Title	**Treat wood with antisapstain chemicals**		
Level	**3**	**Credits**	**10**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of the principles of antisapstain treatment; demonstrate and apply knowledge of antisapstain formulations; demonstrate knowledge of the operation of antisapstain treatment plants; identify, explain and apply safety and security requirements for antisapstain plants; assess the suitability of wood for antisapstain treatment and prepare and check treatment solutions; operate the antisapstain plant, monitor process performance and complete documentation; and apply the maintenance requirements for an antisapstain plant.

Classification	Solid Wood Manufacturing > Timber Drying and Treatment

Available grade	Achieved

Guidance Information

1 Legislation and reference
Hazardous Substances and New Organisms Act 1996.
Health and Safety at Work Act 2015.
Resource Management Act 1991.
Best Practice Guideline for the Safe Use of Timber Preservatives & Anti-sapstain Chemicals (Wellington: 2005). This is referred to below as the 'Guideline', and is available from the New Zealand Timber Preservation Council, Wellington or online at http://www.nztpc.co.nz.

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.
Corrective action may include communication to management, communication to on-site technical person, communication to off-site technical support person, cleaning, communication with maintenance staff, recalibration, or changes made to the operating system.
Efficacy is defined as being capable of or successful in producing an intended result.
Preventative maintenance refers to the care and servicing of equipment and machinery. This may include periodic checks and inspections, testing, measurements, adjustments, or parts replacement as required in accordance with worksite policies and procedures for the purpose of preventing faults or failures and to maintain production requirements.

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 Range
Wood – roundwood, sawn wood, machined wood.

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

5 Recommended unit standards for entry: Unit 156, *Demonstrate knowledge of phytosanitary standards in the wood manufacturing industry*; Unit 159, *Demonstrate knowledge of environmental issues in wood manufacturing industries*; Unit 736, *Demonstrate knowledge of physical characteristics of wood*; Unit 8339, *Demonstrate knowledge of the principles of wood preservation and antisapstain treatment*; and Unit 16240, *Interpret NZS: 3640 requirements and workplace compliance relating to wood preservation operations*.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the principles of antisapstain treatment.

Performance criteria

1.1 Purpose of the antisapstain treatment is described in terms of length of protection against mould, sapstain and decay attack.

1.2 Mould and fungi are identified in terms of their visual appearance and their degrading effects on wood are described.

Range surface mould, sapstain fungi, decay fungi, incipient decay.

1.3 The susceptibility of wood to biological attack is explained and wood products requiring antisapstain treatment are identified.

1.4 Products which require antisapstain protection are identified.

Range further processing, export or domestic market options.

1.5 Antisapstain application methods used in New Zealand are identified and their operating principles, advantages, and limitations are explained.

Range packet dip systems, green chain bath dipping systems, spray systems, pressure.

1.6 Causes of antisapstain treatment failure are identified and means of avoiding failure are explained.

Range may include but is not limited to – plant operation, solution maintenance, chemical incompatibility, treatment delays, wood condition and antisapstain coverage, weather and seasonal influences and adjustments, protection expectations, infection sources, packet build and strapping, machine gauging of antisapstain treated products.

1.7 The efficacy of antisapstain treatments in preventing further biological degradation on infected wood products is explained.

1.8 Storage and handling requirements before and after treatment are identified and explained.

Outcome 2

Demonstrate and apply knowledge of antisapstain formulations.

Performance criteria

2.1 Requirements of an antisapstain formulation are described.

Range includes but is not limited to – human toxicity, environmental impact, spectrum of effectiveness, corrosiveness, solubility, stability, colouration, cost, longevity, ease of solution testing and quality control.

2.2 Antisapstain formulations and other chemical additives used on site are identified and their properties and uses explained in accordance with the Safety Data Sheets (SDS) and the guideline.

Range may include but is not limited to –
chemicals – mouldicides, antisapstain, insecticides, dye additives;
properties – active ingredient(s), concentration requirement relative to product type, solubility, skin irritancy, toxicity, compatibility with other chemicals, environmental factors;
application – behaviour in solution, application requirements, stability, corrosiveness, suspension, stripping, sedimentation, temperature.

2.3 Compatibility of chemical combinations contained in antisapstain solutions and their influence on preservative efficacy are explained.

Range may include but is not limited to –
solution factors – solubility, suspension, compatibility, viability, mixing sequences;
chemicals – mouldicides and/or antisapstains, insecticides, dye additives.

2.4 The effects of contaminants on the efficacy of antisapstain solutions are described.

Range contaminants include but are not limited to – wood extractives, hydraulic fluid, sawdust.

Outcome 3

Demonstrate knowledge of the operation of antisapstain treatment plants.

Performance criteria

3.1 The role, scope, and responsibilities of the operator are described.

3.2 Operating parameters, capability and capacity of the on-site treatment plant are explained.

Range may include but is not limited to – plant design and layout, plant or equipment portability, chemical solution storage capacity, dip tank or treatment cylinder capacity, packet build and length, throughput capacity.

3.3 Operating components of the antisapstain plant and their function and sequence of operation are explained.

Range may include but is not limited to – control panels and mechanisms, automatic and manual control systems, preservative mixing, storage, treatment tank or cylinder, transfer and/or pressure pump(s), agitation mechanisms, valves, gauges, pipe work linkages, filters, hydraulic systems, volume measuring devices, air compressor, spray nozzles, product handling systems and controls, solution containment safeguards, warning devices.

3.4 Plant test equipment is identified, serviceability confirmed, and is used.

Range may include but is not limited to – solution concentration determination references and equipment, test solutions, pH level parameters, titration equipment, refractometer, automatic solution concentration testing equipment, chemical coverage indicators.

Outcome 4

Identify, explain, and apply safety and security requirements for antisapstain plants.

Performance criteria

4.1 Hazardous areas at the treatment site are identified, risks are explained, and safety and security measures required for them are identified and applied.

Range may include but is not limited to – warning signs and symbols, authorised access areas and requirements, chemical storage areas, chemical handling and mixing areas, confined spaces, product handling systems, mobile machinery, wet areas, fumes, vapour suspension, spray booths, dip tanks.

4.2 Risk factors associated with antisapstain formulations and insecticidal or dye additives used at the plant are identified, and the safeguards required for them are identified and applied.

4.3 Safe operating and housekeeping requirements are explained.

Range may include but is not limited to – safe operating practices, codes of conduct and personal hygiene, appropriate protective clothing and equipment, chemical and product handling, eye wash, emergency showers, first aid facilities, emergency procedures.

Outcome 5

Assess the suitability of wood for antisapstain treatment and prepare and check treatment solutions.

Performance criteria

5.1 Pre-treatment suitability of the product is assessed, and non-conforming product is isolated.

Range may include but is not limited to – moisture content, moisture gradient, product type, age and surface condition, bark, biological degradation, product identification, packet build and length, strapping tightness.

5.2 Factors affecting the accuracy of solution concentration measurements are identified and corrective action taken.

Range may include but is not limited to – operator technique, solution contaminants, equipment cleanliness and calibration, incorrect references, chemical reagent viability.

5.3 Representative solution samples are taken from thoroughly mixed solutions and solution concentration is checked.

5.4 Required solution concentration is calculated from test results and adjusted for seasonal and product type requirements.

5.5 Working tank level is adjusted with required amounts of solution concentrate(s) and water to meet production run requirements.

Range mouldicides, antisapstain, insecticidal, dye additives.

5.6 Working tank solution is thoroughly mixed and operating solution concentration is tested and confirmed.

Outcome 6

Operate the antisapstain plant, monitor process performance, and complete documentation.

Performance criteria

6.1 Operational factors influencing successful treatment performance are explained and applied.

Range may include but is not limited to – solution concentration maintenance, working tank level maintenance, product coverage with solution, solution agitation, seasonal and weather factor adjustments and safeguards, handling factors, surface pickup.

6.2 Process is operated and controlled, and plant control equipment is used.

6.3 Solution samples are tested at process stages.

6.4 Equipment faults and malfunctions in the process cycle are identified and corrective action is taken.

Range may include but is not limited to – electrical, hydraulic, mechanical, spillage, temporary suspension of treatment and plant shutdown.

6.5 Reconciliations are completed.

6.6 Antisapstain performance and effectiveness is continuously monitored and referenced back to treatment records, and corrective action is taken.

Range monitoring may include but is not limited to – slow seasoning or slow moving green block stacked products, product type, product identification, solution analysis results, waste minimisation.

Outcome 7

Apply the maintenance requirements for an antisapstain plant.

Performance criteria

7.1 Routine and preventative maintenance and cleaning requirements are explained and carried out.

Range may include but is not limited to – plant maintenance log books, plant and equipment calibration, pump seals, valves, belt or chain drives, filters, spray nozzles, plant operating equipment, sawdust, waste and sludge handling, removal and authorised disposal, anti-corrosion measures, hydraulic systems, product handling systems.

7.2 Product and material inventory levels are maintained to meet production and contingency requirements.

Range may include but is not limited to – preservative chemicals, chemical reagents, test equipment, solution containers, blank charge sheets, plant maintenance materials, protective clothing and first aid kits, strapping.

7.3 Antisapstain solutions for laboratory analysis are collected, tested, labelled, and dispatched.

7.4 Laboratory analysis results for antisapstain solutions are interpreted and matched against operator check measurements.

Range includes but is not limited to – active ingredients solution concentration, contaminants.

7.5 Laboratory analysis results are actioned.

Replacement information	This unit standard replaced unit standard 150.

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	18 December 2006	31 December 2012
Review	2	15 April 2011	N/A
Review	3	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.