

Loctite GC10 Compatibility with Underfill UF3810 and Encapsulant EN 3838T

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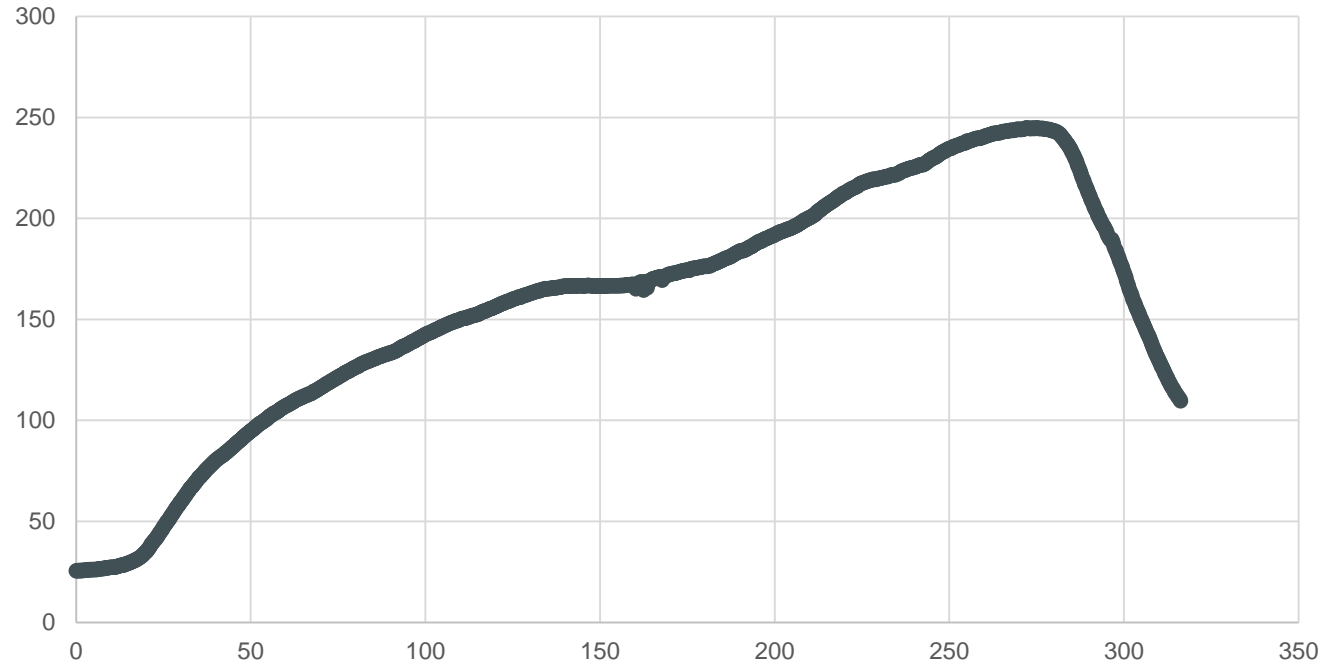
Project Description

- Evaluate compatibility of Loctite GC10 with Henkel underfill UF3810 and Henkel encapsulant 3838T.
- Test Methods
 - Loctite GC 10 and UF3810
 - DSC
 - P-lap
 - SIR
 - Loctite GC10 and 3838T
 - DSC
 - SIR

DSC Test

- Solder paste was dispensed into a DSC pan and reflowed under a standard Pb-free profile.
- Test material was added into the DSC pan with the ratio of solder paste: test material = 3:1.
- Test material and reflowed-solder mixture was further cured under DSC.
- DSC results were compared to pure test material.

Reflow Profile



- Peak 245C, TAL 60sec

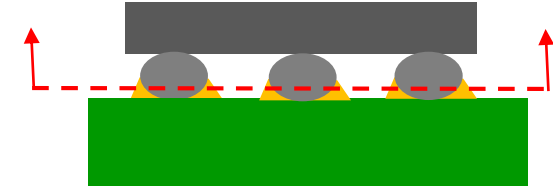
DSC Results Summary

	Onset Temp (C)	Peak Temp (C)	Heat of Reaction (J/g)
3810 only	108	130	282
GC10: 3810=3:1	107	131	287
3838T only	126	134	194
GC10:3838T=3:1	126	134	188

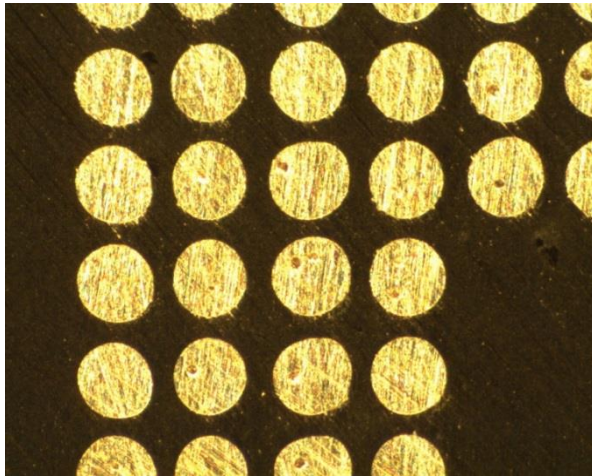
- No observable impact of GC10 on 3810 or 3838T curing by DSC.

P-Lap Test (Applicable for Underfill Only)

- Process: Solder Printing > Comp P/P > Reflow > Underfill > P-lap
- Stencil: 4mil
- Testing vehicle: 6x6mm WLCSP (0.4mm pitch)
- Reflow: lead-free, N2
- Targeted P-lap area: Near solder base and flux rich area
- Compatible underfill: hard (cured)
- Incompatible underfill: Soft/Liquid (un-cure/incomplete cure)



**Result of 3810 and GC10
(hard/cured underfill around solder base
No indication of cure inhibition)**



Example of Incompatible sets



Surface Insulation Resistance

- **Test Vehicle**

- Fine pitch board, IPC B24 format
 - Comb A/D line/space 0.1/0.1mm
 - Comb B/C line/space 0.1/0.2mm

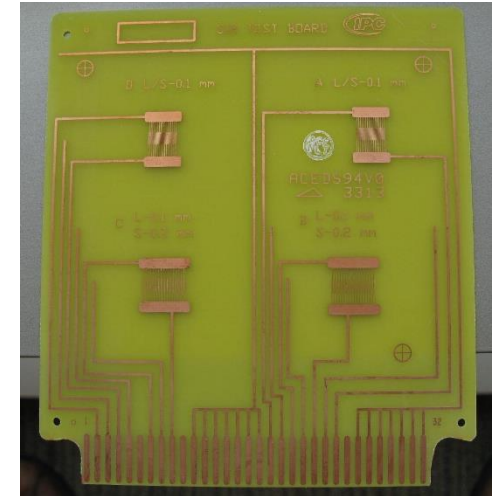
- **Testing Legs**

- Blank (control)
- GC10
- GC10+3810
- GC10+3838T

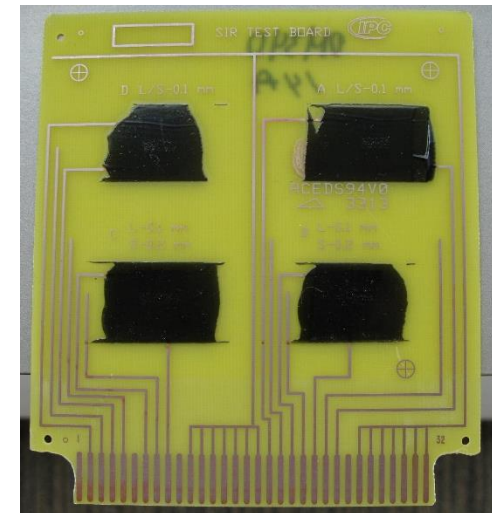
- **Test Conditions**

- 65C/90%RH for 168hrs
- Biased 20V
- Measurement - 50V

Fine pitch board

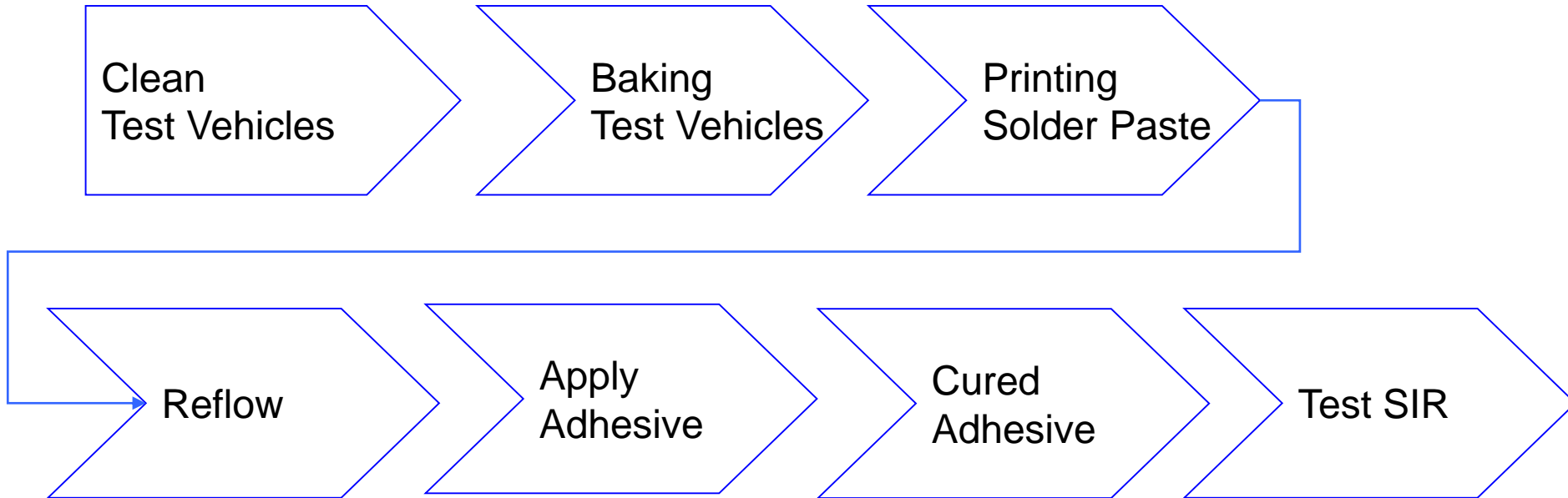


Test board with material



Surface Insulation Resistance

Board Preparation



Results

- All testing legs passed SIR test criteria (resistance $\geq 10E8$ at 96hrs and 168hrs checkpoints)
- No visual evidence of discoloration, corrosion or dendritic growth.

Summary

- Loctite GC10 is compatible with Henkel underfill UF3810 and Henkel Encapsulant 3838T.