

Technical Information for SMT Adhesive

Product Name: JU-90-2LTH

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Koki Company Ltd.

1. Product Specification

Before Curing

Item	Condition/ Unit	Performance	Note	
1	Appearance/Color	-	Red Paste	-
2	Specific Gravity	20 °C	1.19	Density Cup Method
3	Viscosity	20 °C/ Pa·s	65±10	Cone-Plate Viscometer
4	Thixotropic Index	20 °C	6.0±1.0	Cone-Plate Viscometer
5	Non-volatile Content	105°C×3h/%	>99	JIS K 6833
6	Storage Stability	<10 °C (refrigerated)	6 months	-

After Curing - Curing condition: 1&2 (90 °C×90sec), 3-6&10 (100 °C×60sec), 7-9 (100 °C×20min)

Item	Condition/ Unit	Performance	Note	
1	Appearance/Color	-	Solid State Polymerized, Red	-
2	Adhesion strength	3216C	>3kg	Push-Pull force Gauge
3	Copper Plate Corrosion	40 °C×90%RH×72h	No discoloration or corrosion	-
4	Soldering Resistance	250 °C×10sec	No issue	-
5	Surface Insulation Resistance	Original (Ω)	>1×10 ¹³	JIS-II Comb pattern test board Measuring Voltage: 100V
		85 °C×85%RH×1000h (In-chamber)	>1×10 ⁹	
		Same as above (out-chamber)	>1×10 ¹³	
6	Voltage Applied Moisture Resistance Test	85 °C×85%RH×1000h	>1×10 ⁹	JIS-II Comb pattern test board Stress Voltage: 50V
7	Glass Transition Temperature	°C	49-74	TMA Method
8	Coefficient of Linear Expansion	m/m, °C	5.4×10 ⁻⁵	TMA Method
9	Boiling Water Absorption	Boiling Water, 60min/ %	0.7	Koki Method
10	Solvent Resistance	Immersion: 1h (Room Temperature)	No issue	IPA

Other

* Use this product at an ambient temperature of $30\text{ }^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$.

* Viscosity before curation may change around 35°C . Please be advised to follow the usage and storage condition in the handling guide.

This Product Information contains product performance assessed strictly according to our own test procedures and may not be compatible with results at end-users. Conduct thorough verifications and trials before mass production application to determine optimal process condition.

2. Temperature-Viscosity Change

Method

Take the sample cup from cone-plate viscometer and apply 0.1cm³ of sample in the middle of the sample cup. Attach 1.54mm ϕ , 3° cone to the viscometer and set the sample cup back on viscometer. circulate water maintained at predetermined temperature \pm 0.2 °C and start measurement while monitoring the water temperature.

Measurement Condition

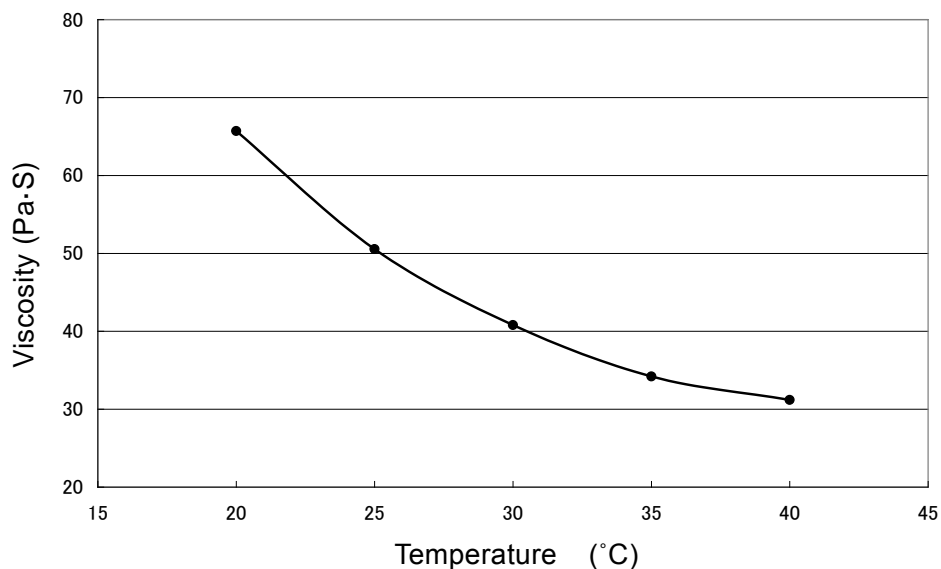
- Equipment: Cone-plate viscometer Type EHD by Toki Sangyo
- Rotation to be set at 10 rpm and measurement to be taken after 2 minutes
- Take 2 measurements and calculate average of 2 measurements which will be regarded as the viscosity. Unit is in Pa·s

Measurement Result

Temperature (°C)	20	25	30	35	40
Viscosity	65.7	50.6	40.8	34.2	31.2

(Unit: Pa·s)

Average of 2 samples



3. Temperature-Thixotropic Index

Method

Measurement method to be the same as described in 2.

Measurement Condition

- Equipment: Cone-plate viscometer Type EHD by Tokyo Keiki
- 1st measurement is taken at 1 RPM, after 2 minutes. 2nd measurement is taken at 10 RPM, after 2 minutes.
- Use following formula to calculate thixotropic index.

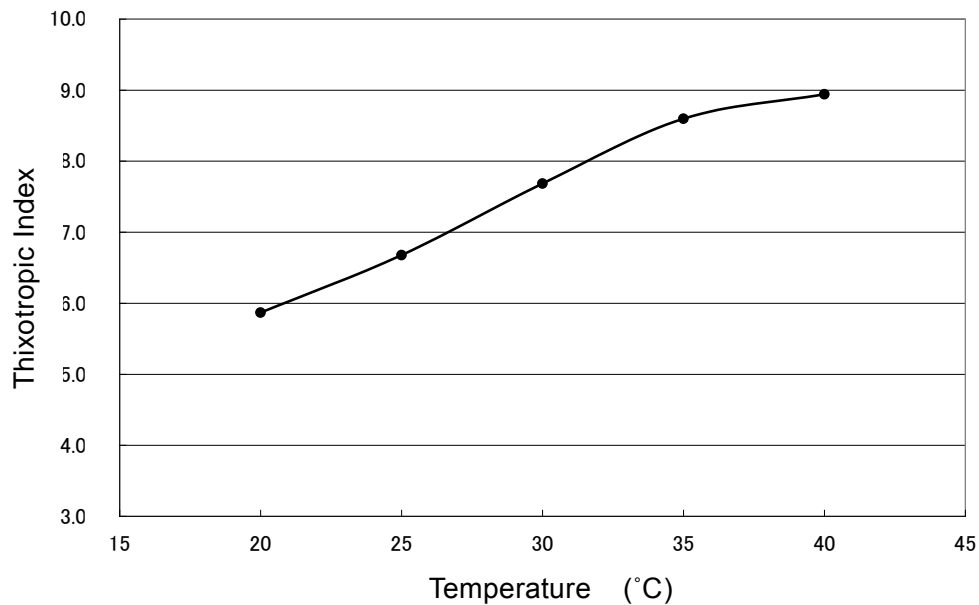
$$\text{Thixotropic Index} = \frac{\text{viscosity at 1 RPM}}{\text{viscosity at 10rpm}}$$

- Take 2 measurements and calculate average of 2 measurements which will be regarded as the viscosity. Unit is in Pa·s.

Measurement Result

Temperature (°C)	20	25	30	35	40
Thixotropic Index	5.9	6.7	7.7	8.6	8.9

Average of 2 samples



4. Storage Stability

Method

Put 100cm³ of sample in a reagent bottle and close the lid. Store at temperature controlled chamber for predetermined time. Chamber shall be set at 10 °C, 25, 30 and 35±2 °C Take measurement on viscosity. Measurements will be taken as same as description under Temperature-Viscosity section.

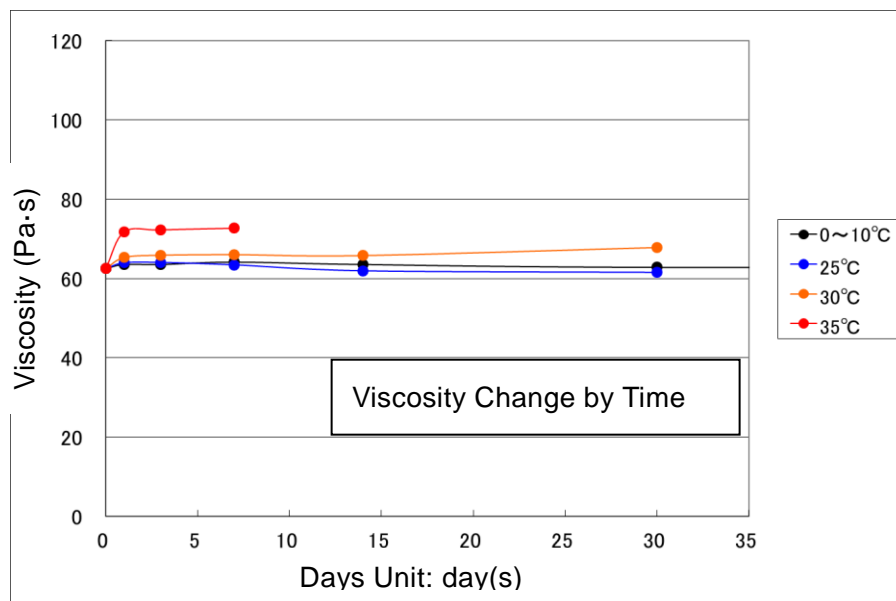
Measurement Condition

- Equipment: Cone-plate viscometer Type EHD by Toki Sangyo
- Rotation to be set at 10 rpm and measurement to be taken after 2 minutes
- Take 2 measurements and calculate average of 2 measurements which will be regarded as the viscosity. Unit is in Pa·s

Measurement Result

Result		Days Passed						
		0 day	1 day	3 days	7 days	14 days	30 days	180 days
Viscosity (Pa·s)	10 °C	63	64	64	64	64	63	62
	25 °C	63	64	64	63	62	62	-
	30 °C	63	65	66	66	66	68	-
	35 °C	63	72	72	73	Viscosity Failure	-	-

(Unit: Pa·s)



5. Cure Temperature and Time, and Adhesion Strength

Method

Apply 0.2mg of sample on glass epoxy board. Mount chip resistor (3216C) in the middle of the sample and slightly push down. Cure this test samples by specified curing condition and let them cool down. Measure the adhesion strength by pushing component to its longitudinal direction.

Measurement Condition

Equipment: Push-pull force gauge (number of samples=5)

Cooling time: Within 1 hour from curing

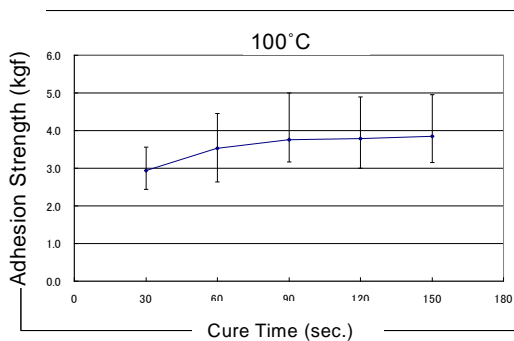
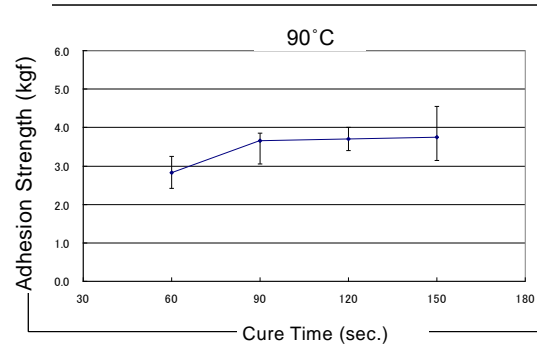
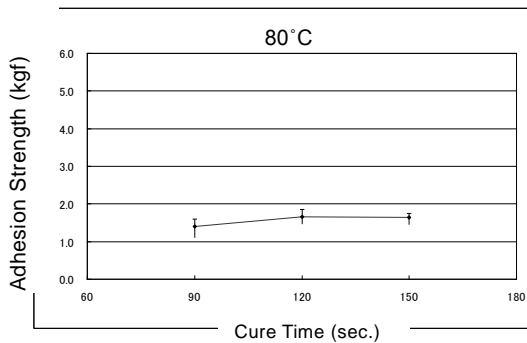
Sample Application Condition

Applicator: Ultra 1400 (Portable dispenser by EFD)

Nozzle: 22G Single needle (inner diameter: 0.42mm)

Result		Cure Time				
		30 sec	60 sec	90 sec	120 sec	150 sec
Temp. (°C)	80 °C	-	-	1.4	1.7	1.7
	90 °C	-	2.8	3.7	3.7	3.8
	100 °C	2.9	3.5	3.8	3.8	3.9

Unit: (kgf)



6. Surface Insulation Resistance

Method

Apply sample on the lines on JIS-II comb pattern electrode test board, whereas the height of applied sample should be 200 μ m. Cure the test sample at 100 $^{\circ}$ C for 1 minute.

Measure the surface insulation resistance of test sample (at an ambient temperature and humidity), then place in an environmental test chamber conditioned at 85 \pm 2 $^{\circ}$ C, 85 \pm 3% RH for 1000 hours straight.

Measure the insulation resistance at each given time.

Measurement Condition

- Equipment: Environmental test chamber, capable of maintaining 85 \pm 2 $^{\circ}$ C, 85 \pm 3% RH

Ohmmeter: 4329A by Yokogawa HP

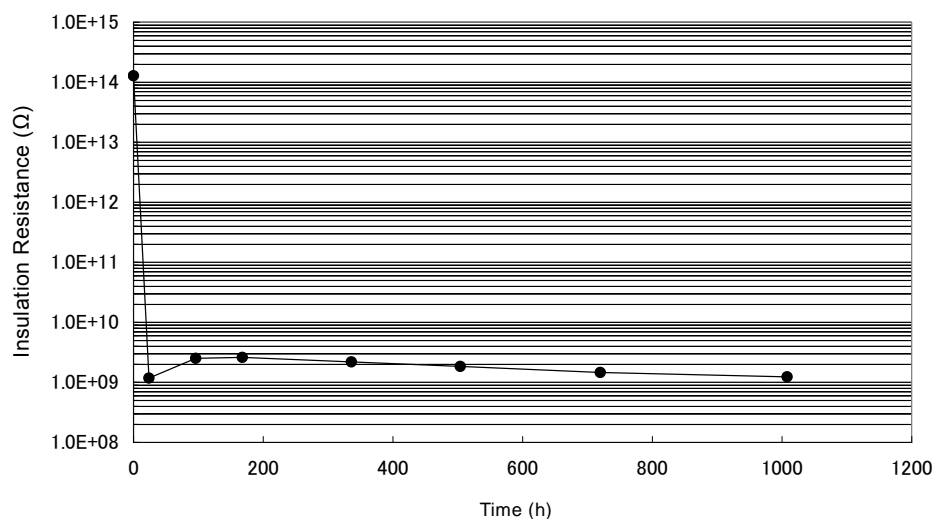
Measurement Results

1.5E+14 is equivalent to 1.5 \times 10¹⁴

	initial	24h	96h	168h	336h	504h	720h	1008h	Outside
n1	1.1E+14	1.0E+09	2.0E+09	2.1E+09	1.8E+09	1.5E+09	1.2E+09	1.0E+09	1.9E+14
	2.0E+15	1.3E+09	2.8E+09	2.8E+09	2.4E+09	2.0E+09	1.6E+09	1.3E+09	5.0E+14
	7.5E+13	1.4E+09	3.0E+09	3.0E+09	2.6E+09	2.1E+09	1.7E+09	1.4E+09	5.0E+13
	2.0E+15	1.1E+09	2.2E+09	2.2E+09	1.9E+09	1.6E+09	1.2E+09	1.1E+09	3.0E+14
n2	2.0E+15	1.1E+09	2.2E+09	2.5E+09	1.9E+09	1.6E+09	1.3E+09	1.1E+09	1.3E+14
	1.4E+13	1.4E+09	3.0E+09	3.0E+09	2.6E+09	2.2E+09	1.7E+09	1.5E+09	2.8E+14
	2.8E+13	1.3E+09	2.8E+09	2.8E+09	2.4E+09	2.0E+09	1.6E+09	1.4E+09	3.5E+14
	5.0E+13	1.1E+09	2.3E+09	2.3E+09	2.0E+09	1.7E+09	1.4E+09	1.2E+09	3.0E+14
n3	5.0E+13	1.1E+09	2.3E+09	2.5E+09	2.0E+09	1.7E+09	1.4E+09	1.2E+09	2.0E+15
	2.2E+13	1.3E+09	2.8E+09	3.0E+09	2.5E+09	2.1E+09	1.7E+09	1.4E+09	2.0E+15
	7.0E+13	1.3E+09	2.8E+09	3.0E+09	2.5E+09	2.1E+09	1.7E+09	1.4E+09	3.0E+14
	2.0E+14	1.1E+09	2.2E+09	2.4E+09	2.0E+09	1.7E+09	1.4E+09	1.2E+09	3.0E+14
Ave	1.3E+14	1.2E+09	2.5E+09	2.6E+09	2.2E+09	1.8E+09	1.5E+09	1.2E+09	3.3E+14

(Unit: Ω .)

SIR



7. Voltage Applied Moisture Resistance Test

Method

Apply sample on the lines on JIS-II comb pattern electrode test board, whereas the height of applied sample should be 200µm. Cure the test sample at 100°C for 1 minute.

Measure the surface insulation resistance of test sample (at an ambient temperature and humidity), then place in an environmental chamber conditioned at 85±2 °C, 85±3% RH and apply stress voltage of 50V, for 1000 hours straight.

Measure the insulation resistance at each given time.

Measurement Condition

- Equipment: Environmental test chamber, capable of maintaining 85±2 °C, 85±3% RH

Ohmmeter: 4329A by Yokogawa HP

Stress voltage: 50V

Measurement voltage: 100V

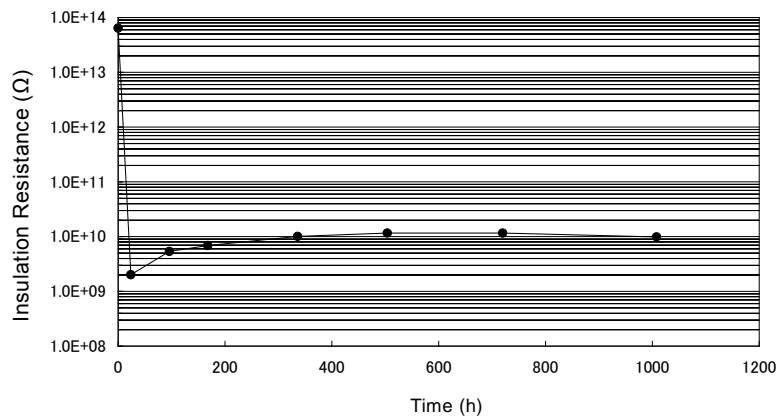
Measurement Results

1.0E+15 is equivalent to 1.0×10¹⁵

	initial	24h	96h	168h	336h	504h	720h	1008h	Out side
n1	4.5E+13	1.7E+09	5.0E+09	6.0E+09	8.5E+09	9.8E+09	9.5E+09	8.0E+09	1.8E+14
	2.2E+13	2.2E+09	5.8E+09	8.0E+09	1.2E+10	1.3E+10	1.3E+10	1.2E+10	2.4E+14
	3.5E+13	2.2E+09	5.6E+09	7.5E+09	1.2E+10	1.3E+10	1.3E+10	1.2E+10	3.0E+14
	1.3E+14	1.7E+09	5.0E+09	5.8E+09	8.5E+09	9.5E+09	1.0E+10	8.5E+09	1.6E+14
n2	2.4E+13	1.9E+09	5.0E+09	6.3E+09	9.0E+09	1.0E+10	9.8E+09	8.5E+09	2.8E+14
	1.9E+13	2.4E+09	6.0E+09	8.0E+09	1.2E+10	1.4E+10	1.3E+10	1.2E+10	2.2E+14
	4.5E+13	2.4E+09	6.0E+09	8.0E+09	1.2E+10	1.4E+10	1.4E+10	1.3E+10	3.0E+14
	1.4E+14	2.0E+09	5.1E+09	6.8E+09	9.5E+09	1.0E+10	1.1E+10	9.0E+09	3.5E+14
n3	1.5E+14	1.7E+09	5.0E+09	5.8E+09	8.5E+09	1.0E+10	1.0E+10	8.4E+09	2.4E+14
	1.2E+14	2.2E+09	5.4E+09	7.4E+09	1.2E+10	1.4E+10	1.4E+10	1.1E+10	2.4E+14
	5.0E+13	2.2E+09	5.4E+09	7.3E+09	1.1E+10	1.4E+10	1.4E+10	1.2E+10	3.0E+14
	4.0E+14	1.7E+09	5.0E+09	5.8E+09	8.5E+09	1.0E+10	1.0E+10	8.0E+09	2.9E+14
Ave	6.4E+13	2.0E+09	5.3E+09	6.8E+09	1.0E+10	1.2E+10	1.2E+10	9.9E+09	2.5E+14

EM

(Unit: Ω.)



* No evidence of migration occurrence

8. Handling Guide

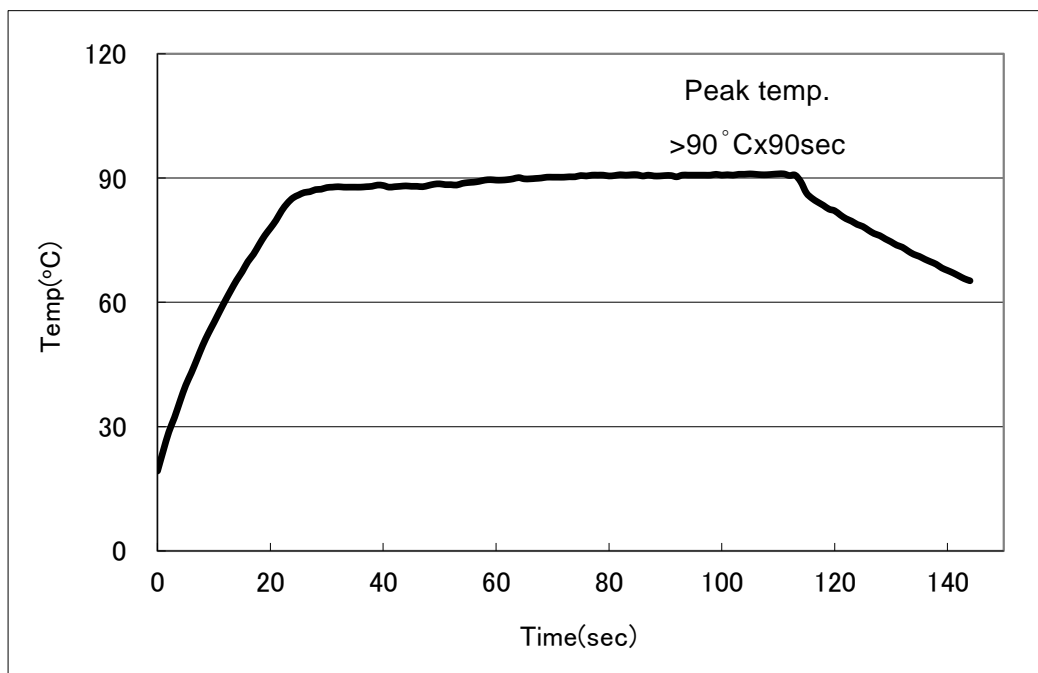
1. Application

- Method: Pneumatic dispense
- Preferred needle inner diameter: 0.3-0.6mm ϕ
- Usage temperature: <35 °C

* Using this product at an ambient temperature over 35°C may affect viscosity and deteriorate product performance.

2. Preferred Curing Condition

90 °C x 90 sec. or above



3. Storage

- Store this product in a dark refrigerated (between 0-10°C) space upon delivery.
- Storing in a high temperature (above 30 °C) environment may deteriorate viscosity.