Reducing Solder Defects

Incomplete pad filling		Dirty stencil or clogged aperture • Clean stencil
Incomplete pad filling		Fogging of stencil • Increase squeegee pressure • Check stop down setting
Incomplete pad filling		Paste Skidding • Add paste • Increase squeegee pressure • Slow print speed
Incomplete pad filling		Contamination in stencil aperture • Clean Stencil

Incomplete pad fill Horizontal pads only		Partial fogging of stencil • Check for damaged squeegee blade
Paste bridging to adjacent pads		Paste catching in apertures • Clean stencil • Adjust separation speed • Increase squeegee pressure
Paste bridging to adjacent pads		Smearing of the paste • Increase frequency of underside wiping of the stencil • Reduce print pressure • Check gasketing of stencil
Paste bridging to adjacent pads		Slumping of the paste • Check printing pressure • Check paste – replace if necessary

Smudged incomplete print		Thumb print • Check for proper handling of boards
Bridging and excessive flux bleed		Solvent in stencil aperture • Make extra dry wipe • Reduce the amount of solvent used in wiping stencil
Flux Bleed		Print pressure too high • Reduce squeegee blade pressure
Poor print definition		Off contact print • Eliminate snap off

Scooping the paste from the center of the pad		Excessive print pressure (polyurethane blades only) • Reduce squeegee pressure • Or increase print speed
Contaminated board		Poor cleaning of misprinted board • Use brush or automated board cleaner
Poor print definition		Poor gasketing due to uneven pads • Reduce squeegee pressure • Or increase print speed
The reflow profile is a critical element to good soldering		Potential problems 1. Insufficient temperature to evaporate solvent 2. Component shock and solder spatter 3. Insufficient flux activation 4. Excessive flux activity and oxidation 5. Trapping solvent and flux in void formations 6. Component/board damage 7. Dull solder joints 8. Thermal Shock to components

<table>
<tr><td>Solder balling within or around the pad area</td><td></td><td>Oxidized solder powder
Flux medium too weak to remove oxide layers – use more active flux medium
Activator break down due to excessive heat prior to reflow
Excessive slump due to high preheat temperatures</td></tr>
<tr><td>Random solder balls away from the pad area</td><td></td><td>Excessive preheat temperature or ramp up causing spattering

Insufficient preheat prior to ramp to peak causing spattering
Adjust reflow temperatures</td></tr>
<tr><td>Random solder balls away from the pad area</td><td></td><td>Moisture absorption by the paste
Refrigerated paste opened before coming to room temperature
Excess paste deposit
Paste build up on the underside of the stencil
Squeegee pressure too high
Poor gasketing of the stencil</td></tr>
<tr><td>Mid-Chip solder balling</td><td></td><td>Excess paste slump during preheat
Metal loading of paste too low
Preheat temperatures too high or too long
Excess paste deposition
Stencil aperture to pad ration too high
Excessive component placement pressure</td></tr>
</table>

Bridging of SOIC leads		• Excessive solder paste slump • Excess paste deposition • Poor resolution of the paste as printed on the board
Bridging, causing a short circuit		Smearing of paste on bottom side of the stencil • Reduce squeegee pressure • Wipe underside of stencil Component placement pressure too high
De-Wetting		Poor solderability of pads Pad contamination
De-Wetting		Deactivation of flux • Preheat time and temperature too long

De-Wetting		Poor solderability • Component lead contamination • Preheat time and temperature too long – deactivating the flux Yellow appearance – time above liquidus to long or excessive reflow temperature
De-Wetting		• Base metal difficult to solder • Solderable coating too thin • Base metal contamination – improper treatment of base metal prior to plating or tinning • Time above liquidus too long Peak temperature too high
Dull Joints		Too long above liquidus – oxidizes solder surface Formation of intermetalics – Cu-Sn Slow cooling causes rough coarse solder structure Disturbance of solder joints before cool down – conveyor line vibration