

Title	Operate printed circuit board flow soldering equipment		
Level	3	Credits	10

Purpose	<p>This unit standard covers the operation of printed circuit board flow soldering equipment in the assembly environment of electronic manufacturing.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> –set up printed circuit board flow soldering process; and –monitor the performance of the printed circuit board flow soldering process.
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Classification	Electronic Engineering > Electronic Manufacturing
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Available grade	Achieved
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Guidance Information

- 1 Definition

surface mount devices (SMD) – components that are bonded directly to the circuit board.
- 2 Candidates are expected to be familiar with the following:
 - a the process parameters required for the flow soldering process and their related quality standards;
 - b the health and safety standards required for the handling and use of the materials used in the flow soldering process;
 - c where required, the operation of relevant process software packages.
- 3 Range
 - a type of flow soldering process – either a manually controlled flow solder process or an automatically controlled flow solder process;
 - b types of printed boards – one or more of single-sided, double-sided, plated through-hole, and multi-layer boards;
 - c types of component – any of conventional components, SMD components, or hybrids of both.
- 4 References

Hazardous Substances and New Organisms Act 1996;
 Health and Safety in Employment Act 1992;
 ANSI/IPC J-STD- 001D, *Requirements for Soldered Electrical and Electronic Assemblies*, February 2005, published jointly by IPC – Association Connecting Electronics Industries and The Electronic Industries Alliance.

- 5 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 and the Hazardous Substances and New Organisms Act 1996.

Outcomes and performance criteria

Outcome 1

Set up printed circuit board flow soldering process.

Performance criteria

- 1.1 Loading and setting operations comply with job instructions and do not compromise the operational integrity of the process.
- Range software controls, process material properties, process settings, equipment settings.
- 1.2 Component and board integrity are not affected by setup or handling operations.
- Range printed circuit boards (PCB) and component physical structure, board cleanliness, component disturbance, electrostatic discharge (ESD) effects.
- 1.3 The equipment and process operation conform to enterprise safety requirements and presents no uncontrolled hazards to any person.
- 1.4 Process tests provide results that comply with job instructions, and meet industry standards.
- Range IPC standards, or equivalent, for specified bonding characteristics.

Outcome 2

Monitor the performance of the printed circuit board flow soldering process.

Performance criteria

- 2.1 Completed boards comply with process quality standards.
- Range bonding integrity, solder bridging, other specified standards.
- 2.2 Operational checks confirm the continuing integrity of the process.
- Range checks may include but are not limited to – PCB inspection, process settings, equipment settings.

2.3 Enterprise procedures are followed to solve process problems.

Range valid methods may include but are not limited to – use of equipment and process guides, technical assistance, fault finding trees, cause and effect analysis, process analysis, or their combination.

2.4 Procedures for dealing with process and equipment emergencies are known.

Range examples of emergencies could include – equipment shutdown, equipment or process failure, occurrence 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>.