

**Manufacturing
Procedure**

Procedure #:

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Special Processes**Revision**

A

Description of Change

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Special Processes**1.0 Purpose**

- 1.1 The purpose of this document is to define the requirements for special processes.

2.0 Scope

- 2.1 This procedure applies to Meritronics.

3.0 References

- 3.1 Process and Test Equipment Acceptance - SOP18
- 3.2 Calibration System - SOP17
- 3.3 Training and Certification - SOP30
- 3.4 Electrostatic Discharge Control (ESD) - SOP22
- 3.5 Control of Non-Conforming Materials - SOP23
- 3.6 Acceptability of Electronic Assemblies - IPC-A-610
- 3.7 Suggested Guidelines for Modification, Rework & Repair of Printed Circuit Board Assembly - IPC-R-700

4.0 Definitions

- 4.1 Special processes - Processes of which the results cannot be fully verified by inspection or testing. The following processes at Meritronics have been defined as special processes.
- 4.1.1 SMT Reflow
- 4.1.2 Hand Solder
- 4.1.3 Wave Solder
- 4.1.4 Air Vac Station
- 4.2 Profile - Time vs. temperature data for SMT reflow or wave solder operations. The original profile may be resident on the hard disk of the computer that controls the machine's operation or a hard copy may be kept around the machine. Profiles are verified against industry standards using a thermocouple.
- 4.3 PCB - printed circuit board

5.0 Responsibilities

- 5.1 Engineering will ensure that the requirements of this specification are incorporated in the documentation, equipment, and design of special processes.

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5.2 All personnel performing special processes will be knowledgeable in and will comply with the detailed procedures of the special processes.

5.3 Management will ensure that training programs are in place.

6.0 Equipment

6.1 As required by detailed procedures.

7.0 Materials

7.1 As required by detailed procedures.

8.0 Records

8.1 The total retention time for all records in this procedure is reflected on the Master Forms Listing under the column heading Record Retention, in which the record may be kept in an active status. If the status is inactive and the customer specifies a longer period, the records may be forwarded to Document Control and filed / maintained in accordance with SOP 29.

8.2 Conceptronic Convection Reflow Oven Operation Procedure - MFG010

8.3 Electro Reflow Oven Operation Procedure - MFG015

8.4 2nd Operation Procedure - MFG004

8.5 Hand Solder Operation Procedure - MFG021

8.6 Wave Solder Operations Procedure - MFG011

8.7 Soldering Using Air Vac, Set-up and Operation - MFG019

8.8 First Article Inspection Procedure - QAP005

9.0 Procedure

9.1 Each special process shall comply with these requirements:

9.1.1 Each process shall be documented by means of a detailed procedure.

9.1.2 Equipment and tools shall be meet the requirements of SOP18.

9.1.3 Where applicable, workmanship standards shall exist and will apply to special processes.

9.1.4 Work areas and machines shall be maintained in a clean and orderly condition.

9.1.5 Operators of each process shall be trained for their duties. The on-going training program shall comply with the requirements as stated in Training SOP30.

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- 9.1.6 Appropriate safety precautions shall be stated in the individual specifications.
- 9.1.7 Magnification aids shall be available to operators as required for inspection.
- 9.1.8 All equipment, work areas and personnel shall comply with ESD requirements as stated in SOP22.
- 9.1.8.1 Skin lotion and/or hand cream that is free from silicones shall be made available.
- 9.1.9 Critical process parameters for each special process shall be identified and continuously monitored.
- 9.2 In addition to section 9.1, SMT reflow and wave solder processes shall comply with these requirements:
- 9.2.1 A profile shall be specified for each assembly. A hard copy of the current profile shall be available to production operators and engineers.
- 9.2.2 When required, Meritronics' customers shall alert Meritronics' engineering staff to special processing requirements. The profile shall be consistent with these requirements.
- 9.2.3 All jigs and fixtures used in the processes shall be checked by the operator before use for acceptable condition. When required, the fixtures shall be taken out of production and given to engineering for corrective/preventive action.
- 9.3 In addition to section 9.1 and 9.2, the solder pots of the wave solder and Air Vac equipment shall be sampled on a monthly basis for chemical analysis. The analysis shall be performed by a qualified outside laboratory. Appropriate corrective/preventive action shall be taken by engineering.
- 9.4 In addition to section 9.1, hand solder operations shall meet the following requirements:
- 9.4.1 Solder stations shall be equipped with sponge style tip cleaners. Soldering tips shall be in good condition and free from oxidation.
- 9.4.2 Flux containers shall be clearly marked with the contents.
- 9.4.3 The maximum temperature and time any part of the product can be exposed to during hand solder is unique for each component type. If damage is encountered, the effected part(s) shall be processed according to Control of Non-Conforming Materials Procedure SOP23.
- 9.4.4 Solder removal shall be performed with vacuum style solder suckers.
- 9.4.5 When required, soldered components shall be removed without damage to the PCB. If damage is encountered, the effected part(s) shall be processed according to Control of Non-Conforming Materials Procedure SOP23.
- 9.5 Various parameters that ensure continuous monitoring of special processes are shown in the following table. With exception to metallurgical analysis, each parameter is continuously monitored by the equipment.

	Zone_ Temp	Conveyor_ Speed	Tip_ Temp	Pre-heat_ Temp	Pot_ Temp	Metallurgical_ Analysis	Auto Flux_ Density Check
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SMT Reflow	YES	YES					
Hand Solder			YES				
Wave Solder		YES		YES	YES	YES	YES
Air Vac Station					YES		YES