

Title	Demonstrate knowledge of kraft pulp bleaching		
Level	4	Credits	10

Purpose	People credited with this unit standard are able to demonstrate knowledge of: the principles of kraft pulp bleaching; multi-stage kraft pulp bleaching; and environmental and safety issues associated with kraft pulp bleaching.
----------------	---

Classification	Wood Fibre Manufacturing > Pulp and Paper Technology
-----------------------	--

Available grade	Achieved
------------------------	----------

Guidance Information

1 Definition

Worksite documentation refers to organisation policies and procedures that are documented in memo, electronic, or manual format and available in the workplace, and are consistent with manufacturer's requirements. 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, sustainability, on-site briefings, supervisor's instructions, and procedures to comply with legislative and local body requirements relevant to the pulp and paper industry.

2 Assessment Information

Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable service information, worksite documentation and legislative requirements. This includes the knowledge and use of suitable tools and equipment.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the principles of kraft pulp bleaching.

Performance criteria

1.1 Reasons for bleaching are identified and explained.

1.2 Steps in kraft pulp bleaching are identified and explained.

Range delignification, decolourisation.

- 1.3 Stages used in multi-stage bleaching sequences are identified and their effects explained.
- Range stages of multi-stage bleaching – E, O, D, P, EOP.
- 1.4 Process variables affecting bleaching reactions are identified and explained.
- Range temperature, time, pH, concentration, dosage, consistency.
- 1.5 Paper making properties affected by lignin removal are identified in terms of bonding, flexibility, strength, hydration, bulk, and freeness.
- 1.6 Visual property changes resulting from bleaching are identified in terms of brightness, opacity, and light scattering co-efficient.

Outcome 2

Demonstrate knowledge of multi-stage kraft pulp bleaching.

Performance criteria

- 2.1 Bleach plant components are identified and their functions are explained.
- Range consistency regulation, mixers, washers, pumps, towers, seal tank, sensors.
- 2.2 Bleaching sequences are explained and the functions of each stage are described.
- Range functions – delignification, extraction, decolourisation;
sequences – DEOPDD

Outcome 3

Demonstrate knowledge of environmental and safety issues associated with kraft pulp bleaching.

Performance criteria

- 3.1 Bleach plant effluent contaminants are identified and their effects on health and the environment are explained.
- Range effects may include but are not limited to – bleaching chemical leaks, fibre loss, contaminated filtrate.
- 3.2 Chemicals used in bleaching are identified and hazards associated with their use are explained.
- Range chemicals may include but are not limited to – caustic soda, chlorine dioxide, liquid oxygen.

Planned review date	31 December 2028
----------------------------	------------------

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	30 November 2000	31 December 2024
Review	2	18 December 2006	31 December 2024
Review	3	24 October 2014	31 December 2025
Review	4	30 November 2023	N/A

Consent and Moderation Requirements (CMR) reference	0173
--	------

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

Comments on this unit standard

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.