rewarding and exciting career, working to create new products and improve existing ones, and the skills you acquire can have you working across many different sectors of manufacturing.

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CABLES



Even though we are often unaware of it, cables are all around us: overhead and underground electrical power cables, computer data cables, telephone cables, transoceanic cables carrying high volumes of internet traffic between countries, and fibre optic cables for voice and data transmission.

Many cables are plastic coated. The plastic acts as an electrical insulator, protects the cable, and also makes it safe for us to handle. Cables are widely used in the construction industry and may be metal covered to protect them from the weather.

You could work in the manufacture of specialised products, such as cable with a fire resistant coating that protects essential services in a fire, or extra tough mining cable for the international market. You might begin as a plastics technician in a cable-making plant operating extruders as well as cable winding equipment.



Cables don't just supply telecommunications and electricity to your home.

One Australian company, Olex, makes 20,000 different types of cables including...

- submarine
- data and security
- fire retardant
- specialty cables for applications in mining, airfields, extra high voltage and locomotives;
- and home theatre video and audio.

WIRED

In our technology driven world, the requirement for faster data transfer, lower electrical resistance and more resilient construction means you'll never be short of a challenge in cabling.

Relevant qualifications that could lead to a job in this area are to be found in the Plastics Rubber and Cabling Training Package ([see the Qualifications InfoSheet](#)).



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RUBBER



A wide range of rubber components are designed and manufactured for many industries including mining, energy, marine, construction, rail, chemical, steel, general engineering and defence.

The biggest volume of rubber products is found in the manufacture of tyres and in tyre retreading. However, the greatest variety is found in 'mechanical goods' - everything from door seals for refrigerators, ovens and washing machines to conveyor belts, 'O' rings for taps, and acoustic bearings to help insulate buildings and rooms from undesirable sounds.

Many products today use styrene butadiene although some still use natural rubber. A range of specialised synthetic rubbers including viton, neoprene, EPDM, butyl, silicone and nitrile are used in tubes, seals, gaskets and heat sink insulators.



Evidence indicates that the peoples of Central America played a game using a rubber ball in 1,600 BC.

They also made a type of temporary rubber shoe by dipping their feet into a latex mixture.

Today, natural rubber is used less and less, but we use synthetic rubber in ...

- wetsuits and mousepads
- hoses and gaskets
- solid rocket propellant
- inflatable boats

BOUNCE

There are great opportunities for Rubber Technicians. You can learn to operate rubber extruders, injection moulding machines, roll builders and roller grinders.

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HYDROCARBONS

The world as we know it depends enormously on hydrocarbons! The hydrocarbons sector refines and distributes oil and gas extracted from the earth or beneath the sea. Primarily this involves the refining of oil to produce lubricants, oils, kerosene, petrol, and various gasses, however the sector is also beginning to use natural gas (methane) extracted from coal seams.

Australia exports high quality lubricants and aviation fuel to the rest of the world. We also produce liquid petroleum gas, petrol, kerosene and diesel. Refined oil also serves as a petroleum feedstock in the production of dyes, industrial plastics, plastic household products, synthetic rubber, packing materials, fabrics, adhesives and paint.

The industry generates a large number of jobs, both directly and indirectly. You could for instance work in preliminary processing on an off-shore platform or maintain a



Climate change and the environment are driving many decisions today, especially in industry.

Hychill Australia has created a range of hydrocarbon refrigerants...

- made from naturally occurring gases that are high performance replacements for CFC's, HCFC's and HFC's
- that have significantly lower impact on the environment than current products;
- and that have been assessed and certified a 'Good Environmental Choice' (Environmental Choice Australia).

Cool and green

CHILL OUT

gas pipeline, operating machinery and inspecting the pipeline and pumping stations. Or, you might work in an export company, organising the best way to move product safely and efficiently...

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