Title	**Demonstrate knowledge of the principles of wood preservation and antisapstain treatment**		
Level	**3**	**Credits**	**10**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: the biological degradation of wood and the reasons for wood preservation and antisapstain treatment; the permeability of wood in relation to wood preservation and antisapstain treatment; wood preservatives and antisapstain treatments; wood preservation and antisapstain treatment processes in New Zealand; and the handling and storage of chemicals and treated wood. They are also able to identify product requirements for wood preservation and antisapstain treatment in New Zealand.

Classification	Solid Wood Manufacturing > Timber Drying and Treatment

Available grade	Achieved

Guidance Information

1 Reference
Competence in this unit standard requires knowledge of the following:
NZS 3640:2003 *Chemical Preservation of Round and Sawn Timber*.

2 Definitions
Accepted industry practice – approved codes of practice and standardised procedures accepted by the wider wood manufacturing industry as examples of best practice.
Biological degradation refers to products affected by insects, mould, sapstain, decay fungi, internal brown stain.
Efficacy is defined as being capable of or successful in producing an intended result.
Workplace procedures refer to documented policies and procedures set by the organisation carrying out the work, and to documented or other directions provided to staff, and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, site specific procedures, site safety procedures, equipment operating procedures, quality assurance procedures, product quality specifications, references, approved codes of practice, housekeeping standards, environmental considerations, on-site briefings, supervisor's instructions, and procedures to comply with legislative and local body requirements relevant to the industry sector.

3 Assessment information
All activities and evidence must meet workplace procedures and accepted industry practice.

4 Recommended unit standards for entry: Unit 736, *Demonstrate knowledge of physical characteristics of wood*; Unit 159, *Demonstrate knowledge of environmental issues in wood manufacturing industries*; and Unit 16244, *Demonstrate knowledge of wood preservation*.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the biological degradation of wood and the reasons for wood preservation and antisapstain treatment.

Performance criteria

1.1 Reasons for wood preservation are described.

1.2 Reasons for antisapstain treatment are described.

1.3 Main organisms responsible for the biological degradation of wood in New Zealand are identified and their influence on wood integrity and treatment efficacy is described.

Range organisms include but are not limited to –
fungi – moulds, sapstain, decay fungi, soft rot;
insects – huhu, anobium, two tooth longhorn, termites;
marine borers – teredo, gribble.

1.4 Natural durability of untreated timbers is explained in relation to graveyard, service tests, and decay resistance.

Range species comparisons using a table of natural durability.

Outcome 2

Demonstrate knowledge of the permeability of wood in relation to wood preservation and antisapstain treatment.

Performance criteria

2.1 Factors affecting wood antisapstain treatability and permeability are identified and their influence on effective treatment is described.

Range factors may include but are not limited to – species (wood structure), moisture content, surface moisture, density, softwood and hardwood, sapwood and heartwood, resin content, compression wood, size, machining;
evidence of five factors is required.

2.2 Treatable species are identified against approved treatment processes, preservative types, and hazard class requirements.

Range species may include but are not limited to – radiata pine, douglas fir.

Outcome 3

Demonstrate knowledge of wood preservatives and antisapstain treatments.

Performance criteria

3.1 Characteristics of a good wood preservative are described.

3.2 Methods by which preservatives are introduced into the wood are identified against preservative types.

3.3 Properties, uses, and limitations of preservatives used in New Zealand are identified.

Range preservatives include but are not limited to – copper chrome arsenic (CCA), boron compounds, light organic solvent preservatives (LOSP), copper azole, copper quarternary (CQ).

3.4 Fixability of wood preservatives is differentiated.

Range boron, copper chrome arsenic (CCA), light organic solvent preservative (LOSP), copper azole, copper quarternary (CQ).

3.5 The effect of heat on the fixation of CCA in wood is explained.

3.6 Examples of fungi, insects or organisms that attack wood are matched with the chemicals that control them.

Range fungi – mould, sapstain, peniophora, decay fungi, soft rot;
insects – anobium, huhu, two tooth longhorn, termites; marine borers – teredo, gribble;
chemicals – copper, mouldicide, fungicide, insecticide, antisapstain.

Outcome 4

Demonstrate knowledge of wood preservation and antisapstain treatment processes in New Zealand.

Performance criteria

4.1 Main approved treatment processes used in New Zealand for applying wood preservatives are described.

Range processes may include but are not limited to – pressure treatment, dip diffusion, vacuum.

4.2 Main methods of applying antisapstain treatments used in New Zealand are identified and described.

4.3 Requirements for wood condition prior to treatment are matched with treatment processes.

Range conditions – raw or final form, sapstain, biological degrade, moisture content, steam conditioning;
treatment – pressure, diffusion, vacuum, dip, spray.

4.4 Reasons for cutting, boring and/or machining prior to treatment are explained.

Outcome 5

Identify product requirements for wood preservation and antisapstain treatment in New Zealand.

Performance criteria

5.1 The product standard and code of practice which cover preservation in New Zealand are identified in terms of their titles and scopes.

5.2 End use situation and examples of end use are identified for hazard classes.

Range H1.1, H1.2, H3.1, H3.2, H4, H5, H6;
two examples of end uses are required for each hazard class.

5.3 Preservatives and processes able to be used for each hazard class are identified.

Range preservatives include but are not limited to – copper chrome arsenic (CCA), boron compounds, light organic solvent preservatives (LOSP), ammoniacal copper quarternary (ACQ), Tanalith E;
processes – diffusion, pressure, vacuum.

5.4 Treated wood products are identified by preservative colour in accordance with NZS 3640:2003.

Range preservatives include but are not limited to – copper chrome arsenic (CCA), boron compounds, ammoniacal copper quarternary (ACQ), light organic solvent preservatives (LOSP), Tanalith E.

5.5 Components of the timber brand mark are identified in terms of plant number, hazard class, preservative code number and wood mark in accordance with NZS 3640:2003.

5.6 Branding methods are identified in terms of type, placement and product requirement in accordance with NZS 3640:2003.

Range methods may include but are not limited to – burn, continuous ink strip branding, impression branding, tagging packet, disc.

Outcome 6

Demonstrate knowledge of the handling and storage of chemicals and treated wood.

Performance criteria

6.1 Requirements for the safe storage of chemicals are described.

6.2 Requirements for safe handling and disposal of treated timber and residues are identified.

Range personal safety, environmental protection.

6.3 Storage requirements for the maintenance of product quality are matched with treatment chemicals.

Range storage requirements – off ground, stacked, out of rain, drip free; treatments – copper chrome arsenic (CCA), boron compounds, light organic solvent preservatives (LOSP), ammoniacal copper quarternary (ACQ), Tanalith E.

6.4 Required condition of treated timber prior to removal from the drip pad is described.

6.5 First aid data relating to wood preservatives are interpreted from Safety Data Sheets (SDS).

Range swallowing, inhaling, splashing into eye or onto skin.

6.6 Chemical names of preservation chemicals are interpreted from SDS.

6.7 Storage and chemicals handling requirements are identified from SDS.

Planned review date	31 December 2024

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 October 1996	31 December 2012
Revision	2	21 April 1998	31 December 2012
Review	3	10 February 1999	31 December 2012
Review	4	18 December 2006	31 December 2012
Rollover and Revision	5	15 April 2011	31 December 2014
Review	6	18 April 2013	N/A
Review	7	28 May 2020	N/A

Consent and Moderation Requirements (CMR) reference	0013

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.