ThreeBond

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ThreeBond Co., Ltd.

Technical Data
ThreeBond 3094G
UV-curing Resin

1. Product description

ThreeBond 3094G is a medium-viscosity UV-curing resin that cures under UV radiation having a wavelength of 200 to 400 nm. It has good adhesion to plastics, such as polycarbonate.
Also, it conforms to ISO10993 (biological safety assessment).

Hereinafter, ThreeBond is abbreviated to TB.

2. Features

(1) Medium-viscosity type.
(2) Good adhesion to plastics, such as polycarbonate and acryl.
(3) Excellent thick film curability.
(4) Curable with UV-LED.
(5) Conforming to ISO10993 (biological safety assessment).
(6) Not containing bisphenol.

3. Applications

Bonding of medical devices (injection needle and hub)

4. Properties and characteristics

4.1 Properties

Table 1 Properties of TB3094G

Test item	Unit	Result	Test method	Remarks
Appearance	-	Light yellow	3TS-2100-020	Visual inspection
Viscosity	mPa·s	2400	3TS-2F00-007	25°C, shear rate: 200 s^{-1}
Specific gravity	-	1.04	3TS-2500-002	25°C

4.2 Flow curves

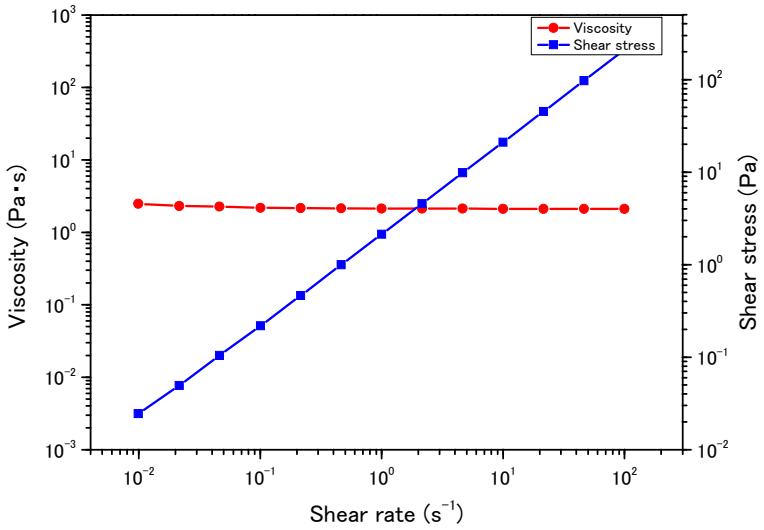

Fig. 1 Flow curves of TB3094G (at 25°C)

Test method: 3TS-4200-001 (flow curve - rheometer method)
Flow curve measuring condition: 25°C
Measuring device: HAAKE MARS-III Geometry C35/1

4.3 Temperature-viscosity curve

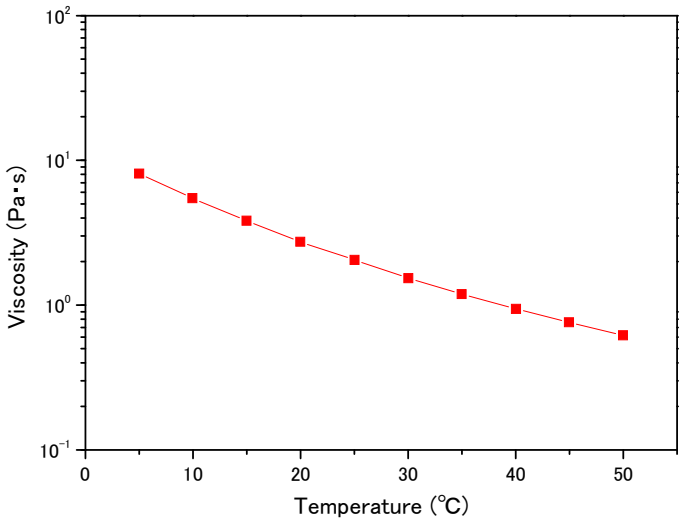

Fig. 2 Temperature-viscosity curve of TB3094G

Test method: 3TS-4200-003 (temperature-viscosity curve - rheometer method)
Temperature-viscosity curve measuring condition: Shear rate: 10 (s^{-1})
Measuring device: HAAKE MARS-III Geometry C35/1

5. Characteristics

5.1 Characteristics of cured resin

Table 2. After cured properties of TB3094G

Test item	Unit	Result	Test method	Remarks
Thick film curability	mm	3.0	3TS-3160-001	*1
		1.3		*2
Cure shrinkage	%	4.8	3TS-2600-001	φ32, 1.5g *1
Hardness	-	D66	3TS-2B00-010	*1
Water absorption	%	4.9	3TS-2530-003	Boiling for 2 hrs, φ32, 1.5 g *1

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

*2 Curing conditions: UV-LED, 500 mW/cm^2 × 6 sec, Dominant wavelength: 365 nm

5.2 Lap shear strength (high-pressure mercury lamp)

Table 3 Lap shear strength of TB3094G to various materials (high-pressure mercury lamp)

Substrate 1	Substrate 2	Unit	Result	Test method	Remarks
Glass	Glass	MPa	9.1*	3TS-4100-013	-
	Acryl		7.7*		ACRYPET®VH000
	PC		7.2*		PANLITE®L-1225Y
	Glass epoxy		7.5*		KEL-GEF®
	ABS		7.3*		ABS-N-WN
	LCP		4.6		VECTRA®E130i
	Fe		8.4*		JISG3141 (SPCC-SD)
	Al		4.5		JISH4000 (A1050P)
	SUS		7.6*		JISG4305 (SUS304)
			7.1*		JISG4305 (SUS430)
PC	PC		8.4*		PANLITE®L-1225Y
	SUS		7.6		JISG4305 (SUS304)
	PP		0.5		-
	PET		4.1		Rynite®530
	ABS		6.1*		ABS-N-WN

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

*Material failure

5.3 Lap shear strength (UV-LED)

Table 4 Lap shear strength of TB3094G to various materials (UV-LED)

Substrate 1	Substrate 2	Unit	Result	Test method	Remarks
Glass	Glass	MPa	8.1*	3TS-4100-013	-
	Acryl		7.6*		ACRYPET®VH000
	PC		7.4*		PANLITE®L-1225Y
	Glass epoxy		8.4*		KEL-GEF®
	ABS		6.2*		ABS-N-WN
	LCP		4.1		VECTRA®E130i
	Fe		9.1*		JISG3141 (SPCC-SD)
	Al		5.4		JISH4000 (A1050P)
	SUS		9.3*		JISG4305 (SUS304)
			7.1*		JISG4305 (SUS430)
PC	PC		8.1*		PANLITE®L-1225Y
	SUS		7.4		JISG4305 (SUS304)
	PP		0.5		-
	PET		4.1		Rynite®530
	ABS		5.4*		ABS-N-WN

Curing conditions: UV-LED, 500 mW/cm^2 × 6 sec, Dominant wavelength: 365 nm
*Material failure

5.4 Thermomechanical analysis (TMA)

Table 5 TMA properties of TB3094G

Test item	Unit	Result	Test method	Remarks
Linear expansion coefficient (α_1)	$\times 10^{-6}$/°C	97	3TS-4740-001	-60 to -40°C
Linear expansion coefficient (α_2)		183		140 to 160°C
Glass transition temperature	°C	53		TMA method

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

5.5 Dynamic viscoelastic properties (DMA)

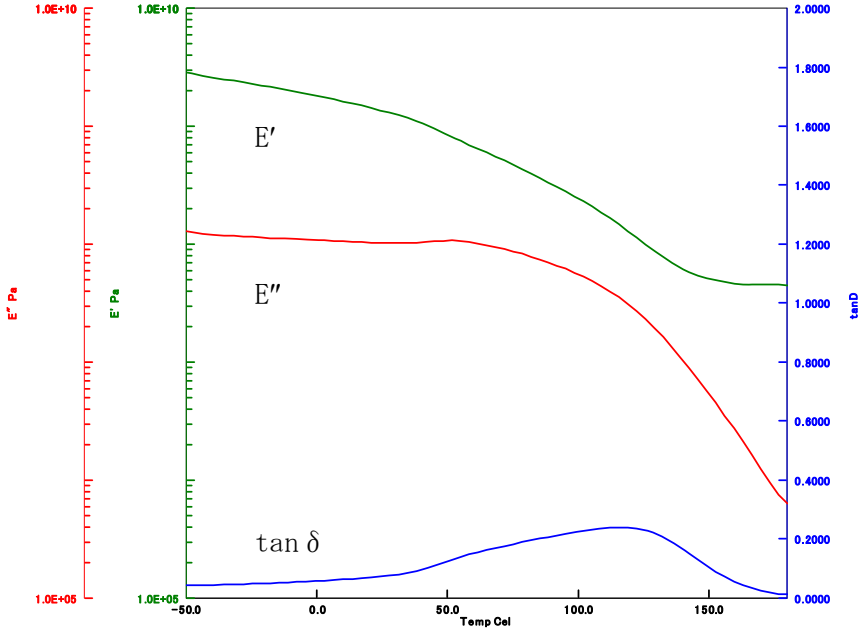

Fig. 3 Results of DMA measurement of TB3094G

Table 6 DMA properties of TB3094G

Test item	Unit	Result	Test method	Remarks
Storage modulus (E')	Pa	1.4×10^9	3TS-4730-001	25°C 1 Hz
Loss modulus (E")	°C	52		Peak value 1 Hz
Loss tangent (tanδ)		115		Peak value 1 Hz

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

6. Usage

(1) Use a solvent to remove moisture, oil and contaminants from the surface to be sealed.
(2) For other information regarding application and curing of the resin, consult our sales engineers.

7. Directions for use

(1) Do not inhale or ingest. Harmful to health. Do not inhale or ingest.
(2) Harmful to the health. Do not directly touch nor inhale vapor.
(3) Wear appropriate protective equipment, such as a mask, goggles and gloves (impervious), and use the product in a place equipped with a local exhaust system.
(4) Keep out of reach of children.
(5) People who have allergies or susceptible skin should avoid handling it.
(6) If swallowed, do not induce vomiting. Immediately rinse the mouth, and get medical attention.
(7) If in eyes, repeatedly and sufficiently rinse with clean water, and immediately get medical attention.
(8) If it adheres to the skin, it may cause inflammation. Immediately wipe away with cloth or paper, and wash the skin with soap and water.
(9) If any bodily abnormality occurs, discontinue use, and get medical attention.
(10) Before using it, sufficiently confirm whether the method of application and the purpose of use are appropriate.

(11) To prevent quality deterioration, do not transfer into other container and do not return to original container.
(12) Use of this product may cause substrate degradation.
The effects of the resin on the substrates must be confirmed by the operator in advance. Refrain from using the resin if any detrimental effects are observed.
(13) 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 liquid temperature and substrate surface temperature owing to changes in temperature and humidity in the room.
(14) The thick film curability varies depending on the irradiation conditions, such as type, intensity and UV dose of the light source. Thoroughly check the conditions prior to use.
(15) Some gas can be generated during application and curing with UV light. Forcibly ventilate the working area and the UV irradiation area.
(16) The resin may freeze at low temperatures. If it has frozen, leave it at room temperature for more than half a day, and use it after stirring the whole well.
(17) For detailed hazard information of the product, see the Safety Data Sheet (SDS).

8. Storage

Seal the container tightly to prevent deterioration and contamination, and store it in an indoor dark, dry place away from flame, heat sources and sunlight.

9. Disposal

Do not burn the product. It may generate harmful gas when burnt.
Ask specialized waste disposal services to dispose of the product.

10. Precautions

For Industrial Use Only (Do not use for household purposes.)

This product is developed for general industrial use. Before using this product, the user must accept the following 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 described herein do not conflict with any intellectual property right.
- Before using this product, confirm the appropriateness and safety of the use for the application in question, and bear all responsibilities and risks involved in the use. Never embed or inject into bodies nor use as a medical implant that 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 or usage of the product to be used are unclear, never use it.
- For detailed safety information of the product, see the Safety Data Sheet (SDS). To obtain the SDS, contact our sales office or customer service center.
- Information in this document is subject to change at our own discretion.

11. Registered trademark