

<b>Title</b>	<b>Assemble through-hole printed circuit boards using semi-automatic assembly equipment</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	<p>This unit standard covers the insertion of through-hole components on printed circuit boards using semi-automatic assembly equipment, such as light-guided assembly tables.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>–set up semi-automatic assembly equipment;</li> <li>–insert through-hole components on printed circuits; and</li> <li>–check completed printed circuit boards.</li> </ul>
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<b>Classification</b>	Electronic Engineering > Electronic Manufacturing
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Definitions
 

*loading or stuffing* – the process of inserting through-hole components into the holes of a printed circuit.

*through-hole (or leaded) components* – components that use leads or wires for their connection to a printed circuit board.
- 2 Range
 

Competence may be demonstrated on one or more of the following printed circuit board types – single sided, double sided, plated through-hole, multi-layer boards.
- 3 References
 

Health and Safety in Employment Act 1992;  
 IPC-A-610D, *Acceptability of Electronic Assemblies*, 2005, published by IPC – Association Connecting Electronics Industries.
- 4 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. These include but are not limited to documentation of activities, results, and decisions;
  - c all activities must comply with policies, procedures, and requirements of the enterprises involved; any relevant legislative and/or regulatory requirements, which include, but are not limited to, the Health and Safety in Employment Act 1992.

- 5 People who are registered as physically disabled may achieve this unit standard with exemption from the requirements of outcome 1 only.

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## Outcomes and performance criteria

### Outcome 1

Set up semi-automatic assembly equipment.

#### Performance criteria

- 1.1 The preparation of equipment and the selection of components match the job instructions.
- Range software – selection, loading and control;  
components – selection, loading, polarity where appropriate;  
equipment – settings, adjustments, calibrations.
- 1.2 The workplace layout conforms to enterprise safety standards and presents no uncontrolled hazards to any person.

### Outcome 2

Insert through-hole components on printed circuits.

#### Performance criteria

- 2.1 The insertion sequence complies with the job instructions.
- 2.2 Component and board integrity are not affected by setup or handling operations.
- Range integrity includes – fit, finish, electrostatic discharge (ESD), other specified build requirements.
- 2.3 All insertion operations are completed to enterprise quality standards, and may include use of specified jigs, tools, and equipment.
- 2.4 Completed boards meet industry quality standards.
- Range IPC standards, or equivalent, for – component selection, component positioning, component mounting, lead treatment.

### Outcome 3

Check completed printed circuit boards.

#### Performance criteria

- 3.1 Checking confirms that insertion work meets enterprise quality standards.
- Range component placement, fixture, visual appearance.

**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	23 November 2003	31 December 2021
Rollover and Revision	2	19 March 2010	31 December 2021
Review	3	26 July 2018	31 December 2021

**Consent and Moderation Requirements (CMR) reference**

0003

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.