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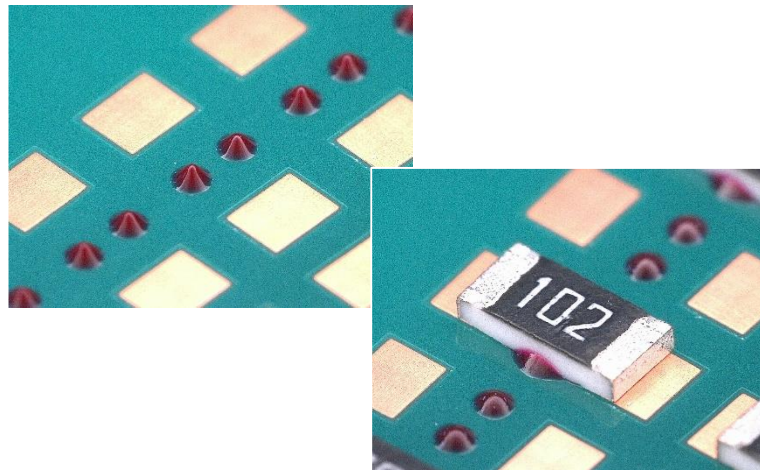
Surface Mount Adhesive for Dispensing

JU-110-3

Product Information



Disclaimer:
This Product Information contains product performance assessed strictly according to our own test procedures and are not the guaranteed results at end-users. Please conduct thorough process optimization before mass production application.

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Product Outline

- Dispense application adhesive to hold down surface mount devices prior to soldering
- Advanced storage stability
- Stable dispense shape during continuous use
- Fine pattern dispensing for components such as 0402(1005) chips
- Superior heat slump resistance allows it to retain its height during the curing process

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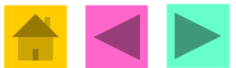

Properties – Before Curing

Purpose			Dispense Application
Product Name			JU-110-3
Property		Condition / Note / [unit]	Performance
Before Curing	Composition	—	Epoxy resin
	Appearance/ Color	Visual observation	Paste, red
	Specific Gravity	25ºC, pycnometer	1.25
	Viscosity	Cone-Plate Viscometer: 20 ºC 10rpm for 2 min. [Pa·s]	60±10
	Non-volatile Content	105 ºC,180 minutes [%]	>99.0
	Shelf Life	Refrigerated (10 ºC)	6 months
		25 ºC	1 month
	Copper Plate Corrosion	40 ºC, 95%RH, after 240 hours	No anomalies

Above results are measured performances in a lab setting and are not guaranteed performance.

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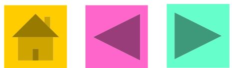

Properties – After Curing

Purpose			Dispense Application
Product Name			**JU-110-3**
Property		Condition/ Note/ [unit]	Performance
After curing	Appearance/ Color	Visual observation	Solid, reddish brown
	Copper Plate Corrosion	40 ºC,90%RH, after 240 hours*1	No anomalies
	Solder Resistance	Solder bath: SAC305, 250 ºC X10sec./ 3216R*1	No anomalies
	Solvent Resistance	Soak in solvents (IPA, acetone, etc.) for 1 hour / 3216R*1	No anomalies
	Surface Insulation Resistance	Initial (out of chamber), [Ω], JIS Z 3197 comb-pattern PCB, 200μm flat application*2	>1.0X10^{14}
		85 ºC, 85%RH, after 168 hours, in chamber*2 [Ω]	>1.0X10^{9}
		85 ºC, 85%RH,after 168 hours, out of chamber*2 [Ω]	>1.0X10^{13}
	Moisture Absorption	1 hour, in accordance with JIS K 6911 [%]*3	<1.0
	Glass Transition Temperature	DSC,10 ºC /min, room temp. ~200ºC, 2nd run [ºC]	90

Above results are measured performance in a lab setting and are not guaranteed performance. Test samples are cured under following condition depending on the amount of application for the respective test.
*1: 130 ºC X1min., *2 130 ºC X10min., *3 130 ºC X60min.

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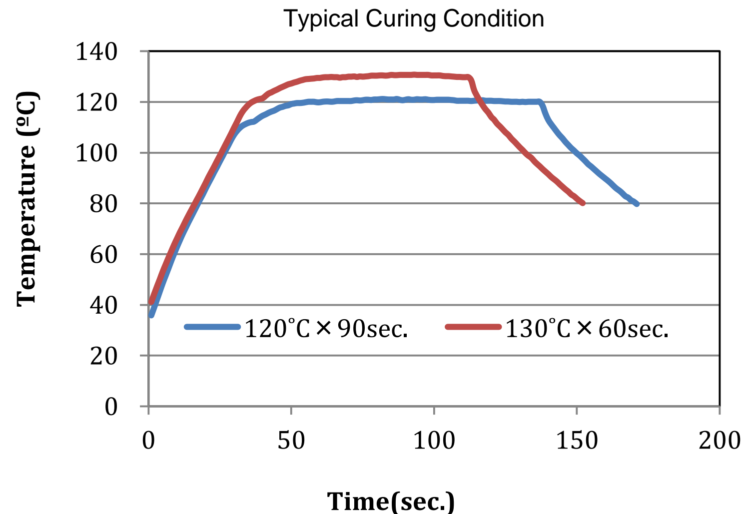
Curing Condition/ Strength

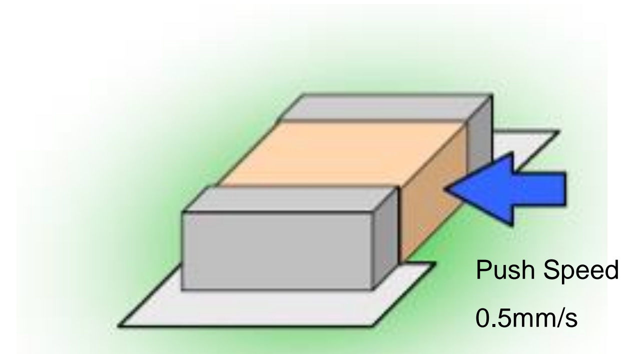
< Test Method >

Print the adhesive on a glass-epoxy PCB using a 150μm thick stencil with 0.8mmΦ aperture. Mount 3216 chip resistors and cure the adhesive. Let the board cool down to room temperature and measure the adhesion strength using a bond tester.

< Test Condition and Equipment >

Test Equipment:	Multi-purpose bond tester 4000Plus (Nordson DAGE)
Test Condition:	Push strength test, push speed 0.5mm/ sec., room temperature
PCB:	FR-4 grade glass-epoxy PCB
Heat Source:	Reflow simulator, SMT SCOPE SK-5000 (Sanyo-Seiko)
Sample Size:	32 chips per curing condition





Curing Condition/ Strength

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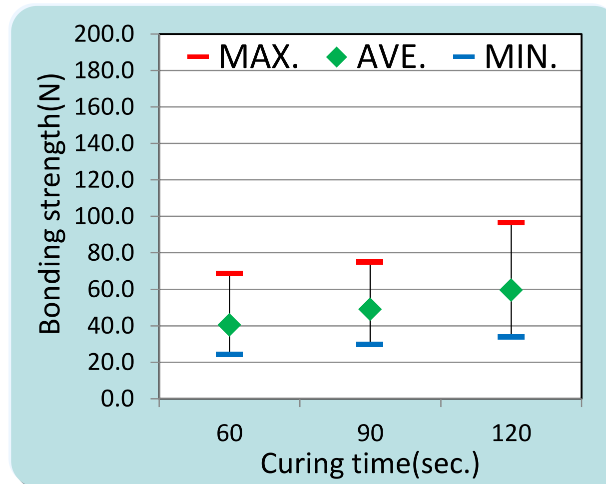
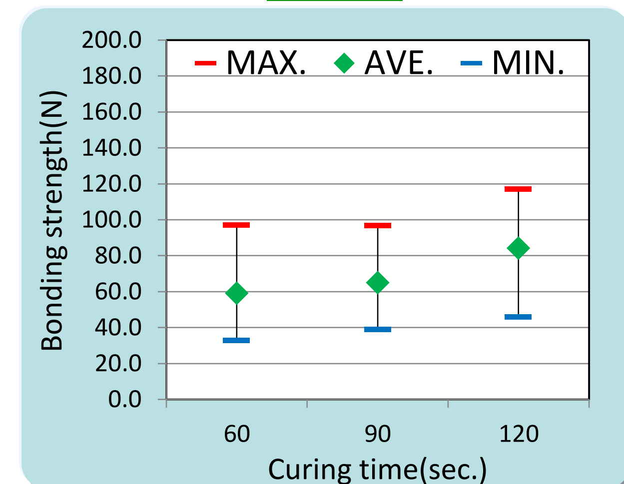
Curing Temp. (°C)		120			130		
Curing Time (sec.)		60	90	120	60	90	120
Bond Strength (N)	Ave.	40.4	49.1	59.5	59.1	64.9	84.2
	Max.	68.7	75.0	96.6	97.2	96.8	117.1
	Min.	24.3	29.8	34.0	32.9	38.9	45.8

[Unit: N]

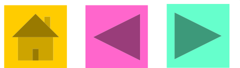
120 °C



130 °C



Recommended curing condition is 120 °C for 90 seconds or longer and 130 °C for 60 seconds or longer.



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Continuous Dispensability

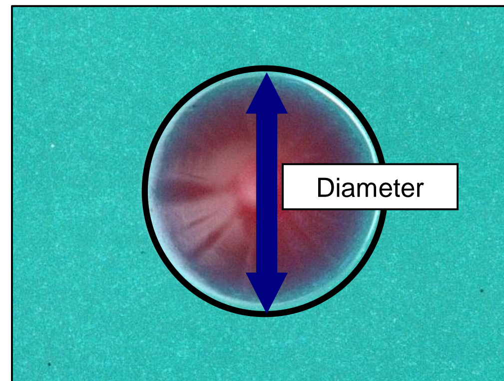
<Test Method>

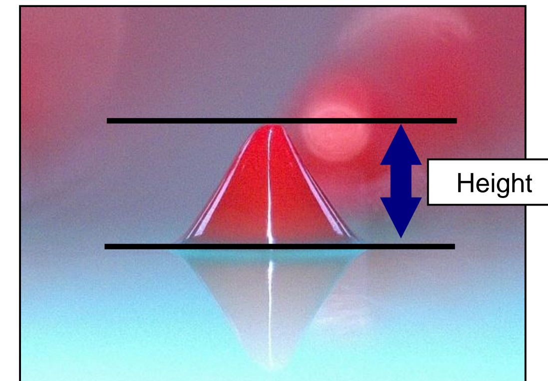
Equipment: DIGITAL MICROSCOPE VHX-600(KEYENCE)
Evaluation Method: Measure the diameter and height of 5 dispensed adhesive dots using a digital microscope at the beginning and every 2500 shots on the PCB. Take their average and plot in the graph.

<Test Equipment>

Dispenser: 350PC,ML-808FX com-CE(Air-pulse, Musashi Engineering)
Temp. Control Unit: ProcessMate 6500 (Nordson EFD)
Test PCB: FR-4, glass epoxy board
Syringe: PSY 30E (Musashi Engineering)
Nozzle: 22G single (needle length 15mm, nozzle inner 0.41mmΦ)

<Evaluation Point>

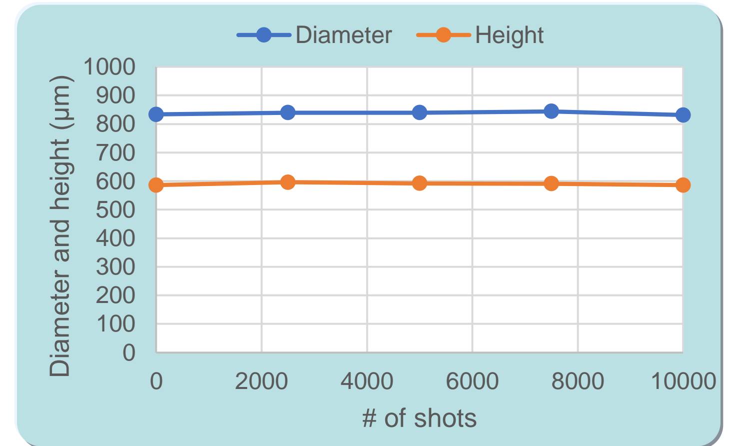


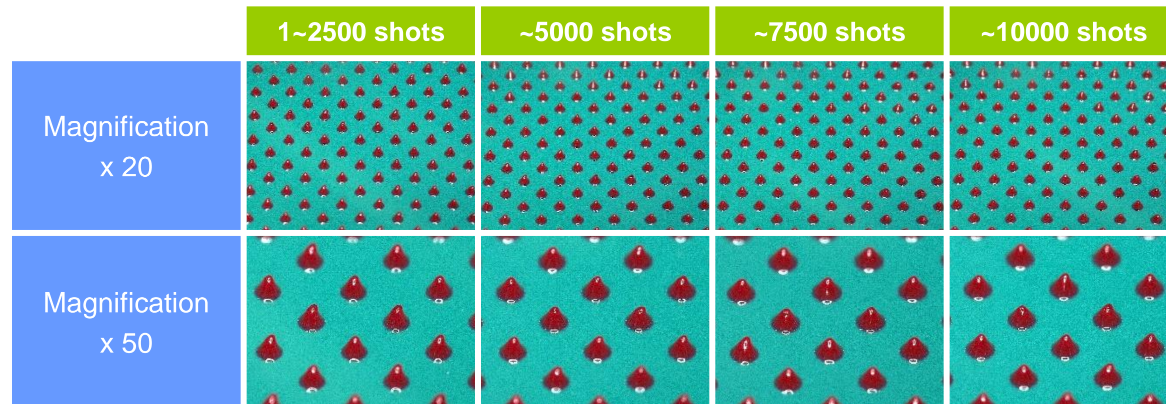


Continuous Dispensability: 22G Single Nozzle

<Equipment>

Nozzle:	22G single (needle length 15mm, nozzle inner 0.41mmΦ)
Dispense pressure:	350kPa
Dispense time:	100msec
Clearance height:	250μm
Syringe temp.:	25 ºC
Dispensing pitch:	1.6mm for both X and Y axis (2500 dots per test board)





JU-110-3 maintained stable shape throughout the continuous dispensing test.

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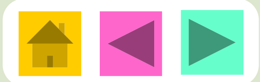

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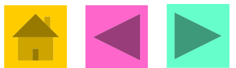
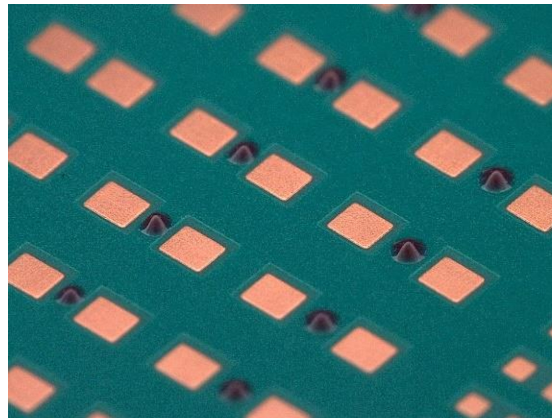


Fine Dispensability: for 0402(1005) chip

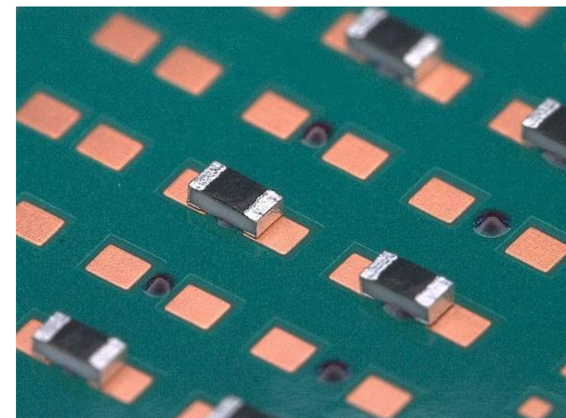
<Equipment>

Chip: 0402(1005) resistor (1.0mm x 0.5mm)
Nozzle: Φ 0.30m precise nozzle (tapered, nozzle inner 0.30mmΦ)
Dispense pressure: 100kPa
Dispense time: 80msec
Clearance height: 150μm
Syringe temp.: 30 ºC

<After Dispensing>



<After Chip mounted and Cured>



JU-110-3 is capable to dispense micro-patterns and shall be applicable even for 0603 chip component.

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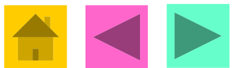


Temperature-Viscosity and Temperature-Ti Value

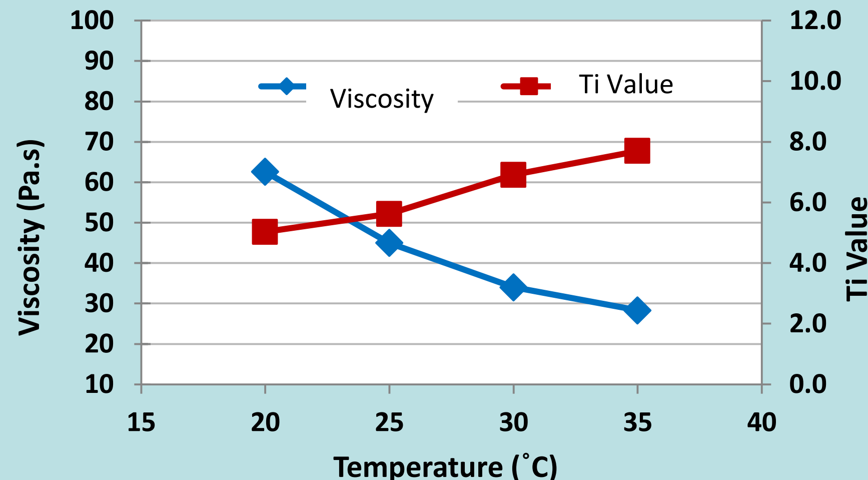
<Test Method>

Measure the viscosity and Ti value at each test condition.

<Condition>

Equipment: Cone-rotor viscometer RE-100U (Tohki Sangyo)
Test Condition: 10rpm for 2 minutes and 1 rpm for 2 minutes
Cone rotor: 3º X R7.7(CORD-7)
Ti Value = viscosity at 1rpm/ viscosity at 10rpm

<Viscometer RE-100U>



Temp. (ºC)	Viscosity (Pa.s)	Ti value
20	62.6	5.0
25	45.0	5.6
30	34.0	6.9
35	28.3	7.7

When temperature is increased, viscosity of JU-110-3 will be reduced but Ti value will increase.

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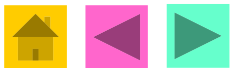
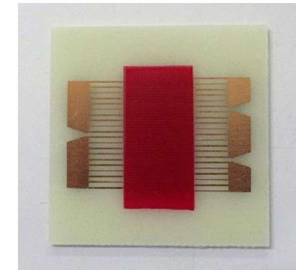


Biased Humidity Test

<Test Method>

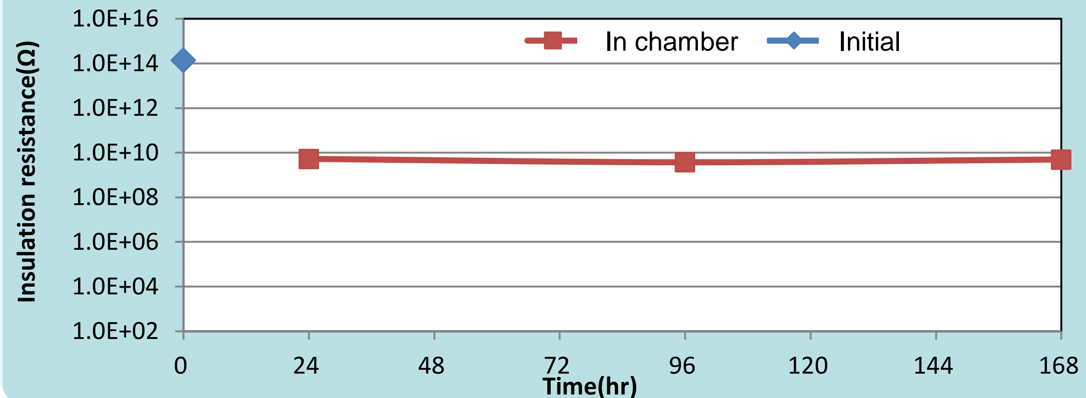
Measure the surface insulation resistance in a consistent temperature/ humidity chamber while applying bias voltage.

<Test coupon>



<Test Condition>

Test PCB: Comb-pattern board defined by JIS Z 3197
Application: Print with squeegee covering the comb patterns
Thickness: 200μm
Curing Condition: 130ºC x 10minutes
Test duration: 168hrs
Bias voltage: 50V
Measurement voltage: 100V
Chamber condition: 85 ºC/ 85%RH



JU-110-3 showed good surface insulation resistance.

Heat Slump Property

<Test Method>

Measure the diameter of dispensed adhesive before and after curing.

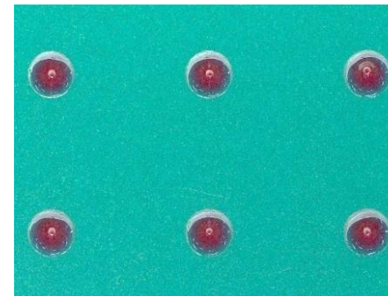
<Measurement Condition>

Test PCB: FR-4 grade glass epoxy board
Heat source: SMT SCOPE SK-5000(Sanyo-Seiko)
Curing condition: 130ºCx 1 minute
Measurement device: DIGITAL MICROSCOPE VHX-600(KEYENCE)

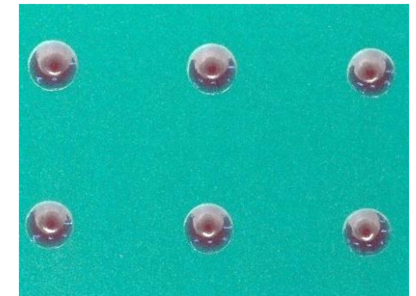
<Evaluation Result>

Sample	Diameter before (mm)	Diameter after (mm)	Change rate (%)
1	758	798	5.3
2	766	799	4.4
3	756	772	2.2
4	745	765	2.6
5	769	797	3.6
6	756	774	2.4
Ave.	758	784	3.4

<Before>



<After>



When JU-110-3 was dispensed with a 0.75mm diameter and cured at 130ºC for 1 minute, the diameter changed approximately 3.4%. It has good heat slump resistance.

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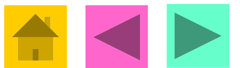

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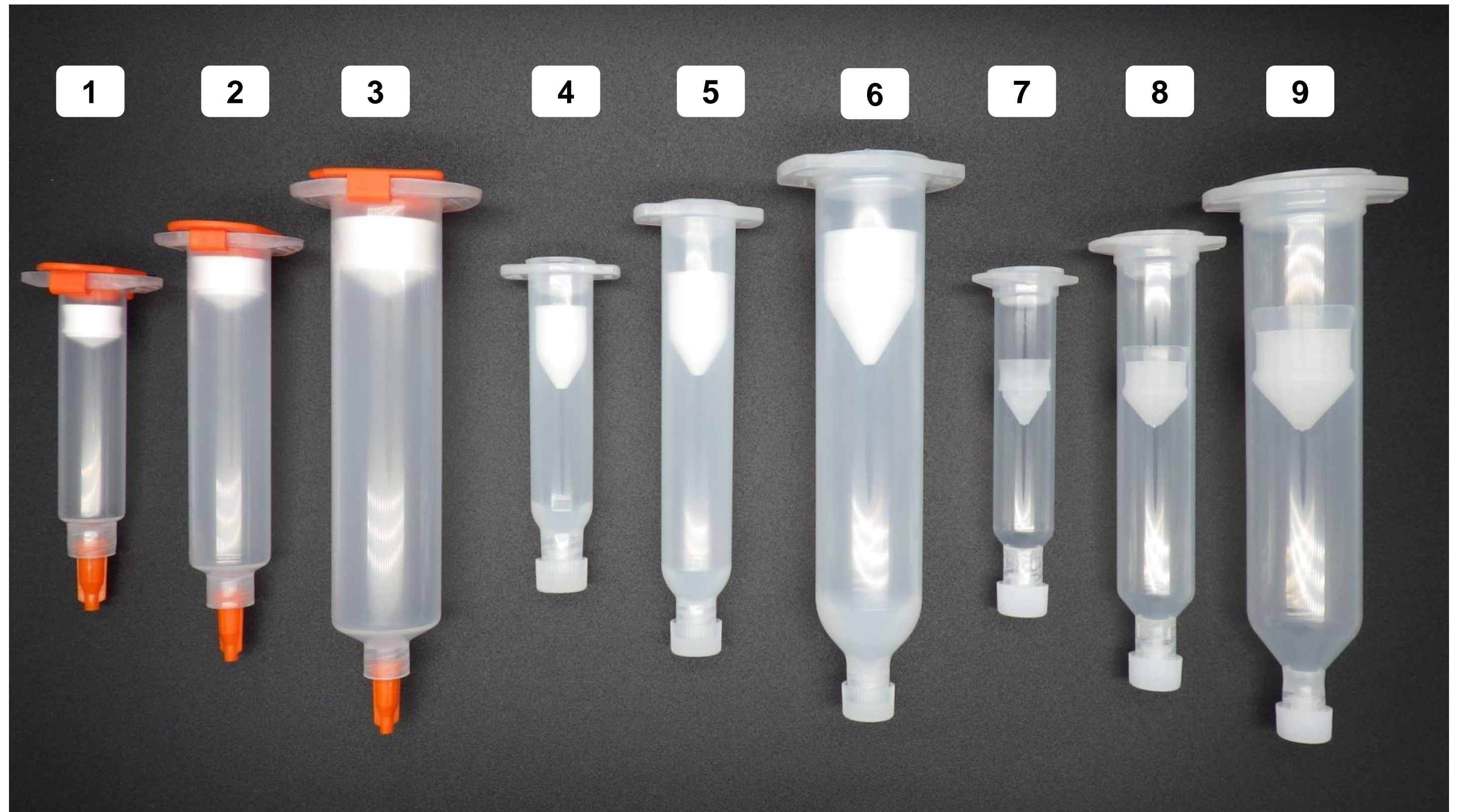
Available Syringes

JU-110-3 is available in a variety of syringes/ containers as shown below.



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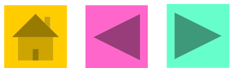

Name and capacity of the syringe numbers 1 to 9 from the previous page are as shown in the Table below.

No	Name of Syringe/ Maker	Capacity (ml)
1	EFD5(S1) / Nordson EFD	5
2	EFD10(S1) / Nordson EFD	10
3	EFD30(S1) / Nordson EFD	30
4	PS 05S / Iwashita Engineering	5
5	PS 10S / Iwashita Engineering	10
6	PS 30S / Iwashita Engineering	30
7	PSY 5E / Musashi Engineering	5
8	PSY 10E / Musashi Engineering	10
9	PSY 30E / Musashi Engineering	30

Please contact your KOKI sales representatives for details and availability of any other type of syringes not listed herein.

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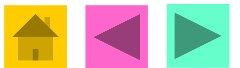


Handling Guide

1. Recommended dispensing condition

(1) Nozzle temperature: 30~33ºC

(2) Syringe temperature: 28~35ºC

(3) Ambient condition:

- Temperature: 22~27ºC
- Humidity: 40~60%RH

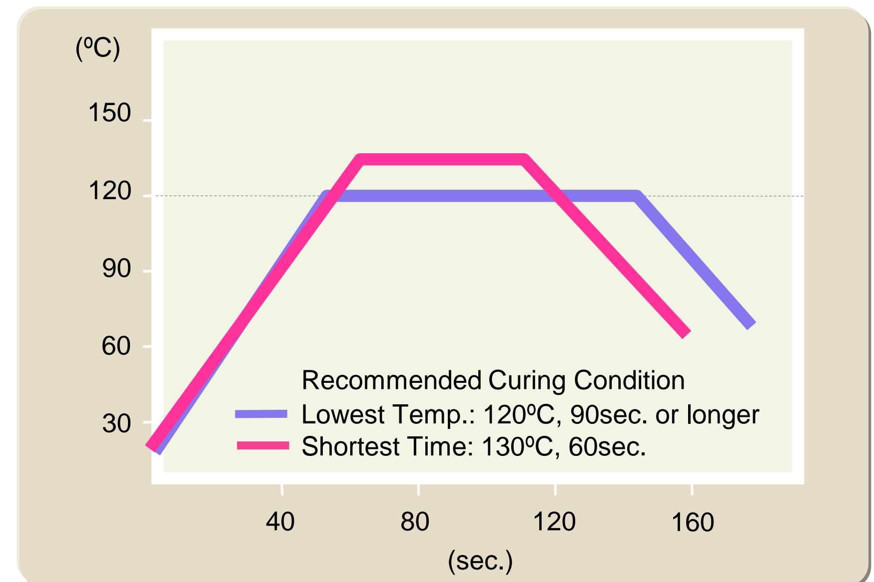
2. Recommended curing condition:

- 120 ºC x ≥ 90sec.
- 130 ºC x ≥ 60sec
- 150 ºC x ≥ 45sec.

3. Shelf life: 6 months (0~10ºC)

1 month (25ºC)

Recommended Curing Profile:
Lower limit of curing temperature and time



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4. Caution

(1) This product shall be refrigerated (0~10ºC)

(2) Bring back to room temperature before placing in the dispenser.
In general, a 30 ml syringe will be back to room temperature in 60 minutes.
Rapidly heating the product in the syringe will cause the adhesive to expand and cause unstable performance.

(3) To store an opened adhesive to use later:

Adhesive may be stored for use later, subject to a proper storage.
1. Put back the tip and end cap firmly
2. Store the adhesive in a refrigerator maintained at 10ºC or below.
3. Use the adhesive within 5 days from when it was originally opened.

Syringe temperature may exceed 35ºC during the continuous use depending on the equipment.
If syringe temperature exceeded 35ºC, the adhesive cannot be used later.

(4) Refer to the product's SDS for other guidance.

* How to interpret lot number