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Three Bond Co., Ltd.

Technical Data

ThreeBond 3124

UV-curing resin for organic EL panels

1. Outline

ThreeBond 3124 is a UV-curing epoxy resin that cures at a wavelength of 200 to 400 nm. Since it can cure in several seconds under irradiation with UV light, it is helpful in increasing the speed of production line, and, since it excels in moisture absorption resistance and moisture permeation resistance, it contributes toward improvement of panel reliability.

Although it can cure under irradiation only with UV light, it develops more stable adhesion when it is annealed.

Since it was developed as a sealant for organic EL panels, it has low moisture absorption and low moisture permeability. It is suitable for glass-to-glass and glass-to-SUS bonding and sealing.

2. Features

- (1) Grade developed as a sealant for organic EL panels
- (2) One-part non-solvent UV-curing epoxy resin
- (3) Curing in several seconds under irradiation with UV light
- (4) Low moisture permeability helpful in improvement of display reliability
- (5) No cobwebbing and excellent dispensing performance
- (6) 20- μm glass fiber contained as a gap material

3. Use

For sealing organic EL panels

4. Properties

4.1 Properties

Table 1 Properties

Test item	Unit	Property	Test method	Remarks
Appearance	-	Pinkish white	3TS-201-01	-
Viscosity	Pa·s	270	3TS-210-05	EHD-type rotary viscometer *1)
Specific gravity	-	1.41	3TS-213-02	Specific gravity cup

*1) Use of 3° R14 cone rotor Number of rotations: 1

4.2 Flow curves (rheometer)

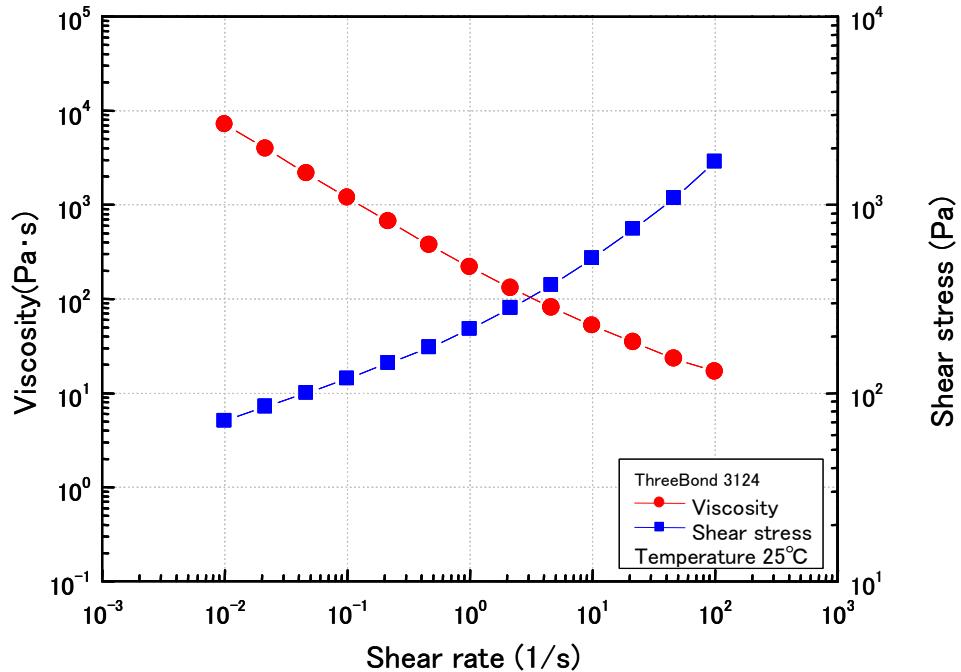


Fig. 1 Viscosity curve and flow curve

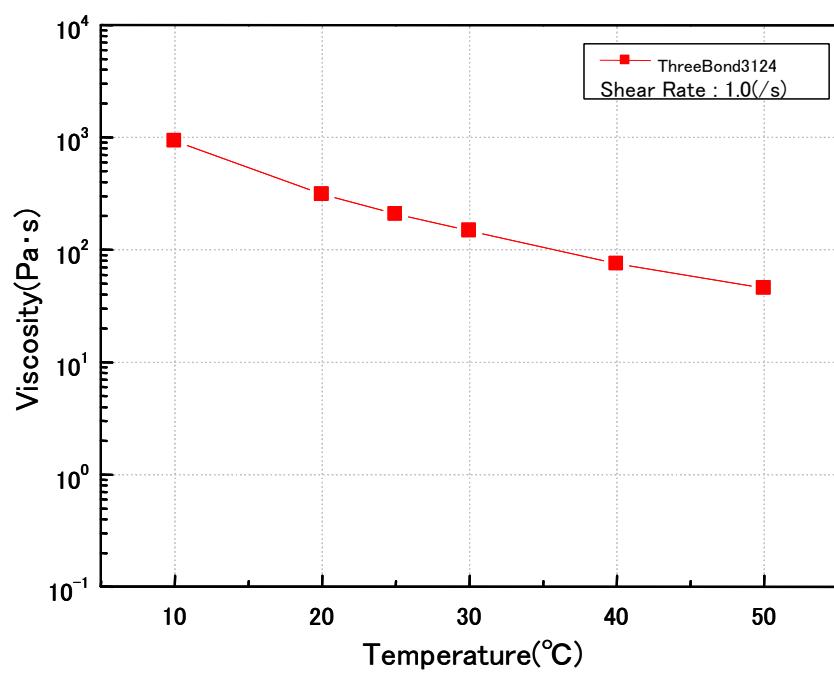


Fig. 2 Temperature-viscosity curve

4.3 Physical characteristics of cured resin

Table 2 Characteristics of cured resin

Test item	Unit	Characteristic	Test method	Remarks
Hardness		D78	3TS-215-01	25°C
Moisture absorption	%	0.6	3TS-233-03	
Cure shrinkage	%	3.5	3TS-228-01	
Tensile shear bond strength	MPa	9.5 8.6	3TS-301-13 3TS-301-13	Glass/glass *1) SUS/glass *1)
Moisture permeability	g/m ² ·24h	80 30	JIS K 7129	80°C × 95%RH 60°C × 95%RH *2)
Glass transition point	°C	134 153	3TS-501-04 3TS-501-04	DMA method, 1 Hz, E" peak DMA method, 1 Hz, tanδ peak
Linear expansion coefficient	1/K	35 × 10 ⁻⁶	3TS-501-05	TMA method
Dynamic viscoelasticity	GPa	5.3 (25°C) 3.7 (100°C)	3TS-501-04	DMA method, elastic modulus (E')
Electrical characteristics			3TS-401-01	Conforming to JIS K 6911
Volume resistivity	Ω·m	4.7 × 10 ¹⁴	3TS-402-01	
Surface resistivity	Ω	1.0 × 10 ¹⁵	3TS-405-01	
Dielectric constant	50 Hz 1 kHz	3.85 3.81	3TS-405-01 3TS-405-01	
Dielectric loss tangent	50 Hz 1 kHz	0.0047 0.0043	3TS-405-01 3TS-405-01	

Irradiation conditions: High-pressure mercury vapor lamp (HMW-244-11CM), 4 kW
 Dominant wavelength: 365 nm
 Irradiation distance: 15 cm
 Integrated light intensity: 60 kJ/m²
 Illuminance: 100 mW/cm²

Heating conditions after irradiation with UV light: Heating for 1 hr at 80°C

Heating conditions after irradiation with UV light: Heating for 20 hrs at 150°C (moisture permeability, glass transition point and linear expansion coefficient)

Remarks:

*1) Glass material failure

*2) Specimen thickness: 150 μm

5. Instructions for use

- (1) The curing speed varies depending on the type of light source and irradiation distance. Check the curing speed prior to use.
- (2) The resin is harmful to the health. Do not touch it directly or inhale its vapor. Adhesion of the resin to the skin may cause an inflammation. If it adheres to the skin, immediately wipe it away with a cloth or paper, and wash the skin with soap and water. If it gets in the eyes, wash them with clean water for about 15 minutes, and get medical attention.

- (3) When using it, wear appropriate protective clothings, such as a mask, gloves (impervious) and goggles. Use it in a place equipped with a local exhaust system.
- (4) If any abnormality is found in the body, stop using it, and get medical attention. People who have allergies or sensitive skin should avoid using it.
- (5) Since it contains harmful components, it must not be used for drinking water or hot water supply piping. Before using it, sufficiently confirm whether the method and purpose of use are appropriate.
- (6) Do not remove the product into other containers. Do not return the product left unused to its container.
- (7) Some materials may deteriorate if this product is used. Ascertain in advance whether or not it affects the parts to be bonded with it. If any problem occurs, do not use it.
- (8) To prevent deterioration or entry of foreign matter, fit the cap tightly after using it.
- (9) Store the product at -5 to 10°C away from light.
- (10) It is refrigerated. Use it after it reaches room temperature.
- (11) Use and store it out of reach of children.
- (12) It is designated as a non-pharmaceutical deleterious substance. Be sure to store it in a locked cabinet.
- (13) Although its flash point is low, it should be carefully stored and handled.

6. Applicable laws

Poisons and Deleterious Substances Control Law: Non-pharmaceutical deleterious substance, antimony compound, 0.7%

Fire Defense Law: Flammable, fourth class, third type petroleum product, epoxy adhesive, hazard class III

7. 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.