

Title	Demonstrate industry knowledge for sheet-fed printing		
Level	3	Credits	15

Purpose	People credited with this unit standard in sheet-fed printing are able to: describe the use and application of halftones; demonstrate knowledge of image carriers; describe the machinery and equipment used in the workplace; outline problems and explain solutions associated with static electricity and relative humidity; demonstrate knowledge of product bar code printing; describe the requirements of sheet-fed printing processes, and factors affecting printing standards; describe characteristics and uses of inks and ink additives; demonstrate knowledge of ink drying systems and ink equipment, and environmental issues relevant to the print industry; and explain colour theory; and use colour terms.
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Classification	Printing > Printing - Sheet-Fed
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Available grade	Achieved
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Guidance Information

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

- Copyright Act 1994;
- Hazardous Substances and New Organisms Act 1996;
- Health and Safety at Work Act 2015;
- Privacy Act 2020;
- 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 Definitions

Halftones refers to a printing technique that simulates continuous tone imagery through the use of dots.

Print industry refers to all sectors involved in print and packaging industries including pre-production, production, and post-production activities, suppliers and distributors. The sectors include graphic pre-press, digital output sheet-fed, reel-fed, screen, binding and finishing, fibreboard packaging.

Workplace procedures refer to organisation policies and procedures that are documented in memo, electronic, or manual format and available in the workplace. 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, manufacturer's requirements, references, approved codes of practice, housekeeping standards, environmental considerations, on-site briefings, supervisor's instructions, and procedures to comply with legislative and local body requirements relevant to the print sector.

3 Assessment information

Industry terms and vocabulary applicable to sheet-fed production processes must be used throughout this unit standard.

Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable service information, workplace procedures and legislative requirements.

Outcomes and performance criteria

Outcome 1

Describe the use and application of halftones for sheet-fed printing.

Performance criteria

- 1.1 Describe the use of halftones is described in terms of reproducing an original copy.
- 1.2 Describe halftone screen ruling applications for the different kinds of substrates and the sheet-fed production process being undertaken in the workplace.

Outcome 2

Demonstrate knowledge of image carriers used for sheet-fed printing.

Performance criteria

- 2.1 Explain procedures for making image carriers in terms of the sheet-fed production processes used in the workplace.
- 2.2 Describe materials used to make image carriers in terms of the sheet-fed production processes used in the workplace.

Outcome 3

Describe the machinery and equipment used in the workplace for sheet-fed printing.

Performance criteria

3.1 Describe the functions of sheet-fed printing machinery.

Range single colour, multi colour, convertible.

3.2 Describe the advantages and disadvantages of using different types of printing machinery in terms of output.

Range digital, offset.

3.3 Describe the processes of digital machinery used for sheet-fed printing.

3.4 Describe the function and application of sheet-fed printing equipment.

Range may include but is not limited to – numbering, imprinting, scoring/creasing, perforating, slitting, guillotining, folding.

Outcome 4

Outline problems and explain solutions associated with static electricity and relative humidity in sheet-fed printing.

Performance criteria

4.1 Outline static electricity problems and explain their solutions.

Range substrate problems, static eliminators, temperature control.

4.2 Outline relative humidity problems and explain their solutions.

Range paper distortion, adhesive tape problems, electronic equipment problems, temperature control, relative humidity control units, ink problems.

Outcome 5

Demonstrate knowledge of product bar code printing.

Performance criteria

5.1 Describe the format and functions of product bar coding.

Range format – country of origin, manufacturer, product, check number; functions – storing information and identifying individual products, pricing, recording stock.

5.2 Outline requirements for reproduction of product bar codes.

Range positioning, readability, printing tolerances, size, colour combinations, positive/negative bar codes.

5.3 Describe processes for checking product bar code tolerances.

Range may include but is not limited to – grey gauges, scanners, verifiers.

5.4 Describe processes for reporting product bar coding faults.

Range faults include – positioning, readability, colour combinations, contrasts, printing tolerances, size.

Outcome 6

Describe the requirements of sheet-fed printing processes.

Performance criteria

6.1 Describe the requirements for sheet-fed printing processes.

Range pre-press, binding and finishing, fibreboard packaging.

6.2 Describe print finishes in terms of their special printing requirements.

Range may include but is not limited to – aqueous coating, hot foil stamping, lamination, overglossing, ultraviolet (UV) coating, waxing.

Outcome 7

Describe the factors affecting printing standards.

Performance criteria

7.1 Describe the characteristics of an acceptable print.

Range colour consistency and registration maintained, correct position, correct substrate, standard maintained to approved sample.

7.2 Describe factors which affect print quality.

Range customer's requirements, speed of the press, width or thickness of the substrate, general condition of the press.

7.3 Describe factors which affect the printing speed for the job.

Range quality requirements, ink being used, substrate being used, register requirements, press condition.

Outcome 8

Describe characteristics and uses of inks and ink additives.

Performance criteria

8.1 Describe the characteristics of different types of printing inks.

Range may include – solvent evaporating, oxidation curing, reactive (ie catalyst curing, two component), baking, UV curable.

8.2 Describe the uses of ink additives.

Range may include – adhesion modifiers, antistatic agents, catalysts (hardeners), flow agents, matt and gloss agents, retarders, thinners.

Outcome 9

Demonstrate knowledge of ink drying systems and equipment.

Performance criteria

9.1 Describe ink drying systems in terms of methods.

Range may include but is not limited to – evaporation, oxidation, thermosetting, catalytic, radiation curing.

9.2 Identify ink drying equipment and describe its uses.

Range jet air, ultraviolet (UV), infrared (IR).

9.3 Describe factors affecting the ink drying process.

Range ink, substrate, speed of printing, air temperature, humidity, light, radiation intensity.

Outcome 10

Demonstrate knowledge of environmental issues relevant to the print industry.

Performance criteria

10.1 Explain terms relating to environmental issues.

Range may include but is not limited to – biodiversity, discharge, ecosystem, emit, emission, land degradation, odour, fossil fuels, greenhouse gases, climate change, global warming, carbon footprint, sustainability.

- 10.2 Outline environmental issues relevant to the print industry in terms of their impact on the workplace.

Range may include but not limited to – pollutants and effects, energy reduction, waste management including recycling systems, sustainable and non-toxic products, forest certification programmes, environmental management programmes, circularity.

- 10.3 Describe a print industry company policy statement in terms of its environmental practices.

Outcome 11

Explain colour theory and use colour terms.

Performance criteria

- 11.1 Explain colour theory in terms of additive colours (red, green and blue light).

- 11.2 Explain colour theory in terms of subtractive colours (cyan, magenta and yellow pigments).

- 11.3 Explain the relationship between additive and subtractive colours.

- 11.4 Use colour terms applicable to the production process used in the workplace.

Range may include but is not limited to – primary colours, secondary colours, additive colours, subtractive colours, complementary colours, lightfast, hue, hue error, greyness, efficiency.

- 11.5 Explain correct viewing conditions in terms of their importance to colour matching.

Range fluorescence, metamerism, colour temperature, viewing booths.

Planned review date	31 December 2027
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 June 2010	31 December 2027
Review	2	30 March 2023	N/A
Revision	3	27 February 2025	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 Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.