



Dec. 19, 2022  
ThreeBond Co., Ltd.

## Technical Data

### ThreeBond 3953

### Two-Component Room Temperature Hardening High Strength Elastic Adhesive, Epoxy Type

#### 1. Product description

ThreeBond 3953 is a non-solvent two-component room temperature curing elastic adhesive. Its main components are an epoxy resin and a silyl-based special polymer. When the two components are mixed, the mixture cures by the reaction of the epoxy resin with an amine compound and of the silyl-based special polymer with a trace of moisture in the air. It is resistant to vibration and shock and excels in relaxation of stress of expansion and contraction.

Additionally, it has strong adhesion to a wide range of materials, including metals, plastics and inorganic materials.

Hereinafter, ThreeBond is abbreviated to TB.

#### 2. Features

- (1) Strong adhesion to a wide range of materials
- (2) After curing, it becomes a rubber-like strong elastic material. It has significantly higher strength and elongation than other elastic adhesives.
- (3) Light- or heat-curing equipment not required
- (4) The pot life (gel time) after mixing of the two components is relatively long, thereby allowing sufficient time for application.

In addition, the curing time can be shortened by heating after bonding, so the curing speed can be controlled according to the situation.

#### 3. Applications

Bonding and sealing of various materials

#### 4. Properties

Table 1 Properties of TB3953

| Test item           | Unit | TB3953<br>Base resin | TB3953<br>Curing agent | Test method  | Remarks  |
|---------------------|------|----------------------|------------------------|--------------|--|
| Color               | -    | Black                | White                  | 3TS-2100-020 | -  |
| Viscosity           | Pa•s | 3.0                  | 30.0                   | 3TS-2F00-007 | Base resin: Shear rate 38.3 s <sup>-1</sup><br>Curing agent: Shear rate 20 s <sup>-1</sup> |
| Specific<br>gravity | -    | 1.11                 | 0.99                   | 3TS-2500-002 | -  |

- Measuring condition: 25°C

Table 2 Gel time of TB3953

| Test item | Unit | Result | Test method  |
|-----------|------|--------|--------------|
| Gel time  | min  | 15     | 3TS-3150-004 |

- Compounding ratio (weight ratio): Base resin : Curing agent = 1 : 1
- Measuring conditions: 23°C, 50%RH

## 5. Characteristics

### 5.1 Characteristics of cured adhesive

Table 3 Characteristics of TB3953 after curing

| Test item        | Unit | Result | Test method  |
|------------------|------|--------|--------------|
| Hardness         | -    | A87    | 3TS-2B00-010 |
| Tensile strength | MPa  | 10.0   | 3TS-4190-001 |
| Elongation       | %    | 370    | 3TS-4190-001 |

- Compounding ratio (weight ratio) : Base resin : Curing agent = 1 : 1
- Curing conditions : (23°C, 50%RH) x 7 days
- Test piece : Dumbbell No.3, 2 mm thick
- Testing rate : 500mm/min

### 5.2 Tensile shearing adhesion strength

Table 4 Tensile shearing adhesion strength of TB3953 to various materials

| Test material |                            | Unit | Result | Remarks              |
|---------------|----------------------------|------|--------|----------------------|
| Metals        | Aluminum                   | MPa  | 9.6    | A1050P               |
|               | Steel                      |      | 10.3   | SPCC-SD              |
|               | Stainless steel            |      | 9.4    | SUS304               |
|               | Copper                     |      | 9.8    | C1100P               |
| Plastics      | Glass epoxy                | MPa  | 12.0   | KEL-GEF®             |
|               | Acryl                      |      | 4.2    | ACRYPET® VH000       |
|               | Polycarbonate              |      | 6.5    | PANLITE® L1225Y      |
|               | Nylon 6,6                  |      | 8.2    | LEONA® 1300 G        |
|               | Polybutylene terephthalate |      | 7.2    | TORAYCON® 1101 G -30 |
| Other         | Glass                      |      | 5.6*   | -                    |

- Compounding ratio (weight ratio) : Base resin : Curing agent = 1 : 1 \* Matrix fracture
- Curing conditions : (23°C, 50%RH) x 7 days
- Test method : 3TS-4100-011 Lamination of test pieces of each material, application to both surfaces, surface bonding
- Testing rate : 10mm/min

### 5.3 Heat resistance (tensile shearing adhesion strength)

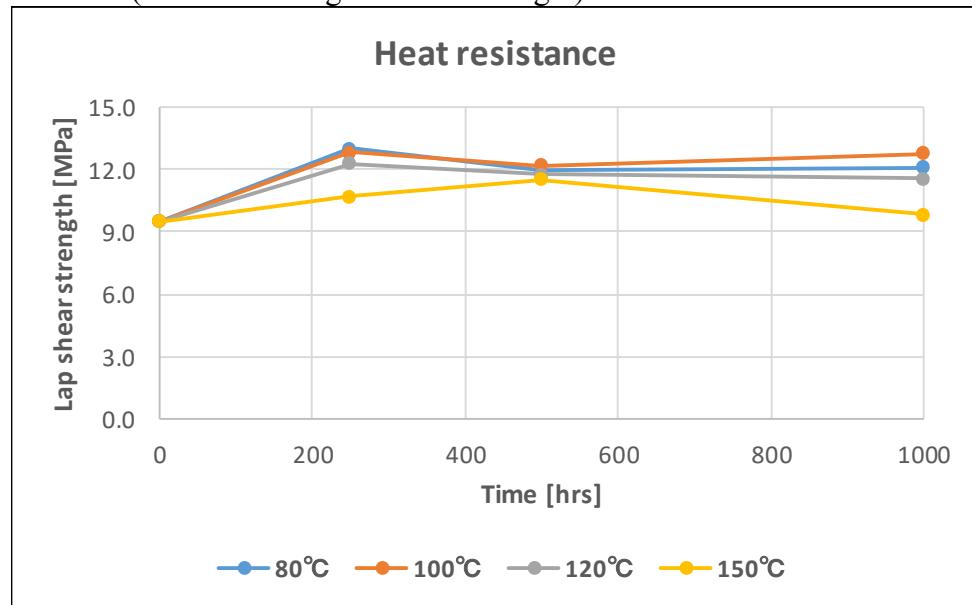


Fig. 1 Heat resistance of TB3953 at each temperature

- Compounding ratio (weight ratio) : Base resin : Curing agent = 1 : 1
- Curing conditions : (23°C, 50%RH) x 7 days
- Test piece : Steel (SPCC-SD)
- Test method : 3TS-4100 -011 Application to both surfaces, surface bonding
- Testing rate : 10mm/min

### 5.4 Chemical resistance (1) (tensile shearing adhesion strength)

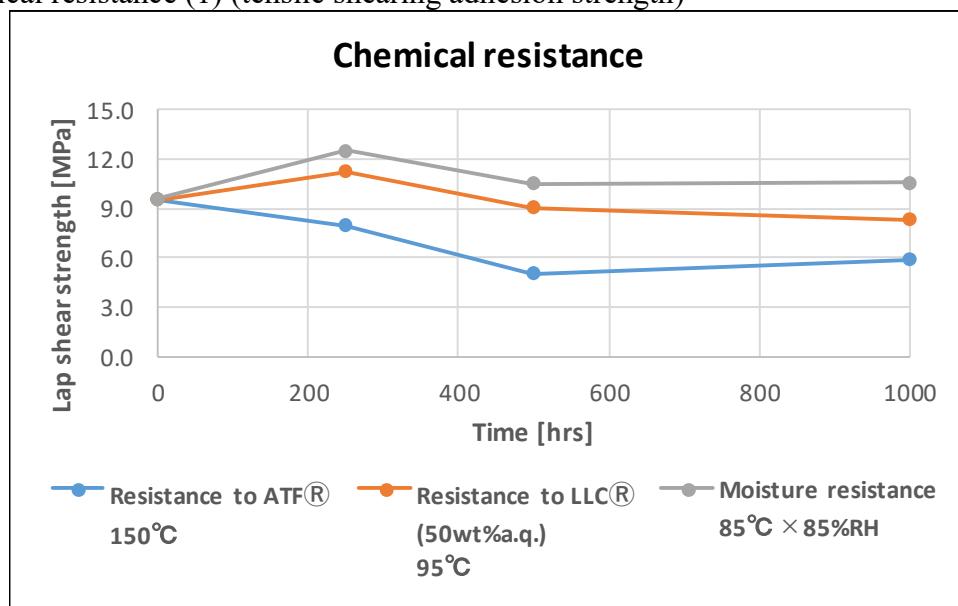


Fig. 2 Resistance of TB3953 to each chemical

- Compounding ratio (weight ratio) : Base resin : Curing agent = 1 : 1
- Curing conditions : (23°C, 50%RH) x 7 days
- Test piece : Steel (SPCC-SD), Al (A1050P) only for moisture resistance test
- Test method : 3TS-4100 -011 Application to both surfaces, surface bonding
- Testing rate : 10mm/min
- Immersion chemicals : ATF® (Auto Fluid WS), LLC® (Super Long Life Coolant)

## 5.4 Chemical resistance (2) (tensile shearing adhesion strength)

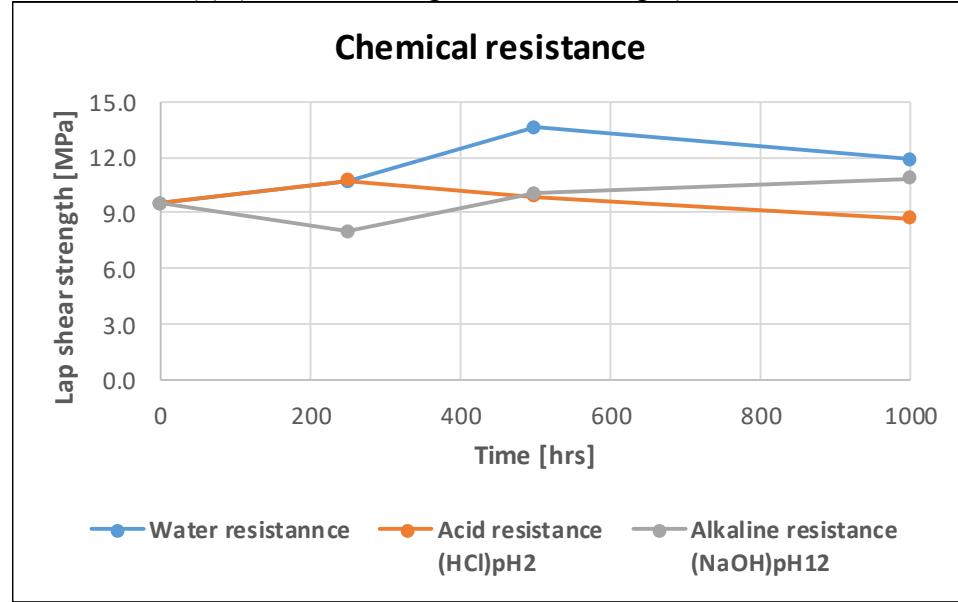


Fig. 3 Resistance of TB3953 to each chemical

- Compounding ratio (weight ratio) : Base resin : Curing agent = 1 : 1
- Curing conditions : (23°C, 50%RH) x 7 days
- Test piece : Steel (SPCC-SD)
- Test method : 3TS-4100 -011 Application to both surfaces, surface bonding
- Testing rate : 10mm/min
- Immersion temperature : 25°C

## 5.5 Heat cycle resistance (tensile shearing adhesion strength)

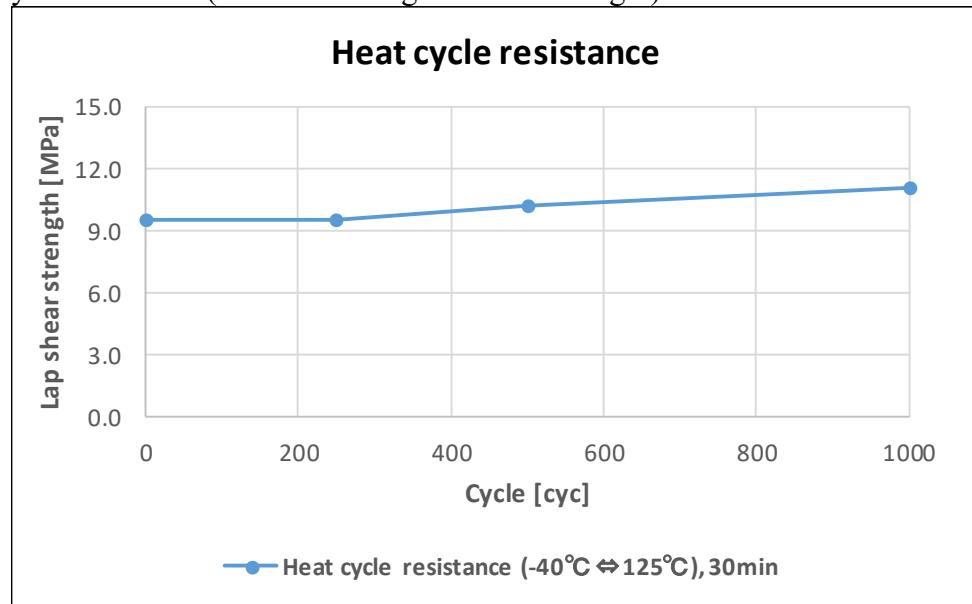


Fig. 4 Heat cycle resistance of TB3953

- Compounding ratio (weight ratio) : Base resin : Curing agent = 1 : 1
- Curing conditions : (23°C, 50%RH) x 7 days
- Test piece : Steel (SPCC-SD)
- Test method : 3TS-4100 -011 Application to both surfaces, surface bonding
- Testing rate : 10mm/min

## 6. Usage

- (1) Remove oil, rust and other contaminants completely from the surfaces to be bonded.
- (2) Be sure to wear rubber gloves (impervious), and mix the base resin and curing agent using the mixer nozzle included in the kit and the optional twin cartridge gun.
- (3) Apply an appropriate amount of the mixture to the surfaces to be bonded.
- (4) Bond the surfaces, and do not move until the adhesive cures.

Since the adhesive cures by reacting with moisture in the air, its thickness, curing temperature and relative humidity will affect the setting time.

If it takes a long time to apply the adhesive and the surfaces are bonded after gelation, the bonding strength may be reduced.

## 7. Directions for use

- (1) Before using, sufficiently confirm whether the method of application and the purpose are appropriate.
- (2) Some materials may deteriorate if this product is used. The effects of the adhesive on the substrates must be confirmed by the operator prior to use. Refrain from using it if any detrimental effects are observed.
- (3) The curing conditions vary depending on the thermal capacities of the substrate and peripheral parts and the usage. Check the conditions with actual parts prior to use.
- (4) Before using, stir at the specified compounding ratio to obtain a uniform mixture.
- (5) Use suitable protective equipment, such as a mask, goggles and gloves (impervious). Use in a well-ventilated outdoor area or in a place equipped with a local exhaust system.
- (6) Moisture absorption may affect the storage stability. After using, immediately seal the containers, and store them in a dark dry place.
- (7) It is harmful to the health. Do not touch it directly or inhale its vapor.
- (8) It contains harmful materials. Do not use for drinking water or hot water supply piping.
- (9) If swallowed, do not induce vomiting. Immediately rinse the mouth, and get medical attention.
- (10) If in eyes, rinse with clean water for over 15 minutes, and get medical attention.
- (11) Persons with allergies or sensitive skin should avoid using it.
- (12) Adhesion of this product to the skin may cause skin disorder. If on skin, wipe away with a cloth, and sufficiently wash with soap.
- (13) If any bodily abnormalities occur, discontinue use and get medical attention.
- (14) It is combustible. Do not put it near fire.
- (15) Keep out of reach of children.
- (16) For hazard and toxicity information not mentioned herein, see the safety data sheet (SDS).

## 8. Storage

- (1) Store with the caps tightly fitted to prevent deterioration and contamination.
- (2) Store it in a cool, dark, dry place avoiding direct sunlight.

## 9. Disposal

Dispose of empty containers and unused product in accordance with local regulations for waste separation.

## 10. Precautions

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 rights.
- 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

ThreeBond is a trademark or a registered trademark of ThreeBond Co., Ltd.