ThreeBond

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ThreeBond Co., Ltd.

Technical Data

ThreeBond 1153C

One-part heat-curing olefin-based sealant

1. Outline

ThreeBond 1153C is a one-part heat-curing olefin-based sealant developed for the purpose of gas sealing of fuel batteries. It is flexible and excels in gas barrier property and chemical resistance.

Hereinafter, ThreeBond is abbreviated to TB.

2. Features

(1) Heat-curing olefin-based resin having excellent gas barrier property and low moisture permeability. Its hydrogen gas barrier property is approx. 20 times higher than that of general silicone-based sealants, and its moisture permeability is approx. 1/100 of that of the said sealants.
(2) Excellent resistance to moisture, acids, coolants and methanol

3. Uses

(1) Usable for gas sealing of fuel batteries
(2) Usable for sealing from water, coolants and methanol

4. Properties

Table 1 Properties of TB1153C

	Item	Unit	Results	Test method	Remarks
Properties	Appearance	-	Gray	3TS-201-02	-
	Viscosity	Pa·s	1700	3TS-210-10	25°C, BS-type, No.7, 5 rpm
	Specific gravity	-	1.03	3TS-213-02	25°C

5. Characteristics of cured sealant

5.1 Characteristics of cured sealant

Table 2 Characteristics of TB1153C after curing

	Item	Unit	Results	Test method	Remarks
Characteristics	Hardness	-	A41	3TS-215-01	-
	Tensile strength	MPa	3.4	3TS-320-01	-
	Elongation	%	221	3TS-320-01	-
	H_2 gas permeability constant	Mol•m/m^2 •s•Pa	9.7×10^{-15}	JIS K 7126	-
	Moisture permeability (1 mm thick)	g/m^2•24h	3.43	JIS Z 0208 (Dish Method)	(40°C,95%RH) for 24hrs
	Glass transition point	°C	-74	3TS-501-04	DMA method, 1 Hz, E" peak
	Linear expansion coefficient	/°C	244×10^{-6}	3TS-501-05	0°C -100°C

* The sealant was cured in a hot-air drying oven at 100˚C for 90 minutes.

5.2 Electrical characteristics of cured resin

Table-3 Electrical characteristics of TB1153C after curing

Item		Unit	Results	Test method	Remarks
Volume resistivity		Ω•m	4.7×10^{12}	3TS-401-01	*
Surface resistivity		Ω	3.5×10^{14}	3TS-402-01	*
Dielectric constant	1 KHz	-	2.9	3TS-405-01	*
	1 MHz	-	2.9	3TS-405-01	*
Dielectric loss tangent	1 KHz	-	0.005	3TS-405-01	*
	1 MHz	-	0.005	3TS-405-01	*
Dielectric breakdown strength		kV/mm	13	3TS-406-02	*

* Curing conditions: Test pieces for measurement of electrical characteristics, hot-air drying oven at 100˚C for 90 minutes

6. Durability

Table 4 Durability of TB1153C

	Item	Unit	Results	Test method	Remarks
Durability characteristics	**Moisture resistance**				
	Hardness	-	A50	3TS-215-01	Exposure conditions: (85°C,85%RH) for 500hrs
	Tensile strength	MPa	4.0	3TS-320-01	
	Elongation	%	185	3TS-320-01	
	Acid resistance				
	Hardness	-	A46	3TS-215-01	Immersion conditions; pH=1, aqueous solution of H_2SO_4 100°C for 500 hrs
	Tensile strength	MPa	3.7	3TS-320-01	
	Elongation	%	180	3TS-320-01	
	Coolant resistance				
	Hardness	-	A50	3TS-215-01	Immersion conditions; 50% aqueous solution of ethylene glycol 100°C for 500 hrs
	Tensile strength	MPa	2.6	3TS-320-01	
	Elongation	%	193	3TS-320-01	
	Methanol resistance				
	Hardness	-	A51	3TS-215-01	Immersion conditions; 50% aqueous solution of methanol 50°C for 500 hrs
	Tensile strength	MPa	4.0	3TS-320-01	
	Elongation	%	218	3TS-320-01	

*The sealant was cured in a hot-air drying oven at 100˚C for 90 minutes.

7. Usage

(1) Application
For application, use a cartridge gun or an automatic applicator.

(2) Curing
After applying the sealant, heat cure it using a hot-air drying oven.
Determine the heating conditions in consideration of the heat capacity of the coated part and the heating method.
(Standard drying conditions: 100°C for 30 min)

8. Instructions for use

(1) The sealant is harmful to the health. Do not touch it directly or inhale its vapor.
(2) Persons who have allergies or sensitive skin should avoid using it.
(3) The product is flammable. Do not use it near fire.
(4) Use and store it out of reach of children.
(5) If it gets in the eyes, wash them with clean water for 15 minutes or more, and get medical attention.
(6) Do not use it for any purpose other than industrial uses.
(7) To prevent condensation, unseal the container after it reaches room temperature.
(8) Before using it, sufficiently confirm whether the method of application and the purpose of use are appropriate.

(9) Some materials may deteriorate if this product is used. Ascertain in advance whether or not it affects the parts to be sealed with it. If any problem occurs, do not use it.
(10) Do not dilute or mix the sealant with organic solvents or any other substance.
(11) Do not pour the product into other containers. Do not return the product left unused to its container. Doing so can deteriorate its quality.
(12) Note that curing failure may be caused if the sealant is brought into contact or mixed with substances, such as water, sulfur, phosphorus, nitrogen compounds and organic metal salt, which may become catalytic poisons.
(13) For hazard and toxicity information not mentioned in this document, see the material safety data sheet (MSDS).

9. Storage

Before and after using the product, store it with the cap tightly fitted in a dry refrigerator (-5 to 10˚C) avoiding direct sunlight.

10. Disposal

When burnt, it may generate toxic gas. Do not burn it.

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

11. Cautions

For industrial use only (Do not use it for household products.)

This product has been developed for general industrial use. Before using the product, you must accept the following sales 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 introduced herein do not conflict with any intellectual property right.
- Users are asked to evaluate the validity and safety of the use of the product for the relevant purpose prior to use and bear all responsibilities and hazards involved in its use.
  Never use the product for medical implants that will be implanted or injected into the body or 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 use of the relevant product are unknown, never use it.
- For detailed information on product safety, see the material safety data sheet (MSDS).
  To obtain the MSDS, contact our sales department or customer service office.
- This document is subject to change at our discretion.