



# Careers in manufacturing: engineering mechanical

## Mechanical trades

This information sheet covers the following trade areas within the engineering mechanical sector:

- Fitter and machinist
- Machinist trade specialisation
- Fitter trade specialisation
- Fitter-welder specialisation
- Toolmaker.

### Fitter and machinist

Fitters and machinists are highly skilled tradespeople who manufacture precision metal components using a range of computer numerically controlled (CNC) and manually operated machines, such as lathes and mills.

They also fit and assemble precision components, either as new products or as part of planned maintenance. They use a range of precision measuring equipment to ensure tight tolerances are maintained.

It is quite common for a job to require application of both areas of skill. However, a fitter and machinist may often specialise in either fitting or machining.

#### **Specialisations:**

- Machinist
- Fitter
- Fitter-welder

A fitting and machining trade qualification is an ideal starting point for a career path into mechanical engineering.

#### **Relevant qualifications:**

Trade fitting and machining and its relevant specialisations requires one of the following qualifications:

- Certificate III in Engineering (Mechanical Trade)
- Certificate IV in Engineering

For engineering/manufacturing employees performing production work, the relevant qualification is:

- Certificate II in Engineering

### Machinist trade specialist

Machining involves the manufacture of metal components and products using a range of equipment, such as lathes, mills, surface grinders, boring and drilling machines. Machines may be manual or CNC assisted.

Metal machinists set up and operate machines to cut, shape and form metal stock and castings to exact sizes, using detailed drawings. Machinists increasingly specialise in the use of computer-controlled machines that accurately cut or electrically erode shapes.

Machinists use a range of precision measuring equipment to machine work pieces to exact tolerances. Precision components may then need to be assembled using precision techniques, which is the 'fitting' aspect of the trade.

## Fitter trade specialisation

A fitter fits and assembles precision parts and sub-assemblies made from metal and other materials to make products, production machinery or other equipment. The work generally can be divided into three areas: accurate marking out of work to be done on work pieces, assembling and installing machined components, such as shafts, bearings and gears, and maintaining and repairing components.

Maintenance fitters are usually responsible for the planned maintenance, overhaul and repair of machinery, plant and equipment. Depending on the work, they may also be known as bench fitters, diesel fitter mechanics, fluid power fitters or plant technicians.

### **Specialisations:**

- Diesel fitter-mechanic
- Fitter-mechanic
- Maintenance fitter
- Mechanic (diesel and heavy earthmoving equipment)
- Plant mechanic

## Fitter-welder specialisation

Fitter-welders lay out, fit, fabricate and weld metal parts and sub-assemblies to fabricate a wide range of production machinery, pressure vessels, structures and other equipment. They require a range of knowledge and skills, including welding techniques, measurement, drawing interpretation and metallurgy.

## Toolmaker

Toolmakers make and repair moulds, dies, jigs, fixtures, press tools and other special tooling that is then used to produce parts for industrial machinery and many other manufactured articles. Toolmakers work to extremely fine tolerances and must have an excellent grasp of measurement, engineering theory and tooling design.

Toolmakers may:

- use a range of processes, precision tools and machines
- work out sizes and allowances for error based on their knowledge of how materials, such as metals, metal alloys and plastics, will behave when they are being cut (frequently, their work must be accurate to less than 0.01 mm)
- position, measure and mark out metal stock or castings, checking dimensions and alignments with gauges, micrometers and other measuring devices
- machine complex internal shapes using advanced machine tools, such as electrical discharge machines which use a spark erosion process
- design tooling and precision equipment.

### **Specialisations:**

- Die caster
- Die sinker
- Jigmaker (metal)
- Plastic mould maker
- Press-tool maker

### **Relevant qualifications:**

- Certificate II in Engineering
- Certificate III in Engineering (Mechanical Trade)
- Certificate IV in Engineering.

*This information sheet has been produced with assistance from the Australian Government.*

