Title	**Prepare purified brine in pulp or paper chemical plants**		
Level	**4**	**Credits**	**10**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of brine purification; operate equipment for brine purification; and monitor and control the performance of process and equipment for brine purification.

Classification	Wood Fibre Manufacturing > Pulp and Paper - Chemical Plants

Available grade	Achieved

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 brine purification.
Operating procedures refer to the process(es) that are worked through, e.g. standard operating procedure (SOP) in brine purification.
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.

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 brine purification.

Performance criteria

1.1 Operating principles of brine purification are explained.

Range saturation, filtration, flocculation, chemical reaction, ionic purification, aeration, sedimentation.

1.2 Operating parameters and capability of brine purification are explained.

Range temperature, pH, density, purity, clarity, concentrations, output volume.

1.3 Operating components and process controls of brine purification plant are described and their purpose is explained.

Range operating components may include but are not limited to – salt handling system, saturator, chemical makeup tanks, reactor, clarifier, settling system, saturated brine tank, filters, ion exchange columns, heat exchangers, dechlorinators, depleted brine system, distributed control system.

1.4 Hazards associated with brine purification are identified and actions to be taken to minimise, or eliminate the hazard are described.

Range hazards may include but are not limited to – corrosion, burns, compressed air, chemicals, steam.

1.5 The consequences of non-conformance with worksite operating procedures are described.

1.6 Roles and responsibilities of the brine purification plant operator are described.

Outcome 2

Operate equipment for brine purification.

Performance criteria

2.1 Safe work practices associated with operating equipment for brine purification are identified and used.

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 Equipment is set up, started up, operated, and shut down.

Range equipment may include but is not limited to – salt handling system, saturator, chemical makeup tanks, reactor, clarifier, settling system, saturated brine tank, filters, ion exchange columns, heat exchangers, dechlorinators, depleted brine system.

2.3 Chemicals are assembled.

Range soda ash, caustic soda, sodium carbonate, hydrochloric acid, flocculent, sodium sulphite, resins, alpha-cellulose.

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

Range operating parameters – temperatures, concentrations, pressures, flows, pH, purity.

2.5 Essential care and housekeeping requirements are carried out.

Outcome 3

Monitor and control the performance of process and equipment for brine purification.

Performance criteria

3.1 Performance of process and equipment for brine purification are monitored and parameters are controlled in accordance with key operating parameters.

Range control parameters – temperatures, concentrations, pressures, flows, purity.

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

Range operating faults and malfunctions may include but are not limited to – blockages, contamination, leakages;
equipment faults and malfunctions – electrical, mechanical, hydraulic, pneumatic, instrumentation, distributed control system.

3.3 Purity and density of output product is monitored to meet specified requirements.

3.4 Production rate is regulated in accordance with process requirements.

3.5 Production, maintenance, 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	25 February 1999	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.