Thermal Bonding Sheet

FB-ML80A

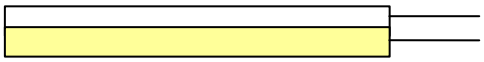
-Moist heat resistant non substrate adhesive, designed for the built-in contact IC card module-

1. Features

1) Strong adhesion
2) High durability under moist heat condition
3) Long shelf life : hardener free enables easy storage
4) Contamination free of impure ions

2. Construction

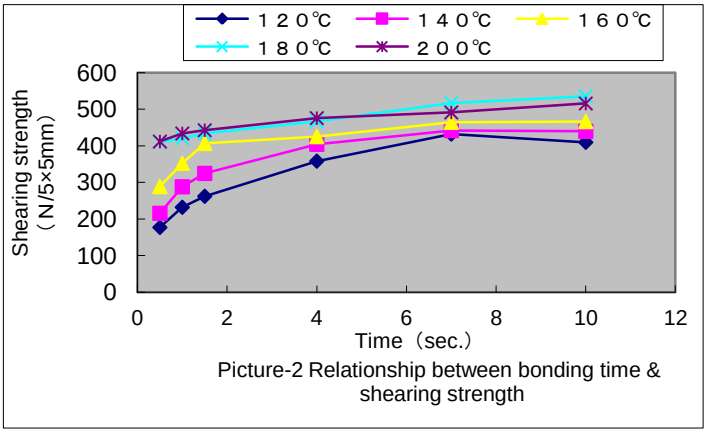
The thermal bonding sheet is a transfer tape laminated on a silicon coated paper liner



Picture -1

3. Bonding Condition

Relationship between bonding strength and pressure-time in the bonding process.(see picture-2 & Table-1)
(Bonding pressure: 0.5MPa)



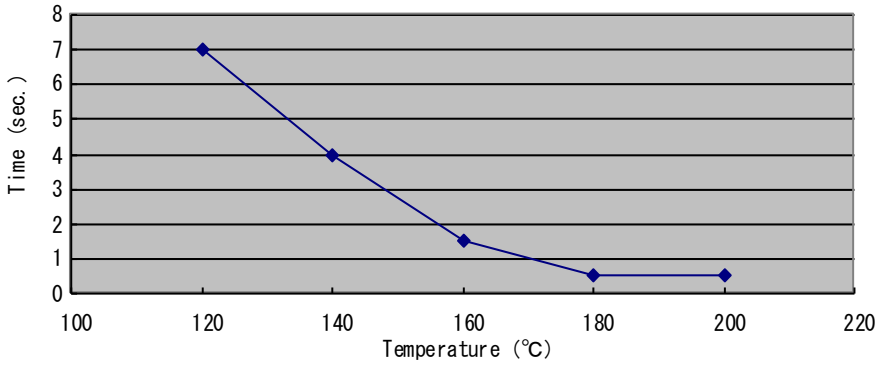
Picture-2 Relationship between bonding time & shearing strength

Table-1 Shearing strength in each conditions
[Unit : N/ 5 X 5mm]

Temp (°C)	Time (sec.)					
	0.5	1.0	1.5	4	7	10
120	177	232	262	358	432	410
140	216	288	325	404	442	440
160	289	352	407	425	464	466
180	410	421	434	467	517	535
200	412	434	443	476	491	516

◆ Red figure is the available figures.

Relationship between each bonding temperature & most effective available time.



Picture-3 Shortest available time in each temperatre
(Pressure: 0.5MPa)

◆Shortest available time = The time FB-ML80 begins to show the bonding strength in each temperature

4. General characteristic

Table-2

Item	Result	Measuring method
Specific Gravity	1.5	ASTM-D1622
Melting Point (°C)	About 70	DSC
Shore sclerscope hardness(D)	85	ASTM-D785

5. Bonding strength

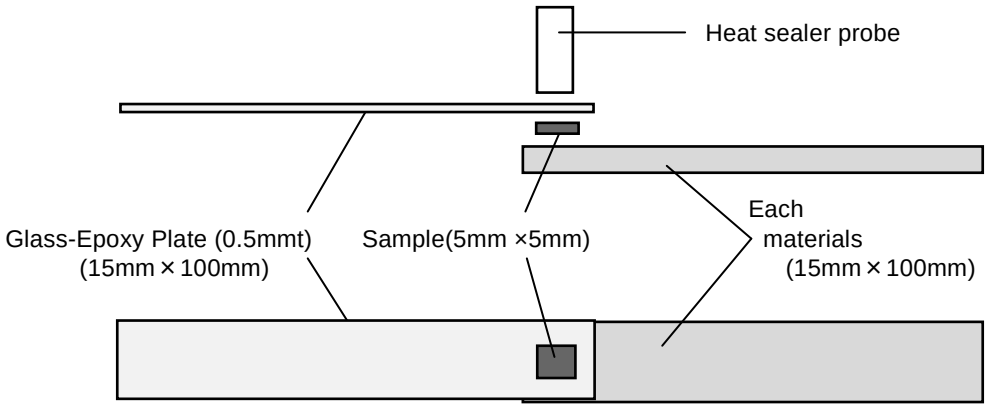
Following test (table-3) shows the bonding strength when fix the adherend to glass/epoxy plate and changed another material in shearing test.

Table-3 [N=5 Unit : N / 5X 5mm]

Thickness (μm)	Shearing speed (mm/min)	Materials							Condition
		PVC	PET	PET-G	ABS	PC	CU	SUS304	
50	50	437	188	434	409	413	252	190	180°CX2secX0.5MPa

(Measuring method for shearing strength)

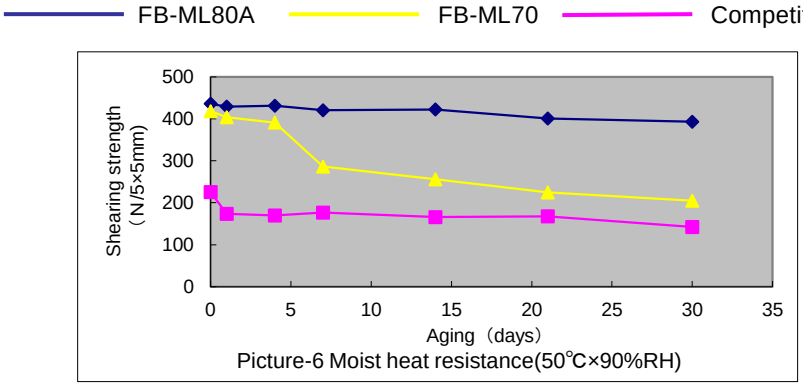
After bonded each materials (Nitto Shinko glass/epoxy plate & several materials) at above condition, Leave at room temperature more than 20 minute and measure the shearing strength.



Picture – 5

6. Moist heat resistance

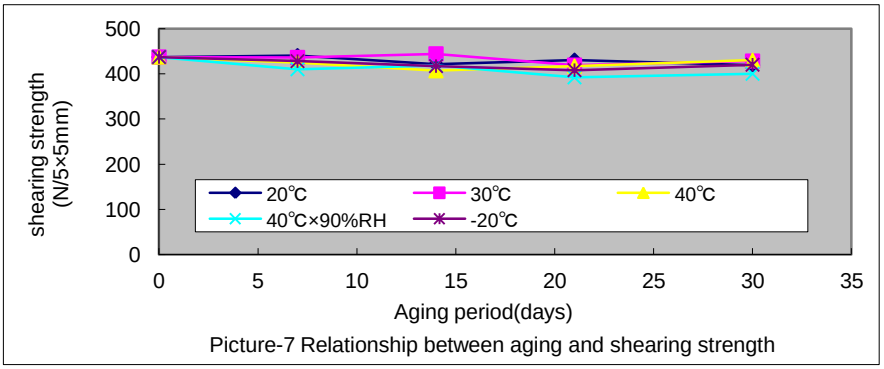
After bonded to glass-epoxy FRP & PVC, FB-ML80 still shows strong bonding strength even leave at high temperature & moist condition.



Picture-6 Moist heat resistance(50°C×90%RH)

7. Sheet Life

Following picture shows the change of shearing strength under storage in several temperature .
FB-ML80 still shows good bonding characteristics even storage under severe circumstance.



Picture-7 Relationship between aging and shearing strength

8. Ion Analysis

Test result by ion chromatography
Test Machine :CM-8000(Made by Toso
Column : IC anion PW, IC cation
Preparation of specimen condition : Extract the blended and boiled sample with distilled water after 24hours. (N=2)

Table-4

Anion	Result	Anion	Result	Cation	Result
F^-	<0.07	NO_3^-	<0.10	Na^+	0.11
Cl^-	0.03	PO_4^{3-}	<0.50	Li^+	<0.02
Br^-	<0.10	PO_3^{3-}	<1.00	NH_4^+	0.65
NO_2^-	<0.08	SO_4^{2-}	<0.20	K^+	0.24

9. Change of tackiness at each temperature

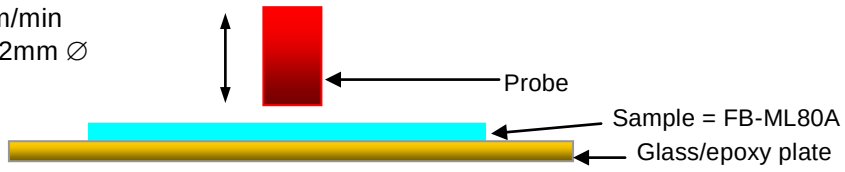
Table-5

Temperature	**°C**	**25**	**40**	**60**	**70**	**80**	**90**
Tack	N	0	0	0.02	0.09	0.24	0.49

Measuring method

- Heat the probe and bond it on to the bonding sheet as picture-8.
- Measure the bonding strength under the following condition.

Probe ∅ : 2 mm ∅
Peeling speed : 600mm/min
Pressure : 0.1N / 2mm ∅
Contact time : 0.1sec



Picture-8

10. Chemical-resistance

Test table-6 indicates the results of shearing strength after dipped 24 hour into the specified testing chemical of ISO7810. (test method see Picture-5)

Table-6 [N=5 Unit: N / 5X5mm]

Item	Result	Item	Result
Room atmosphere 20°C	437	Gasoline	438
Sodium carbonate 5%	403	Ethanol 60%	401
Acetic acid 5%	418	Ethylene glycol 50%	410
Salt in water 5%	447	-	-

11.Standard size

1) Thickness : 50 µm (tolerance ±10µm)
2) Length : As ordered
3) Width : As ordered

12. Precautions in handling

1) Do not bring in direct contact with the human skin. Is non-toxic in normal conditions of use.
2) Remove oil, grease, moisture, dirt and dust before adhering to the surface of the substrate.
3) This product is used for hot-melt bonding, so be careful not to be burned or injured in handling.
4) When setting the bonding conditions, it is necessary to take into account the heat conductivity of the tape and the capacity of the hot press to be used. Therefore performing a preliminary experiment is essential to examine the conditions in advance.
5) Dispose of this product according to local laws and regulations.

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