ThreeBond

August 31, 2010
Three Bond Co., Ltd.

Technical Data
ThreeBond 3081J
Soft type UV-curing resin

1. Overview

ThreeBond 3081J is an acrylic ester based, solventless, UV curing resin. Within seconds of exposure to UV light, forms a heat resistant, cold resistant soft rubber material. Suitable for CIPG* applications that require elasticity and durability.

*CIPG is an abbreviation for Cured-In-Place Gasket

Hereinafter, ThreeBond is abbreviated as TB.

2. Features

① Cures by UV irradiation in seconds (200 to 400 nm wavelength)
② After curing, maintains rubber elasticity over a wide temperature range (-40 to 120℃).
③ After application, has excellent shape retention before curing
④ Low compression set ensures excellent seal

3. Uses

① CIPG for electric, electronic and other electrical parts
② Elastic sealing application which requires heat and cold resistance

4. Properties

4.1 Properties

Table 1. Properties for TB3081J

Test item	Unit	Result	Test method	Remark
Appearance	-	Light transparent yellow	3TS-201-01	-
Viscosity	Pa･s	95	3TS-210-10	35℃, Shear rate: $2s^{-1}$
Structural viscosity ratio	-	2.3	3TS-211-19	35℃, Shear rate: $2s^{-1}/10s^{-1}$
Specific gravity	-	1.11	3TS-213-02	25℃
Thick film curability	mm	3.6	3TS-222-01	*1

*1 Integrated UV light: $45kJ/m^2$
Curing conditions: $80mW/cm^2$ Used high pressure mercury lamp cold mirror, cold filter
Irradiation distance: 150mm

4.2 Flow curve (rheometer)

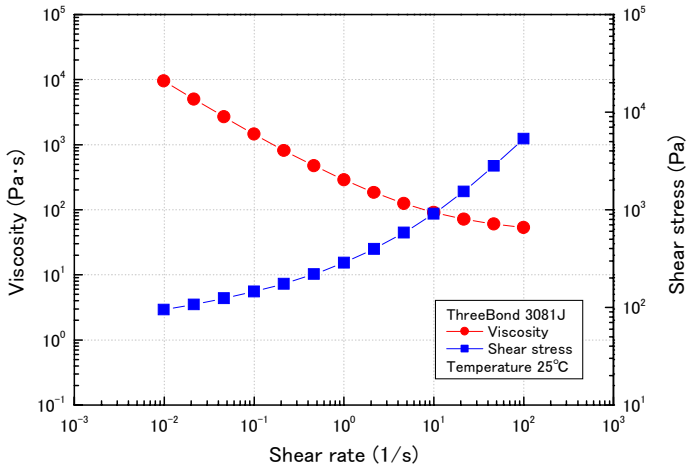

Figure 1. Flow curve for TB3081J

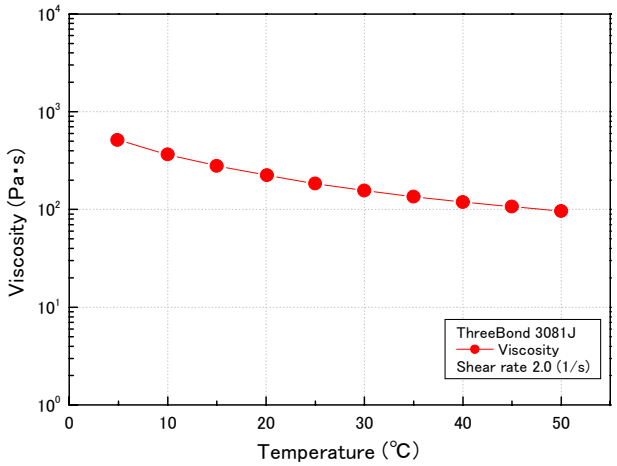

Figure 2. Viscosity temperature curve for TB3081J

5. Cured material general properties

Table 2. Cured resin property for TB3081J

Test item	Unit	Result	Test method	Remark
Hardness	-	A27	3TS-215-01	-
Elongation	%	180	3TS-320-01	No. 3 Dumbbell
Tensile strength	MPa	1.8	3TS-320-01	No. 3 Dumbbell
Cure shrinkage	%	3.1	3TS-228-01	20φ

Integrated UV light: 45kJ/m^2

Curing conditions: 120mW/cm^2 Used high pressure mercury lamp cold mirror, cold filter

Irradiation distance: 150mm

6. Electrical properties

Table 3. Electrical properties for TB3081J

Test item	Unit	Cured properties	Test method	Remark
Volume resistivity	Ω·m	1.2×10^{10}	3TS-401-01	-
Surface resistance	Ω	1.4×10^{14}	3TS-402-01	-
Dielectric breakdown strength	kV/mm	19	3TS-406-02	-
Dielectric constant	-	5.4	3TS-405-01	1kHz
		4.6		1MHz
Dielectric dissipation factor	-	0.013	3TS-405-01	1kHz
		0.077		1MHz

Integrated UV light: 45kJ/m^2
Curing conditions: 120mW/cm^2 Used high pressure mercury lamp cold mirror, cold filter
Irradiation distance: 150mm

7. Viscoelastic properties

Table 4. Viscoelastic properties for TB3081J

Test item	Unit	Result	Test method	Remark
Storage modulus (E')	Pa	2.1×10^{6}	3TS-501-04	25℃
Loss tangent (tan δ) peak	℃	-29	3TS-501-04	-
Loss modulus (E") peak	℃	-47	3TS-501-04	

Integrated UV light: 45kJ/m^2 Measuring device: DMS made by Seiko Instruments
Curing conditions: 120mW/cm^2 Used high pressure mercury lamp cold mirror, cold filter
Irradiation distance: 150mm Frequency 1Hz

8. Linear expansion coefficient

Table 5. Linear expansion coefficient for TB3081J

Test item		Unit	Result	Test method	Remark
Linear expansion coefficient	α1	ppm/℃	97	3TS-501-05	-120～-70℃
	α2		205		100～150℃
Glass transition temperature		℃	-55	3TS-501-05	TMA method

Integrated UV light: 45kJ/m^2 Measuring device: TMA made by Rigaku
Curing conditions: 120mW/cm^2 Used high pressure mercury lamp cold mirror, cold filter
Irradiation distance: 150mm

9. Sealing properties

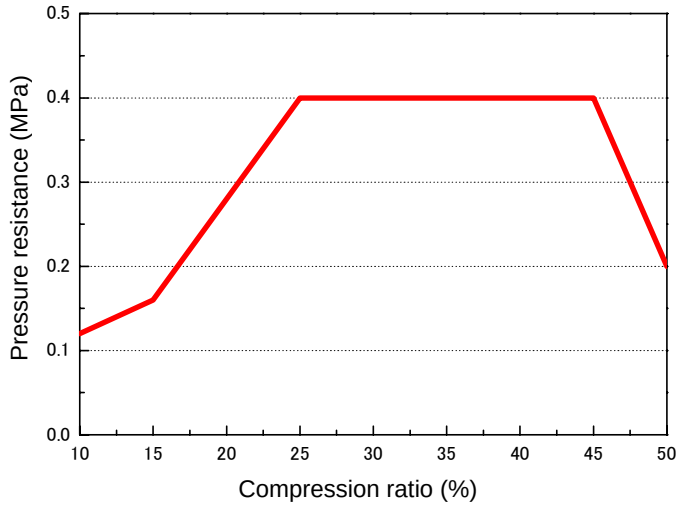

Figure 3. Relationship between compression ratio and pressure resistance

Flange used:	Flange outer diameter 70mm, inner diameter 56mm, width 7mm
Pressurization medium:	Air
Pressure booster condition:	0.01MPa/15sec (maximum pressure: 0.4MPa)
Bead shape:	Width: 3mm, Height: 2mm
Integrated UV light:	45kJ/m^2
Curing conditions:	120mW/cm^2 Used high pressure mercury lamp cold mirror, cold filter
Irradiation distance:	150mm

10. Durability properties

Table 6. Durability properties (120℃×240h)

Item	Unit	Result	Test method	Remark
Hardness	-	A30	3TS-215-01	-
Elongation	%	190	3TS-320-01	No. 3 Dumbbell
Tensile strength	MPa	2.0	3TS-320-01	No. 3 Dumbbell
Compression set	%	23	3TS-332-01	*2

	Integrated UV light:	45kJ/m^2
	Curing conditions:	120mW/cm^2 Used high pressure mercury lamp cold mirror, cold filter
	Irradiation distance:	150mm
*2	Compression ratio:	25% Bead shape: Width: 3mm, Height: 2mm
	Measuring device:	Three-dimensional non-contact measurement device made by Mitaka Optical

11. Usage method

① Remove oil, moisture and other contaminants completely from the bonding surface.

② Cure by UV light irradiation. If the curing method is not clear, please contact our sales engineer.

12. Usage precautions

① Harmful to health. Do not touch directly nor inhale fumes.

② Persons with allergies or sensitive skin should avoid using.

③ Do not use near fire.

④ Keep out of reach of infants and children.

⑤ The curing speed varies depending on the type of light source and irradiation distance. Sufficiently confirm the curing speed prior to use.

⑥ Before using, sufficiently confirm whether the method of application and the purpose of use are appropriate.

⑦ While handling, use suitable protective equipment (respirator, safety glasses, protective gloves, protective clothing, etc.). And use local exhaust system.

⑧ Because quality deterioration is likely, if the content is transferred to another container, confim the effects before using. Do not return the unused portion into the original container.

⑨ Harmful to health. Do not inhale or swallow. If swallowed, get medical aid

⑩ If on skin, may cause inflammation.
If on skin, immediately wipe off with cloth or paper, and wash the affected area with soap and water. If in eyes, rinse with clean water for at least 15 minutes and seek medical attention.

⑪ If any bodily abnormalities occur, discontinue use and get medical attention.

⑫ For hazards not mentioned in this document, please read the material safety data sheet (MSDS).

13. Storage

Store with the cap closed tightly to prevent deterioration and contamination. Store at -5 to 25℃ under low humidity, away from direct sunlight.

14. Disposal method

Dispose as industrial waste.

15. Precautions

For Industrial Use Only (Do not use for household purposes)

This product was developed for general industrial use. Before using this product, the user must agree with the following conditions.

- The technical data described in this report are based on our company's test method specifications. These values do not represent guaranteed values.

  Also, there are no guarantees that the uses presented in this report do not infringe on any third party's intellectual property rights.
- Regarding safety validation, the user bears all responsibilties and risks associated for confirming prior to use. Absolutely do not embed this product into body by injection or as residue from medical implant applications.
- Three Bond accepts no responsibility for injuries and damages caused by improper handing of this product. If the user is uncertain about properties of this product and/or how to use it, absolutely do not use.
- For more information about product safety information, please read this product's Material Safety Data Sheet (MSDS). To obtain the MSDS, please contact our sales office or our customer service.
- Three Bond reserves the right to modify this report at its own discretion.