

CS83 Materials Technologies Specialist

Disclaimer

These Occupational Frameworks and Skill Profiles have been developed as workforce planning, occupational mapping and skills reference resources for the Australian textile, clothing and footwear (TCF) industry. They are intended to describe the typical functions, responsibilities, skills and capabilities associated with occupations across the industry.

These documents are not intended to replace or override industrial instruments or employment arrangements, including awards, enterprise agreements, employment contracts, position descriptions, classification structures, licensing or regulatory requirements, or other statutory obligations. Where differences arise, the relevant industrial, legislative or regulatory requirements take precedence. The Skill Profiles should be used as complementary reference documents to support workforce planning, career development, training and skills recognition.

1. Job role

TCF sub-sector	Cross sector
Job role	CS83 Materials Technologies Specialist
Job role description	Develops, analyses, tests and applies textile materials and material technologies across the Textile, Clothing and Footwear (TCF) industry, ensuring that fibres, yarns, fabrics and composite systems meet performance, manufacturing, sustainability and end-use requirements. In the Australian TCF industry, this role operates across a wide range of applications including apparel, footwear, furnishings, automotive textiles, protective clothing, industrial fabrics and advanced technical textiles. The Materials Technologies Specialist works at the intersection of textile science, chemistry, engineering and product development to ensure materials are fit for purpose and aligned with market, regulatory and environmental expectations. The role involves selecting and engineering fibres and materials, evaluating performance characteristics, supporting product development and ensuring compatibility with manufacturing processes such as spinning, weaving, knitting, finishing and assembly. It also includes assessing durability, comfort, aesthetics, safety and sustainability across different applications. The position collaborates with product developers, designers, production teams, quality specialists and suppliers to ensure materials perform consistently from concept through to production and end use.
Performance expectations	• Selecting and developing materials that meet product and market requirements. • Ensuring material performance across durability, comfort, functionality and aesthetics. • Supporting efficient and scalable manufacturing processes. • Conducting testing and validation of material performance. • Maintaining traceability and technical documentation.

	• Minimising material defects, inconsistencies and waste. • Supporting innovation in materials and product development. • Integrating sustainability principles into material selection and use. • Ensuring compliance with relevant standards and regulations.
Specialisation	Fibre and yarn development, fabric engineering, coatings and finishes, composite textiles, performance materials, sustainable materials, smart textiles.
Application in other TCF sectors	• Apparel and fashion manufacturing. • Footwear design and production. • Interior and furnishing textiles. • Automotive and transport textiles. • Defence and protective equipment. • Industrial and technical textiles. • Medical and healthcare textiles. • Outdoor and performance products.

2. Key tasks and critical work functions

Key tasks	• Selecting fibres, yarns and textile materials for specific applications. • Developing new materials or modifying existing materials for improved performance. • Evaluating material properties such as strength, flexibility, durability, comfort and appearance. • Conducting laboratory and production-based testing of materials. • Supporting product development and prototyping activities. • Assessing compatibility of materials with manufacturing processes. • Investigating material failures and performance issues. • Maintaining material specifications and technical documentation. • Collaborating with designers, engineers, suppliers and production teams.
Critical work functions	• Ensuring materials meet performance requirements for end use. • Maintaining consistency and reliability of materials in production. • Preventing material-related defects and product failures. • Supporting efficient and scalable manufacturing processes. • Maintaining traceability and documentation of material specifications. • Enabling innovation and continuous improvement in materials. • Supporting compliance with industry standards and regulations. • Aligning material performance with customer, market and environmental expectations.

3. Technical skills

Materials science knowledge	Understanding fibres (natural, synthetic), polymers, yarn structures and textile constructions.
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Material testing and evaluation	Conducting physical, mechanical, chemical and performance testing.
Fabric construction knowledge	Understanding weaving, knitting, nonwoven and composite structures.
Finishing and treatment technologies	Applying coatings, dyes, finishes and functional treatments.
Process compatibility	Assessing materials for spinning, weaving, knitting, dyeing, finishing and assembly.
Failure analysis	Investigating defects, wear, degradation and performance issues.
Data analysis and interpretation	Interpreting test results and production data.
Documentation and traceability	Maintaining technical specifications, test records and material histories.
Standards and compliance	Applying relevant industry standards (ISO, AS/NZS, performance specifications).

4. Generic Skills

Attention to detail	Ensuring accuracy in testing, specifications and analysis.
Analytical thinking	Interpreting complex material performance data.
Communication	Working with designers, engineers, suppliers and production teams.
Problem solving	Identifying and resolving material-related issues.
Teamwork	Supporting cross-functional product development and production.
Time management	Managing testing, development and production timelines.
Adaptability	Responding to evolving materials, technologies and market needs.
Professionalism	Maintaining technical accuracy, compliance and documentation standards.

5. Emerging skills

Emerging skills	• Sustainable and circular textile materials (recycled, bio-based fibres). • Smart textiles and wearable technology integration. • Advanced coatings and functional finishes. • Digital material modelling and simulation tools. • Automation and Industry 4.0 integration. • Nanotechnology and advanced fibre engineering. • Lifecycle analysis and environmental impact assessment.
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6. VET Qualifications and Skill Sets

Entry-level preparation	MSL40122 Certificate IV in Laboratory Techniques or equivalent qualification.
Advanced development	MSL50122 Diploma of Laboratory Technology or equivalent qualification or bachelor's degree in chemistry, chemical engineering or materials science.

7. Job progression

Possible job progression	Materials Technician → Materials Technologies Specialist → Senior Specialist → Product Development Technologist → R&D Scientist / Engineer → Technical or Innovation Manager.
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8. Classification

Australian Qualifications Framework	Level 5-7.
Australian Bureau of Statistics (ABS) Skill Levels	Skill Level 1.
Open Source Classification of Occupations for Australia (OSCA)	243133 - Materials Engineer.



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