

# METALLURGIST

ALSO KNOWN AS:

MATERIALS ENGINEER

METALS SPECIALIST

METALLURGICAL ENGINEER

MATERIALS SCIENTIST

## SHAPE THE FOUNDATIONS OF OUR TECHNOLOGICAL WORLD.

Be at the forefront of materials science. These experts in metal properties and behaviour drive innovation in engineering and manufacturing, pushing the boundaries of what's possible with metallic materials.

### KEY SKILLS

Skills which may benefit anyone considering a job as a metallurgist include:

- ✔ Analytical skills
- ✔ Materials Science
- ✔ Problem solving
- ✔ Process optimisation
- ✔ Technical writing

### CAREER PROGRESSION

In this role, you may have the opportunity to progress to other positions. Career progression opportunities include:

- Chemical Engineer
- Supply Chain Manager
- Chief Operating Officer
- Chief Engineering Officer

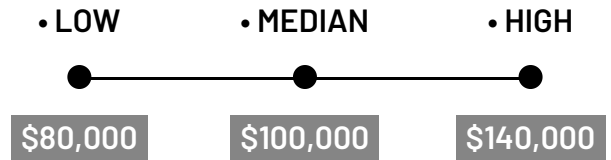
### VALUES & ATTRIBUTES

Values and attributes of anyone considering a job as a metallurgist include:

- ✔ Precision
- ✔ Innovative
- ✔ Curious
- ✔ Persistence
- ✔ Attention to detail
- ✔ Investigative – “Thinker”

### SALARY EXPECTATION

The expected salary for an Metallurgist can vary across different areas of manufacturing and may vary as you become more experienced.



### RELATED INDUSTRIES

▶ Chemicals, Hydrocarbons and Refining ▶ General Manufacturing and Engineering ▶ Polymers, Plastic and Rubber

### RECOMMENDED SCHOOL SUBJECTS

- Biology
- Engineering Skills
- Mathematical Methods
- Physics
- Specialist Mathematics

### CORE SCHOOL SUBJECTS

- General Mathematics
- Essential English
- Engineering
- Chemistry

## JOB OVERVIEW

Metallurgists are key figures in materials science, playing a crucial role in industries ranging from aerospace and automotive to electronics and infrastructure. Their expertise lies in understanding, developing, and manipulating metals and alloys to create materials with specific properties tailored for various applications.

The daily work of a metallurgist combines scientific research with practical problem-solving. They conduct experiments in advanced laboratories, oversee critical processes in manufacturing plants, and analyse complex data sets. Their toolkit includes powerful electron microscopes, spectrometers, sophisticated computer modelling software, and industrial-scale furnaces.

The role of a metallurgist requires a unique combination of scientific knowledge, technical skills, and innovative thinking. They must possess a deep understanding of the atomic structure of metals, their physical and chemical properties, and the various methods to alter and enhance these properties through processes such as heat treatment, alloying, or mechanical working. This expertise enables metallurgists to develop new materials that meet the evolving demands of modern technology and industry.

## WHAT WILL YOU DO?

Your role may include duties as follows:

1. Develop new metal alloys with specific properties for particular applications
2. Analyse metal failures and propose solutions to prevent future issues
3. Optimise manufacturing processes to improve product quality and efficiency
4. Conduct research to advance metallurgical knowledge and techniques
5. Ensure compliance with safety and environmental regulations in metal production

## HOW TO BECOME A METALLURGIST

Becoming a metallurgist typically requires a bachelor's degree in metallurgy, materials science, or a related field. Some positions, especially in research or advanced development, may require a master's or doctoral degree. Here are the steps to become a metallurgist:

1. Undertake a bachelor's degree in metallurgy, materials science, or a related engineering field
2. Gain practical experience through internships or co-op programs during your studies
3. Consider pursuing a master's or Ph.D. for advanced positions or research roles
4. Research employers looking for qualified metallurgists. Even if employers aren't advertising for an open position, consider sending your resume and letter expressing your interest.
5. Stay updated with the latest developments in the field through continuous learning and professional development

## VOCATIONAL EDUCATION & TRAINING

While most metallurgist positions require a university degree, there are vocational education and training options that can provide a foundation for entering the field or supporting roles within metallurgy. These courses can also be valuable for those looking to enhance their skills or move into specialised areas.

Relevant qualifications include:

- Certificate IV in Engineering (MEM40119)
- Diploma of Engineering – Advanced Trade (MEM50119)
- Diploma of Engineering – Materials (MEM50522)
- Advanced Diploma of Engineering (MEM60122)

## UNIVERSITY & HIGHER EDUCATION

A university degree is typically required to become a metallurgist. Most employers prefer candidates with a bachelor's degree in engineering in a related field like metallurgy or materials science. These programs provide a strong foundation in chemistry, physics, and mathematics, along with specialised courses in metal properties, processing techniques, and materials characterisation.

For those seeking to advance their careers or specialise in research and development, postgraduate degrees such as a Master of Engineering (Materials) or a Ph.D. in Metallurgy can be highly beneficial. These advanced programs often involve in-depth research projects and can lead to leadership roles in industry or academia.