

Materials Engineers

SOC: 17-2131 • Career Profile Report

■ Key Facts

\$108,310 Median Salary	23,000 Employment	+6.0% Growth Rate
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■ Requirements & Salary Range

Education: Bachelor's degree

■ Automation Risk Assessment

Low Risk - 17.0% probability of being automated in the next 10-20 years.
This job is relatively safe from automation due to its creative, social, or complex problem-solving requirements.

■ Work-Life Balance

8.1/10 - Excellent work-life balance

■ Personality Fit (RIASEC)

Higher scores indicate better personality fit for this career type.

Realistic	8.2/10	Investigative	8.8/10
Artistic	6.4/10	Social	5.2/10
Enterprising	5.8/10	Conventional	6.6/10

■ Top Skills Required

Analytical skills, Computer skills, Math skills, Problem-solving skills, Communication skills

✓ Strengths

- High Demand
- Flexible Work
- Continuous Learning

■ Challenges

- Burnout Risk
- Rapid Technological Change

■ What They Do

Materials Engineers research, develop, and test **materials used to create products and structures**. They analyze metals, plastics, ceramics, and composites to ensure strength, durability, and suitability for specific applications. Their work is critical in manufacturing, aerospace, automotive, electronics, and construction industries.

This career is well suited for individuals who enjoy problem-solving, chemistry, physics, and designing materials for practical applications.

What Do Materials Engineers Do?

Materials engineers study and develop materials for use in products and structures.

Common responsibilities include:

- Analyzing material properties and performance under different conditions
- Developing new materials and improving existing ones
- Testing materials for strength, durability, and suitability
- Collaborating with designers, engineers, and manufacturers
- Ensuring compliance with safety and quality standards
- Documenting findings and preparing technical reports
- Troubleshooting material failures or defects

Key Areas of Materials Engineering

Materials engineers may specialize in specific fields:

- Metallurgy: Working with metals for construction and manufacturing
- Polymers and Plastics: Designing plastics and synthetic materials
- Ceramics and Composites: Creating advanced materials for high-performance applications
- Nanomaterials: Developing materials at the molecular or atomic scale
- Quality and Safety: Testing and ensuring materials meet standards

Skills and Abilities Needed

Materials engineers combine technical expertise with analytical skills.

Core Professional Skills

Personal Qualities That Matter

Education and Career Pathway

This role typically requires formal education and training:

- Bachelor's Degree (common): Materials science, engineering, chemistry, or related fields
- Internships or Co-ops: Hands-on experience in labs or manufacturing
- Certifications (optional): Specialty materials or engineering credentials
- Continuous Learning: Staying current with new materials, technology, and research

Where Do Materials Engineers Work?

They are employed across industries that design, manufacture, or research materials:

- Aerospace and Automotive Companies
- Electronics and Technology Firms
- Manufacturing and Industrial Plants
- Research Laboratories and Universities
- Construction and Infrastructure Companies

Work environments may include offices, laboratories, factories, or testing facilities.

Is This Career Difficult?

This career requires strong technical knowledge, analytical thinking, and attention to detail. Engineers must solve complex material challenges and ensure quality, safety, and innovation.

Who Should Consider This Career?

This career may be a strong fit if you:

- Enjoy chemistry, physics, and materials science
- Are analytical and detail-oriented
- Like solving technical problems
- Have interest in manufacturing, aerospace, or technology
- Want a career that combines research and practical application

How to Prepare Early

- Take math, chemistry, physics, and engineering courses in high school
- Explore materials science or engineering programs in college
- Participate in internships or lab experiences
- Learn laboratory and data analysis techniques
- Stay informed on emerging materials and technology

Materials engineers develop and test the materials that form the foundation of modern products and infrastructure, ensuring safety, performance, and innovation.