

## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

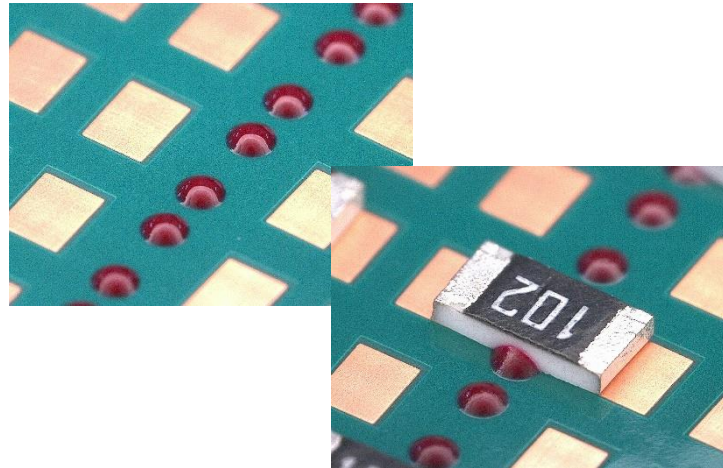
Handling Guide

## Surface Mount Adhesive

# Surface Mount Adhesive for Printing

## JU-50P

### 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.



## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Product Outline

- Printing application adhesive to hold down surface mount devices prior to soldering
- Stable dispense shape during continuous use
- Fine pattern printing available
- Post curing adhesive ensures high electrical reliability
- Superior heat slump resistance allows it to retain its height during the curing process



## Contents

Product Outline

**Properties**

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Properties – Before Curing

Purpose		Printing Application
Product Name		<b>JU-50P</b>
Property	Condition / Note / [unit]	Performance
Before Curing	Composition	—
	Appearance/ Color	Visual observation
	Specific Gravity	25°C, pycnometer
	Viscosity	Malcom PCU-205, 25 °C 10rpm [Pa·s]
	Non-volatile Content	105 °C, 180 minutes [%]
	Shelf Life	Refrigerated (10 °C)
		25 °C
	Copper Plate Corrosion	40 °C, 95%RH, after 240 hours
		Epoxy resin
		Paste, red
		1.51
		150±25
		>99.0
		6 months
		1 month
		No anomalies

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



## Contents

Product Outline

**Properties**

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Properties – After Curing

Purpose		Printing Application	
Product Name		JU-50P	
Property	Condition/ Note/ [unit]	Performance	
After curing	Appearance/ Color	Visual observation	Solid, reddish brown
	Copper Plate Corrosion	40 °C,90%RH, after 240 hours*1	No anomalies
	Solder Resistance	Solder bath: SAC305, 250 °C X10sec./ 3216R*1	No anomalies
	Solvent Resistance	Soak in solvents (IPA, acetone) 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 <sup>14</sup>
		85 °C, 85%RH, after 168 hours, in chamber*2 [Ω]	>1.0X10 <sup>9</sup>
		85 °C, 85%RH,after 168 hours, out of chamber*2 [Ω]	>1.0X10 <sup>13</sup>
	Moisture Absorption	1 hour, in accordance with JIS K 6911 [%]*3	<1.0
Glass Transition Temperature	DSC,10 °C /min, room temp. ~200°C, 2nd run [°C]	97	

Above results are measured performance in a lab setting and are not guaranteed performance. Test samples are cured under the following condition depending on the amount of application for the respective test.

\*1: 130 °C X90sec., \*2 130 °C X10min., \*3 130 °C X60min.



## Contents

Product Outline

Properties

**Curing Condition/ Strength**

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

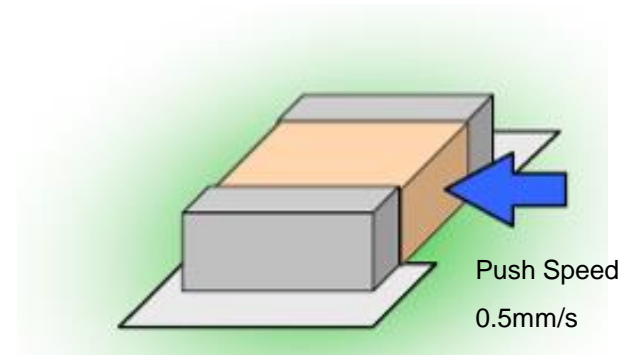
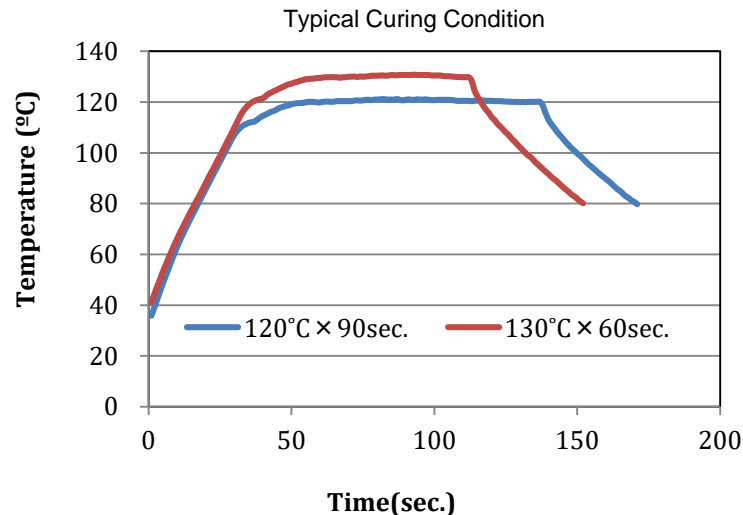
## Curing Condition/ Strength

### < Test Method >

Print the adhesive on a glass-epoxy PCB using a 150 $\mu$ m thick stencil with 0.8mm $\Phi$  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



## Contents

Product Outline

Properties

**Curing Condition/ Strength**

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

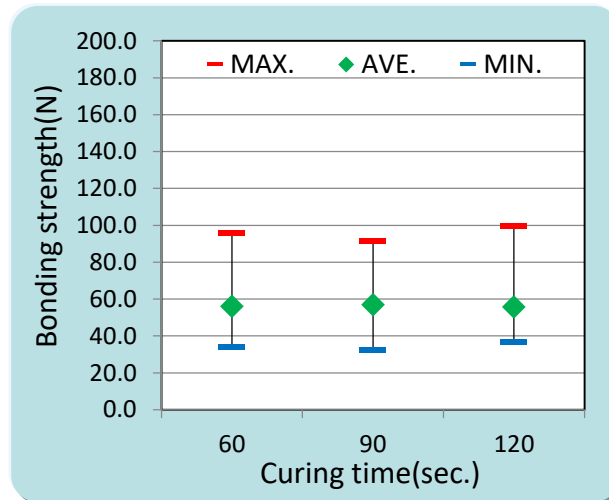
Handling Guide

## Curing Condition/ Strength

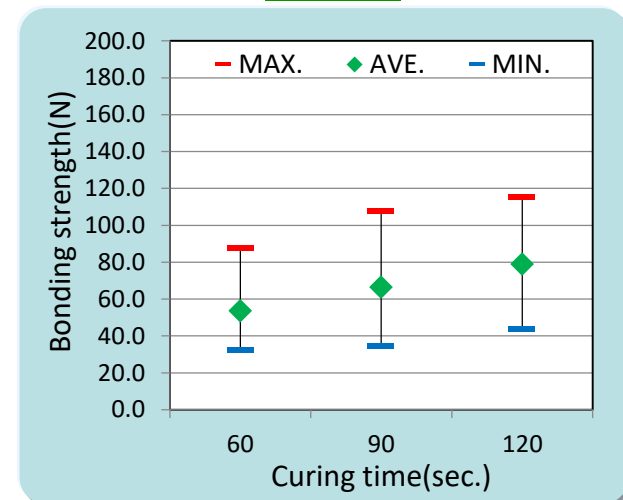
Curing Temp. (°C)		120			130		
Curing Time (sec.)		60	90	120	60	90	120
Bond Strength (N)	Ave.	56.0	57.0	55.6	53.5	66.5	79.0
	Max.	95.7	91.5	99.8	88.0	107.9	115.4
	Min.	33.9	32.6	36.9	32.3	34.7	43.5

[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.



**Contents**

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

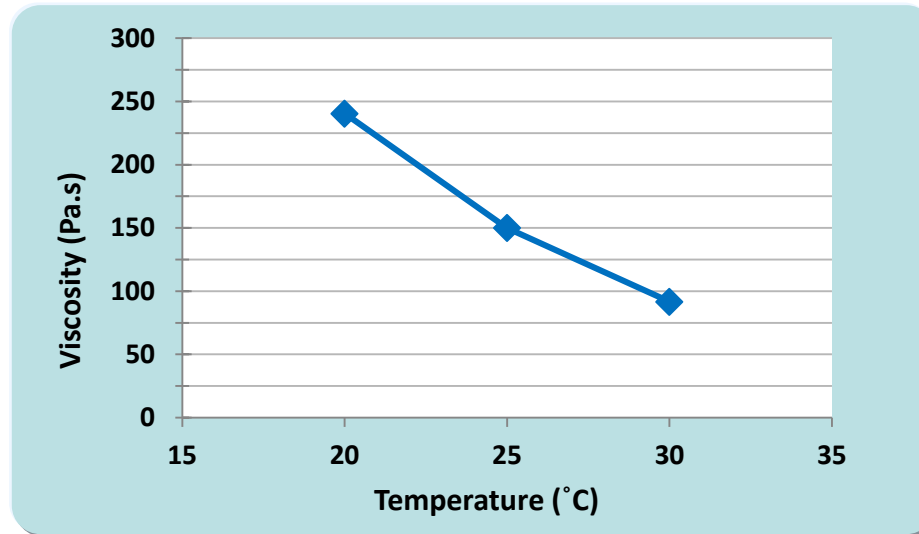
**Temperature-Viscosity Curve**

<Test Method>

Measure the viscosity at each test condition.

<Condition>

Equipment: PCU-205 (Malcom)  
Test Condition: 10rpm



< Viscometer Malcom PCU-205 >



Temp. (°C)	Viscosity (Pa.s)
20	240.5
25	150.0
30	91.7

When temperature is increased, viscosity of JU-50P will be reduced.



## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

**Viscosity Stability**

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

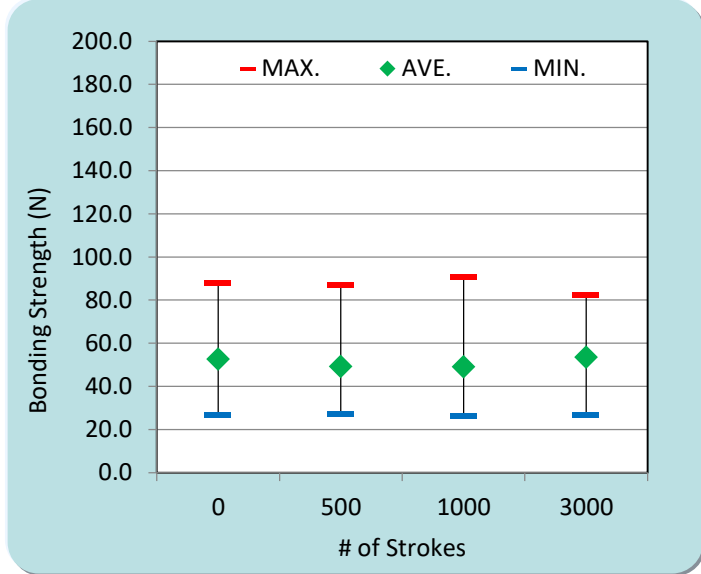
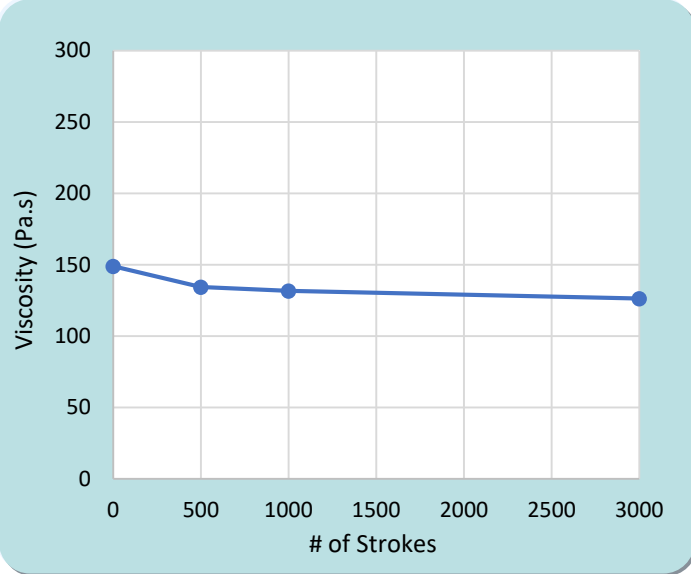
Handling Guide

## Viscosity Stability

Test condition

Print (knead) adhesive on the sealed-up stencil continually up for 24 hours to observe viscosity variation.

- |                          |                          |                      |                                 |
|--------------------------|--------------------------|----------------------|---------------------------------|
| • Squeegee :             | Metal blade, Angle - 60° | • Viscosity :        | PCU-205, Malcom 10rpm, 25°C     |
| • Squeegee speed :       | 30mm/sec.                | • Bonding Strength : | See "Cure condition / Strength" |
| • Print stroke :         | 300mm                    | • Curing :           | 130°C x 90sec.                  |
| • Printing environment : | 21.0~25.0°C              |                      |                                 |



JU-50P retains consistent rheology during continual printing and ensures stable print quality.

Also, no degradation in bonding strength shall occur due to the continual rolling on the stencil.





## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Printability

### <Test Method>

According to recommended print conditions, perform print test and determine threshold value for each stencil thickness.

### <Test Conditions>

Substrate:	Glass epoxy FR-4
Stencil:	t=150, 200, 250 $\mu$ m, Laser cut
Squeegee:	Metal blade, Angle- 55°
Print speed:	20mm/sec.
Print pressure:	50N
Stencil separation speed :	1mm/sec.
Atmosphere	23.0~25.0°C (40~60%RH)



## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability





Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Printability (Circles)

	Typical failure	Φ0.5mm	Φ0.6mm	Φ0.8mm	Φ1.0mm	Min. dia.
t=0.15mm		OK	OK	OK	OK	Φ0.5 mm
t=0.20mm		NG Insufficient	OK	OK	OK	Φ0.6 mm
t=0.25mm		NG Insufficient	NG Insufficient	NG Insufficient	OK	Φ1.0 mm
t=0.25mm (dual print)		NG Insufficient	NG Insufficient	OK	OK	Φ0.8 mm



## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Printability (Lines)

○ Typical failure	0.3mm × 0.15mm	0.4mm × 0.15mm	0.5mm × 0.2mm	Min. aperture
t=0.15mm	OK	OK	OK	0.3mm × 0.15mm
t=0.20mm	NG Insufficient	OK	OK	0.4mm × 0.15mm
t=0.25mm	NG Insufficient	NG Insufficient	OK	0.5mm × 0.2mm
t=0.25mm (dual print)	NG Insufficient	NG Insufficient	OK	0.5mm × 0.2mm





## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

**Biased Humidity Test**

Heat Slump Property

Available Containers

Handling Guide

## Biased Humidity Test

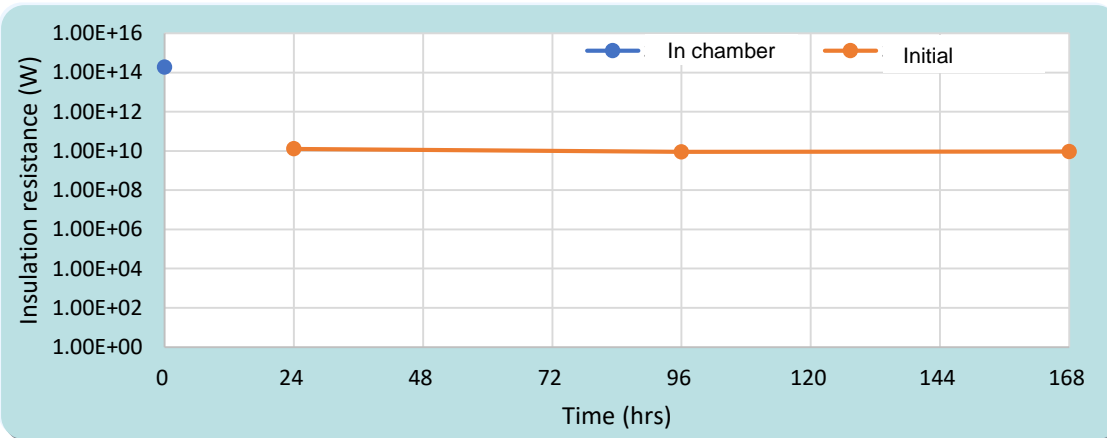
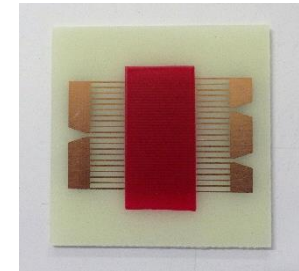
### <Test Method>

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

### <Test Condition>

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

### <Test coupon>



JU-50P showed good surface insulation resistance.



## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

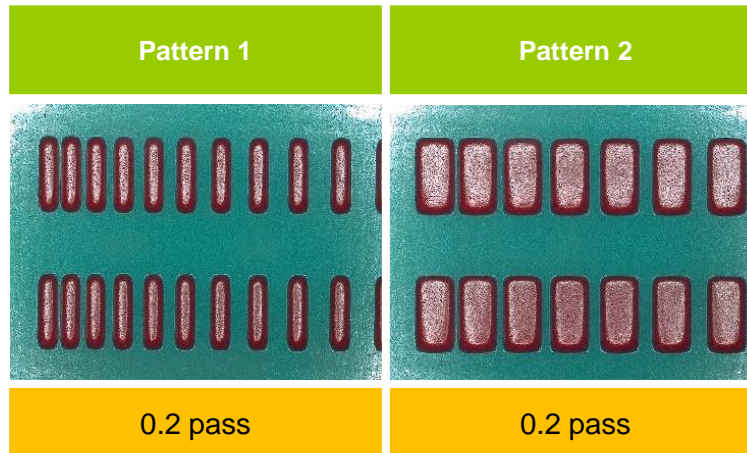
Available Containers

Handling Guide

## Heat Slump Property

<Test Conditions>

Substrate: Glass epoxy FR-4  
 Stencil: t=200 μm, Laser cut  
 Apertures: See right  
 Curing : 130 °C x 10 min.



Pattern gap 0.2 0.4 0.6 0.8 1.0 1.2 (mm)  
0.3 0.5 0.7 0.9 1.1



Pattern 1

Aperture size  
3.0X0.7mm



Pattern gap 0.2 0.4 0.6 0.8 1.0 1.2 (mm)  
0.3 0.5 0.7 0.9 1.1



Pattern 2

Aperture size  
3.0X1.5mm



JU-50P showed almost no heat slump during the curing process..



**Contents**

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

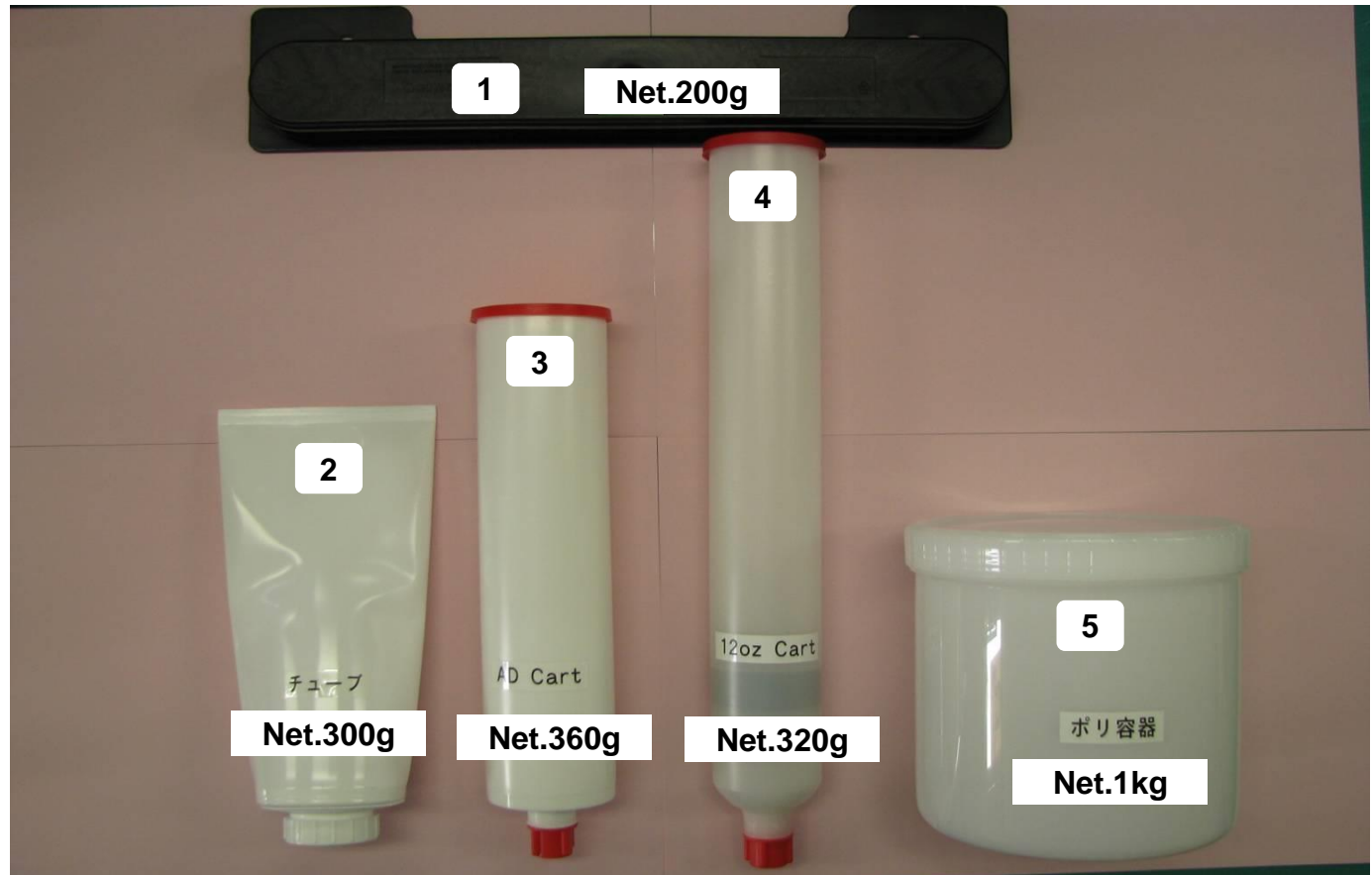
Heat Slump Property

Available Containers

Handling Guide

**Available Containers**

JU-50P is available in a variety of containers as shown below.



## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Available Containers

Name and capacity of the container numbers 1 to 5 from the previous page are as shown in the Table below.

No	Name of Container	Capacity (g)
1	Proflow	200
2	Tube	300
3	AD Cartridge	360
4	12oz Cartridge	320
5	Poly container	1000

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



## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Handling Guide

### 1. Recommended Printing Conditions

#### (1) Squeegee

1. Kind : Flat
2. Material : metal, urethane, plastic blade
3. Pressure : Lowest
4. Squeegee speed : 10~20mm/sec.

#### (2) Stencil

1. Thickness : 150~250 $\mu$ m See "Printability"
2. Separation speed : 0.5~10mm/sec.
3. Snap-off distance : 0mm
4. Stencil Cleaning : Acetone is recommended especially for micro-pattern apertures. IPA may also be used.  
Water-based cleaners are typically not recommended due to relatively weak cleaning power.

#### (3) Ambient Condition

1. Temperature : 22~27°C
2. Humidity : 40~60%RH





## Contents

Product Outline

Properties

Curing Condition/ Strength

Temp.-Viscosity Curve

Viscosity Stability

Printability

Biased Humidity Test

Heat Slump Property

Available Containers

Handling Guide

## Handling Guide

### 2. Recommended curing condition

- (1) 120°C x ≥ 90sec.
- (2) 130°C x ≥ 60sec.

### 3. Shelf life

- (1) 0~10°C: 6 months from manufacturing date
- (2) 25°C: 1 month from manufacturing date

### 4. Caution

- (1) This product shall be refrigerated (0~10°C)
- (2) Bring back to room temperature before placing in the printer.  
Rapidly heating the product in the container will cause the adhesive to expand and cause unstable performance.
- (3) Once the material is worked on the stencil, the leftover should be kept in a separate container.
- (4) Refer to the product's SDS for other guidance.

\* How to interpret lot number

ex. Lot No. 0 03 20 1

- Batch number: 1st batch
- Production date: 20th
- Production month: April
- Production year: 2020

Recommended Curing Profile:  
Lower limit of curing temperature and time

