ThreeBond

Oct. 23, 2013
Three Bond Co., Ltd.

Technical Data
ThreeBond 1533F
Single-component, Moisture-curing Elastic Adhesive (for Difficult -to-bond Materials)

1. Product description

ThreeBond 1533F is a solvent-free, single-component, moisture-curing elastic adhesive which can bond difficult-to-bond materials without the use of primers.

Its main component is a silyl-based special polymer. The adhesive cures when reacting with a trace of moisture in the air. Since it has an extremely low content of volatile components and does not contain low-molecular weight cyclic siloxane, it will not cause electrical contact failures.

Hereinafter, ThreeBond is abbreviated to TB.

2. Features

(1) Good adhesion to difficult-to-bond materials, such as polypropylene
(2) Single-component adhesive not requiring primer treatment
(3) Its elasticity ensures excellent vibrating and impact stress relaxation properties.
(4) No dibutyltin compounds (in compliance with EU regulations)

3. Applications

Bonding and sealing of olefin-based resin electric components, electric parts and plumbing parts

4. Properties

Table 1 Properties of TB1533F

Test item	Unit	Result	Test method	Remarks
Appearance	-	Gray	3TS-2100-020	-
Viscosity	Pa·s	180	3TS-2F00-007	25°C Shear rate: 5.0(s^{-1})
Specific gravity	-	1.21	3TS-2500-002	-

5. Characteristics

Table 2 General characteristics of TB1533F

Test item	Unit	Result	Test method	Remarks
Hardness	-	A25	3TS-2B00-004	-
Tensile strength	MPa	3.0	3TS-4190-001	-
Elongation	%	460	3TS-4190-001	-

Curing conditions: At 23±2°C and 50±5%RH for 7 days

Table 3 Characteristics of TB1533F

Test item	Unit	Result	Test method	Remarks
Tack-free	min	20	3TS-3130-006	23±2°C, 50±5%RH
Low-molecular siloxane	Wt %	Detection limit or less	-	$D_3 \sim D_{10}$

Table 4 Electrical characteristics of TB1533F

Test item	Unit	Result	Test method	Remarks
Volume resistivity	Ω·m	6.8×10^{13}	3TS-5200-001	-
Surface resistivity	Ω	2.2×10^{15}	3TS-5200-002	-
Dielectric constant	-	4.9	3TS-5220-001	1kHz
	-	4.1	3TS-5220-001	1MHz
Dielectric loss tangent	-	0.037	3TS-5220-001	1kHz
	-	0.039	3TS-5220-001	1MHz
Dielectric breakdown strength	kV/mm	26	3TS-5230-002	-

Table 5 Lap shear strength of TB1533F to various materials (plastics)

Material	Unit	Result	Test method	Remarks
Polypropylene (PP)	MPa	1.3	3TS-4100-013	AF
Polyethylene (PE)		0.8		AF
Phenol		4.6		CF
Acryl		4.5		CF
Polybutylene terephthalate (PBT)		1.8		AF
Polyphenylene sulfide (PPS)		3.0		CF
Polycarbonate (PC)		4.2		CF
ABS		3.6		CF
Polyethylene terephthalate (PET)		3.8		CF
Nylon 6,6		4.3		CF

Curing conditions: At 23±2°C and 50±5%RH for 7 days, application to both surfaces, without open time AF: Adhesive failure CF: Cohesive failure

Table 6 Lap shear strength of TB1533F to various materials (metals)

Material	Unit	Result	Test method	Remarks
Aluminum (A1050P)	MPa	3.9	3TS-4100-013	CF
Steel (SPCC-SD)		3.7		CF
Stainless steel (SUS304)		3.8		CF
Copper (C1100P)		4.0		CF

Curing conditions: At 23±2°C and 50±5%RH for 7 days, application to both surfaces, without open time AF: Adhesive failure CF: Cohesive failure

Table 7 Lap shear strength of TB1533F when heated

Material	Unit	Ambient temperature					Test method
		0 ºC	25 ºC	50 ºC	80 ºC	100 ºC	
Aluminum	MPa	4.9	3.9	2.9	1.8	1.3	3TS-4100-013
Polypropylene		1.9	1.3	0.6	0.4	0.4	

Curing conditions: At 23±2°C and 50±5%RH for 7 days, application to both surfaces, without open time AF: Adhesive failure CF: Cohesive failure

Table 8 Heat resistance of TB1533F - Lap shear strength (aluminum)

Exposure temperature	Unit	Exposure time					Test method
		Blank	7 days	14 days	21 days	28 days	
80 ºC	MPa	3.9	7.1	7.5	7.5	7.4	3TS-4100-013
100 ºC		3.9	7.1	7.2	6.9	6.8	
120 ºC		3.9	6.9	7.1	6.8	6.6	

Curing conditions: At 23±2°C and 50±5%RH for 7 days, application to both surfaces, without open time

Table 9　180°peel strength of TB1533F

Material	Unit	Result	Test method	Remarks
Cotton canvas/cotton canvas	kN/m	1.7	3TS-4130-011	CF
Cotton canvas/polypropylene		0.4		AF
Cotton canvas/polyethylene		0.3		AF

Curing conditions: At 23±2°C and 50±5%RH for 7 days, application to both surfaces, without open time AF: Adhesive failure CF: Cohesive failure

Table 10　Thick film curability of TB1533F

Curing conditions	Unit	Actual measurement		Test method
		7 days	14 days	
25 ºC×55%RH	mm	2.7	3.5	3TS-3160-005
40 ºC×95%RH		6.6	7.5	

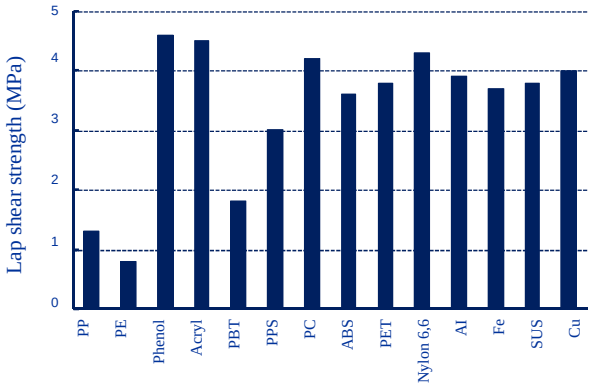

Fig. 1 Comparison of lap shear strength to various materials

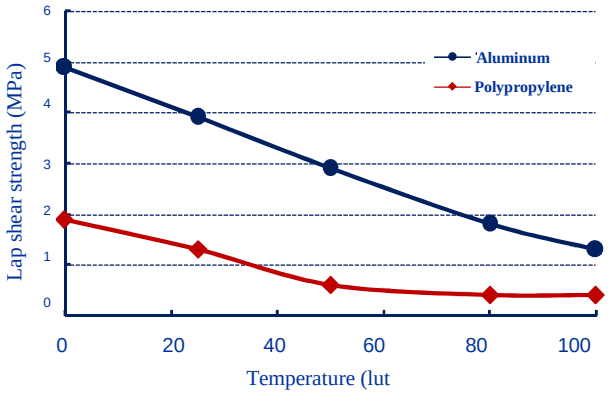

Fig. 2 Lap shear strength when heated

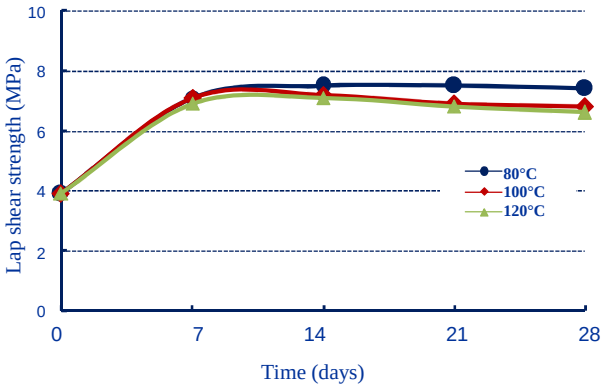

Fig. 3 Heat resistance - Lap shear strength

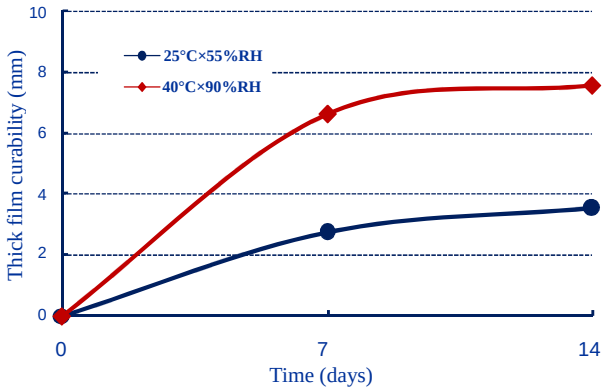

Fig. 4 Thick film curability

6. Directions for use

(1) For industrial use. Do not use for household purposes.

(2) Before using, sufficiently confirm whether the method of application and the purpose are appropriate.

(3) Do not ingest.
(4) Keep out of reach of children.
(5) Do not use it near fire.
(6) Before using, sufficiently confirm whether the method of application and the purpose are appropriate.
(7) To prevent burning, never apply the adhesive to a heating element when the element is at a high temperature.
(8) Carefully check for foreign matter on the surface to be coated with the adhesive.
(9) Cures upon exposure to moisture therefore, if possible, use up entire content after opening the container .
(10) For hazard and toxicity information not mentioned herein, see the material safety data sheet (MSDS).

7. Storage

Store it with the cap tightly fitted to prevent deterioration and contamination.
Store at -5 to 25ºC avoiding direct sunlight.

8. Disposal

Dispose of the product and its empty containers as industrial waste.
Dispose of the container after the agent has all been used.

9. Cautions

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 material safety data sheet (MSDS).
  To obtain the MSDS, contact our sales office or customer service center.
- Information in this document is subject to change at our own discretion.