ThreeBond

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ThreeBond Co., Ltd.

Technical Data
ThreeBond 3017E
UV-curing resin

1. Outline

ThreeBond 3017E is a one-part nonsolvent light-curing resin whose main component is urethane acrylate. It cures quickly under irradiation with UV light having a wavelength of 200 to 380 nm. The cured resin has flexibility and excels surface curability.

This product is a low halogen content material. The total chlorine content and total bromine content are less than 900 ppm each, and the sum of total chlorine content and total bromine content is less than 1500 ppm.

Hereinafter, ThreeBond is abbreviated to TB.

2. Features

(1) The resin cures under irradiation with UV light from several to several tens of seconds.
(2) Excellent surface curability.
(3) The resin cures under irradiation with LED lamp.
(4) It has high adhesive property to the hard to bond materials of polyolefin.
(5) When applying, the dispensing flow is held under controlled.

3. Use

Fixing of optical parts

4. Properties

Table 1 Properties of TB3017E

Test item	Unit	Result	Test method	Remarks
Appearance	-	White	3TS-201-01	
Viscosity	Pa·s	25.0	3TS-210-10	Shear rate : $20s^{-1}$, 25°C
Specific gravity	-	0.93	3TS-213-02	

5. Flow curves

5.1 Viscosity curve

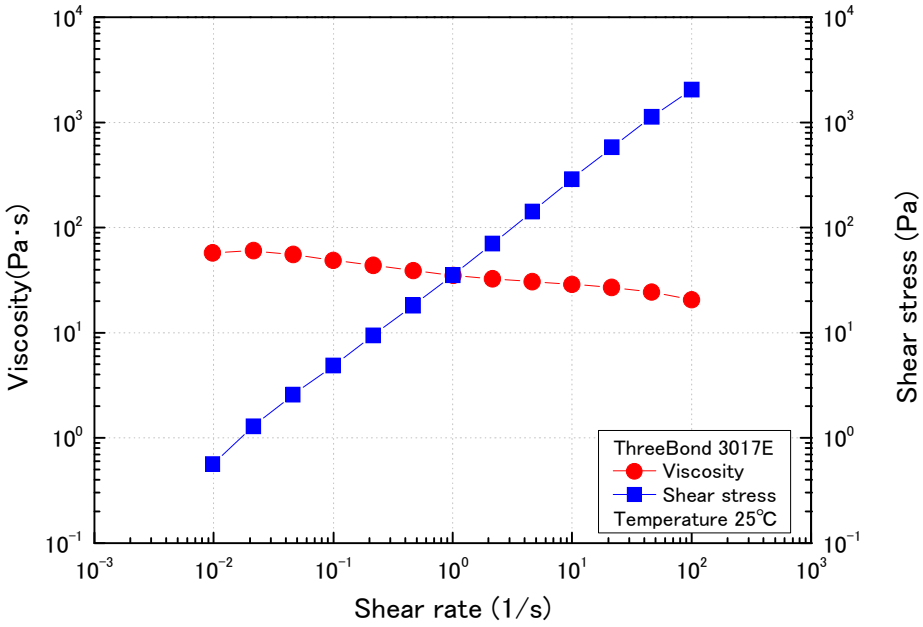

Fig. 1 Viscosity curve of TB3017E

5.2 Temperature-viscosity curve

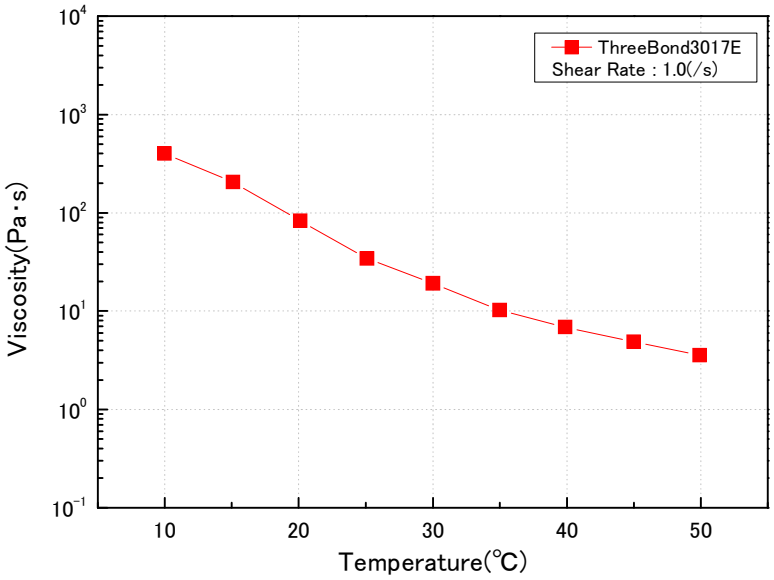

Fig. 2 Temperature-viscosity curve of TB3017E

6. Characteristics

6.1 Characteristics of cured resin

Table 2 Characteristics of cured TB3017E

Test item	Unit	Result	Test method	Remarks
Hardness	-	A35	3TS-215-01	25°C
Cure shrinkage	%	6.5	3TS-228-01	φ32, 1.5g
Thick film curability	mm	3.0	3TS-222-01	30 kJ/m^2

Curing conditions: 30 kJ/m^2 × 2, High-pressure mercury vapor lamp,
Dominant wavelength: 365 nm, Irradiation distance: 15 cm

6.2 Tensile shear bond strength

Table 3 Tensile shear bond strength of TB3017E

Substrate 1	Substrate 2	Unit	Result	Test method	Remarks
ZeDc	Glass	MPa	3.0	3TS-301-13	
ZEONEX®	ZEONEX®		2.8		
	ZeDc		3.0		
	PPS		1.2		GS-40®
	LCP		1.0		Vectra E130®

Curing conditions: 30 kJ/m^2, High-pressure mercury vapor lamp,
Dominant wavelength: 365 nm, Irradiation distance: 15 cm

Table 4 Tensile shear bond strength of TB3017E

Substrate 1	Substrate 2	Unit	Result	Test method	Remarks
ZeDc	Glass	MPa	3.2	3TS-301-13	
ZEONEX®	ZEONEX®		3.0		
	ZeDc		3.2		
	PPS		1.2		GS-40®
	LCP		1.1		Vectra E130®

Curing conditions: 30 kJ/m^2, LED lamp, Dominant wavelength: 365 nm

6.3 The amount exception of irradiation, tensile shear bond strength

Table 5 Tensile shear bond strength of TB3017E

Substrate 1	Substrate 2	Unit	Result	Test method	Remarks
ZEONEX®	ZEONEX®	MPa	2.9	3TS-301-13	10 kJ/m^2
			2.9		20 kJ/m^2
			2.9		30 kJ/m^2

Curing conditions: High-pressure mercury vapor lamp,
Dominant wavelength: 365 nm, Irradiation distance: 15 cm

Table 6 Tensile shear bond strength of TB3017E

Substrate 1	Substrate 2	Unit	Result	Test method	Remarks
ZEONEX®	ZEONEX®	MPa	3.0	3TS-301-13	10 kJ/m^2
			3.0		20 kJ/m^2
			3.0		30 kJ/m^2

Curing conditions: LED lamp, Dominant wavelength: 365 nm

6.4 Dynamic viscoelastic characteristics

Table 7 Dynamic viscoelastic characteristics of TB3017E

Item	Unit	Result	Test method	Remarks
Storage modulus (E')	Pa	8.80×10^6 : 25°C	3TS-501-04	
Loss modulus, (E") peak	°C	-55		
Loss tangent (tan δ) peak	°C	-32		

Curing conditions: 30 kJ/m^2 × 2, High-pressure mercury vapor lamp,
Dominant wavelength: 365 nm, Irradiation distance: 15 cm
Measuring condition: 1Hz

6.5 Linear expansion coefficient

Table 8 Linear expansion coefficient of TB3017E

Item	Unit	Result	Temperature range	Test method
α_1	ppm	91	-80 to -30	3TS-501-05
α_2		252	0 to 80	
Tg	°C	-20	—	

Curing conditions: 30 kJ/m^2 × 2, High-pressure mercury vapor lamp
Dominant wavelength: 365 nm, Irradiation distance: 15 cm

6.6 Thermal mass change

Table 9 Thermal mass change of TB3017E

Item	Unit	Result	Test conditions	Test method
Thermal mass change	%	-0.8	80°C ×2 h	3TS-501-03

Curing conditions: 30 kJ/m^2, High-pressure mercury vapor lamp
Dominant wavelength: 365 nm, Irradiation distance: 15 cm

7. Instructions for use

(1) It is harmful to the health. Do not inhale or drink it.
(2) It is harmful to the health. Do not touch it directly or inhale its vapor.
(3) Wear appropriate protective clothings, such as a mask, goggles and gloves (impervious), as necessary, and use the resin in a place equipped with a local exhaust system.
(4) Use and store it out of reach of children.
(5) People who have allergies or sensitive skin should avoid using it.
(6) If it is swallowed, immediately get medical attention.
(7) If it gets in the eyes, wash them with clean water for more than 15 minutes, and get medical attention.
(8) Adhesion of the resin to the skin may cause inflammations. If it adheres to the skin, immediately wipe it away with a cloth or paper, and wash the skin with soap with water.
(9) If any abnormality is found in the body, stop using the resin, and get medical attention.
(10) Because fluidity of this product is very low in the state of keeping in refrigerator or freezer, please fully return to room temperature (15-25℃) before using it.
(11) Stir well the whole resin prior to use.
(12) Before using it, sufficiently confirm whether the method of application and the purpose of use are appropriate.
(13) Some materials may deteriorate if TB3017E is used. Ascertain in advance whether or not it affects the parts to be sealed with it. If any problem occurs, do not use it.
(14) The curing speed varies depending on the type of light source and irradiation distance. Sufficiently check the curing speed prior to use. Particularly, the curing speed is greatly affected by the adhesive temperature and substrate surface temperature owing to changes in temperature and humidity in the room.
(15) Some gas is generated during application and curing with UV light. Forcibly ventilate the working area and the place of irradiation with UV light.
(16) When using it after pouring it into another container, check for influence on its curability prior to use. Do not return the product left unused to the container.
(17) For hazard and toxicity information not mentioned in this document, see the material safety data sheet (MSDS).

8. Storage

To prevent deterioration and entry of foreign matter, fit the cap tightly, and store it in a dark dry place at -5 to 25°C away from light.

9. Disposal

Ask disposal services having specialized knowledge to dispose of the product. When burnt, it may generate toxic gas. Do not burn it.

10. 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.