

Title	Control printed circuit board fabrication operations		
Level	3	Credits	30

Purpose	<p>This unit standard covers the fabrication operations of printed circuit board (PCB) manufacture. This includes board cutting, scoring, drilling, routing, and press operations.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> –set up printed circuit board fabrication equipment; and –ensure performance of printed circuit board fabrication operations.
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Classification	Electronic Engineering > Electronic Manufacturing
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Available grade	Achieved
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Guidance Information

- 1 **Definition**
PCB fabrication operations refers to printed circuit board cutting, scoring, drilling, routing, and press operations.
- 2 For *PCB manufacturing processes*, covering etching, plating, tinning, and deposition of conductive films, refer to Unit 12583, *Control printed circuit board manufacturing processes*.
 For *PCB screenprinting processes*, covering circuit printing, solder masking, and component layout masking, refer to Unit 12584, *Control printed circuit board screenprinting processes*.
 For *preparation of screenprinting stencils*, covering track layouts, component layout, screening layout, conductive layout, and solder masking, refer to Unit 12585, *Prepare screenprinting stencils for printed circuit board processes*.
- 3 Candidates are expected to be familiar with the operation of relevant fabrication software packages where required.
- 4 **Range**
 - a fabrication operations – any two of – board cutting, scoring, drilling, routing, press operations;
 - b types of printed circuit boards – one or more of – single sided, double sided, plated through-hole boards.
- 5 **References**
 Health and Safety in Employment Act 1992;
 IPC-A-610D, *Acceptability of Electronic Assemblies*, 2005, published by IPC – Association Connecting Electronics Industries.

- 6 The following apply to all outcomes of this unit standard:
- a all activities are to be completed and reported within agreed timeframes;
 - b all work practices must meet worksite's documented quality management requirements;
 - c all activities must comply with policies, procedures and requirements of the enterprises involved; and any relevant legislative and/or regulatory requirements, which include, but are not limited to, the Health and Safety in Employment Act 1992.

Outcomes and performance criteria

Outcome 1

Set up printed circuit board fabrication equipment.

Performance criteria

- 1.1 The preparation of equipment and the selection of tools match the job instructions.
- Range software selection, tool selection, equipment settings.
- 1.2 Loading and setting operations do not compromise the operational integrity of the machine.
- Range operations may include but are not limited to – registration, tool location, tool integrity.
- 1.3 Board integrity is not affected by setup or handling operations.
- Range PCB physical structure, PCB appearance.
- 1.4 The equipment setup and operation conform to enterprise safety requirements and present no uncontrolled hazards to any person.
- Range safety screen status, specified enterprise operational safety protocols.
- 1.5 Process tests provide results that comply with job instructions, and meet industry standards.
- Range IPC standards, or equivalent, for registration accuracy, tolerances, other specified PCB characteristics.

Outcome 2

Ensure performance of printed circuit board fabrication operations.

Performance criteria

- 2.1 Completed boards comply with industry quality standards.
 Range IPC standards, or equivalent, for registration accuracy, tolerances, other specified PCB characteristics.
- 2.2 Operational checks confirm the continuing integrity of equipment operations.
 Range board inspection, machine settings, machine warnings.
- 2.3 Enterprise procedures are followed to solve operational problems.
 Range valid methods may include but are not limited to – use of equipment guides, technical assistance, fault finding trees, cause and effect analysis, process analysis.
- 2.4 Procedures for dealing with equipment operation emergencies are known.
 Range examples of emergencies could include – machine shutdown, machine failure, occurrences of known operational hazards.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 February 1998	31 December 2021
Review	2	28 June 1999	31 December 2021
Revision	3	3 April 2001	31 December 2021
Review	4	23 November 2003	31 December 2021
Rollover and Revision	5	19 March 2010	31 December 2021
Review	6	26 July 2018	31 December 2021

Consent and Moderation Requirements (CMR) reference	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.