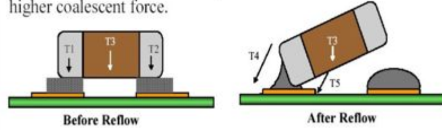
Reflow Soldering Process

Lead Free Soldering Damages – Tombstoning (1/2)

EFSOT reseach program

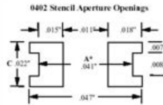
TOMBSTONE FAILURE

Lead-free Solder paste is more prone to tombstone failures due to higher coalescent force.



T1 & T2 : Tack Force
T3 : Weight
T4 : Surface Tension (outside)
T5 : Surface Tension (underneath)

- Tombstone failures are attributed to lead-free solder paste and the presence of blind vias under pads.
- Different aperture designs could be used to help to reduce the paste volume at the extremities and limit the tombstone failures.



35 avantec Performance Chemicals

Tombstoning

Typical tombstoning problems are:

Board Design	Pad size too large Identical pad geometry Bad pad location	Better board design
Printing process	Print size Print geometry Dirty, clogged stencil Stencil too thick Print off center Print repeatability	New stencil Stencil cleaning Use smaller size Printer calibration
Solder paste	Low surface tension Low wetting property Paste out of date Changing temperatures Dry solder paste	Use good solder paste Correct storage Good equipment and same conditions
Placement of components	Bad location (off center) Low placement force Repeatability	Adjustment, calibration
Soldering	Heating too fast Heating too slow	Adjust solder profile

Reflow Soldering Process

Lead Free Soldering Damages – Tombstoning (2/2)

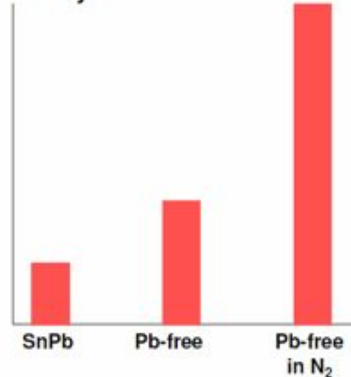
EFSOT reseach program

TOMBSTONE FAILURE

SnPb

Lead-free

Tombstone sensitivity



34 avantec Performance Chemicals