This application note is designed to provide step-by-step processing recommendations. It covers the popular SMC soldering processes currently in use and provides recommendations and cautions for each step. Since many variations of temperature, time, processes, cleaning agents and board types are found in the electronics industry, you’ll want to test and verify your own system.

The process steps, recommendations and cautions are based on Bourns® Trimpot® surveys of SMC users, equipment manufacturers and materials suppliers. Also, comments reflect results of Bourns’ testing. Our findings suggest the following soldering and cleaning processes:

1. **SOLDERING** - Forced Hot Air, Convection, IR, Vapor Phase (In-Line), Wave (Single and Dual)
2. **CLEANING** - Solvent, Aqueous, Semi-Aqueous, No-Clean

### Standard Soldering And Cleaning Processes - Trimming Potentiometers

**Solder Paste Printing**
- **Reflow**
  - **GENERAL** Use the optimum solder paste for the pattern, printing process, solder paste density and solder joint quality.
  - **RECOMMENDED** Use Sn 63 % Pb 37 % solder paste. Use 8 to 10 mil thickness for solder paste print.
  - **CAUTION** Since solder paste usually contains a high percentage of activators, you must ensure adequate cleaning to remove all residues, unless no-clean (low solids) paste is used.

**SMC Placement**
- **Reflow**
  - **GENERAL** Use pick-and-place equipment with vacuum nozzle ID size that allows adequate suction to pick the SMC out of the embossed cavity.
  - **RECOMMENDED** Nozzle inside diameter (ID) should not exceed .100 in. (2.54mm) to ensure adequate suction and part alignment.
  - **CAUTION** Ensure parts are placed so that all terminals are equidistant (<4 mils) from the solder pads.
  - Align terminals with solder belt direction of travel to avoid body shadowing effects during flow soldering.

**Flux Application**
- **Flow (Wave)**
  - **GENERAL** Use the correct flux to remove surface oxides, prevent reoxidation and promote wetting.
  - **RECOMMENDED** RMA or No-clean SBR (Synthetic resin based)
  - **OA** (Organic Acid) (See caution)
  - **CAUTION** Avoid highly activated fluxes. Consult factory before using OA.

**Solder Reflow**
- **Hot Air, IR and Vapor Phase**
  - **GENERAL** Preheat sufficiently using both time and temperature to vaporize all solder paste solvents and moisture, leaving only solder and flux as component enters solder reflow phase.
  - **RECOMMENDED** Use Sn 63 % Pb 37 % solder or lead free solder paste, depending upon application. Solder zone profile of 245 °C for 5 seconds.
  - **RECOMMENDED** Solder zone profile of 230 °C for 20 seconds.
  - **CAUTION** Do not exceed time and temperature reflow profile of 235 °C for 45-55 seconds for hot air/IR reflow and 215 °C for 3 minutes for vapor phase reflow. Use 215 °C as minimum reflow temperature.
  - **CAUTION** Do not exceed 260 °C peak temperature for dual wave solder process with a flow zone totaling 5 seconds.

**Wash**
- **Solvent**
  - **GENERAL** Use any suitable washing solvents that meet ODC requirements.
  - **RECOMMENDED** Use terpene or hydrocarbon based for prewash. Use water for final wash.
  - **CAUTION** Limit excessive direct spray pressure to 60 psi or below for optimum reliability.

**Wash**
- **Aqueous**
  - **GENERAL** Use aqueous cleaning primarily for polar contaminants such as organic flux residues.

**Wash**
- **Semi-Aqueous**

**No-Wash**

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*Process descriptions 5 through 7 do not apply to open frame trimmers.*

### Board Rework Technique
- **GENERAL** Limit solder iron temperature to 330 °C for 3 seconds.
Following are the common methods, materials and maximum temperature/time parameters for soldering and cleaning processes.

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<td>(See Caution)</td>
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Specifications are subject to change without notice.
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.