Hitachi Chemical Data Sheet

Anisotropic Conductive Film

ANISOLM®

AC-7813KM

2011/12/20

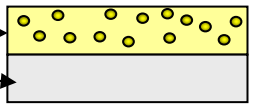
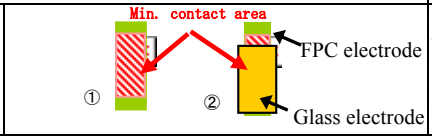
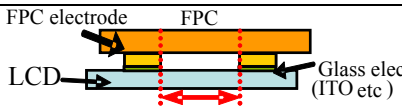
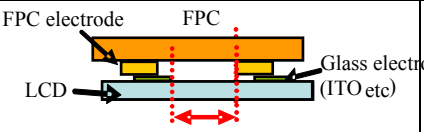
Hitachi Chemical Co., LTD.,

Material Polymer Science Sector

Advanced Performance Materials Operational Headquarters

Hitachi Chemical

1. Standard specification, bonding condition, storage condition and characteristic

Item			Unit	AC-7813KM		Remark
Standard specification	Configuration		—	ACF(25μm) Separetor(50μmPET) 		
	Thickness		μm	25		
	Conductive particle	Size	μm	5		
		Density	Pcs./mm²	5000		
	Width		mm	1.0、1.2、1.5、2.0		Contact us for other width request
	Length		m	50、100		Contact us for other length request
	Core diameter		mm	18.5		
	Min. contact area		μm²	>13000		Captured particle number between Glass electrode-FPC electrode Ave-3stdev>2pcs.
	Min. insulation gap (FPC-FPC)		μm	>19		Short probability<1300ppm (400space)
	Min. insulation gap (FPC-LCD)		μm	>15		Short probability<1300ppm (400space)
Bonding condition	ACF lamination	Temperature	Deg.C	70(60～100)		Final ANISOLM temperature
		Pressure	MPa	1.0(0.5～1.5)		Per unit area of ANISOLM
		Time	S	1～3		
	Final bonding	Temperature	Deg.C	180(165～205) ／ 170(160～205)		Final ANISOLM temperature
		Pressure	MPa	3(2～4)		Per unit area of ANISOLM
		Time	S	5 ／10		
Storage condition	Unopened		—	6 months after date of manufacture when stored at -10 to 5degC.		Under affirming
	Opened		—	14 days at 25 degC or below and 70%RH or below.		Under affirming

Notes:

1)Take ANISOLM out of the refrigerator or other storage without taking it out of its hermetic containers. Leave the ANISOLM in the containers at room temperature for about an hour. Then make sure that it does not risk condensation before using it.

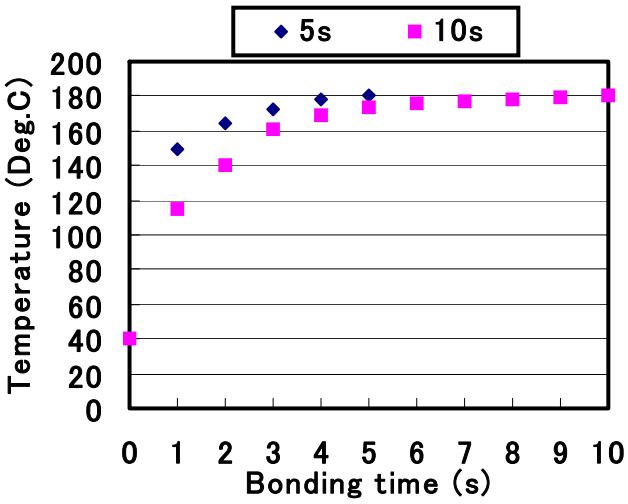
2)Connection resistance: The table indicates a half of the resistance between neighboring circuits.
Current measured: 1mA. Includes the circuit resistances of the FPC and ITO glass.

3)Operating range: As per reliability tests using Hitachi's test pieces.(This range varies according to the material used and external stress applied. Check the reliability of specific pieces.)

The values given above represent typical measurements, not guaranteed ones.

2. Precautions in bonding

2.1 Bonding conditions (Typical)



The temp shown on this data sheet is not the machine-setting temp but the ultimate temp of ACF.

(Please refer to the temperature profile data on left.)

<Typical bonding conditions>

Boning condition: 180Deg.C-5s / 180Deg.C-10s

Heat head setting temp. : 380Deg.C (5s) / 345Deg.C (10s)

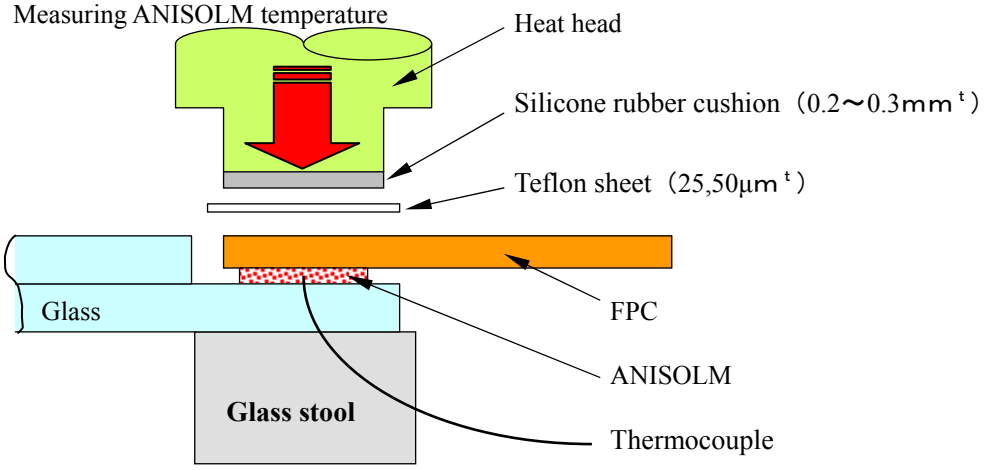
FPC(2 layer): P=0.15, Cu: 18um, Au plated

Thickness of glass TEG: 1.1mmt

Cushion: silicone rubber (200μmt)

Back up heat: 40Deg.C

2.2 Measuring ANISOLM temperature



2.3 Heat/Pressure Head

(1) Adjust carefully the evenness and parallelism of the heating head to keep the equal pressure.

(2) Tip the head with a thin and hard cushion, not a soft and thick one. Silicone rubber may be used for example. The use of too soft a cushion or excessive pressure in connection will drive adhesive in the space toward the end, resulting in insufficient adhesion. Be particularly careful when the space is wider than the circuits.

Misalignment of Opposite Circuits

(1) Align opposite circuits well. Do not let them get misaligned.

(2) In designing TABs (FPCs), allow for the misalignment of opposite circuits due to their expansion during connection.

(3) Keep the circuit misalignment at or less than the circuit width.

3 ACF attachment property

ACF width : 1.2mm, Substrate : Hitachi's 15.1' panel (p:0.05)

Bonding machine : SHIBAURA MECHATRONICS CORP. ACF attachment machine

Tool width : 1.5mm, Cushion material : silicon rubber (200mmt), back up heat: 30Deg.C,

<Test results of various temperature>

ACF attachment condition: X Deg.C, 1MPa, 1, 2s

ACF temperature	Deg.C	50	60	70	80	90	100
AC-7813KM	1s	×	○	○	○	○	○
	2s	×	○	○	○	○	○

<Test results of various pressure>

ACF attachment condition: X Deg.C, 0.5, 1, 1.5MPa, 1s

ACF temperature	Deg.C	50	60	70	80	90	100
AC-7813KM	0.5MPa	×	×	○	○	○	○
	1MPa	×	○	○	○	○	○
	1.5MPa	×	○	○	○	○	○

4 Connection reliability

(1) Peel strength（High temp.- high humidity test）

ACF width: 1.0mm

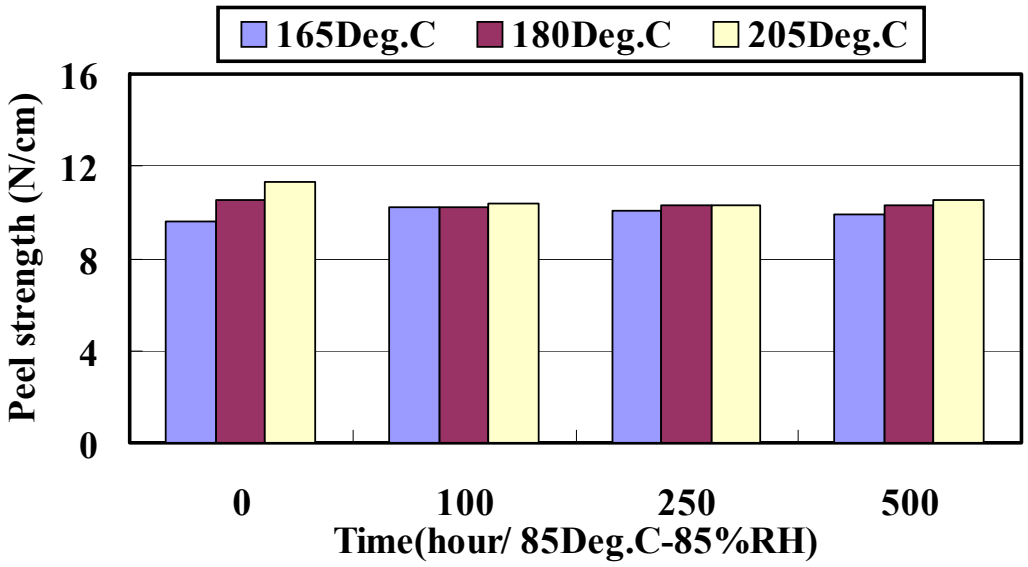
Bonding condition: 165, 180, 205Deg.C-5s-3MPa, 160, 170, 205Deg.C-10s-3MPa

Silicone rubber　0.2mmt ，Teflon sheet　0.06mmt

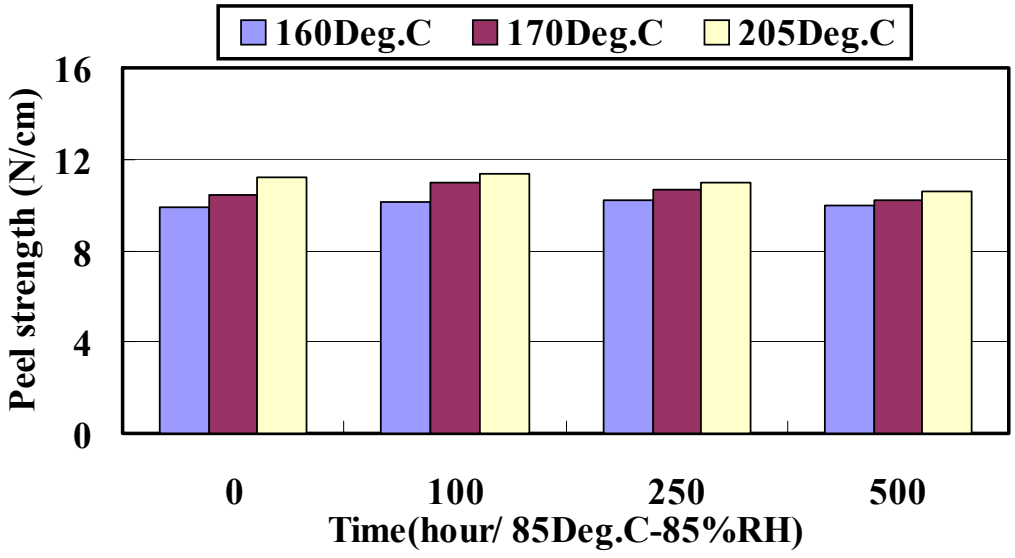
TEG: Hitachi's FPC (P=0.15, Cu: 18um, Au plated) / Hitachi's ITO all coated TEG glass 1.1mmt

Test condition: 85Deg.C-85%RH

5s bonding



10s bonding



(2) Reliability of connection resistance（High temp.- high humidity test）

ACF width: 1.0mm

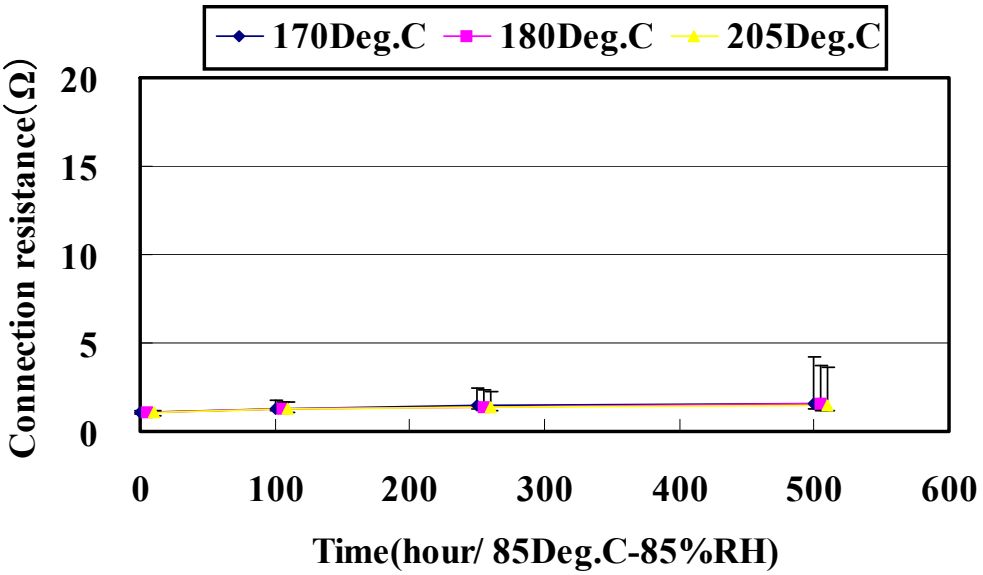
Bonding condition: 165, 180, 205Deg.C-5s-3MPa, 160, 170, 205Deg.C-10s-3MPa

Silicone rubber　0.2mmt ，Teflon sheet　0.06mmt

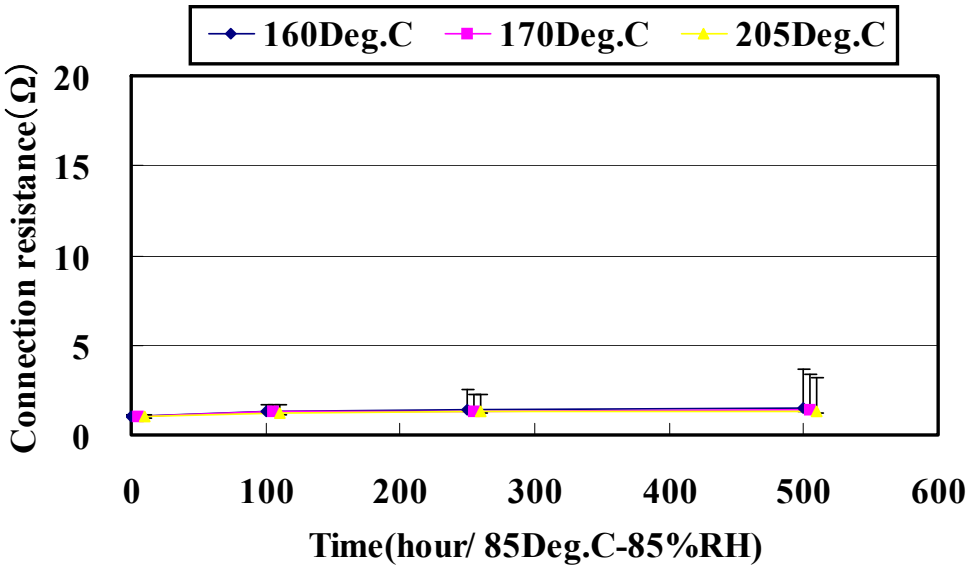
TEG: Hitachi's FPC (P=0.15 Cu: 18um, Au plated) / Hitachi's ITO all coated TEG glass 1.1mmt

Test condition: 85Deg.C-85%RH

5s bonding



10s bonding



(3) Reliability of connection resistance（Heat cycle）

ACF width: 1.0mm

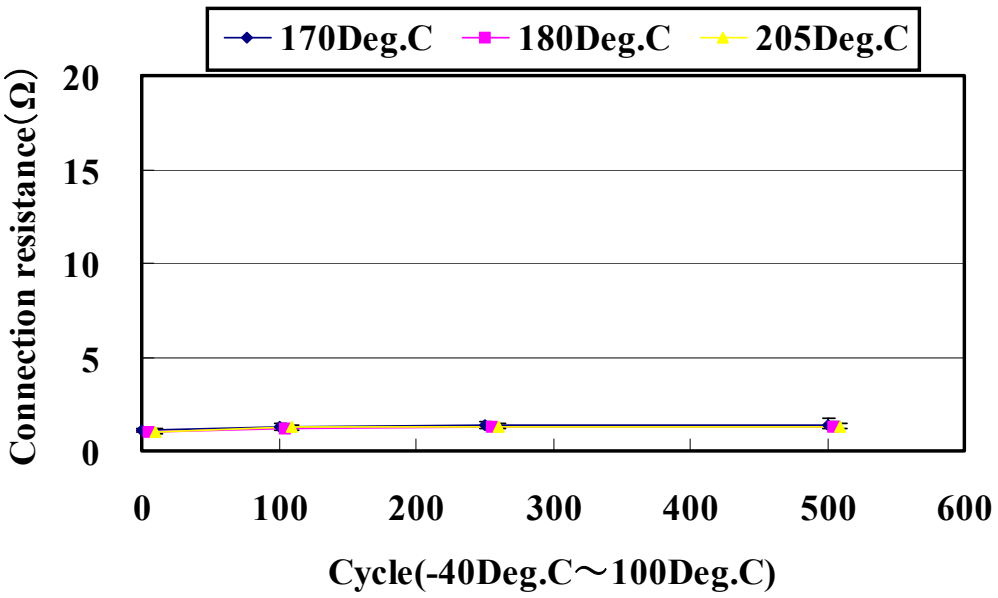
Bonding condition: 165, 180, 205Deg.C-5s-3MPa, 160, 170, 205Deg.C-10s-3MPa

Silicone rubber　0.2mmt ，Teflon sheet　0.06mmt

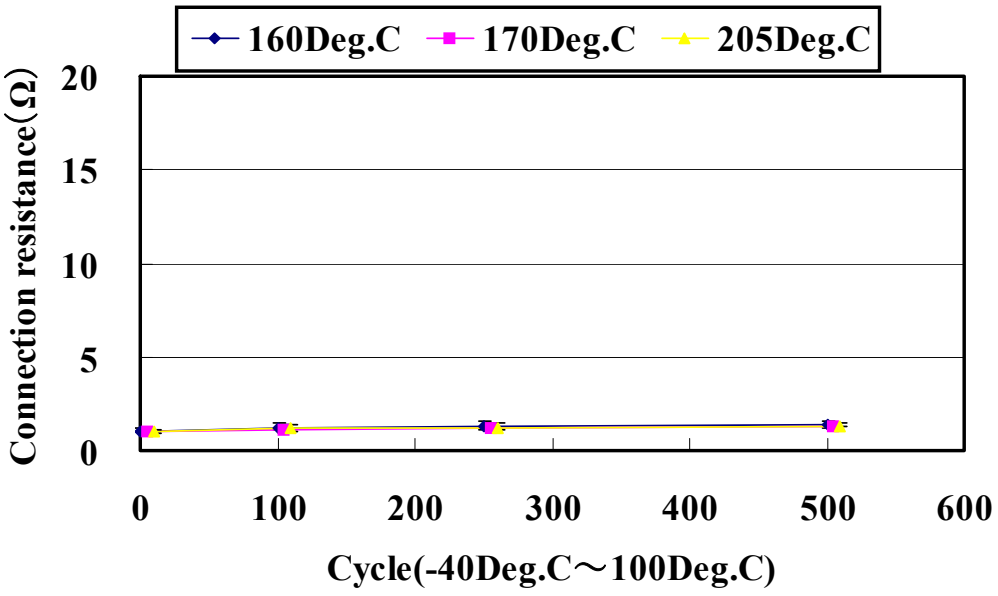
TEG: Hitachi's FPC (P=0.15 Cu: 18um, Au plated) / Hitachi's ITO all coated TEG glass 1.1mmt

Test condition: -40Deg.C(30min)⇔100Deg.C(30min)

5s bonding



10s bonding



(4) Reliability of insulation resistance（High temp. - High humidity test）

ACF width: 1.0mm

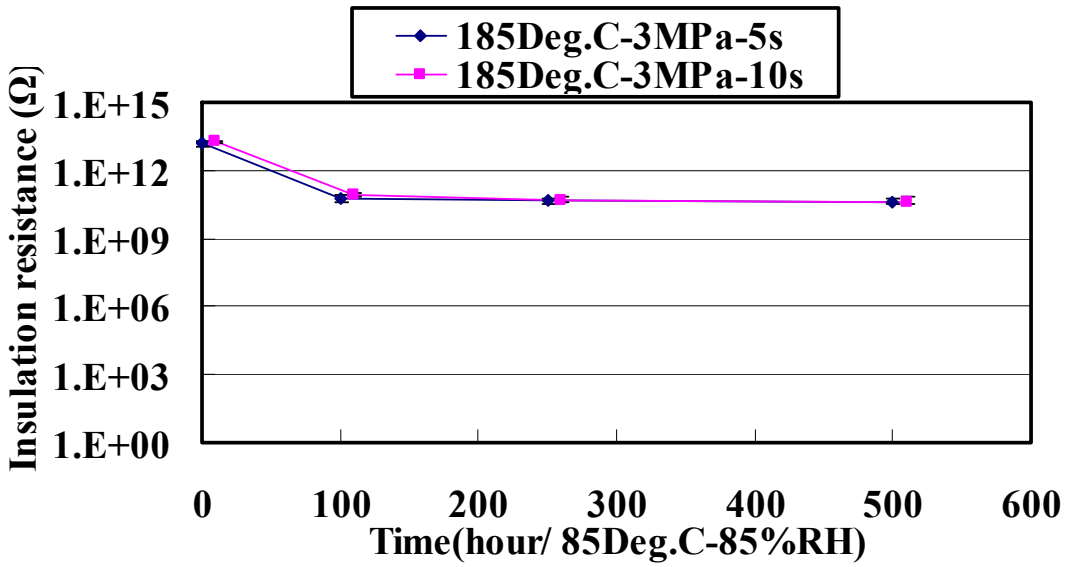
Bonding condition: 185Deg.C-5s-3MPa, 185Deg.C-10s-3MPa

Silicone rubber　0.2mmt ，Teflon sheet　0.06mmt

TEG: Hitachi's comb circuit TCP (P=0.05 Cu: 18um, Sn plated) / Hitachi's Insulation glass

Test condition: 85Deg.C-85%RH

Resistance measuring condition: 50V-60s



5 Reaction rate

Bonding condition: 155~205Deg.C-5, 10s-3MPa

Silicone rubber　0.2mmt ，Teflon sheet　0.06mmt

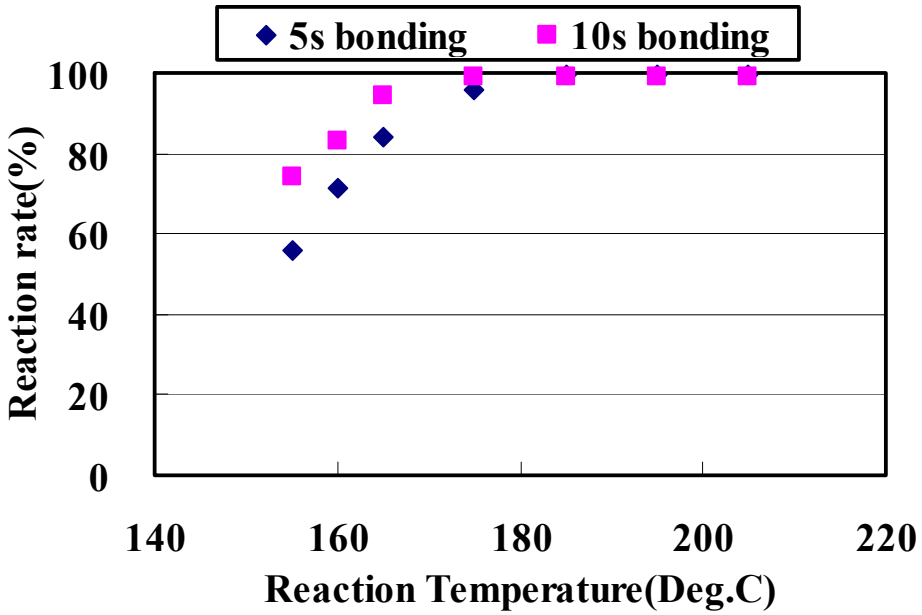
TEG: Hitachi's FPC (P=0.15 Cu: 18um, Au plated) / Hitachi's ITO all coated TEG glass (1.1mmt)

The amount of heat generated was measured with a DSC unit, and the reaction rate was determined with the following formula;

Reaction rate = $(Q_0-Q_T)/Q_0\times100$

Q_0 : initial amount of heat generated

Q_T : amount of heat generated after hardening



6 Physical properties

Curing condition: 180Deg.C-1hour

Measurement condition: -40 ～ 200Deg.C 5Deg.C/min, 1Hz

ANISOLM	Elastic modules(Gpa)	Tg (Deg.C)
	40Deg.C	
AC-7813KM	0.4	90