ThreeBond

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Three Bond Co., Ltd.

Technical Data

ThreeBond 2249G
One-part heat-curing epoxy-compound resin

1. Outline
ThreeBond 2249G (hereinafter, ThreeBond is abbreviated to TB) is a one-part heat-curing epoxy resin having well-balanced shear bond strength and peel strength.

2. Features
(1) One-part heat-curing adhesive
(2) High adhesive strength

3. Uses
Bonding of magnets
Bonding of various metallic materials
Bonding of other general materials

4. Properties

Table 1. Properties of TB2249G

Test item	Unit	Property	Test method
Appearance	–	Black	3TS-201-02 (visual inspection)
Specific gravity	–	1.59	3TS-213-02 (specific gravity cup)
Viscosity	Pa·s	75	3TS-210-02 (BH-type rotational viscometer, No.7 rotor, 20 rpm)

The values are given for your reference.

5. Characteristics

Table 2. Characteristics of TB2249G

Test item	Unit	Characteristic	Test method
Hardness	–	D90	3TS-215-01 (JISD)
Glass transition temperature	°C	104	3TS-501-05 (TMA method)
Linear expansion coefficient	$\times 10^{-5}$/°C	42	Thermal dilatometer, 10°C/min
Storage modulus	Pa	5.4×10^{9} (-40°C)	3TS-501-04 (DMA method) 1 Hz, 3°C/min
		4.4×10^{9} (25°C)	
		1.8×10^{7} (200°C)	

* Standard curing conditions: 160°C × 30 min The values are given for your reference.

* The above characteristic values are not guaranteed or specified values, but experimental values.
* The curing conditions depend on the thermal capacities of the substrate and peripheral parts and applying method. Check the curing state on the actual parts in advance, and determine the optimum curing conditions.

6. Electrical characteristics

Table 3. Electrical characteristics of TB2249G

Test item	Unit	Characteristic	Test method
Volume resistivity	Ω·m	1.02×10^{13}	3TS-401-01
Surface resistivity	Ω	2.56×10^{13}	3TS-402-01
Dielectric breakdown voltage	kV/mm	33.0	3TS-406-01

* Standard curing conditions: 160°C × 30 min The values are given for your reference.

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* The curing conditions depend on the thermal capacities of the substrate and peripheral parts and applying method. Check the curing state on the actual parts in advance, and determine the optimum curing conditions.

7. Tensile shear bond strength to various materials

Table 4. Tensile shear bond strength to various materials

Material	Unit	Characteristic	Test method	Remarks
Iron	MPa	39.0	3TS-301-11	SPCC-SD: 1.6 × 25 × 100 mm
Stainless steel		36.0		SUS430: 1.5 × 25 × 100 mm
Nickel plating		35.3		SPCC-SB: 2.0 × 25 × 100 mm
Trivalent chrome plating		31.2		SPCC-SB: 1.6 × 25 × 100 mm
Hexavalent chrome plating		38.3		SPCC-SB: 1.6 × 25 × 100 mm
Aluminum		22.0		A1050P: 2.0 × 25 × 100 mm

* Standard curing conditions: 160°C × 30 min The values are given for your reference.

* The above characteristic values are not guaranteed or specified values, but experimental values.
* The curing conditions depend on the thermal capacities of the substrate and peripheral parts and applying method. Check the curing state on the actual parts in advance, and determine the optimum curing conditions.

8. T-peel strength to various materials

Table 5. T-peel strength to various materials

Material	Unit	Characteristic	Test method	Remarks
Iron	kN/m	8.0	3TS-304-21	SPCC-SD: 0.5 × 25 × 100 mm
Stainless steel		3.6		SUS430: 0.5 × 25 × 150 mm
Nickel plating		4.0		SPCC-SB: 0.5 × 25 × 150 mm
Trivalent chrome plating		2.7		SPCC-SB: 0.5 × 25 × 150 mm
Hexavalent chrome plating		5.0		SPCC-SB: 0.5 × 25 × 150 mm
Aluminum		4.5		A1050P: 0.5 × 25 × 150 mm

* Standard curing conditions: 160°C × 30 min The values are given for your reference.

* The above characteristic values are not guaranteed or specified values, but experimental values.
* The curing conditions depend on the thermal capacities of the substrate and peripheral parts and applying method. Check the curing state on the actual parts in advance, and determine the optimum curing conditions.

9. Reference

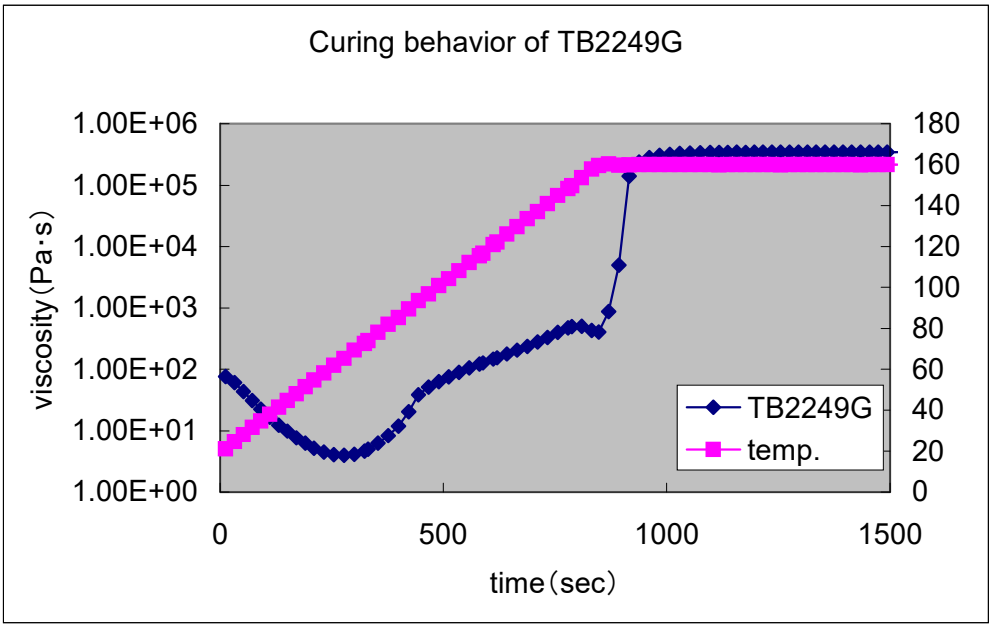

Fig. 1 Rheometer curing behavior

10. Instructions for use

(1) The curing conditions depend on the thermal capacities of the substrate and peripheral parts and applying method. When the resin is applied in a large quantity (cures in a state of a thick film) or it is applied in a certain shape, it may foam or burn owing to heat generated during curing.
The resin components may be separated or the resin may not cure depending on the shape of work or applying conditions.
It is recommended to check the curing state on the actual parts in advance and determine the optimum curing conditions.

(2) Remove moisture, dust, rust, oil, parting agent and other contaminants from the surfaces to be bonded.

(3) Open the container after the adhesive reaches room temperature to prevent condensation.

(4) Direct adhesion of the resin to the skin may cause inflammation.
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 for more than 15 minutes, and get medical attention.

(5) TB2249G 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.

(6) For the details of safety, see the attached material safety data sheet (MSDS).

11. Storage

Store the resin in a refrigerator (at -5 to 10°C). After unsealing it, use it up as soon as possible.

12. Disposal

Have the product disposed of as industrial waste by authorized industrial waste disposal services.
Treat the used container and waste cloth in the same manner.
When burnt, this adhesive can generate harmful substances, such as carbon monoxide, ammonia, chlorine and cyanogen gas.

13. Safety precautions

For industrial use only (It is not intended for household use)

Before using the product, approve the following conditions of sale.

(1)This technical information gives experimental values obtained by our specified test methods. We cannot thoroughly guarantee the correctness and perfectness of the data.

The user should determine whether the product is appropriate to the use and purpose before using it, and take all responsibilities for danger caused by it. The guarantee applies only to replacement of apparently defective product.

(2)We are not liable to injuries and damages caused by improper handling of this product.

(3)We do not take responsibility for any matter not mentioned herein unless otherwise mutually agreed in the contract.