2000. 02. 10
Three Bond Co., Ltd.

TECHNICAL DATA

ThreeBond 2274C

Underfil for Mounting of CSP/BGA

1. Outline

ThreeBond 2274C is a one-part epoxy resin developed as an underfil for mounting of CSP/BGA. The cured material realizes the improved adhesion reliability against external thermal and physical stresses after mounting of CSP/BGA as well as the repairability, which has been difficult so far.

2. Characteristics

- Moderate viscosity: Possesses a moderate viscosity with a good permeability as well as a suppressed spreading of the resin into the peripheral parts.
- Added repairability: Heating enables it to dismount CSP/BGA parts after curing and remove the cured material.
  (Refer to 9. Example of Repairing)

3. Applications

Sealing and reinforcement of CSP/BGA (Underfil)

4. Properties

Table 1 Properties of ThreeBond 2274C

	Unit	Property	Test method	Note
Appearance	-	Black	3TS - 201 - 01	
Viscosity	Pa • s	12	3TS - 210 - 02	(BH-type viscometer: 20rpm)
Specific gravity	-	1.13	3TS - 213 - 02	

※ The property values in the above are test values and not guaranteed or specification values.

5. Characteristics

Table 2 Characteristics of TB 2274C

	Unit	Measured value	Test method	Note
Standard curing condition	-	85ºC x 1 hour	―	※1
Tension Shear Adhesive Strength	MPa	16	3TS – 301 – 11	Fe/Fe
Hardness	-	D83	3TS – 215 – 11	
Glass transition point	ºC	80	3TS – 501 – 05	TMA method
thermogravimetry	／ºC	α1: 77 x10-6 α2: 192 x10-6	3TS – 501 – 05	10-50ºC ※2 110-150ºC
Softening point	ºC	90	―	TMA method ※3
Surface resistivity	Ω	3.0 x1013	3TS－401－01	
Volume resistivity	Ω·m	2.5 x1015	3TS－402－01	
Dielectric constant	-	3.03	3TS－405－01	1MHz
Dielectric dissipation factor	-	0.013	3TS－402－01	1MHz

Curing Condition when Measuring the Properties: 85°C x 1h

※1: The curing condition changes according to the method of application and the amount of coating besides the heat capacities of the adherend and peripheral parts. It is recommended to determine the optimum curing condition confirming by using the actual parts.

※2: The second measured value of measuring twice by the TMA method under the temperature range - 20°C to 200°C and temperature rising condition at 10°C/min.

※3: Bending penetration method of TMA, sample thickness 0.5 mm, weighing 10 g.

The characteristic values above are experimentation values and not guaranteed performances and specification values.

6. Curing Velocity of TB 2274C at 85°C (Fe/Fe: SPCC-SD)

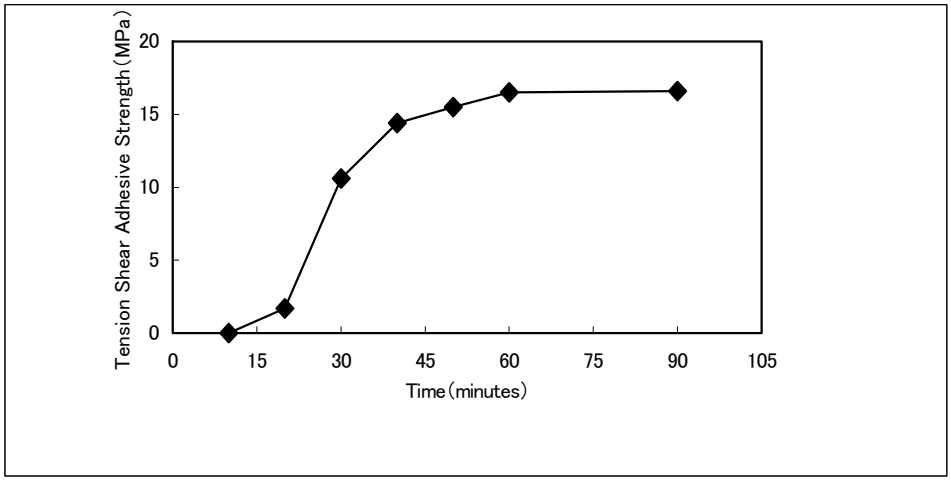
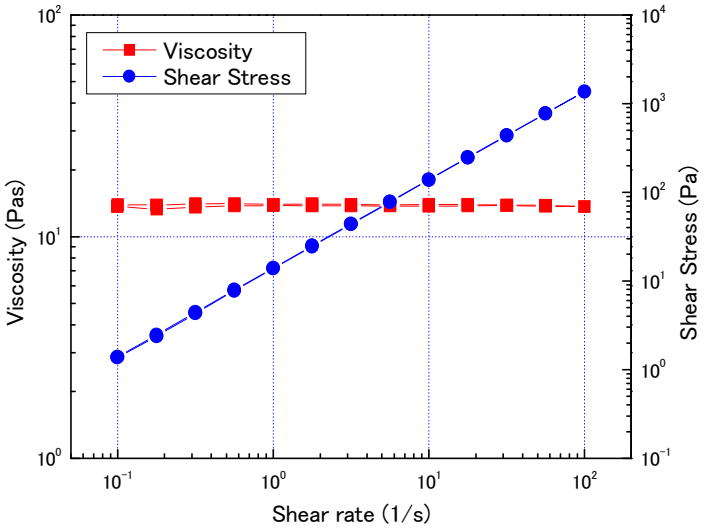


Fig. 1 Curing Velocity of TB2274C at 85°C

7. Shear rate dependability of viscosity and shear stress



Equipment: VAR-50 made by REOLOGICA Co.

Test geometry: cone plate 25 ϕ 4°

Measurement mode : Constant Rate

Share rate : 0.1—100(1/s)

Temperature : 25℃

Fig.2 Shear rate dependability of viscosity and shear stress

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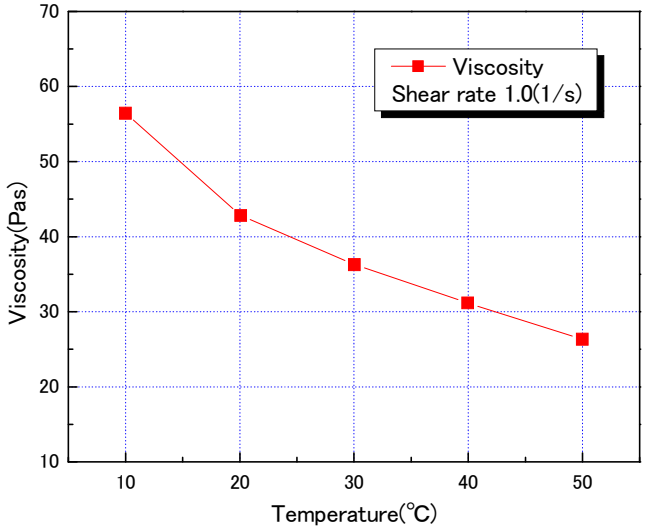
8. Viscosity - Temperature Curve



Equipment: VAR-50 made by REOLOGICA Co

Test geometry: cone plate 25 ϕ 4°

Measurement mode : Constant Rate

Share rate : 1.0 (1/s)

Temperature : 10-50℃ (10℃/steps)

Fig. 2 Viscosity - Temperature Curve.

9. Example of Repairing Method

(1) Dismounting of the Defect BGA/CSP:

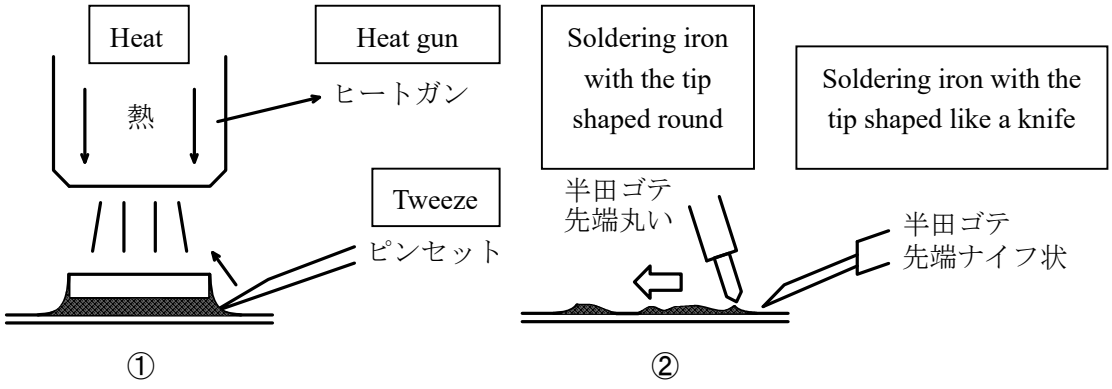
Heat the CSP/BGA from the above using a local heater (270 - 280°C) such as a heat gun and remove the CSP/BGA using a pair of tweezers when the underfil is softened (5 - 10 seconds).

* Take precautions not to damage the peripheral parts.

(2) Rough cutting:

Roughly cut off the remaining underfil on the substrate using 2 soldering irons (a one with the tip shaped round and the other with the tip shaped like a knife). (Soften the underfil with the one with the tip shaped round and remove with the one with the tip shaped like a knife. The soldering irons heated to about 350°C.)

※Take precautions not to damage the patterns on the substrate.



(3) Finish-cutting:

Completely remove the remaining underfil using the soldering iron with the tip shaped like a knife.

(4) Removal of the soldering residues:

Remove the soldering residues using braided wires.

(5) Finish-cleaning:

Finish-clean the repaired surface using cleaning agents such as alcohol.

※Because the degree of repairing changes according to the curing condition, it is recommended to determine the optimum curing condition confirming by using the actual parts.

10. Precautions for Handling

(1) The curing condition changes according to the method of application and the amount of coating besides the heat capacities of the adherend and peripheral parts. It is recommended to determine the optimum curing condition confirming by using the actual parts.

(2) Remove the stains of moisture, dust, rust, grease or mold releasing agent from the adherend surface.

(3) The product is a one-part epoxy resin. Thickening of the resin may take place due to the storage under a high temperature and the storage extending over a long period. Accordingly, the storage is made under refrigeration (5 - 10°C) and use after returning to the room temperature (When unsealed without returning to the room temperature, dew condensation takes place, and there is a possibility of a problem taking place such as gelation when the dew coming into contact with the resin). And, it is recommended to use up as soon as possible after unsealing.

(4) Similar to the general epoxy resins, coming into directly with the skin may cause dermal inflammation. When adhered to the skin, wipe out with paper or cloth and completely wash out with soap and water. When coming into contact with the eyes, immediately arrange to receive a medical treatment after cleaning with clean water for at least 15 minutes.

(5) The product is not classified into “Dangerous Substance” of the Fire Services Act. But, as the same as the general adhesives, full attention should be paid to fire.

(6) For the details concerning the safety, refer to the attached Material Safety Data Sheet (MSDS)

11. Storage

Store in the refrigerator (5 - 10 ºC).

12. Disposal consideration

Consign the disposal of the product to an authorized professional disposal trader for industrial wastes.

13. Precautions for use

For industrial use

Never use for household use.

Acknowledge the following terms of sales before use of the product.

(1) As for the technical data listed herein, the values are the test values in accordance with the test methods of our company, and we cannot warrant absolutely for the accuracy and completeness. Users are requested to infallibly decide the application and purpose by themselves and bear all of the accompanying responsibilities and risks. The coverage of warranty is limited to the replacement of for a clearly defective product with new item.

(2) We cannot bear any responsibility for injuries and losses caused by mishandling of the product.

(3) We cannot bear any responsibility for the matters not listed in this data book unless otherwise so specified in the contract.