

ThreeBond

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Three Bond Co., Ltd.

Technical Data

ThreeBond 2274S

Underfill agent for mounting CSP and BGA

1. Outline

ThreeBond 2274S is a one-part heat-curing epoxy compound resin developed as an underfill agent for mounting CSP and BGA. The agent improves the connection reliability against internal and external physical and thermal stresses after mounting of CSP and BGA.

(Hereinafter, ThreeBond is abbreviated to TB.)

2. Features

- (1) Adequate viscosity: Excellent flowability and rapid penetration, and excellent workability and spreadability
- (2) High reliability: High glass transition temperature and stable physical characteristics under actual environment of usage
- (3) High adhesion: Excellent adhesion to iron and glass epoxy

3. Uses

Sealing and reinforcement (underfill) of CSP and BGA

4. Properties

Table 1 Properties of TB2274S

Test item	Unit	Property	Test method	Remarks
Appearance	-	Blue	3TS-201-02	
Viscosity	Pa·s	3.8	3TS-210-05	Shear rate: 19.2 s ⁻¹
Specific gravity	-	1.17	3TS-213-02	

5. Characteristics

5.1 Characteristics of cured resin

Table 2 Characteristics of TB2274S

Test item	Unit	Characteristic value	Test method	Remarks
Tensile shear bond strength	MPa	23 24	3TS-301-11	Fe/Fe Glass epoxy/glass epoxy
Glass transition point	°C	124	3TS-501-05	TMA
Linear expansion coefficient α_1	ppm/°C	58		
α_2	ppm/°C	173		
Reaction starting temperature	°C	65	3TS-501-02	DSC
Storage modulus (25°C)	GPa	2.5	3TS-501-04	DMA
E'' peak top	°C	106		
tan δ peak top	°C	121		
Volume resistivity	$\Omega \cdot m$	1.6×10^{14}	3TS-401-01	DC500V
Dielectric constant	-	3.85 (1kHz)	3TS-405-01	
Dielectric loss tangent	-	3.66 (1MHz)		
		0.006 (1kHz)		
		0.019 (1MHz)		

Curing conditions: Tensile shear bond strength: 120°C for 10min

Other test items: 120°C for 30 min

5.2 Flow curves

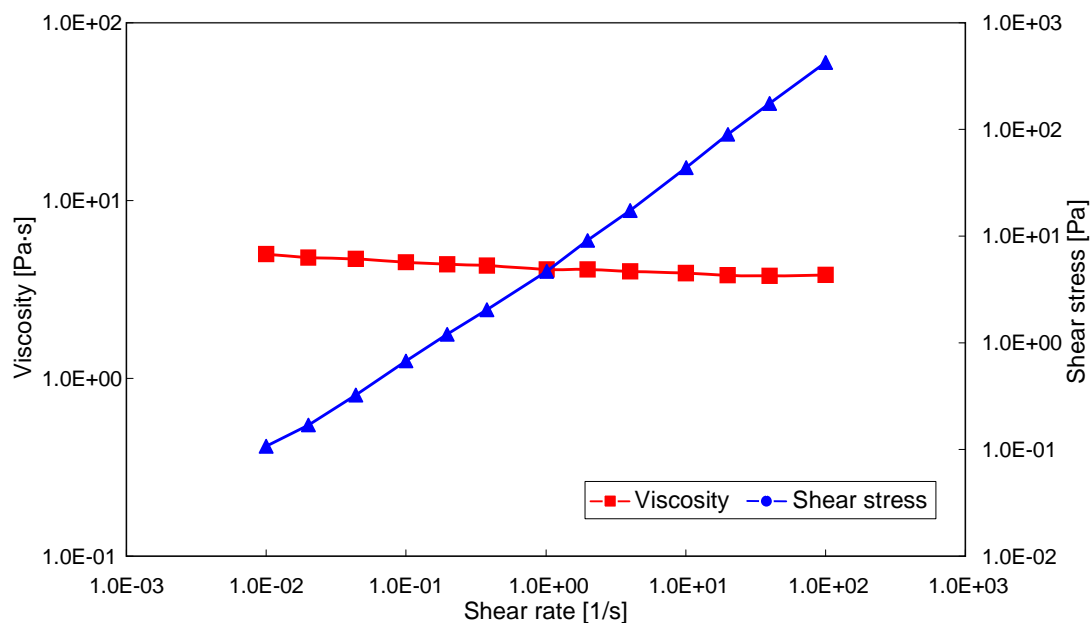


Fig. 1 Flow curves

Shear rate : 1.0 to 100 [1/s], Temperature : 25°C

5.3 Temperature-viscosity curve

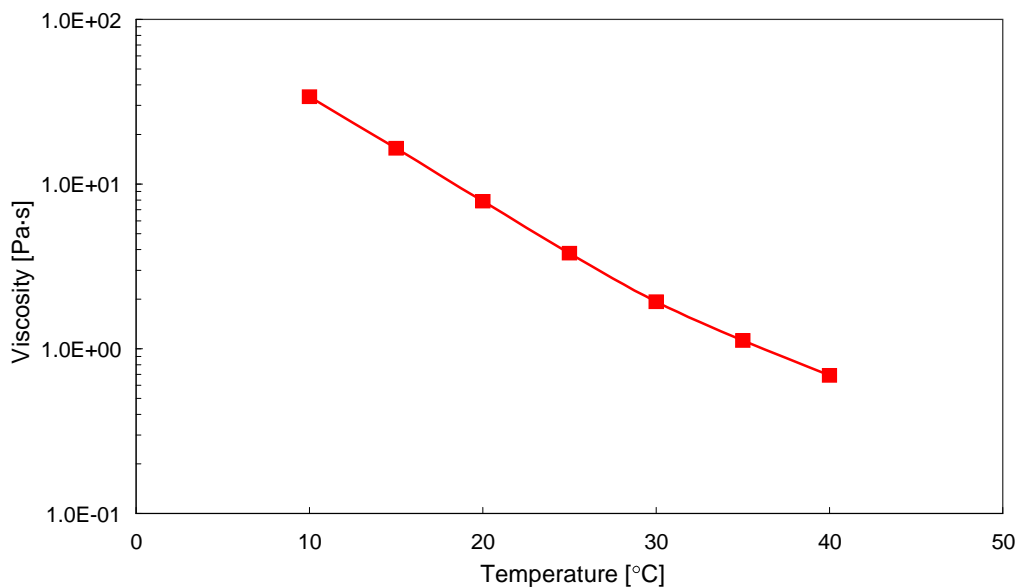


Fig. 2 Temperature-viscosity curve
Shear rate : 10 [1/s]

5.4 DMA

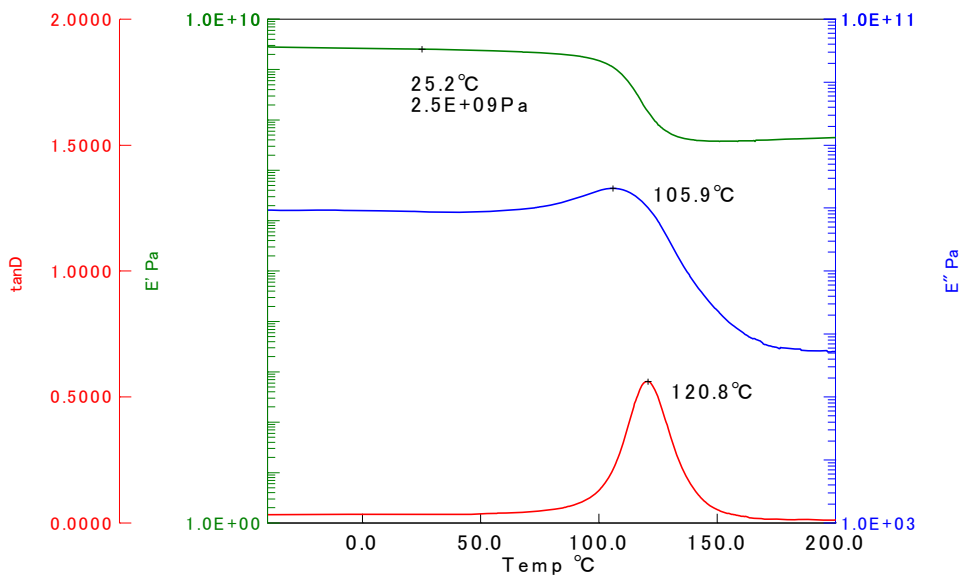


Fig. 3 DMA chart

5.5 TMA

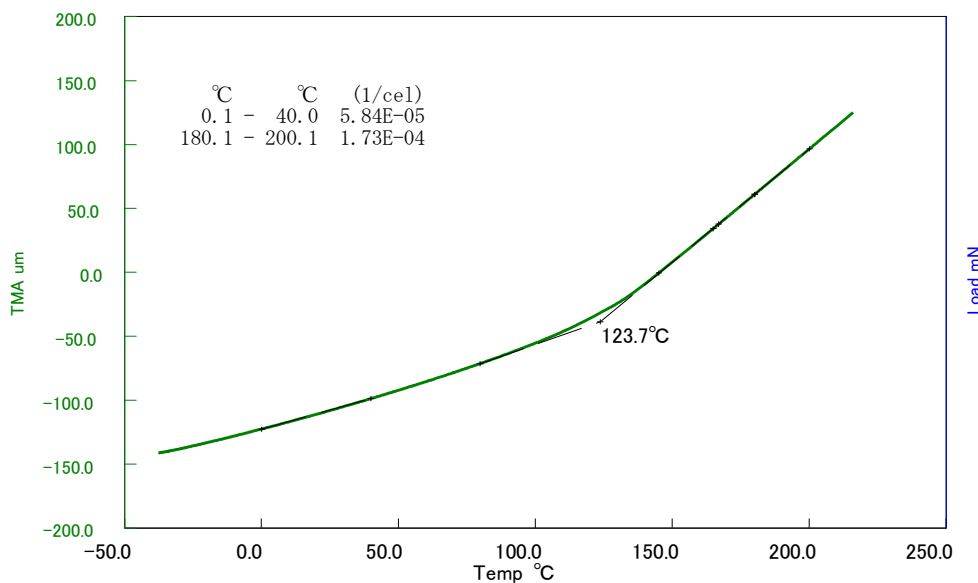


Fig. 4 TMA chart

6. Usage

- (1) Carefully read the instructions prior to use.
- (2) Completely remove dust, oil and other contaminants from the surfaces to be treated with the agent.
- (3) The applying and curing conditions vary depending on the chip shape and the substrate material and shape. It is recommended to check the curing state on the actual equipment and determine the optimum applying and curing conditions.

7. Instructions for use

- (1) Before using the product, sufficiently confirm whether the method of application and the purpose of use are appropriate.
- (2) This product is a one-part epoxy-compound resin. Separation of resin components or increase in viscosity may be caused if it is stored at a high temperature or for a long time. Therefore, store it in a refrigerator (-5 to 10°C), and return it to room temperature prior to use. (If it is unsealed before it reaches room temperature, dew condensation can occur, and nonconformity, such as gelation, may be caused when the resin gets into contact with the dew.) After unsealing, use it up as soon as possible.
- (3) Like general epoxy compound resins, the resin may cause inflammation if it adheres directly to the skin. If it adheres to the skin, wipe it away with paper or cloth, and wash the skin with soap and water. If it gets in the eyes, wash them with clean water, and immediately get medical attention.
- (4) Although it is not designated as a hazardous material under the Fire Defense Law, watch out for fire when using it in the same manner as when using general adhesives.

- (5) For hazard and toxicity information not mentioned herein, see the material safety data sheet (MSDS).

8. Storage

Store the product in a dark dry place at -5 to 10°C avoiding direct sunlight.

9. Disposal

Dispose of the product and its empty container as industrial waste.

10. Applicable law

Fire Defense Law: Not applicable

11. Cautions

For industrial use only

(Do not use it for household products.)

This product has been developed for general industrial use. Before using the product, you must accept the following sales terms.

- The technical data given herein are not guaranteed values, but examples of experimental values obtained by our specified test methods. We do not guarantee that the uses introduced herein do not conflict with any intellectual property right.
- Users are asked to evaluate the validity and safety of the use of the product for the relevant purpose prior to use and bear all responsibilities and hazards involved in its use.
Never use the product for medical implants that will be implanted or injected into the body or may be left in the body.
- We are not liable for personal injury or property damage caused by improper handling of this product.
If the properties and use of the relevant product are unknown, never use it.
- For detailed information on product safety, see the material safety data sheet (MSDS).
To obtain the MSDS, contact our sales department or customer service office.
- This document is subject to change at our discretion.