Title	**Operate multi-cylinders to dry pulp or paper webs**		
Level	**4**	**Credits**	**10**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of web drying; operate multi-cylinder dryer section, associated hood, and sheet tensioning equipment; and monitor and control the performance of dryer section, associated hood, and sheet tensioning equipment.

Classification	Wood Fibre Manufacturing > Pulp and Paper Manufacturing Skills

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

4 Recommended skills and knowledge:
Unit 3513, *Run machine clothing in pulp or paper manufacturing*; or demonstrate equivalent knowledge and skills.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of web drying.

Performance criteria

1.1 Function of multi-cylinder dryers and associated hood system in the paper and pulp drying process is explained.

1.2 Function, control, and purpose of drive systems are explained.

Range may include but is not limited to – draws, load sharing, sheet tension, speed.

1.3 Components of a multi-cylinder dryer section are described and their purpose and operation are explained.

Range components may include but are not limited to – steam system, exhaust, heat induction system, siphons, spoiler bars, condensate system, blow boxes, associated hood system, rope system, screens, cylinders, doctor blades, distributed control system.

1.4 Dryer feed-up process is explained.

1.5 Operating parameters and capability of multi-cylinder dryers, sheet tension control, and associated hood systems are explained.

Range operating parameters may include but are not limited to – temperature, throughput, sheet tension, pressure, curl control.

1.6 Hazards associated with multi-cylinder dryers, sheet tension control, and associated hood systems are identified and actions to be taken to minimise, or eliminate the hazards are explained.

Range hazards may include but are not limited to – moving components, sheet breaks, nips, ropes, heat, steam, steam and condensate lines, pressure, compressed air, paper cuts.

1.7 Immediate emergency response procedures for the multi-cylinder dryer and associated hood systems are described.

1.8 Consequences of non-conformance of web drying with worksite operating procedures are described.

1.9 Roles and responsibilities of the multi-cylinder dryer operator are described.

Outcome 2

Operate multi-cylinder dryer section, associated hood, and sheet tensioning equipment.

Performance criteria

2.1 Safe work practices associated with operating multi-cylinder dryer section, associated hood, and sheet tensioning equipment are demonstrated.

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

2.2 Multi-cylinder dryer section, associated hood, and sheet tensioning equipment are set up, started up, operated, and shut down.

Range steam adjustment, condensate removal, sheet threading, draw and tension control adjustments.

2.3 Doctor blades are set up and operated.

2.4 Controls for draw and load sharing are operated.

2.5 Rope is installed and spliced, and the rope and tail threading equipment is operated.

2.6 Essential care and housekeeping requirements for the dryer section, sheet tensioning, and associated hood equipment are carried out.

Outcome 3

Monitor and control the performance of dryer section, associated hood, and sheet tensioning equipment.

Performance criteria

3.1 Performance of dryer section, associated hood and sheet tensioning equipment are monitored and parameters are controlled in accordance with operating parameters.

Range performance may include but is not limited to – draw control, condensate management, drying efficiency;
performance parameters may include but are not limited to – moisture specifications, sheet strength, required finish.

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

Range operating faults may include but are not limited to – sheet breaks, flooding (water logging), cracked edges, visual defects, folding, bursting, creasing, dryer clothing faults, process steam variations, hood control;
equipment faults and malfunctions – electrical, mechanical, instrumentation, distributed control system.

3.3 Output product, sheet finish, curl, and moisture content are monitored to meet specified requirements.

3.4 Production and quality records are completed.

Replacement information	This unit standard replaced unit standard 3521 and, with unit standard 21491, replaced unit standard 3575.

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	18 December 2006	31 December 2024
Review	2	24 October 2014	31 December 2025
Review	3	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.