

# ThreeBond

March 21, 2013  
Three Bond Co., Ltd.

## Technical Data

### ThreeBond 2089B

#### (Metal Stick Putty, Epoxy-based)

#### 1. Product description

ThreeBond 2089B is a stick putty consisting of two concentrically formed components, base epoxy resin and curing agent. It is unnecessary to weigh the base resin and curing agent separately. The putty can be used by cutting the required amount and kneading it with gloved fingers. Since its base material is a fast-curing epoxy resin, it starts curing 2 to 3 minutes after application. After 1 hour, it will become as hard as metal and can be drilled, polished, tapped and coated.

It is suitable for filling, sealing, bonding and repairing metallic parts (automobile parts, machine tools, equipment, etc.). It is applicable not only to metals, but also to wood, glass, stones, ceramics and plastics. (However, it does not adhere to polyethylene, polypropylene, nylon, silicone resin, fluorocarbon resin or soft vinyl chloride.)

(Hereinafter, ThreeBond is abbreviated to TB.)

#### 2. Features

- (1) The base resin and curing agent are formed together. It is only necessary to cut and knead to cure the putty. No part of the putty will be wasted, and the working efficiency will be improved.
- (2) Excelling in fast curability. It starts curing after 2 to 3 minutes and can be machined by tools, such as a cutter, after 1 hour. Excelling in curability at low temperatures
- (3) It has excellent heat resistance. (Thermal decomposition starting temperature: 260°C)
- (4) The putty epoxy resin does not sag even on vertical surfaces.

#### 3. Applications

- (1) Filling of dents on cars
- (2) Repair of threaded holes in machine tools
- (3) Repair of cracks in pipe connections
- (4) Repair bonding of various metals

#### 4. Result

**Table 1. Result**

| Item                              | Units                          | Main agent    | Curing agent  | Test methods   |
|-----------------------------------|--------------------------------|---------------|---------------|----------------|
| Appearance                        | —                              | Outside: Gray | Inside: Black | 3TS-2100-002   |
| Specific gravity of cured sealant | —                              | 2.15          |               | 3TS-2500-003   |
| Usage life                        | min                            | 4             |               | 3TS-3150-002*1 |
| Standard curing conditions        | 1 hr at 25°C or 10 min at 60°C |               |               |                |

\* 1 40-g scale The pot life is the time to the exothermic peak.

#### 5. Characteristics

##### 5.1 Properties of cured adhesive

**Table 2. Properties of cured adhesive**

| Test items           | Units | Property value  | Test methods                    |
|----------------------|-------|---|---------------------------------|
| Hardness             | —     | 1 hr at 25°C: D73<br>2 hrs at 25°C: D81<br>24 hrs at 25°C: D87    | Test method                     |
| Lap shear strength   | MPa   | 1 hr at 25°C: 5.2<br>2 hrs at 25°C: 8.0<br>24 hrs at 25°C: 8.8    | 3TS-4100-011<br>(Fe/Fe:SPCC-SD) |
| Compression strength | MPa   | 1 hr at 25°C: 28.0<br>2 hrs at 25°C: 42.3<br>24 hrs at 25°C: 71.8 | 3TS-4111-001<br>(12×12×24mm)    |

##### 5.2 Tensile shear bond strength to each material

**Table 3. Tensile shear bond strength to each material**

| Material | Result | Material                    | Result |
|----------|--------|-----------------------------|--------|
| Aluminum | 7.2    | Stainless steel             | 7.3    |
| Brass    | 6.8    | Hard PVC                    | 3.0    |
| Copper   | 8.0    | Glass epoxy                 | 6.9    |
| Ceramics | 6.3    | Philippine mahogany plywood | 3.1 *1 |
| Glass    | 3.8 *1 |                             |        |

\*1 Material failure

\* Unit: MPa Curing conditions: 24 hrs at 25°C Test method: 3TS-4100-011

### 5.3 Heat resistance

Unit Thermal decomposition starting temperature Thermal decomposition temperature Test method °C2603603TS-4700-001

| Units | Thermal decomposition starting temperature | Thermal decomposition temperature | Test methods |
|-------|--|-----------------------------------|--------------|
| °C    | 260  | 360                               | 3TS-4700-001 |

## 6. Usage

- (1) Surface treatment  
Remove oil and other contaminants completely from the surfaces to be bonded. To remove oil, use thinner or the like.
- (2) Mixing  
Remove the transparent film, cut the required amount of the putty with a knife or the like, wear protective gloves, and sufficiently knead it until unevenness in color is eliminated. The standard kneading time is approx. 2 minutes. The putty will start curing after 2 to 3 minutes at 25°C.
- (3) Application  
Press the putty to the surface to be bonded or repaired. When bonding a part, secure the part after laminating.
- (4) Curing  
The putty will start curing after 2 to 3 minutes at 25°C and become hard after 30 minutes to 1 hour. The agents do not cure forever unless they are mixed. However, once they are mixed, the mixture cures as the result of chemical reaction. Use up the mixture within 3 minutes.

## 7. Usage precautions

- (1) Before using, sufficiently confirm whether the method of application and the purpose are appropriate.
- (2) If the agents have not been mixed completely, the resin does not cure sufficiently, thereby causing bonding failure.
- (3) Some materials may deteriorate if this product is used. The effects on the substrates should be confirmed in advance. If there are any problems, do not use.
- (4) To prevent deterioration and contamination, after using, wrap the putty with the transparent film, put it in the container, and store it with the cap fitted.
- (5) Due to the properties of the resin, slight discoloration may occur.
- (6) When the agents are mixed, the mixture generates heat. Take care not to scald your hands.
- (7) Keep out of reach of children.
- (8) At temperatures lower than 10°C in winter, it may take a longer time to cure. If necessary, heat it with a dryer or the like.
- (9) Harmful to the health. Do not touch it directly or inhale its vapor.

- (10) When using it, wear appropriate protective clothings, such as a mask, gloves (not permeable) and goggles. Use it in a well-ventilated outdoor area or in a place equipped with a local exhaust system.
- (11) If in eyes, rinse with clean water for over 15 minutes, and get medical attention.
- (12) If on skin, wipe it away with a cloth, and wash the skin with soap.
- (13) If any bodily abnormalities occur, discontinue use, and get medical attention.
- (14) Persons with allergies or sensitive skin should avoid use.
- (15) Contains harmful materials. Do not use for drinking water or hot water supply piping.
- (16) For hazard and toxicity information not mentioned herein, see the MSDS (material safety data sheet).

## 8. Storage

Fit the caps tightly, and store the product avoiding direct sunlight, high temperature, splashes and high moisture.

## 9. Disposal

Ask an authorized industrial waste disposal firm to dispose of the product.

## 10. Cautions

|                            |
|----------------------------|
| For Industrial<br>Use Only |
|----------------------------|

(Do not use as a household product)

This product was 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. Furthermore, we do not guarantee that the uses described herein do not conflict with any intellectual property right.
- Users are asked to examine whether the product is appropriate to the purpose of use and can be used safely before they use it and bear all responsibilities and hazards involved in its 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 and usage of this product are unknown, do not use.
- For more information on product safety, see the material safety data sheet (MSDS). To obtain the MSDS, contact our sales office or customer service center.
- Information in this technical document is subject to change at our discretion without notice.