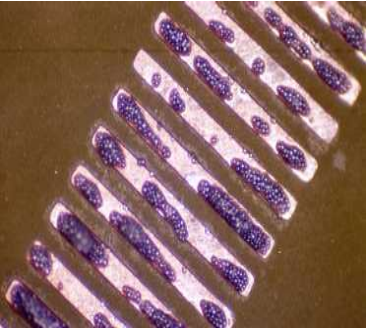
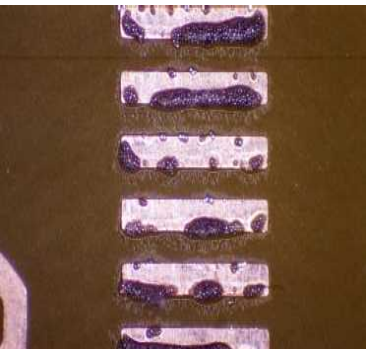

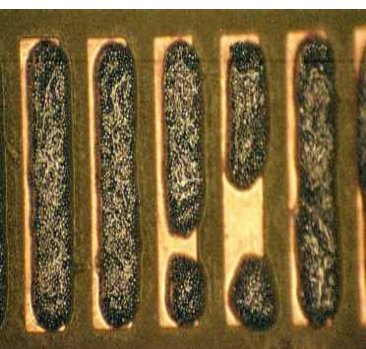
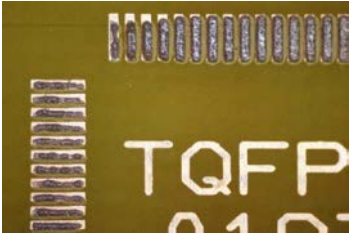
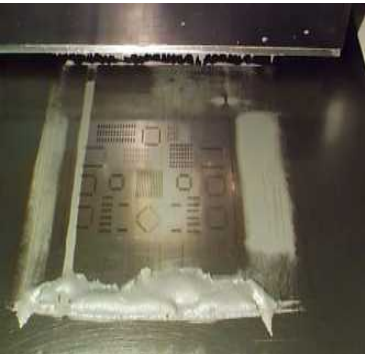
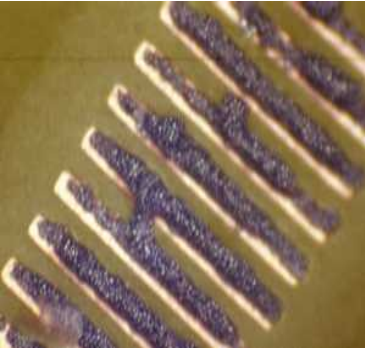
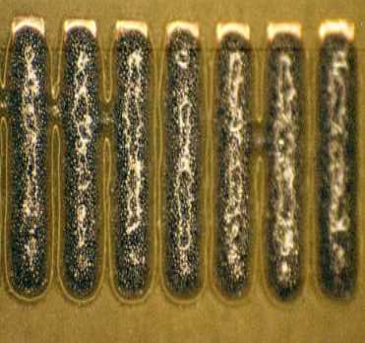
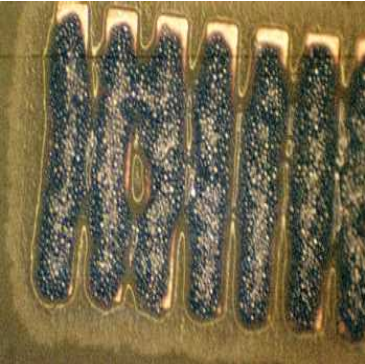
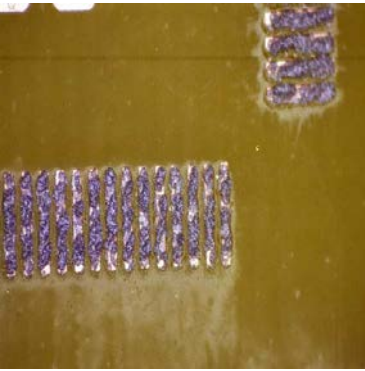
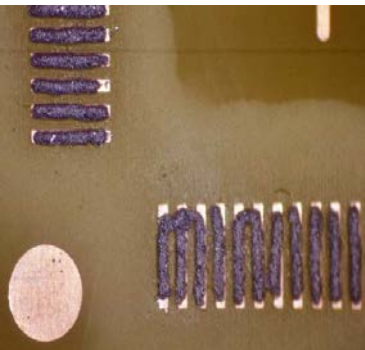
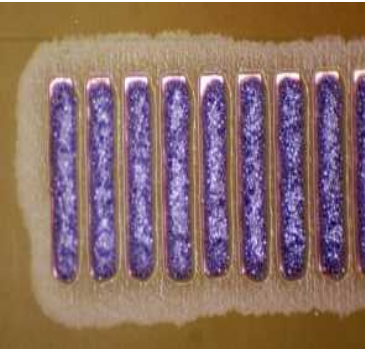

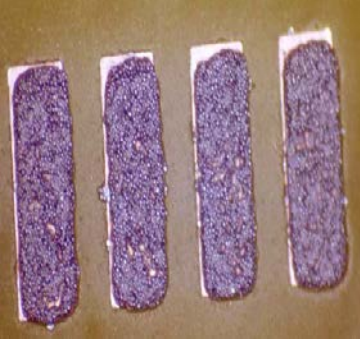
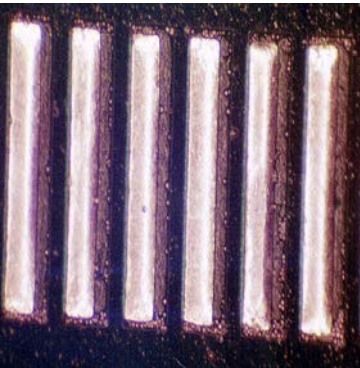
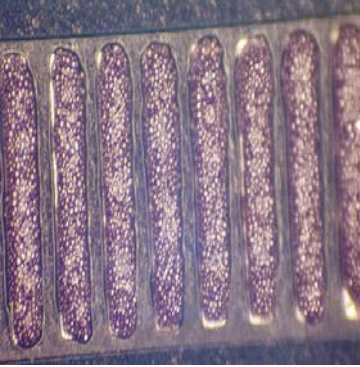
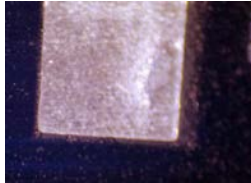



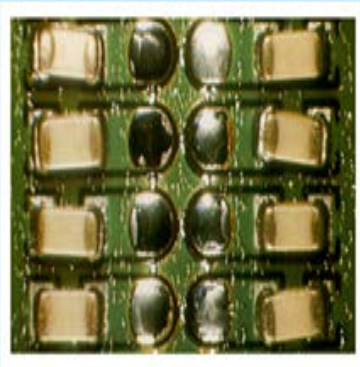
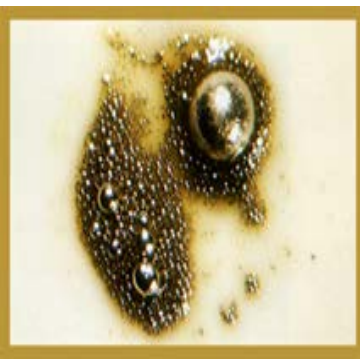
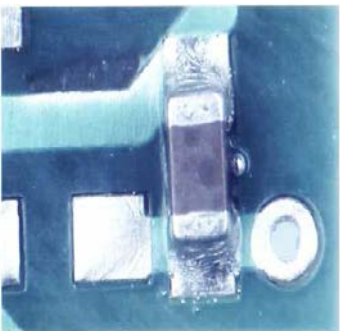
Reducing Solder Defects


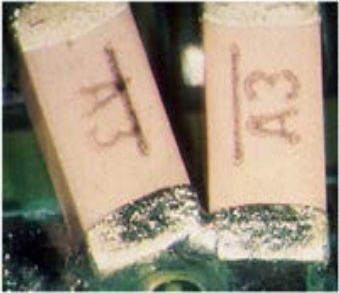

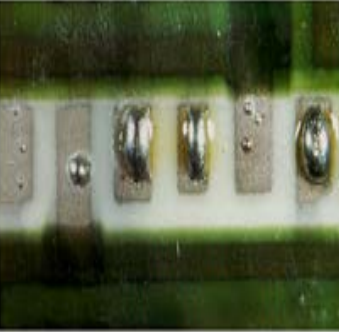
Incomplete pad filling		Dirty stencil or clogged aperture <ul style="list-style-type: none">• Clean stencil
Incomplete pad filling		Fogging of stencil <ul style="list-style-type: none">• Increase squeegee pressure• Check stop down setting
Incomplete pad filling		Paste Skidding <ul style="list-style-type: none">• Add paste• Increase squeegee pressure• Slow print speed
Incomplete pad filling		Contamination in stencil aperture <ul style="list-style-type: none">• Clean Stencil

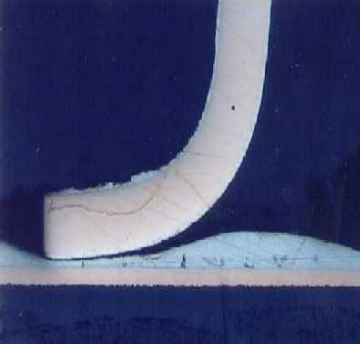


<p>Incomplete pad fill Horizontal pads only</p> 		<p>Partial fogging of stencil</p> <ul style="list-style-type: none"> • Check for damaged squeegee blade
<p>Paste bridging to adjacent pads</p>		<p>Paste catching in apertures</p> <ul style="list-style-type: none"> • Clean stencil • Adjust separation speed • Increase squeegee pressure
<p>Paste bridging to adjacent pads</p>		<p>Smearing of the paste</p> <ul style="list-style-type: none"> • Increase frequency of underside wiping of the stencil • Reduce print pressure • Check gasketing of stencil
<p>Paste bridging to adjacent pads</p>		<p>Slumping of the paste</p> <ul style="list-style-type: none"> • Check printing pressure • Check paste – replace if necessary

<p>Smudged incomplete print</p>		<p>Thumb print</p> <ul style="list-style-type: none"> • Check for proper handling of boards
<p>Bridging and excessive flux bleed</p>		<p>Solvent in stencil aperture</p> <ul style="list-style-type: none"> • Make extra dry wipe • Reduce the amount of solvent used in wiping stencil
<p>Flux Bleed</p>		<p>Print pressure too high</p> <ul style="list-style-type: none"> • Reduce squeegee blade pressure
<p>Poor print definition</p>		<p>Off contact print</p> <ul style="list-style-type: none"> • Eliminate snap off

<p>Scooping the paste from the center of the pad</p>		<p>Excessive print pressure (polyurethane blades only)</p> <ul style="list-style-type: none"> • Reduce squeegee pressure • Or increase print speed
<p>Contaminated board</p>		<p>Poor cleaning of misprinted board</p> <ul style="list-style-type: none"> • Use brush or automated board cleaner
<p>Poor print definition</p>		<p>Poor gasketing due to uneven pads</p> <ul style="list-style-type: none"> • Reduce squeegee pressure • Or increase print speed 
<p>The reflow profile is a critical element to good soldering</p>		<p>Potential problems</p> <ol style="list-style-type: none"> 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

<p>Solder balling within or around the pad area</p>		<p>Oxidized solder powder</p> <ul style="list-style-type: none"> • 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
<p>Random solder balls away from the pad area</p>		<p>Excessive preheat temperature or ramp up causing spattering</p> <p>Insufficient preheat prior to ramp to peak causing spattering</p> <ul style="list-style-type: none"> • Adjust reflow temperatures
<p>Random solder balls away from the pad area</p>		<p>Moisture absorption by the paste</p> <ul style="list-style-type: none"> • Refrigerated paste opened before coming to room temperature <p>Excess paste deposit</p> <ul style="list-style-type: none"> • Paste build up on the underside of the stencil • Squeegee pressure too high • Poor gasketing of the stencil
<p>Mid-Chip solder balling</p>		<ul style="list-style-type: none"> • 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

<p>Bridging of SOIC leads</p>		<ul style="list-style-type: none"> • Excessive solder paste slump • Excess paste deposition • Poor resolution of the paste as printed on the board
<p>Bridging, causing a short circuit</p>		<p>Smearing of paste on bottom side of the stencil</p> <ul style="list-style-type: none"> • Reduce squeegee pressure • Wipe underside of stencil <p>Component placement pressure too high</p>
<p>De-Wetting</p>		<p>Poor solderability of pads</p> <p>Pad contamination</p>
<p>De-Wetting</p>		<p>Deactivation of flux</p> <ul style="list-style-type: none"> • Preheat time and temperature too long

De-Wetting		<p>Poor solderability</p> <ul style="list-style-type: none"> • Component lead contamination • Preheat time and temperature too long – deactivating the flux <p>Yellow appearance – time above liquidus too long or excessive reflow temperature</p>
De-Wetting		<ul style="list-style-type: none"> • 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 <p>Peak temperature too high</p>
Dull Joints		<p>Too long above liquidus – oxidizes solder surface</p> <p>Formation of intermetallics – Cu-Sn</p> <p>Slow cooling causes rough coarse solder structure</p> <p>Disturbance of solder joints before cool down – conveyor line vibration</p>