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**WOOD MANUFACTURING**  
**Develop rationale for the use of**  
**substitutes in place of solid wood**  
**products**

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<b>level:</b>	<b>6</b>
<b>credit:</b>	<b>10</b>
<b>planned review date:</b>	September 2005
<b>sub-field:</b>	Wood Processing Technology
<b>purpose:</b>	People credited with this unit standard are able to: describe characteristics of wood products, substitute materials and their impact on product performance; develop a rationale for the emergence of wood based substitutes for solid wood products; develop a rationale for the use of non-wood substitutes in place of solid wood products; and develop a rationale for the emergence of new wood based products incorporating optimal use of material properties.
<b>entry information:</b>	Open.
<b>accreditation option:</b>	Evaluation of documentation and visit by NZQA and industry.
<b>moderation option:</b>	A centrally established and directed national moderation system has been set up by Forest Industries Training.
<b>special notes:</b>	<ol style="list-style-type: none"><li>1 Definitions <i>Wood characteristics</i> refers to a combination of properties that distinguish wood from other materials, for example wood/water relationship. <i>Wood properties</i> refers to the essential qualities of wood for example density, stiffness, durability, strength. <i>Wood</i> refers to wood species use in New Zealand wood process operations. <i>Solid wood</i> includes finger jointing, laminated veneer lumber, plywood, and other laminated products. <i>Wood composite products</i> refers to wood fibre mixed with any other materials, such as plastic, concrete or steel, to improve product performance.</li><li>2 The reference text for this unit standard is <i>Introduction to Wood and Materials Science</i> (Forest Industries Training: Rotorua, 2003). All performance criteria must be demonstrated and assessed in accordance with the reference text.</li></ol>

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## **Elements and Performance Criteria**

### **element 1**

Describe characteristics of wood products, substitute materials and their impact on product performance.

### **performance criteria**

- 1.1 Description identifies physical properties of wood and substitute materials at the macroscopic level.
- Range: physical properties may include - stiffness, strength, stability, density.
- 1.2 Description identifies mechanical properties of wood and substitute materials at the macroscopic level.
- 1.3 Description identifies chemical composition of wood and substitute materials in accordance with the reference text.
- 1.4 Description includes an explanation of the impact of environmental factors on wood and substitute materials in accordance with the reference text.
- 1.5 Description includes an explanation and factors effecting wood anatomy.
- Range: wood anatomy includes - soft woods and hardwoods, vertical cells (tracheids, vessels, fibres, parenchyma), rays, resin canals, ultrastructure (wall layers, microfibrils, pits); factors include - forest management regime, geography, tree age, environmental conditions.
- 1.6 Description includes explanation of the types of biological attack and their impacts on wood and substitute materials.
- 1.7 Description includes a summary of the impact of materials properties on product performance.

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**element 2**

Develop a rationale for the emergence of wood based substitutes for solid wood products.

Range: substitute wood products include but are not limited to - medium density fibre board, hardboard, particle board, oriented strand board (OSB), triboard, overlays, Scrimber.

**performance criteria**

- 2.1 Rationale includes the advantages and disadvantages of re-constituted wood as a material.
- 2.2 Rationale includes the need for improved performance from end products in terms of variability, predictability, cost effectiveness, ease of use, durability, solid wood limitations, life cycle, environmental impacts and legislative requirements.

**element 3**

Develop a rationale for the use of non-wood substitutes in place of solid wood products.

Range: non-wood substitute products include but are not limited to - plastic, concrete, metals.

**performance criteria**

- 3.1 Rationale includes the advantages and disadvantages of non-wood substitute products compared with solid wood as a material.
- 3.2 Rationale includes the need for improved performance from end products in terms of variability, predictability, cost effectiveness, ease of use, durability, solid wood limitations, environmental impacts and legislative requirements.

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**element 4**

Develop a rationale for the emergence of new wood based products incorporating optimal use of material properties.

**performance criteria**

- 4.1 Rationale includes a description of enhanced wood and wood composite materials in accordance with the reference text.
- 4.2 Rationale includes alternative uses for wood based products.
- 4.3 Rationale includes research into emerging trends in new wood based products.

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**Comments on this unit standard**

Please contact Competenz at [info@competenz.org.nz](mailto:info@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.

**Please Note**

Providers must be accredited by the Qualifications Authority or a delegated inter-institutional body before they can register credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for providers wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

This unit standard is covered by AMAP 0173 which can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.