ThreeBond

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Three Bond Co., Ltd.

Technical Data

ThreeBond 1386H
Anaerobic sealant for Welch plugs

1. Outline

ThreeBond 1386H is a delayed-curing anaerobic sealant for Welch plugs. The sealant does not cure while it is exposed to air. When it is applied to metal and isolated from air, it reacts (cures through polymerization) and bonds and seals Welch plugs. The state of application of the sealant can be checked with a fluorescent sensor. (Hereinafter, "ThreeBond" is abbreviated to "TB.")

2. Features

(1) Delayed-curing type
(2) Mid-strength type
(3) The state of application can be checked with a fluorescent sensor.

3. Use

Welch plugs

4. Properties

Table 1 Properties of TB1386H

Test item	Unit	Property value	Test method	Remarks
Main component	—	(Meth)acrylate ester	—	
Appearance	—	Fluorescent yellow	3TS-201-01	Visual check
Viscosity	mPa·s	2200	3TS-210-02	BH-type, No.4, 20 rpm
Specific gravity	—	1.10	3TS-213-02	

5. Characteristics

Table 2 Characteristics of TB1386H (bolt/nut)

Test item	Unit	Characteristic value	Test method	Remarks
Failure torque after 24 hrs.*	N·m	15.3	3TS-306-01	Fe bolt/nut
		14.8		SUS306 bolt/nut
		4.8		Al bolt/nut
		2.4		Zn-Cr bolt/nut
Set time *	h	1	3TS-220-03	Fe bolt/nut
		6		Zn-Cr bolt/nut

* Test conditions: TB1386H was applied to M10 P1.5 bolt and nut of each material, the bolt and nut were fitted to a tightening torque of 0 N.m, and the sealant was cured at 25°C. Then, the torque and set time were measured.

Table 3 Characteristics of TB1386H (fitting)*1

Test item	Unit	Characteristic value	Test method	Remarks
Bonding strength after 2 hrs.	MPa	4.2	3TS-305-01	Fe
		6.6		SUS306
		0		Al
		23.6		Fe (TB1390K)*2
		20.2		Fe (TB1390E)*2
		17.6		Fe (TB1390F)*2
Bonding strength after 24 hrs.	MPa	20.6	3TS-305-01	Fe
		26.7		SUS306
		11.4		Al
		33.8		Fe (TB1390K)*2
		24.6		Fe (TB1390E)*2
		21.3		Fe (TB1390F)*2
Set time	min	50	3TS-220-03	Fe
	s	150		Fe (TB1390K)*2
		50		Fe (TB1390E)*2
		10		Fe (TB1390F)*2

*1 Test conditions: TB1386H was applied to the test piece for fitting of each material, the test piece was fitted, and the sealant was cured at 25°C. Then, the bonding strength and set time were measured.

*2 The characteristic value was obtained when the cure accelerator TB1390K, TB1390E or 1390F was applied to the Fe test piece.

Table 4 Characteristics of TB1386H

Test item	Unit	Characteristic value	Test method	Remarks
Cure shrinkage	%	5.2	3TS-228-01	
Hardness	—	D78	3TS-215-01	Durometer D
Glass transition point	°C	160	3TS-501-04	E" value
	°C	160		tanδ value
Linear expansion coefficient	$\times 10^{-6}$°C	69.0	3TS-501-05	20 - 30°C

* Test piece for measurement of strength: Bonding area; 6 in diameter × 15 mm Clearance; 1/100 mm

6. Curing speed

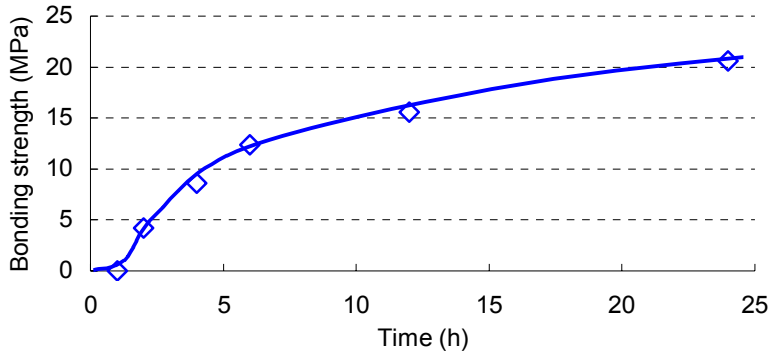

Fig. 1 Curing speed curve of TB1386H

Test conditions: TB1386H was applied to the Fe test piece for fitting, the test piece was fitted, and the sealant was cured at 25°C. Then, the bonding strength was measured at the specified time intervals.

7. Strength under heat

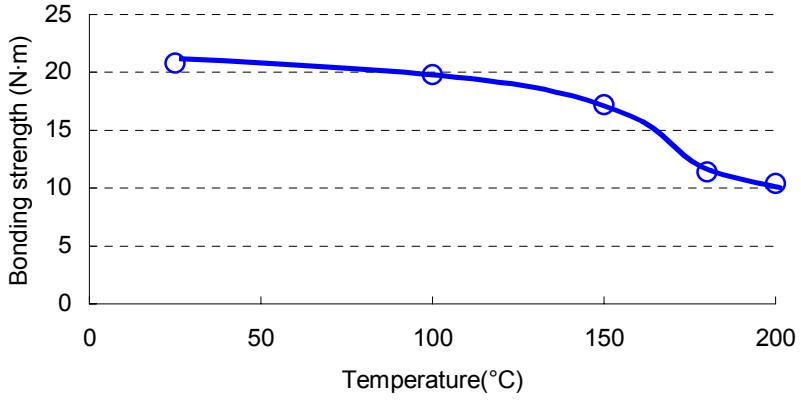

Fig. 2 Curve of strength of TB1386H under heat

Test conditions: TB1386H was applied to M10 P1.5 bolt and nut of each material, the bolt and nut were fitted at a tightening torque of 0 N.m, and the sealant was cured at 25°C for 48 hours. After this, the sealant was cured for one hour at each temperature, and the torque was promptly measured.

8. Sealing property test

Table 5 Sealing properties of TB1386H

Test item	Unit	Characteristic value	Remarks
Sealing property test	Pressure resistance (MPa)	4 or more	After 2 hours
		7 or more	After 24 hours
		7 or more	Heat aging at 150°C
		7 or more	Anti-freeze resistance at 100°C for 240 hrs.
		7 or more	Engine oil resistance at 100°C for 240 hrs.
	Holding time (hrs.)	2 or more	After 2 hours
		2 or more	After 24 hours
		2 or more	Heat aging at 150°C
		2 or more	Anti-freeze resistance at 100°C for 240 hrs.
		2 or more	Engine oil resistance at 100°C for 240 hrs.

Test conditions: TB1386H was applied to a 40-diam Welch plug, the Welch plug was press-fitted to the testing jig, and the sealing properties were measured under the specified test conditions.

9. Usage

1) Remove moisture, oil and contamination from the surface to be bonded with a solvent or the like.
2) Apply an appropriate amount of the sealant to each plug, and fit the plug.
3) As for the procedures for applying and curing the sealant, consult with our sales engineer.

10. Instructions for use

1) The product is harmful to the health. Do not touch it directly or inhale its vapor. Adhesion of the sealant to the skin may cause an inflammation. If it adheres to the skin, immediately wipe it away with cloth or paper, and wash the skin with soap and water. If it enters the eyes, wash the eyes with clean water for about 15 minutes, and get medical attention.
2) If any abnormality is found in the body, quit handling it, and get medical attention. Persons who have allergies or sensitive skin should avoid using it.
3) Since it contains harmful substances, it must not be used for piping for clean water or hot-water supply. Sufficiently confirm that the method of application and the purpose of use are appropriate to ensure that its components will not be eluted in clean water.
4) Do not remove the product into other containers. Do not return the product left unused to its container.
5) Some materials may be deteriorated (cracked, corroded or melted) by this product. Check the influence of the product on the parts to be bonded or peripheral parts in advance. If any problem occurs, do not use it.

6) Do not use metallic parts, such as a metallic nozzle. The product will set on such metallic parts.
7) After using it, store it with the cap tightly fitted to prevent deterioration and entry of foreign matter.
8) This product may set under heat. Check the fluidity and curability at the working temperature prior to use.
9) For detailed hazard and toxicity information, see the material safety data sheet (MSDS).

11. Storage

1) Store the product in a place at -5 to 25°C away from light.
2) Use and store it out of reach of children.

12. Disposition

1) Do not burn the sealant. When burnt, it may generate toxic gas.
2) Have the product disposed of by a professional waste disposal company.

13. Applicable law

1) This product is designated as a non-hazardous material under the Fire Defense Law. It has a low flammability, but it shall be stored and handled with utmost care.

14. 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.