

TECHNICAL INFORMATION

SMT Adhesive

JU - 41P

KOKI COMPANY LIMITED

1. Features

- 1) Ensures excellent printing with high dot profile.
- 2) High slump resistance.
- 3) Very high bonding strength.
- 4) Long shelf life.

2. Specification

• Before curing

No	Item	Treatment	Value	Remarks
1	Composition	–	Epoxy	–
2	Appearance • colour	–	Paste, red	–
3	Specific gravity	20°C	1.22 ± 0.05	Cup method
4	Viscosity	20°C, Pa.S	100 ± 5	E-type viscometer
5	Thixotropy	20°C	5.5 ± 0.5	E-type viscometer
6	Non volatile	110°C × 3hr	> 99%	–
7	Viscosity variation rate	40°C × 2hr	< 5%	–
8	Shelf life	Room temp. (20°C)	2 months	–
		Below 10°C	6 months	–

• After curing (cured at 150°C × 1 min.)

No	Item	Treatment	Value	Remarks
1	Appearance • colour	–	Polymerized solid, dark red	–
2	Bonding strength	2125 chip condenser	> 3 kg	Push gauge
3	Copper plate corrosion	40°C × 95%RH × 96hr	No discoloration, corrosion	–
4	Solder resistivity	250°C × 10sec.	No abnormality	–
5	Surface insulation resistance	Room temp., humidity	$> 1 \times 10^{11} \Omega$	JIS specified comb electrode type II
		40°C × 90%RH × 500hrs	$> 1 \times 10^{12} \Omega$	
6	Dielectric constant	20°C	3.5	1MHz
		40°C × 90%RH × 250hrs	3.6	
7	Dielectric tangent	20°C	0.015	1MHz
		40°C 90%RH 250hours	0.017	
8	Linear expansion coefficient	cm/cm, °C	8×10^{-5}	–
9	Boiled water absorption	Boiled water, 1hr	< 0.1%	–
10	Solvent resistivity	Room temp. 1 hr dip	No abnormality	IPA, toluene

3. Temperature - Viscosity

- Method

Taking sample cup from E-shape viscometer , apply sample at about 0.1cm³ around in centre of it. Then, set cone with 3° and 1.54mm diameter in the viscometer and the sample cup.

Circulate water controlled at a specific temperature with ± 0.2 in sample cup and wait until sample comes to temperature after a specific time and start measurement.

- Measurement condition

Equipment : E-shape viscometer – EHD shape (Tokyo Keiki)

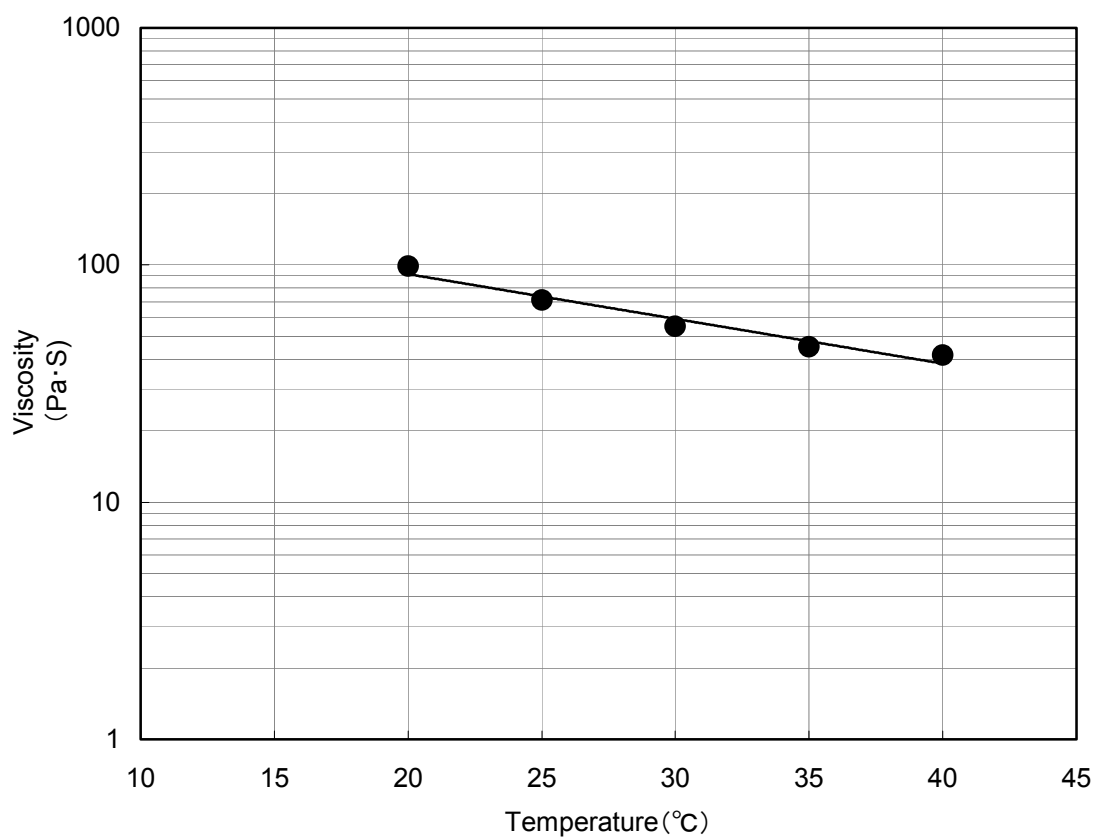
Rotation speed : 10rpm, value after 2 minutes rotation

- Measurement result

(Unit : Pa·S)

Temperature ()	20	25	30	35	40
Viscosity (Pa.s)	98.7	71.7	55.2	45.3	41.7

Average of n = 2

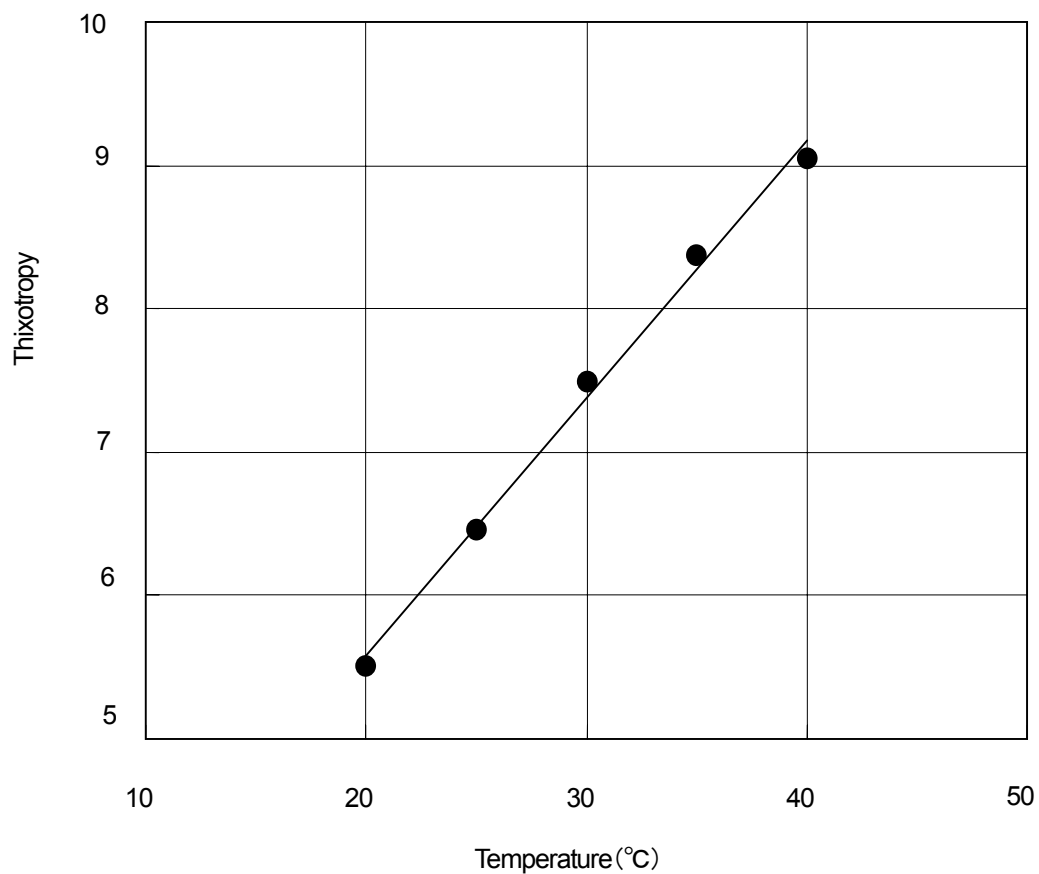


4. Temperature - Thixotropy variation

- Method
Measurement of viscosity is same as that in item.1.
- Measurement condition
Equipment : E-shape viscometer – EHD shape (Tokyo Keiki)
Measurement is done at 1rpm and later at 10rpm. Measure value after 2 minutes.
Thixotropy = viscosity at 1rpm/ viscosity at 10rpm
Measurement is done twice to get the average
- Measurement result

Temperature ()	20	25	30	35	40
Thixotropy	5.5	6.5	7.5	8.4	9.1

Average of n = 2



5. Bonding strength

- Method

Print sample with 150 μ m thick stencil which has hole of 1.0mm \times 0.5mm on glass-epoxy PCB.

Place chip component on printed glue around the centre. Cure it at specific condition below and cool it to room temperature.

Measure the value when adhesive is removed by push gauge.

- Measurement condition

Equipment : Push gauge

PCB : Glass fibre based epoxy resin GE-4 specified JIS-C-6480.

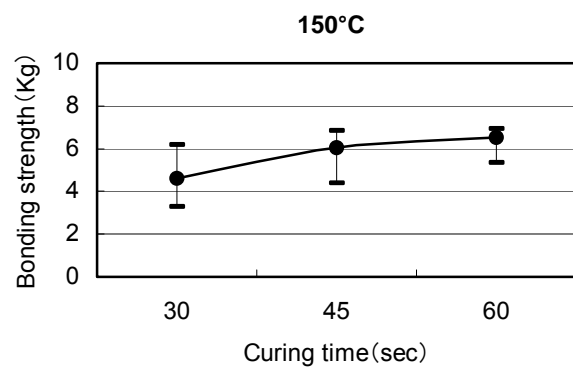
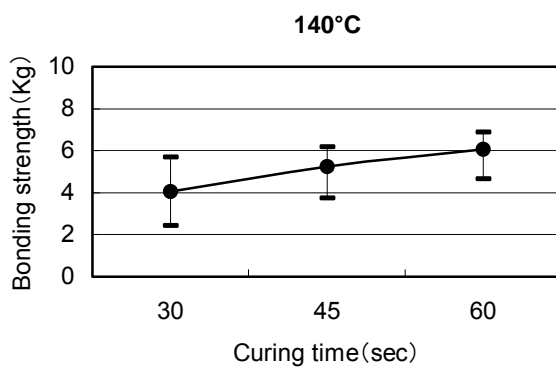
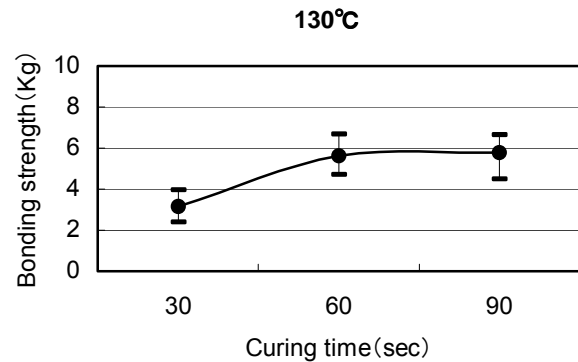
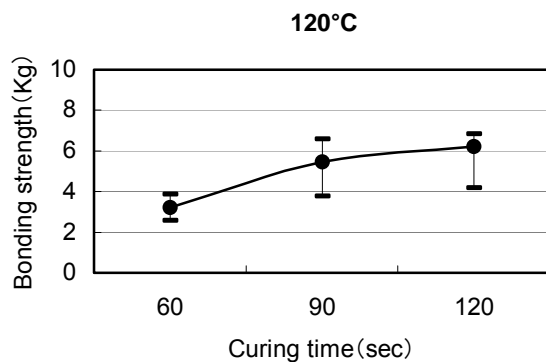
Chip component : 2125 Condenser

- Measurement result

(Unit : Kg)

	120°C			130°C			140°C			150°C		
	60 sec	90 sec	120 sec	/30sec	60sec	90sec	30sec	45sec	60sec	30sec	45sec	60sec
Maximum	3.88	6.60	6.86	3.98	6.70	6.65	5.70	6.20	6.90	6.20	6.85	6.95
Minimum	2.60	3.80	4.20	2.42	4.72	4.50	2.45	3.75	4.65	3.30	4.40	5.35
Average	3.22	5.45	6.23	3.16	5.62	5.77	4.05	5.25	6.06	4.60	6.04	6.54

Average of n = 10



6. Surface insulation resistance test

- Method

Deposit approx. 200 μ m thick glue uniformly on the comb type electrode type-II ensuring the coverage is only on the overlapping combs and cure it at 140 for 60sec.

Measure surface insulation resistance (S.I.R) of above sample at room temperature and room humidity and leave it in thermohygrostat controlled at 40 ± 2 and $90 \pm 3\%$ RH for 1000 hours.

Then measure S.I.R at specific times in thermohygrostat below.

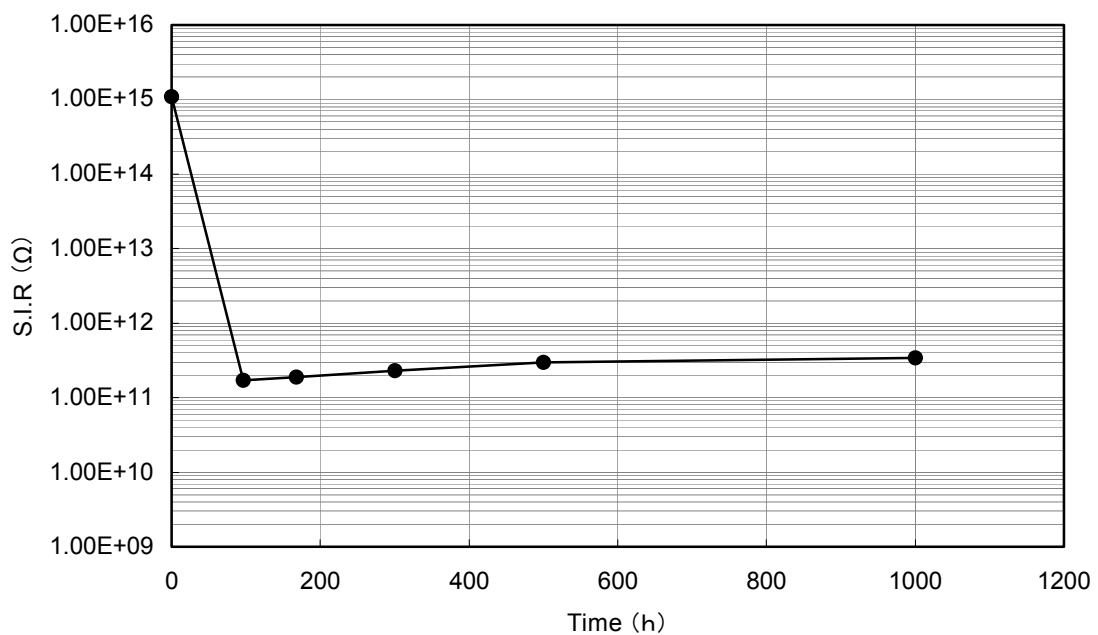
- Measurement condition

Equipment : Thermohygrostat (40 ± 2 , $90 \pm 3\%$ RH)

Surface insulation resistance meter : Yokogawa Hewlett-Packard, 4329A

- Measurement result

n	Initial	96h	168h	300h	500h	1000h	Out of themohygrostat
1	1.5×10^{14}	1.1×10^{11}	1.4×10^{11}	1.7×10^{11}	2.5×10^{11}	3.0×10^{11}	1.2×10^{13}
	2.0×10^{15}	3.5×10^{11}	3.8×10^{11}	4.5×10^{11}	0.5×10^{12}	0.6×10^{12}	1.7×10^{13}
	1.0×10^{15}	3.0×10^{11}	3.0×10^{11}	3.2×10^{11}	3.8×10^{11}	4.5×10^{11}	1.5×10^{13}
	2.0×10^{15}	2.5×10^{11}	2.3×10^{11}	2.5×10^{11}	3.2×10^{11}	3.0×10^{11}	1.0×10^{13}
2	2.0×10^{15}	2.0×10^{11}	2.5×10^{11}	2.7×10^{11}	3.6×10^{11}	4.2×10^{11}	1.5×10^{13}
	2.0×10^{15}	2.2×10^{11}	2.8×10^{11}	3.3×10^{11}	5.0×10^{11}	0.5×10^{12}	2.0×10^{13}
	0.5×10^{15}	0.8×10^{11}	1.0×10^{11}	1.6×10^{11}	2.5×10^{11}	3.6×10^{11}	0.8×10^{13}
	1.0×10^{15}	1.2×10^{11}	1.3×10^{11}	1.8×10^{11}	2.1×10^{11}	2.4×10^{11}	0.6×10^{13}
3	1.5×10^{15}	1.0×10^{11}	1.5×10^{11}	1.5×10^{11}	1.7×10^{11}	1.9×10^{11}	0.7×10^{13}
	5.0×10^{14}	0.7×10^{11}	0.7×10^{11}	1.1×10^{11}	1.6×10^{11}	2.3×10^{11}	1.0×10^{13}
	2.0×10^{15}	2.0×10^{11}	2.4×10^{11}	3.0×10^{11}	3.1×10^{11}	3.3×10^{11}	1.4×10^{13}
	2.0×10^{15}	2.5×10^{11}	2.6×10^{11}	3.2×10^{11}	4.0×10^{11}	4.0×10^{11}	2.2×10^{13}
Average	1.1×10^{15}	1.7×10^{11}	1.9×10^{11}	2.3×10^{11}	3.0×10^{11}	3.4×10^{11}	1.2×10^{13}



7 . Voltage applied SIR test

- Method

Deposit approx. 200 μ m thick glue uniformly on the comb type electrode type-II ensuring that the coverage is only on the overlapping combs and cure it at 140 for 60sec.

Measure surface insulation resistance (S.I.R) of above sample at room temp and room humidity and leave it in thermohygrostat controlled at 85 \pm 2 and 85 \pm 3% RH for 1000 hours with voltage at 50V applied.

Then measure S.I.R at specific time in thermohygrostat below.

- Measurement condition

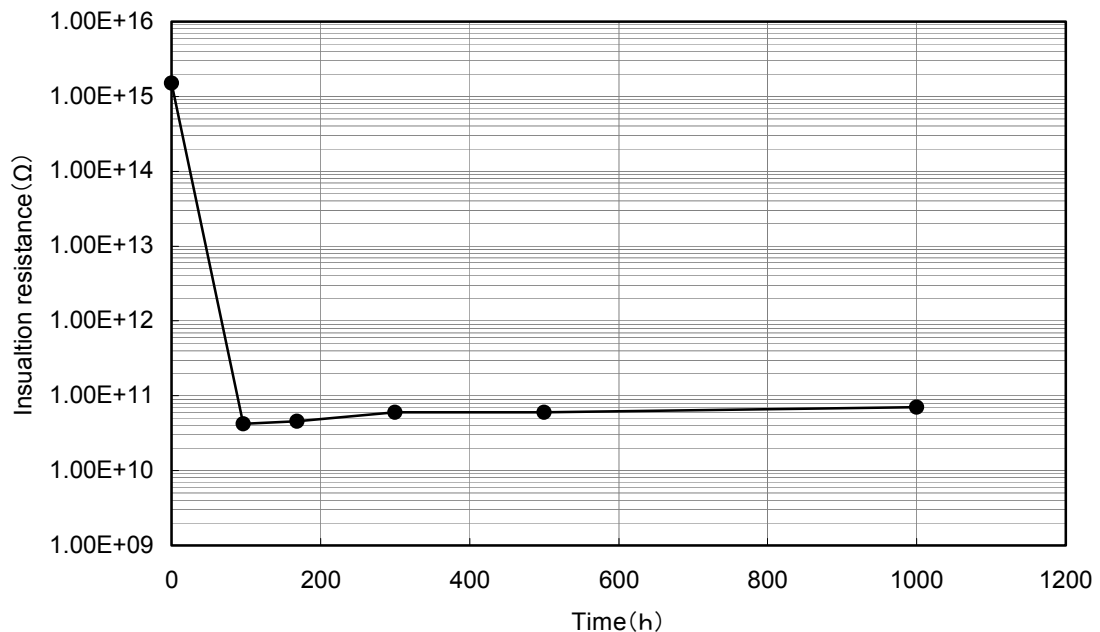
Equipment : Thermohygrostat (capable of control at 85 \pm 2 , 85 \pm 3% RH)

Surface insulation resistance meter : Yokogawa Hewlett-Packard 4329A

Measurement voltage : 100V

- Measurement result

n	Initial	96h	168h	300h	500h	1000h	Out thermohygrostat
1	2.0X10 ¹⁵	0.6X10 ¹¹	0.6X10 ¹¹	0.7X10 ¹¹	0.8X10 ¹¹	0.8X10 ¹¹	0.6X10 ¹³
	2.0X10 ¹⁵	0.5X10 ¹¹	4.5X10 ¹⁰	5.0X10 ¹⁰	0.5X10 ¹¹	0.7X10 ¹¹	0.8X10 ¹³
	1.0X10 ¹⁵	3.0X10 ¹⁰	3.2X10 ¹⁰	3.8X10 ¹⁰	3.6X10 ¹⁰	4.1X10 ¹⁰	5.0X10 ¹²
	1.2X10 ¹⁵	2.0X10 ¹⁰	2.5X10 ¹⁰	3.5X10 ¹⁰	4.0X10 ¹⁰	4.2X10 ¹⁰	0.5X10 ¹³
2	2.0X10 ¹⁵	4.5X10 ¹⁰	0.5X10 ¹¹	0.7X10 ¹¹	0.7X10 ¹¹	0.9X10 ¹¹	1.0X10 ¹³
	1.5X10 ¹⁵	4.5X10 ¹⁰	5.0X10 ¹⁰	0.7X10 ¹¹	0.8X10 ¹¹	1.1X10 ¹¹	0.9X10 ¹³
	0.8X10 ¹⁵	2.5X10 ¹⁰	2.2X10 ¹⁰	3.3X10 ¹⁰	3.5X10 ¹⁰	4.0X10 ¹⁰	0.5X10 ¹³
	2.0X10 ¹⁵	0.5X10 ¹¹	0.6X10 ¹¹	0.6X10 ¹¹	0.7X10 ¹¹	0.8X10 ¹¹	1.1X10 ¹³
3	1.0X10 ¹⁵	3.5X10 ¹⁰	4.0X10 ¹⁰	0.5X10 ¹¹	0.6X10 ¹¹	0.6X10 ¹¹	0.7X10 ¹³
	2.0X10 ¹⁴	0.7X10 ¹¹	1.0X10 ¹¹	1.1X10 ¹¹	1.1X10 ¹¹	1.3X10 ¹¹	1.0X10 ¹³
	1.5X10 ¹⁵	0.5X10 ¹¹	0.5X10 ¹¹	0.8X10 ¹¹	1.0X10 ¹¹	1.2X10 ¹¹	1.0X10 ¹³
	1.5X10 ¹⁵	5.0X10 ¹⁰	0.6X10 ¹¹	0.8X10 ¹¹	0.8X10 ¹¹	1.0X10 ¹¹	0.8X10 ¹³
Ave	1.5X10 ¹⁵	4.2X10 ¹⁰	4.6 X10 ¹⁰	0.6X10 ¹¹	0.6X10 ¹¹	0.7X10 ¹¹	0.8X10 ¹³



* No evidence of electromigration was observed.

8. Recommended use

Substrate surface temperature (120°C~150°C) and the following curing time are required.

Bonding strength tends to become higher as the curing temperature increases.

- Recommended curing condition

Curing temperature (°C)	Curing time (sec.)
150	> 60
130	> 60
120	> 90

*A temperature profile for reflowing solder paste also can cure this product.

9. Packaging

Available in 300gms tube, 360 gms cartridge, 1kg jar.

10. Storage

Store in a refrigerator below 10°C. – never freeze the adhesive
Warm to a room temperature before setting up in a dispensing machine.

11. Handling instruction

- 1) Warm to a room temperature before setting up in a dispensing machine.
- 2) For the storage of the product at the halfway use, put it back to the refrigerator for a long term storage, and keep it at room temperature off the printer for the short term storage.
- 3) In case of repairing, heat the adhesive to some 100~150°C for removal.
- 4) As the cured adhesive cannot be removed by an organic solvent, shave it off while keeping it warm.
The adhesive before curing shall be removed by ketone based solvent (methyl ethyl ketone, acetone).
- 5) In case of skin contact, wash with soap and water.
- 6) Use in well-ventilated area and keep away from source of fire.
- 7) Others
 - (1) All of chemical components formulated in this product are registered in the existing chemical substances.
 - (2) This product is not inflammable.
 - (3) Used containers shall be disposed of as waste plastic. Request an industrial waste disposal company according to local regulation and law.
 - (4) Read the MSDS very carefully before use.