

Data Package

3103WLV-3104WXL

Henkel Westerlo TCS - 2018

| Agenda

- 1. Introduction**
2. Cure schedules
3. Viscosity measurements
4. Properties
5. Reliability Data

| CE3103WLV – CE3104WXL

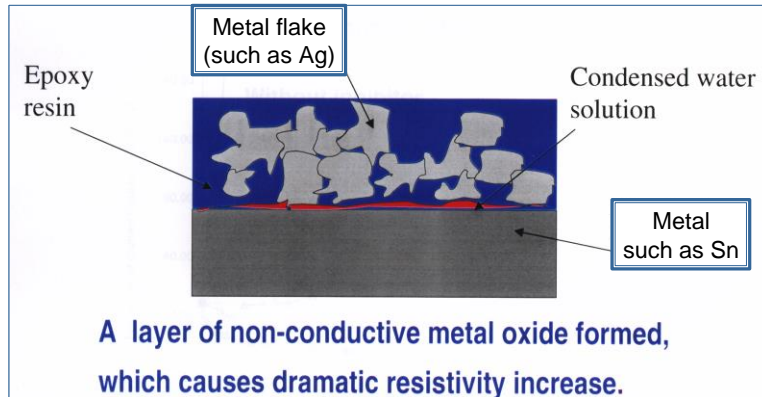
Introduction

Technology	Rigid Ag Epoxy 1 component heat cure
Operating temperature	-40°C / +150°C
Cure	3min@150°C
Product benefits	Lead free alternative to solder, cure possibilities using standard solder reflow profile Low viscosity for good dispensing (CE3103WLV) Anti-corrosion technology
Applications	Bonding of noble passive components onto noble terminated LTCC boards Bonding of Sn or AgSn coated Cu ribbon to front contact (TCO) of thin film PV cells
CE3103WLV vs CE3104WXL	CE3103WLV for dispensing CE3104WXL for printing
Primary manufacturing site	Westerlo IDH CE3103WLV: 1189520 (10CC – 25g) IDH CE3104WXL: 1189530 (10CC – 25g)

| CE3103WLV – CE3104WXL

Introduction

- Traditional electrically conductive adhesives display an unstable contact resistance on common electronic metallisations such as Cu, SnPb and Sn under elevated temperature and humidity.
 - ⇒ Formation of an electrochemical cell resulting in oxidation of non-noble metallisation.
- Metals with electrochemical potential $< 0,40$ V
 - ⇒ Potential risk of unstable contact resistance : galvanic corrosion
- Based on these fundamental understandings, Henkel developed electrically conductive adhesives using anti-corrosion agent (US patents 6344157, 6583201)



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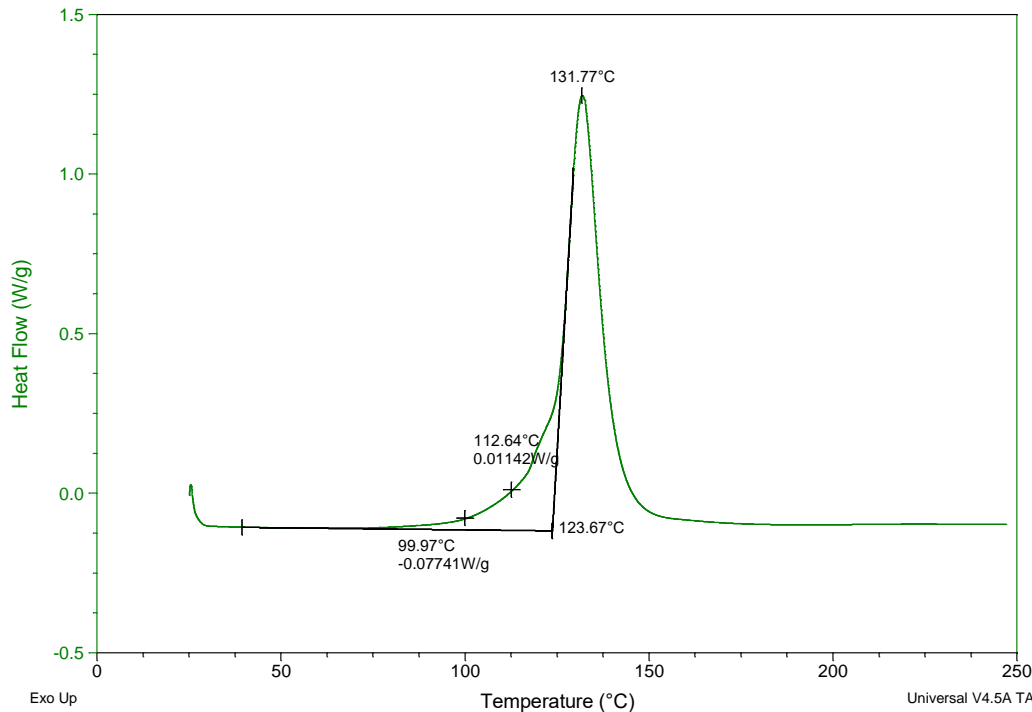
Cure Schedules – Dynamic DSC

Sample: CE 3103 WLV liquid #62760
Size: 14.4000 mg
Method: DYN 25- 250 10°MIN

DSC

File: I:\...CE 3103 WLV LIQUID 62760.001
Operator: hg
Run Date: 03-Dec-2007 20:06
Instrument: DSC Q1000 V9.8 Build 296

Test: Dynamic DSC – CE3103WLV
Aluminum Hermetic Pan – 14,4 mg
Range: 25°C – 250°C
Ramp: 10°C / minute



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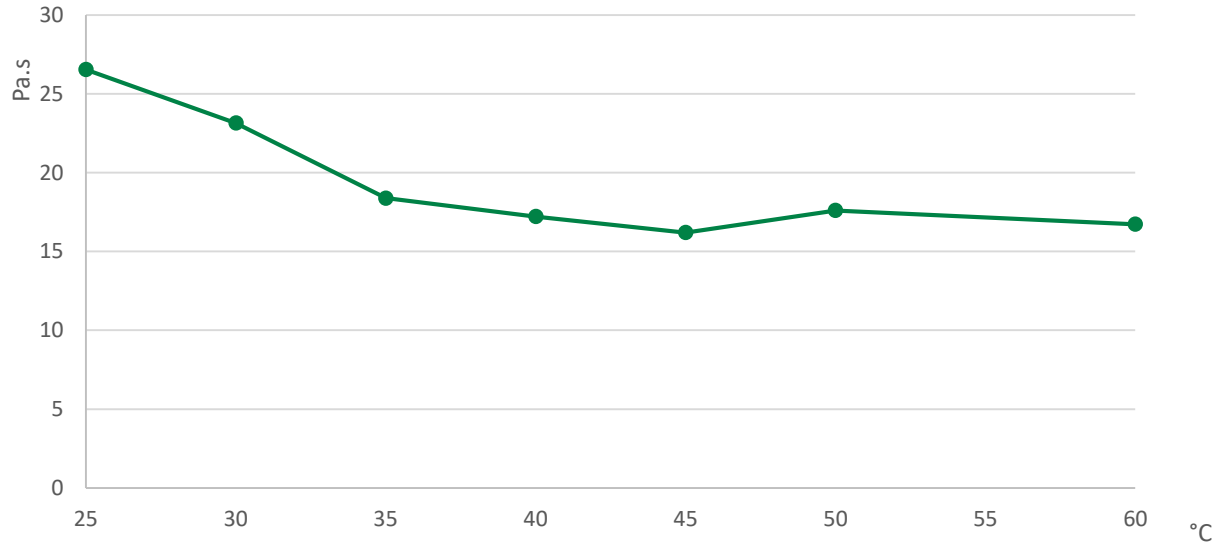
Viscosity Measurements – IFO Temperature

Test parameters:

Method: TP-Ag – Plate 2 cm – Gap 200 μ - 15s-1

Device: Rheometer TA-AR 200

Sample: CE3103WLV



> Viscosity of CE3103WLV is going down a little in function of the application temperature

CE3103WLV – CE3104WXL

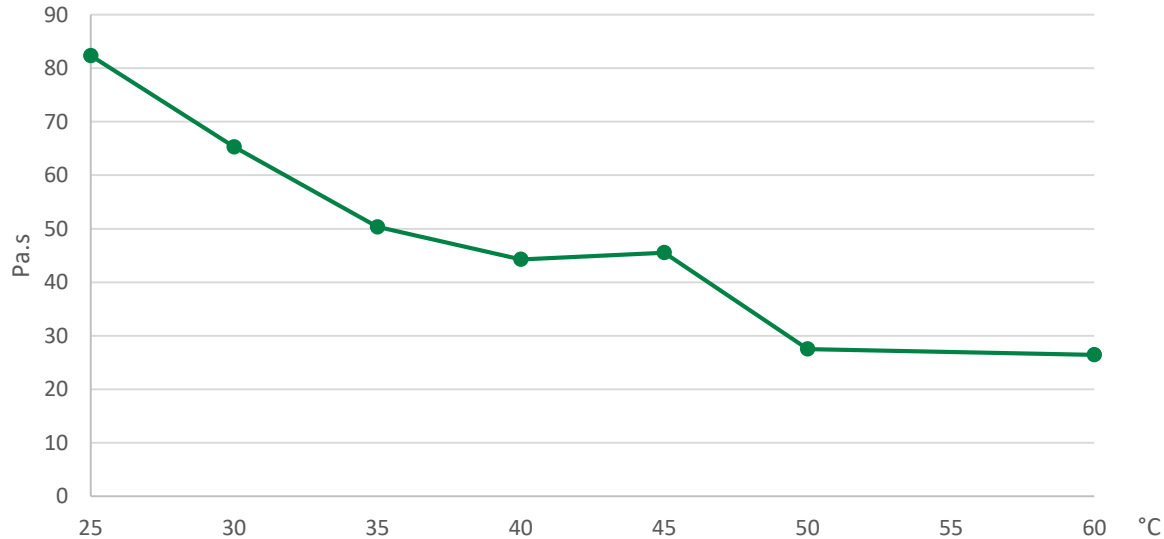
Viscosity Measurements – IFO Temperature

Test parameters:

Method: TP-Ag – Plate 2 cm – Gap 200 μ - 15s-1

Device: Rheometer TA-AR 200

Sample: CE3104WXL



> Viscosity of CE3104WXL is going down a lot more in function of the application temperature

CE3103WLV – CE3104WXL

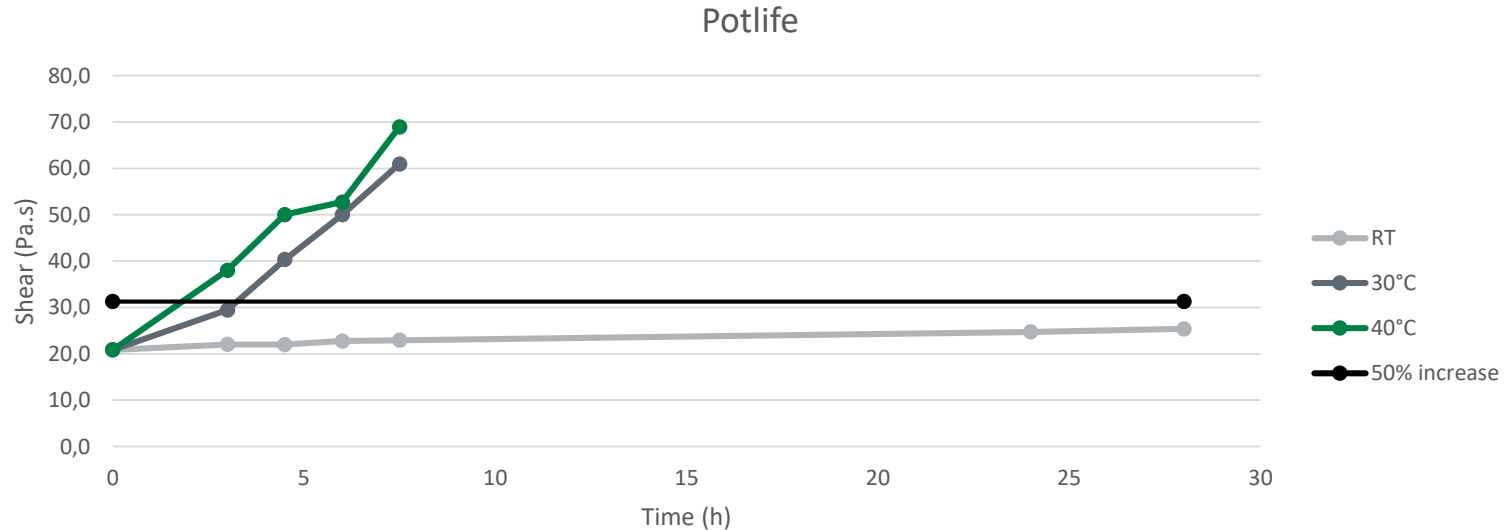
Viscosity Measurements – Potlife

Test parameters:

Method: TP-Ag – Plate 2 cm – Gap 200 μ

Device: Rheometer TA-AR 200

Sample: CE3103WLV



> Potlife of CE3103WLV is depending a lot on the application temperature

CE3103WLV – CE3104WXL

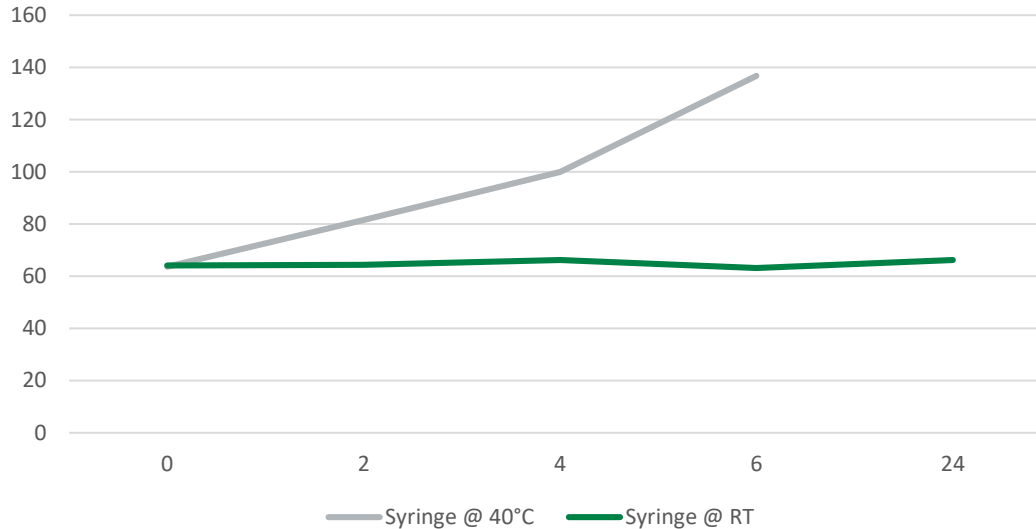
Viscosity Measurements – Potlife

Test parameters:

Method: TP-Ag – Plate 2 cm – Gap 200 μ

Device: Rheometer TA-AR 200

Sample: CE3104WXL



- > Potlife of CE3104WXL is depending a lot on the application temperature
- > Temperature should be controlled during printing

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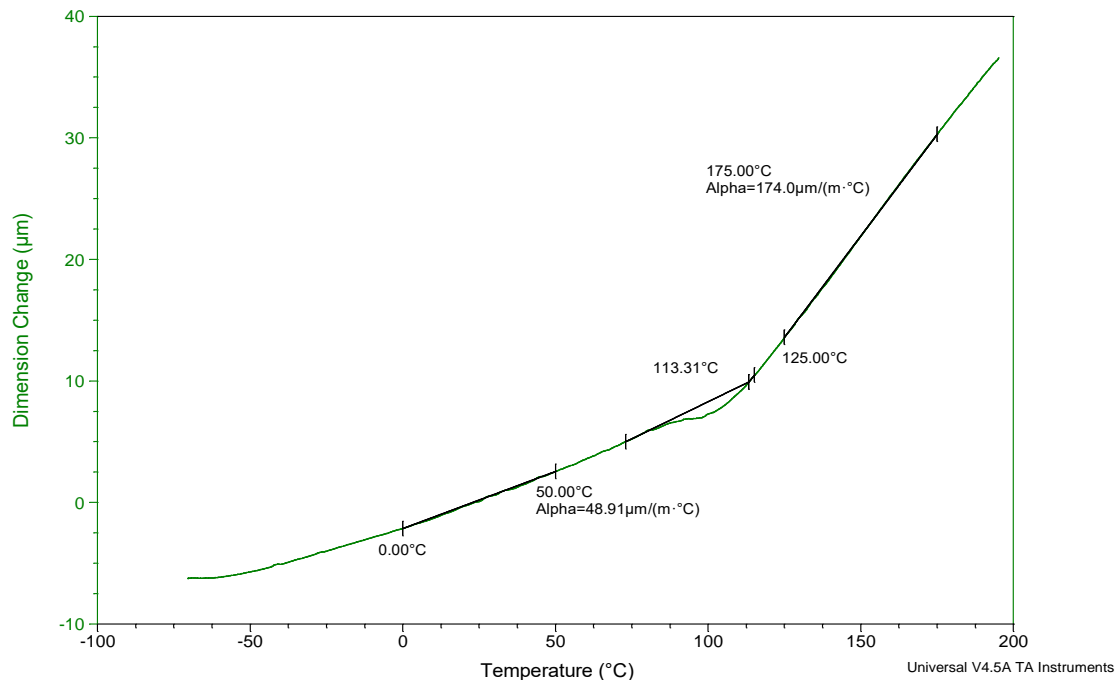
CE3103WLV – CE3104WXL

TMA – Tg and CTE

Sample: CE3103WLV 15-6-15 TEST 2
Size: 1.9196 mm
Method: -70 to 200/10°min 0.2N + 0.02N

TMA

File: G:\...CE3103WLV 15-6-15 TEST 2.001
Operator: ML
Run Date: 15-Jun-2015 15:21
Instrument: TMA Q400 V22.5 Build 31



Test: TMA
Sample: cured 5 min @ 150°C
Range: -50 to 150°C
Ramp: 10°C / minute
CE3103WLV

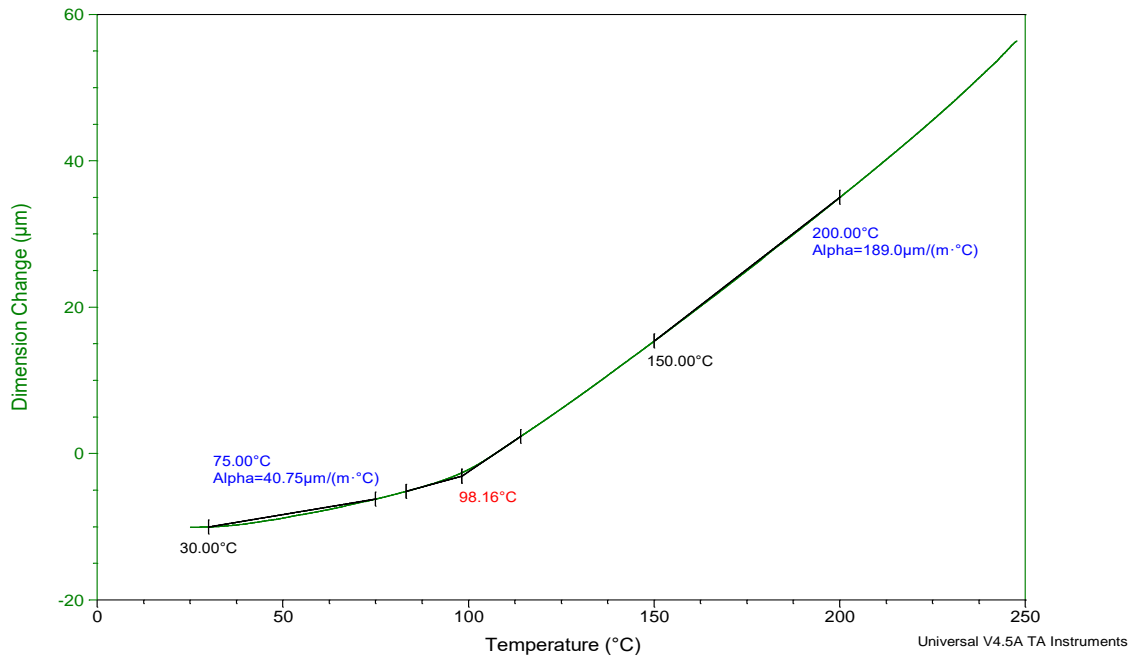
CE3103WLV – CE3104WXL

TMA – Tg and CTE

Sample: CE3104WXL #O25F992021 r2 T1
Size: 2.0782 mm
Method: 25 to 250°C/10°min 0.02N
Comment: ECA datapackage

TMA

File: G:\...CE3104WXL #O25F992021 R2 T1.001
Operator: iv
Run Date: 17-Jul-2015 12:03
Instrument: TMA Q400 V22.5 Build 31



Test: TMA
Sample: cured 5 min @ 150°C
Range: -50 to 150°C
Ramp: 10°C / minute
CE3104WXL

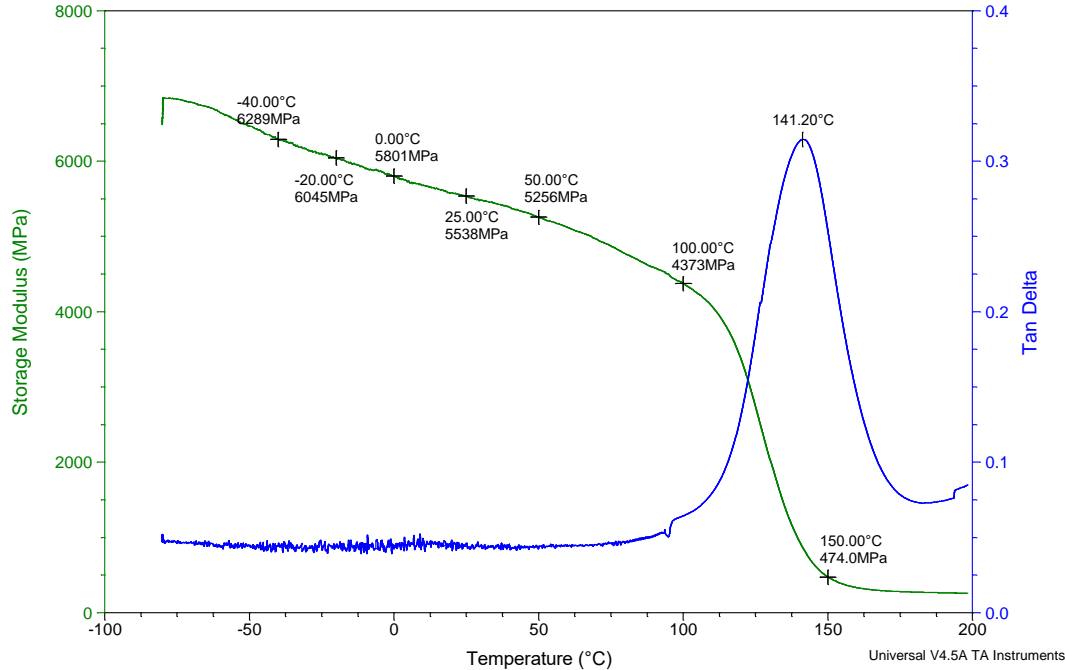
CE3103WLV – CE3104WXL

DMA – Modulus

Sample: CE 3104 WXL
Size: 13.7950 x 8.7720 x 0.2350 mm
Method: E-modulus van -80 tot 200
Comment: cure: 30 min 150°C

DMA

File: I:\...lelec cond prod\CE 3104 WXL (1).001
Operator: hg
Run Date: 27-Oct-2008 12:55
Instrument: 2980 DMA V1.7B



Test: DMA
Sample: cured 5 min @ 150°C
Range: -50 to 200°C
Ramp: 10°C / minute
CE3104WXL

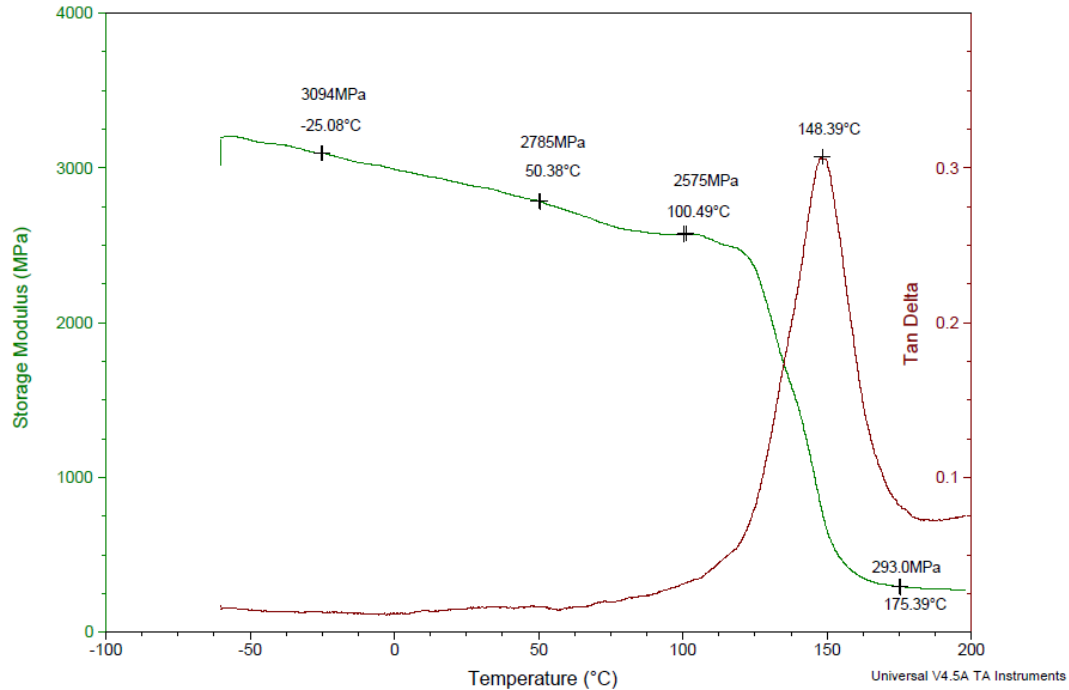
CE3103WLV – CE3104WXL

DMA – Modulus

Sample: CE3103WLV 1st
Size: 14.4440 x 5.9300 x 0.1300 mm
Method: E-modulus van -80 tot 150

DMA

File: G:\SharonalCE3103WLV\CE 3103WLV.001
Operator: RVDE
Run Date: 23-Mar-2012 09:16
Instrument: 2980 DMA V1.7B



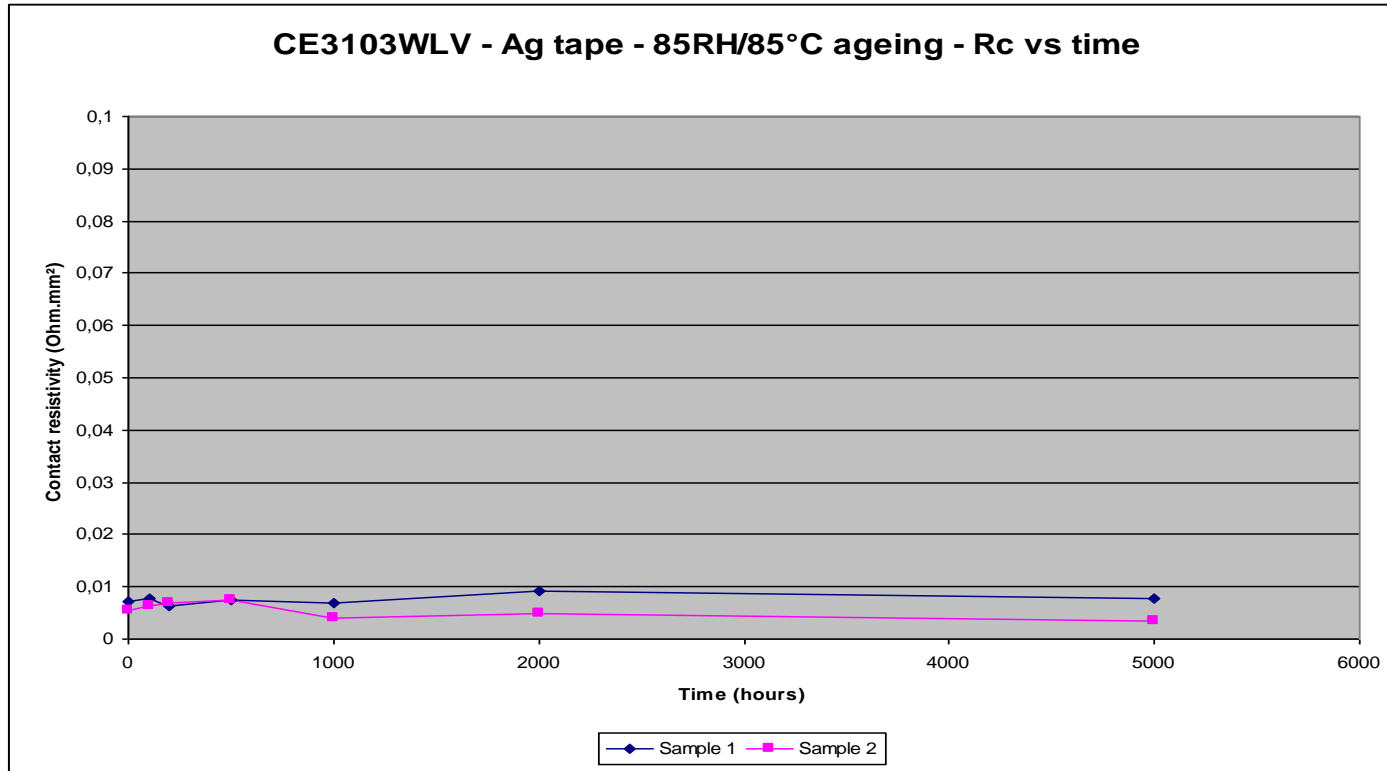
Test: DMA
Sample: cured 5 min @ 150°C
Range: -50 to 200°C
Ramp: 10°C / minute
CE3103WLV

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Reliability – SJCR after 85/85

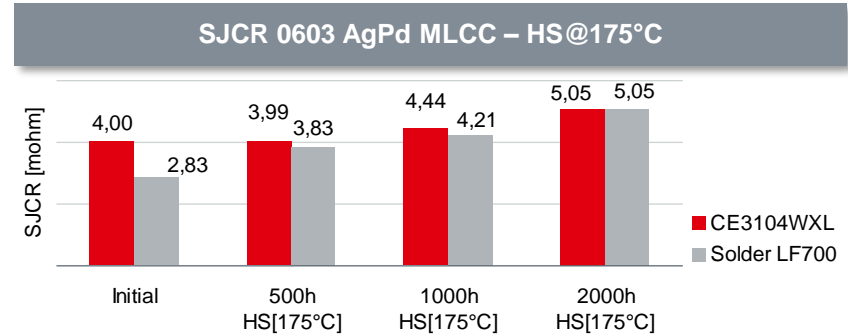


Electrically Conductive Adhesives

Products – CE3103WLV/CE3104WXL

Product	CE3104WXL				
Test	Electrical Reliability of Assembled Components 0603 AgPd MLCC				
Substrate	Au-plated High Tg PCB				
Test	SJCR & DSS after HS 175°C				
Cure	Reflow solder profile @ 260°C				
Z1	Z2	Z3	Z4	Z5	Z6
250°C	210°C	210°C	210°C	280°C	320°C
Speed	65 cm/min				

- CE3103WLV/CE3104WXL can be used as a solder replacement, shows the capability to cure under standard solder reflow profiles.
- In addition, CE3103WLV/CE3104WXL can be cured in a conventional oven
- 3 min @ 150°C
- 10 min @ 120°C



Thank you!