

# LED-3 Non-Refrigeration

**Halide Free Ultra Life Paste  
SAC 305 (Sn96.5/Ag3.0/Cu0.5)**

## DESCRIPTION

**LED-3** has been formulated to provide increased stability at room temperatures whilst maintaining excellent printing and wetting properties.

**LED-3** gives bright, smooth and shiny void free solder joints with low, clear, post process residues that make for reliable pin probe testing.

**LED-3** is particularly suitable for fine pitch printing due to reduced particle size.

## BENEFITS

- Does not require refrigeration
- Prints down to at least 0.2mm
- Decreased "head-in-pillow" problem
- Constant viscosity during 3 days continuous printing
- Constant viscosity during storage for 30 days up to 50°C
- Superior wetting and spreading characteristics
- Reduces or eliminates voiding, particularly under BGA's
- High resistance to slumping
- High humidity resistance
- High resistance to solder balling
- Extended stencil life
- 3 - 5 day tack time

### Typical specification and test results

	Specification
Alloy	96.5Sn, 3.0Ag, 0.5Cu
Flux type and content	11.5% RMA
Particle size	T4 20-38 Micron
Alloy melting temp	216-221°C
Viscosity	180
Tensile Strength (MPa)	37
Elongation	33%
Wetting time	1.58 sec
Silver Chromate Test	No discolouration
Insulation resistance	Pass
Electromigration	Pass
J-STD-004	ROLO

## APPLICATION

If the product has been refrigerated allow to warm up to room temperature (at least 8 hours) if using for the first time. Stir with a spatula for at least 30 seconds to ensure homogenisation of paste. Apply sufficient paste to stencil to allow a smooth even roll. A bead diameter of 1/2 to 5/8 inch is normally sufficient. Squeegees should be set at 60° for highest print definition. Pressure should be around about 0.28-0.33Kg/sq cm, print speed 20-150mm/sec with 0.0mm snap-off distance (on contact).

Do not store new and used paste in the same container. Once a pot of paste has been opened, replace the internal plug, re-seal and store in a cool place out of direct sunlight. Do not return to fridge Paste that has not been opened may be kept in a refrigerator for at least 8 months.

Paste can be stored at up to 50°C for 30 days without affecting viscosity.

This paste does not require refrigerated storage, however can be stored in a fridge if you prefer.

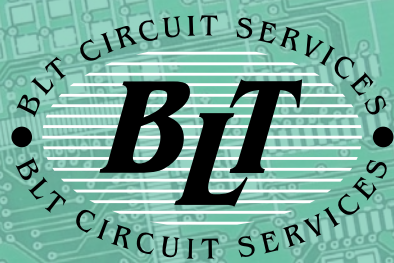
## REFLOW

The **LED-3** paste can be reflowed using any of the two most commonly used profile types i.e RSS (Ramp-Soak-Spike) and RTS (Ramp-To-Spike). Please refer to Reflow Profile on page 2.

## EQUIPMENT AND CIRCUIT CLEANING

BLT manufactures a range of aqueous and solvent cleaning equipment for stencils and misprinted boards. SCS/1 and SCS/2 are particularly recommended for use with LED-3 series solder pastes.

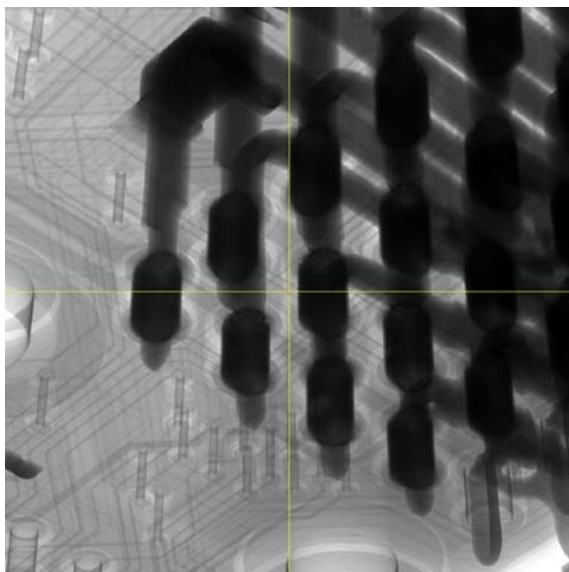
Post cleaning is not necessary for **LED-3**, but however, should cleaning be necessary, Vigon N640 or Vigon US are recommended.



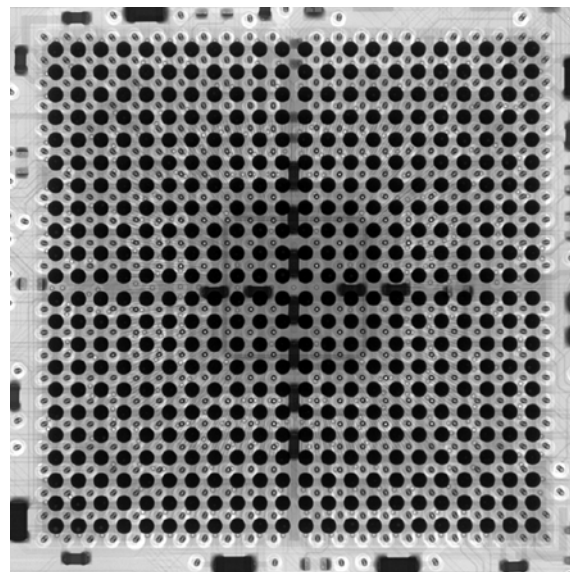
# ***LED-3 Non-Refrigeration***

***Halide Free Ultra Life Paste  
SAC 305 (Sn96.5/Ag3.0/Cu0.5)***

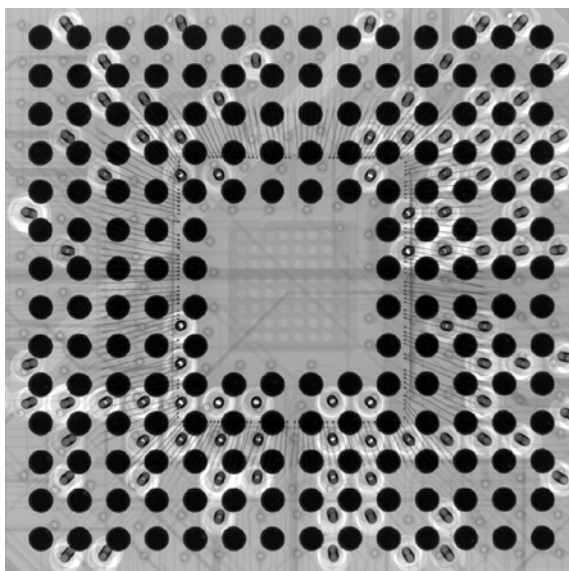
## **TYPICAL X-RAY EXAMPLES**



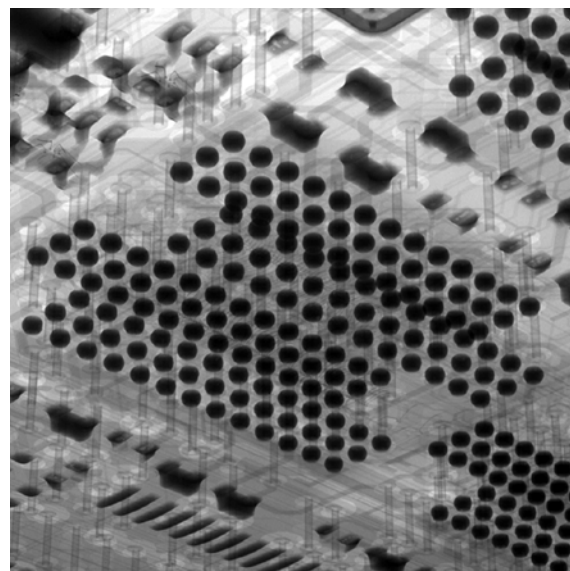
**Pin In-Hole**



**Micro-BGA**

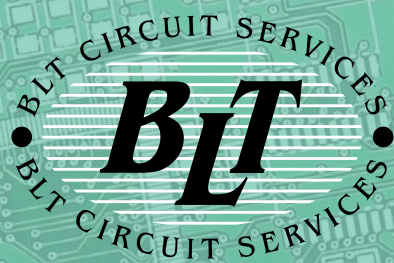


**BGA**



**3D SMD Devices**



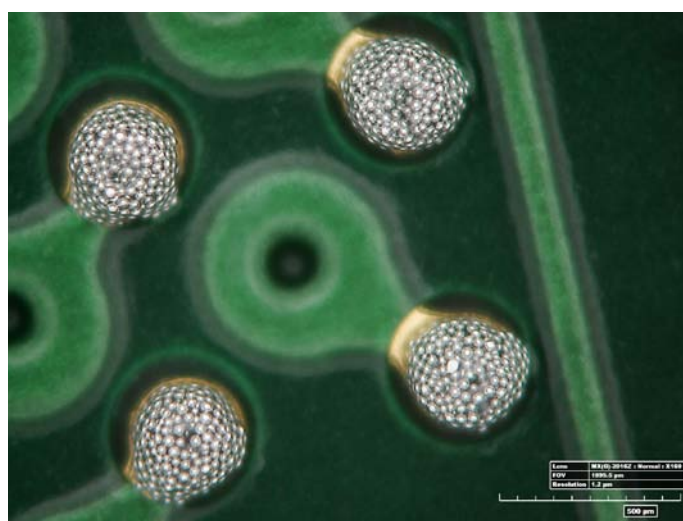
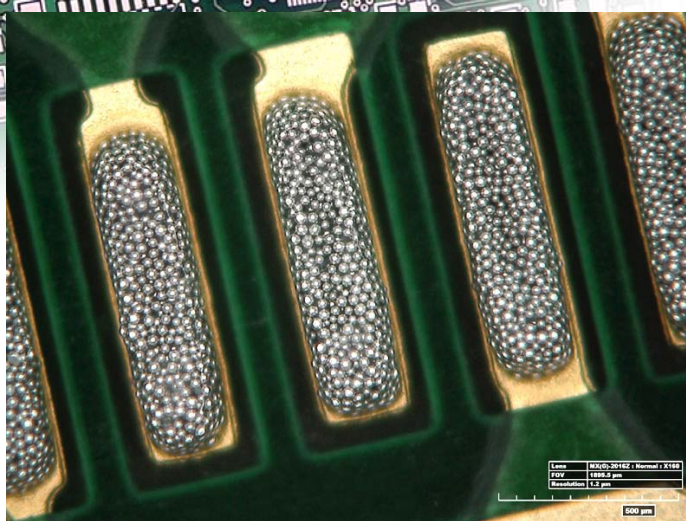


# LED-3 Non-Refrigeration

**Halide Free Ultra Life Paste  
SAC 305 (Sn96.5/Ag3.0/Cu0.5)**

## SUPPORT DATA & TEST RESULTS

### Printability



*Type 4 Solder Spheres 20-38 microns giving excellent printing definition.*

### Recommended Reflow Profile

*Typical Profile length 3-4.5 minutes*

*Initial heating rate 1-4°C*

*Soak time from 150-180°C 60-90 secs or 60-120 seconds if using a faster initial heating rate to 170°C Ramp*

*From 180°C to peak 2-3°C per second*

*Time above 220° C 45-75 seconds*

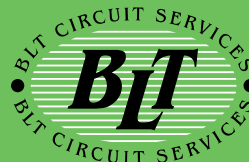
*Peak temp 240-260°C\* \*To accommodate some LED component profiles*

*Cool down 2-5°C per second*

*Please find two examples of a typical RSS and RTS with the LED-3 paste on the following 2 pages.*

### Warranty

*All reasonable endeavours have been made to ensure that the information contained in this data sheet is accurate, but it is submitted on the express condition that BLT Circuit Services Ltd. shall be under no liability whatsoever in respect thereof or for any loss, injury, damage or liability of whatsoever nature arising, suffered or incurred as a consequence of its use.*



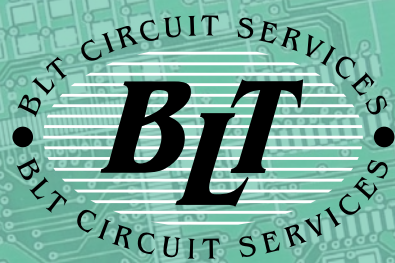
BLT Circuit Services Ltd  
Brome Industrial Estate,  
Brome, Eye, Suffolk,  
IP23 7HN England

**Telephone** +44 (0)1379 870870

**Fax** +44 (0)1379 870970

**Email** sales@blt.keme.co.uk

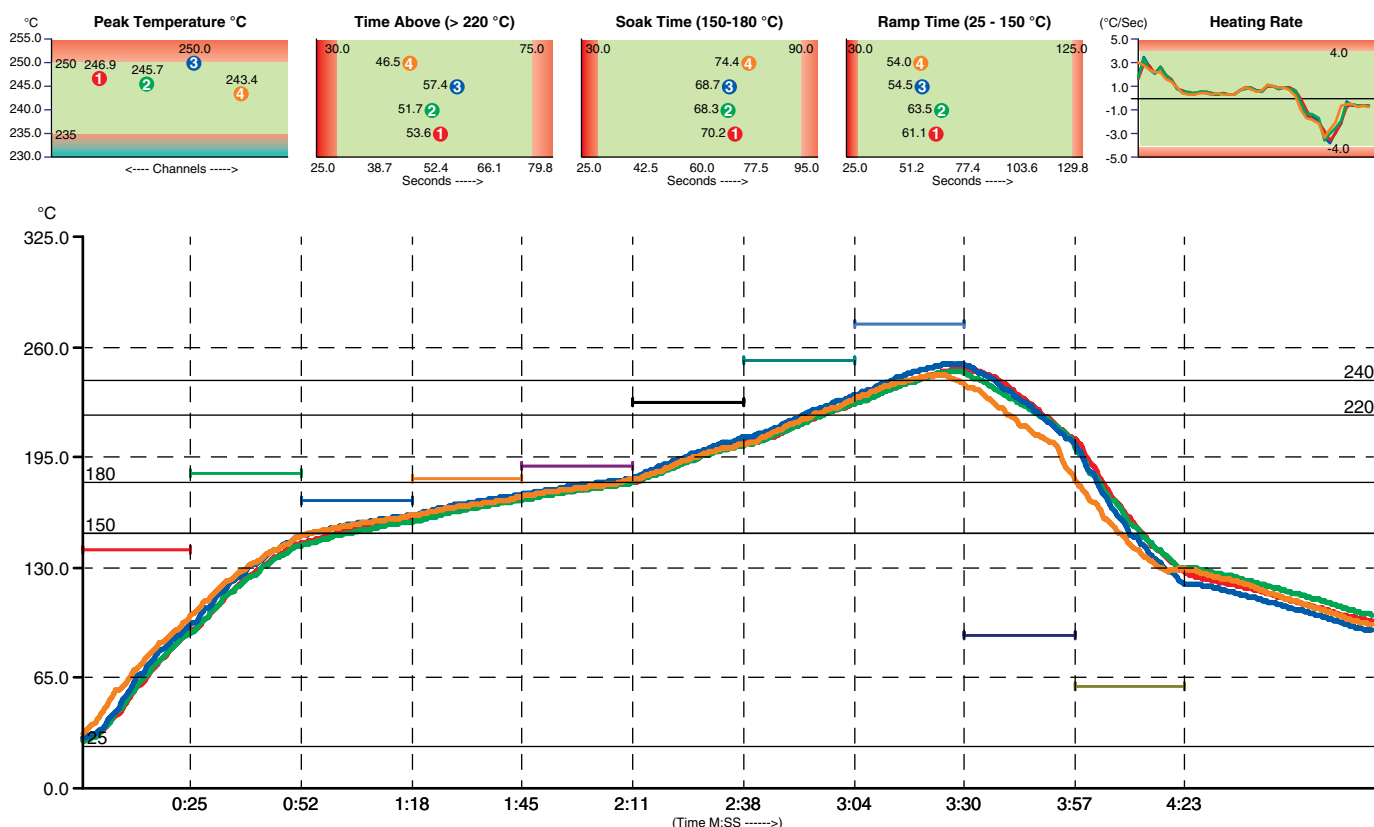
**Web** www.bltcircuitservices.co.uk



# LED-3 Non-Refrigeration

Halide Free Ultra Life Paste  
SAC 305 (Sn96.5/Ag3.0/Cu0.5)

## RAMP SOAK SPIKE DATA



### Process Parameters

Solder Type: BLT LED 3 Solderpaste

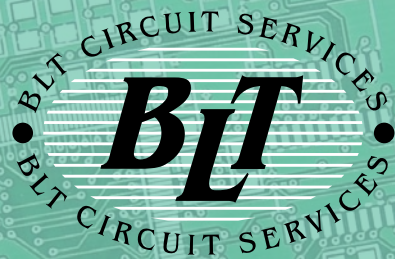
	Min	Max
Soak Time (150-180°C)	30 seconds	90 seconds
Time Above (t>220°C)	30 seconds	75 seconds
Peak Temperature	235°C	260°C

### Zone Setpoints (Machine: : Soltec quantis) Recipe: Ramp Soak Spike

95.00 cm/min (N2)	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	10
Top Heater (°C)	140	186	170	182	190	227	252	273	90	60
Bottom Heater (°C)	140	186	170	182	190	227	252	273	90	60

	Process Data									Zone Slopes (°C/Sec)											
Channel	Peak	25-150	t=150	t=180	150-180	t=220	t>220	t>240	t=Peak	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	Max+	Max-
1	246.9	61.1	61.1	131.3	70.2	176.8	53.6	20.0	3:29.0	2.9	2.2	0.5	0.5	0.3	1.0	1.0	0.9	-2.1	-3.7	2.9	-3.7
2	245.7	63.5	63.5	131.8	68.3	177.8	51.7	15.0	3:29.0	3.3	2.4	0.6	0.5	0.5	0.9	1.0	0.9	-2.7	-3.7	3.3	-3.7
3	250.0	54.5	54.5	123.2	68.7	172.1	57.4	25.0	3:29.0	3.5	2.5	0.5	0.5	0.5	1.0	1.1	0.9	-2.5	-4.2	3.5	-4.2
4	243.4	54.0	54.0	128.5	74.4	175.4	46.5	11.0	3:24.6	3.0	2.2	0.5	0.4	0.6	0.9	1.0	-1.0	-3.8	-3.1	3.0	-3.8
Delta	6.6	9.5	9.5	8.6	6.1	5.7	10.9	14.0	14.0	0.6	0.3	0.1	0.1	0.3	0.1	0.1	1.9	1.7	1.1	0.6	0.5
Mean	246.50	58.27	58.27	128.70	70.40	175.53	52.30	17.75	17.75	3.17	2.33	0.53	0.47	0.47	0.95	1.02	0.43	-2.78	-3.68	3.17	-3.85

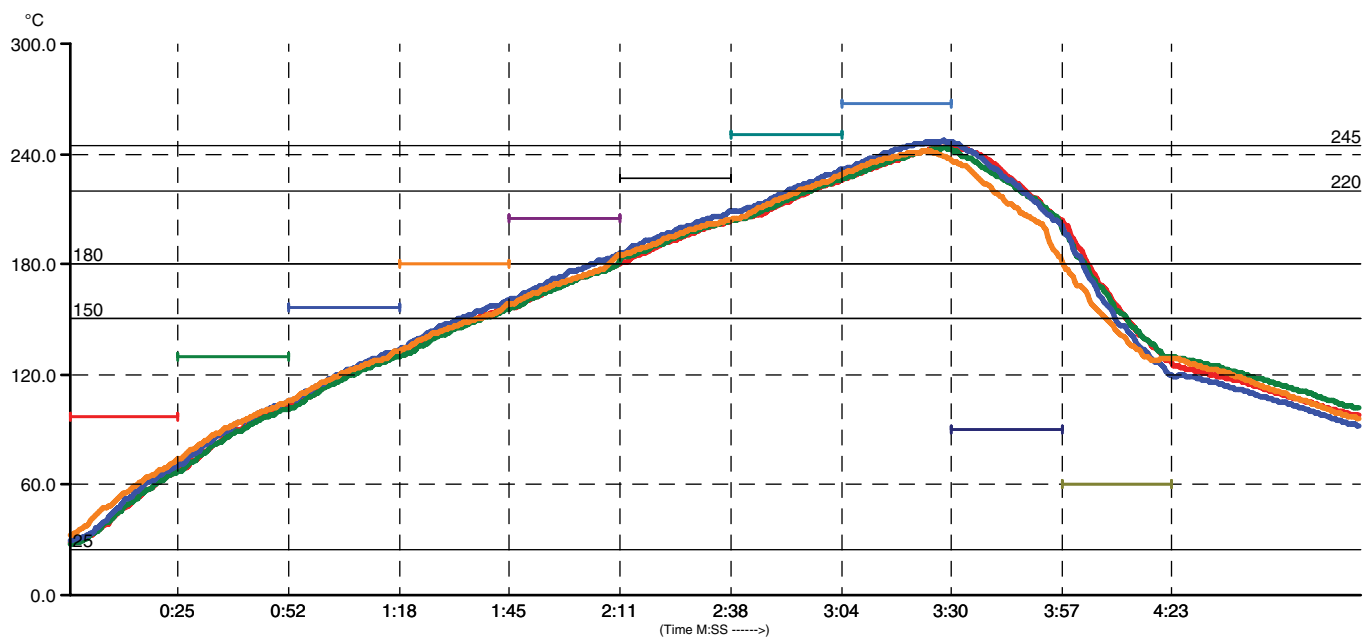
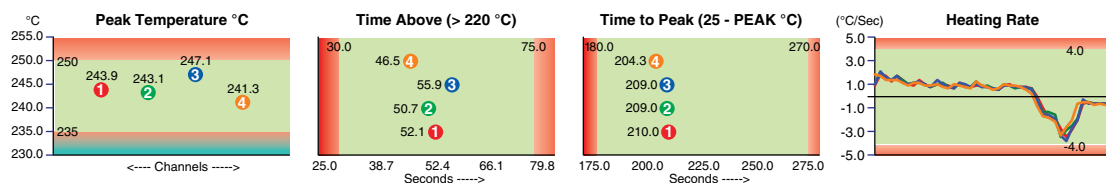




# LED-3 Non-Refrigeration

**Halide Free Ultra Life Paste  
SAC 305 (Sn96.5/Ag3.0/Cu0.5)**

## RAMP TO SPIKE DATA



### Process Parameters

**Solder Type: BLT LED 3 Solderpaste**

	Min	Max
Soak Time (150-180°C)	40 seconds	90 seconds
Time Above (t>220°C)	30 seconds	75 seconds
Peak Temperature	235°C	260°C

### Zone Setpoints (Machine: : Soltec quantis) Recipe: Ramp To Spike

95.00 cm/min (N2)	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	10
Top Heater (°C)	97	130	156	180	205	227	250	267	90	60
Bottom Heater (°C)	97	130	156	180	205	227	250	267	90	60

	Process Data									Zone Slopes (°C/Sec)											
Channel	Peak	25-150	t=150	t=180	150-180	t=220	t>220	t>245	t=Peak	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	Max+	Max-
1	243.9	210.0	97.2	131.3	34.1	177.3	52.1	0.0	3:29.0	1.8	1.5	1.1	1.0	0.9	1.0	1.0	0.8	-2.1	-3.6	1.8	-3.6
2	243.1	209.0	98.6	131.3	32.7	177.3	50.7	0.0	3:29.0	2.0	1.6	1.2	1.2	1.2	1.0	0.9	0.8	-2.7	-3.6	2.0	-3.6
3	247.1	209.0	92.9	125.1	2.2	172.1	55.9	10.0	3:29.0	2.1	1.7	1.2	1.2	1.0	1.0	1.0	0.8	-2.4	-4.1	2.1	-4.1
4	241.3	204.3	97.2	129.4	32.2	174.9	46.5	0.0	3:24.6	1.8	1.5	1.2	1.0	1.3	0.8	0.9	-0.9	-3.8	-3.1	1.8	-3.8
Delta	5.8	5.7	5.7	6.2	1.9	5.2	9.4	10.0	0.0	0.3	0.2	0.1	0.2	0.4	0.2	0.1	1.7	1.7	1.0	0.3	0.5
Mean	243.85	208.07	96.48	129.28	32.80	175.40	51.30	2.50	0.00	1.93	1.58	1.18	1.10	1.10	0.95	0.95	0.38	-2.75	-3.60	1.93	-3.78