

Title	Demonstrate knowledge of the recycling of fibre for paper making		
Level	4	Credits	10

Purpose	People credited with this unit standard are able to: demonstrate knowledge of recycling fibre products, waste paper pulping, waste paper furnish screening and de-inking; and explain waste paper furnish cleaning and recycled fibre dispersion plants.
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Classification	Wood Fibre Manufacturing > Pulp and Paper Technology
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Available grade	Achieved
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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 recycling fibre products.

Performance criteria

1.1 Grades of waste paper are identified.

Range grades may include but are not limited to – broke, converter's, used, old cardboard cartons (OCC), new cardboard cartons (NCC).

1.2 Characteristics and end use of each recycled fibre group are identified and explained in terms of fibre type and content, contaminants, fillers, and substitution.

Range contaminants may include but are not limited to – plastics, heavy contraries, light contraries, contraries requiring dispersion or de-inking.

1.3 Effluent solids are explained and possible disposal methods for each are identified.

Range solids may include but are not limited to – polythene, ink, clarifier solids; disposal methods may include but are not limited to – land fill, fuel, soil conditioner.

1.4 Liquid effluent treatment methods are explained.

Range effluent treatment methods may include but are not limited to – clarification, anaerobic, settlement, aeration.

1.5 Functions of the fiberiser and drum sorter are identified and explained in terms of accepts, heavy rejects, and light rejects.

Outcome 2

Demonstrate knowledge of waste paper pulping.

Performance criteria

2.1 Components of a waste paper pulping system are identified and explained in terms of their purpose.

Range components may include but are not limited to – low-consistency hydropulper, high-consistency hydropulper, ragger, flote-purge, junker, drubber, deflaker.

2.2 Components of a hydropulper are identified and explained in terms of their purpose.

Range bowl, rotor, screen plate, conveyor, drive.

Outcome 3

Demonstrate knowledge of waste paper furnish screening.

Performance criteria

- 3.1 Components of a waste paper furnish screening system are identified and explained in terms of their purpose.
- Range furnish screening systems may include but are not limited to – flat screen, pressure screen, trash screens.
- 3.2 Screening is explained in terms of positive and probability separation.
- 3.3 The operation of pressure screens is explained.
- Range pressure screen operation must include – baskets, foils, pressure pulses.
- 3.4 Reasons for multi-stage screening in terms of reject reduction and separation, and typical cascade system are explained.
- 3.5 Fractionation is explained in terms of fibre type separation, fibre treatment, energy, waste grading, and fibre utilisation, and its benefits.
- 3.6 Method of fibre separation is explained in terms of statistical function, and its effects are explained on reject-to-accept ratio and consistency.
- 3.7 Importance of stock consistency and its control are explained in terms of fractionation rate, reject consistency, flow rates, and capacity.

Outcome 4

Explain waste paper furnish cleaning.

Performance criteria

- 4.1 Components of a waste paper furnish cleaning system and their purpose are explained.
- Range cyclones, centrifugal cleaners, thickeners.
- 4.2 Principles and operation of centrifugal cleaners are explained.
- Range liquid cyclone, vortex, reject valves, pressure drop.

Outcome 5

Explain recycled fibre dispersion plants.

Performance criteria

- 5.1 Purpose of dispersion is explained in terms of the dispersal and reduction in size and/or removal of contraries.

5.2 Components of a dispersion system and their functions are explained.

Range thickener, heater, disperser, refiner, slusher.

Outcome 6

Demonstrate knowledge of de-inking.

Performance criteria

6.1 Purpose of de-inking is explained in terms of removal or dispersal of ink and the end uses for the de-inked product are identified.

Range end uses – newsprint, writing and printing, boards, virgin pulp substitute.

6.2 Chemicals added to the pulper to assist de-inking are identified and their effects are explained.

Range chemicals – caustic soda, soaps, dispersants, stabilisers, chelating agents.

6.3 Flotation de-inking is described and its advantages are identified in terms of losses, water economy, and particle removal.

6.4 Air injection and foam removal methods are explained for flotation de-inking.

Range air injection – injector, compressor;
foam removal – overflow, suction.

6.5 De-inking by washing is described in terms of particle size removal and requirements for good removal.

Range requirements – fibre mass.

Planned review date	31 December 2028
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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
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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.