

Title	Explain principles of paper tissue manufacture		
Level	3	Credits	5

Purpose	People credited with this unit standard are able to: demonstrate knowledge of the processes involved in tissue manufacture; demonstrate knowledge of furnish components and explain the effects of wet end chemistry; explain tissue manufacture forming principles; explain the functions and operation of the felt section in tissue manufacture; demonstrate knowledge of the operation of a yankee cylinder; and demonstrate knowledge of the operating principles for crepeing of tissue.
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Classification	Wood Fibre Manufacturing > Tissue Converting
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Available grade	Achieved
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Guidance Information

1 Legislation and references

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

- Health and Safety at Work Act 2015
- Resource Management Act 1991.

Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

2 Definition

Worksite policies and procedures refer to documented policies and to other directions provided to staff. These include, but are not limited to – ways of managing health and safety, environmental considerations, quality, and production, and must conform to legislation. Examples include – standard operating procedures, company health and safety plans, on-site briefings, and supervisor's instructions.

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 policies and procedures and legislative requirements. This includes the knowledge and use of worksite specific equipment, procedures, and practices. This unit standard may be assessed in the workplace using naturally occurring evidence or in a simulated environment that demands performance equivalent to that required in the workplace.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the processes involved in tissue manufacture.

Performance criteria

- 1.1 Crepeing processes used to categorise tissue products are explained.
Range wet crepe, semi-dry crepe, dry crepe.
- 1.2 Techniques for tissue manufacture are identified and explained.
Range conventional, recreped, through dried, layered.
- 1.3 The importance of tissue properties is explained.
Range substance, moisture, bulk, strength, machine direction to cross direction ratio, wet tensile, stretch, absorbency rate, absorbency capacity, softness, brightness.

Outcome 2

Demonstrate knowledge of furnish components and explain the effects of wet end chemistry.

Performance criteria

- 2.1 Characteristics of pulps used for tissue manufacture are explained.
Range bleached softwood kraft, bleached softwood sulphite, bleached hardwood kraft, mechanical, secondary.
- 2.2 The uses and effects of chemical additives are explained.
Range dyes, wet strength resin, dry strength agents, retention aids, defoamers, dispersers.
- 2.3 Effects of electrostatic surface charges are explained in terms of dispersion, coagulation, and deposition.
- 2.4 Operating conditions affected by changes in wet end chemistry are explained.
Range drainage, flocculation, retention, strength, adhesion.
- 2.5 Stock processing operations for tissue are explained.
Range slushing, blending, refining, cleaning, screening.

Outcome 3

Explain tissue manufacture forming principles.

Performance criteria

3.1 Factors contributing to tissue formation are explained.

Range consistency, head box conditions, drainage, retention, support.

3.2 The operating characteristics of formers are explained.

Range fourdrinier, periformer, crescent, twin wire, layering.

Outcome 4

Explain the functions and operation of the felt section in tissue manufacture.

Performance criteria

4.1 Designs of a felt section are explained and their operating characteristics compared.

Range single run, double run, moisture, showering, and pressing.

4.2 Position and function of felt cleaning showers are explained.

4.3 The effects of pressure roll operating variables are explained.

Range nip pressure, dwell time, flow, temperature.

Outcome 5

Demonstrate knowledge of the operation of a yankee cylinder.

Performance criteria

5.1 Reasons for the use of yankee cylinders are explained.

Range evaporation rate, draw, and product property development.

5.2 Evaporative drying is described and the functions of the various components are explained.

Range heat transfer, hood air.

5.3 Through drying components are described and the advantages are explained in terms of bulk, absorbency, opacity, and softness.

Range components – drum, hood, air heaters.

Outcome 6

Demonstrate knowledge of the operating principles for crepeing of tissue.

Performance criteria

- 6.1 Properties affected by crepeing are identified.
Range evidence of a minimum of four is required.
- 6.2 Factors affecting the result of the crepeing operation are explained.
Range fibre flexibility, formation, strength, moisture, adhesion, pocket angle, blade geometry.
- 6.3 Factors affecting crepeing blade wear are identified (a minimum of four) and the effects of worn blades are explained (a minimum of two).

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	23 November 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	29 June 2023	N/A

Consent and Moderation Requirements (CMR) reference	0013
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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 Work Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.