Title	**Delignify wood pulp with oxygen**		
Level	**4**	**Credits**	**10**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of oxygen delignification; operate delignification plant; and monitor and control the performance of delignification plant.

Classification	Wood Fibre Manufacturing > Pulp Making

Available grade	Achieve

Guidance Information

1 Legislation and references
Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the:

- Hazardous Substances and New Organisms Act 1996;
- Health and Safety at Work Act 2015;
- Resource Management Act 1991;
- Health and Safety at Work (Major Hazard Facilities) Regulations 2016.

2 Definitions
Operating parameters refer to the boundary conditions in which the operations are carried out in operating delignification plant.
Operating procedures refers to the process(es) that are worked through, e.g. standard operating procedure (SOP) in operating delignification plant.
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 making industry.

3 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 oxygen delignification.

Performance criteria

1.1 Function of oxygen delignification in the pulp making process is explained.

1.2 Reactions involved in oxygen delignification are described.

Range reactions include chemical and physical.

1.3 Operating components and process controls of oxygen delignification plant are described and their purpose and operation are explained.

Range oxygen delignification components may include but are not limited to – screw conveyors, medium consistency pumps, standpipes, reactor, press washer, filtrate tanks, blow valve, blow tank, pipework.

1.4 Operating parameters and capability of the oxygen delignification process are explained.

1.5 Hazards associated with oxygen delignification plant operation are identified and actions to be taken to minimise, or eliminate the hazards are explained.

Range hazards may include but are not limited to – heat, pressure, oxygen, sulphuric acid, magnesium sulphate, height.

1.6 Consequences of non-conformance with worksite operating procedures are explained.

1.7 Roles and responsibilities of the delignification plant operator are explained.

Outcome 2

Operate delignification plant.

Performance criteria

2.1 Safe work practices associated with operating delignification plant are demonstrated.

Range practices may include but are not limited to – isolation procedures, lock-outs or tag-outs, emergency stops, machine guarding, wearing appropriate safety equipment.

2.2 Delignification plant is set up, started up, operated, and shut down.

2.3 Operating parameters are set and adjusted to enable production requirements to be achieved.

Range operating parameters – flows and strengths of chemical, temperature, pressure, consistency, time;
production requirements – product quality, production rate, residual chemical concentration.

2.4 Essential care and housekeeping requirements are carried out.

Outcome 3

Monitor and control the performance of delignification plant.

Performance criteria

3.1 Delignification is monitored and parameters are controlled in accordance with operating parameters.

Range control parameters – chemical strengths and flows, stack emissions, temperature consistency, pressure, kappa number.

3.2 Operating and equipment faults and malfunctions are identified, and relevant corrective actions are taken.

Range operating faults and malfunctions – blockages, leaks, spillage;
equipment faults and malfunctions – mechanical, electrical, hydraulic, instrumentation, distributed control systems.

3.3 Residual chemical concentrations, consistency, and pulp quality of output pulp for delignification are monitored to meet specified requirements.

3.4 Production, maintenance notifications, and quality records are explained and completed.

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	22 February 1995	31 December 2024
Revision	2	27 January 1997	31 December 2024
Review	3	25 February 1999	31 December 2024
Review	4	18 December 2006	31 December 2024
Review	5	24 October 2014	31 December 2025
Review	6	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.