ThreeBond

March 26, 2010

ThreeBond Co., Ltd.

Technical Data

ThreeBond 1630 (30t)

UV-curing sheet adhesive

1. Outline

ThreeBond 1630 (30t) is a UV-curing sheet adhesive. It is transferred and pre-bonded by heat and pressure and then polymerize and cure by irradiating ultraviolet rays.

After cure, it becomes transparent and flexible, and since it has superior light resistance, it is suitable for bonding parts requiring light resistance. (ThreeBond is hereinafter referred to as TB)

2. Features

1) Superior uniform thickness
2) Superior flexibility
3) Superior transparency
4) Superior light resistance

3. Application

Face-bonding of transparent parts

Face-bonding of parts requiring light resistance

4. Properties

Table 1 Properties

Test item	Unit	Characteristic value	Test method	Remarks
Appearance	—	Colorless, transparent	3TS-201-92	-
Film thickness	μm	27 - 33	3TS-261-01	-
Loss on heating	%	3.0 or less	3TS-216-01	120ºC x 30min

Table 2 Product Composition

Product composition	Material	Thickness	Surface treatment	Back treatment
Separator film	PET	25μm	Silicon releasing	No treatment
Adhesive layer	—	27 - 33μm	—	—
Base film	PET	38μm	Silicon releasing	No treatment

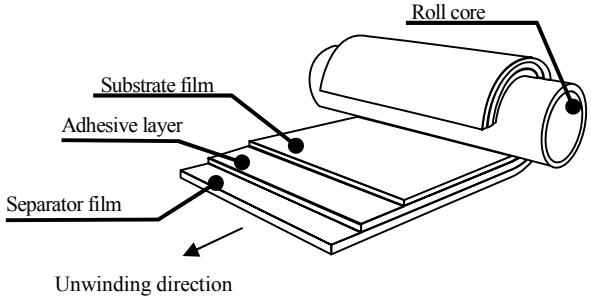

Fig. 1 Product Structure

5.Characteristic values

5.1 Characteristic values of cured resin

Table 3 Characteristic Values of Cured Resin

Test item	Unit	Characteristic value	Test method	Remarks
Specific gravity	—	1.18	3TS-213-03	
Hardness	Shore A	35	3TS-215-01	
Water absorption	%	1.9	3TS-233-03	Boiling 2h
Elastic modulus	Pa	1.9×10^6	3TS-501-04	Elastic modulus at 25ºC

Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm wavelength measuring)

Ultraviolet irradiator: UVC-2539 (Ushio Inc.) metal halide lamp 160W/cm^2

5.2 Adhesive strength

Table 4 Adhesive Strength by Material

Test item		Unit	Characteristic value	Test method	Remarks
Tensile shear strength	Glass/Glass	MPa	5.1	3TS-301-13	-
	Acrylic/Glass	MPa	4.0		
	Polycarbonate/Glass	MPa	3.5		
T-type peel strength	Easy-bonding PET/Easy-bonding PET	kN/m	0.56	3TS-304-21	-
	No-treatment PET/No-treatment PET	kN/m	0.23		

1)Test material

Glass:Soda glass 5.0 x 25 x 100mm

Acrylic:Acrypet®VH-000 2.0mm x 25mm x 100mm

Polycarbonate:Panlite® L-1225Y 2.0mm×25mm×100mm

Easy-bonding PET:Cosmoshine® A4300 125μm×25mm×150mm

No-treatment PET:Lumirror® S-56 100μm×25mm×150mm

2)Testpiece fabrication conditions

(1)Transfer condition

Transfer equipment:Roll laminator (made by MCK: MRS-500JK)

Roll temperature: 80ºC

Roll pressure: 0.1MPa

Speed: 0.3m/min

(2)Laminating conditions

Laminating equipment:vacuum laminator

Laminating temperature: 80ºC

Vacuum: 300Pa

Vacuumizing time: 2min

Press pressure: 95kPa

Press bonding time: 3min

*The above-mentioned transfer and laminating conditions are hereinafter represented as The standard fabrication condition.

3)Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm wavelength measuring)

Ultraviolet irradiator: UVC-2539 (Ushio Inc.) metal halide lamp 160W/cm^2

5.3 Refraction index

Table 5 Refraction index

Temperature	D line (589nm)	F line (486nm)	C line (656nm)	Remarks
20℃	1.520	1.511	1.509	－
25℃	1.519	1.510	1.507	－

1)Measuring equipment

Multi-wavelength Abbe Refractometers DR-M2 （made by ATAGO）

2)Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm wavelength measuring)

Ultraviolet irradiator: UVC-2539 (Ushio Inc.) metal halide lamp 160W/cm^2

5.4 Total luminous transmittance/haze

Table 6 Total Luminous Transmittance/Haze

Test item	Unit	Characteristic value	Measuring method	Remarks
Total light transmittance	%	99.9	3TS-538-01	－
Haze	%	0.01	3TS-538-02	－

1)Measuring equipment

Haze meter NDH2000(made by Nippon Denshoku Industries)

2)Test method

2 pieces of alkali-free glass(0.7t) was laminated with TB1630 (30t) and then UV-cured and measured.

The measurement results are those when one piece of alkali-free glass(0.7t) was used as the reference.

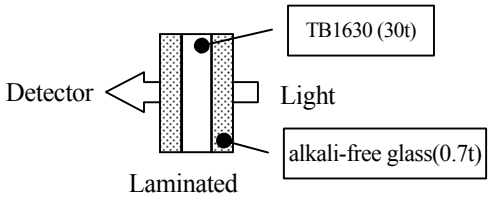

Fig. 2 Testpiece

3)Test material

alkali-free glass：Corning Eagle 2000® (0.7t)

4)Testpiece fabrication conditions

The standard fabrication condition

5)Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm wavelength measuring)

Ultraviolet irradiator: UVC-2539 (Ushio Inc.) metal halide lamp 160W/cm

5.5 Spectral transmittance characteristics

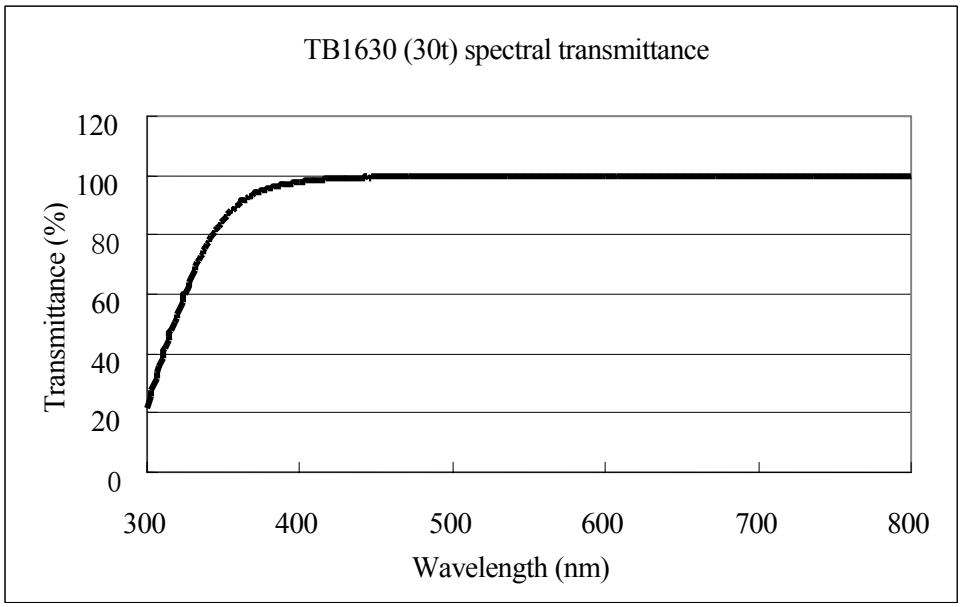

Fig. 3 Spectral Transmittance of TB1630 (30t)

1)Measuring equipment

UV-VIS spectrometer UV-1600 （made by Shimadzu Corporation ）

2)Test method

2 pieces of alkali-free glass(0.7t) was laminated with TB1630 (30t) and then UV-cured and measured.

The measurement results are those when one piece of alkali-free glass(0.7t) was used as the reference.

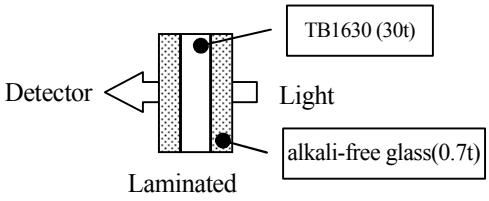

Fig. 4 Testpiece

3)Test material

Alkali-free glass：Corning Eagle 2000® (0.7t)

4)Testpiece fabrication conditions

The standard fabrication condition

5)Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm wavelength measuring)

Ultraviolet irradiator: UVC-2539 (Ushio Inc.) metal halide lamp 160W/cm

5.6Electrical characteristics

Table 7 Electrical Characteristics of TB1630 (30t)

Test item	Unit	Characteristic value	Test method	Remarks
Volume resistivity	Ω・m	3.72×10^{12}	3TS-401-01	—
Dielectric constant	-	3.8	3TS-405-01	Frequency 1MHz
Dielectric loss tangent		0.059	3TS-405-01	Frequency 1MHz

Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm wavelength measuring)

Ultraviolet irradiator: UVC-2539 (made by Ushio Inc.) metal halide lamp 160W/cm

5.7 Light resistance

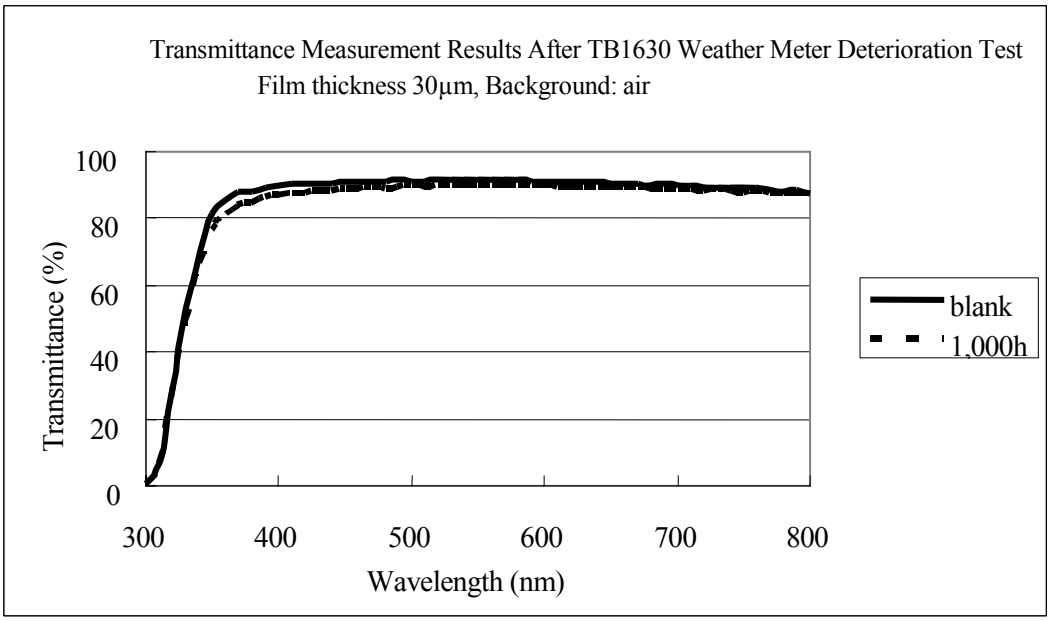

Fig. 5 Spectral Transmittance Before/After Weather Meter

1)Measuring equipment

UV-VIS spectrometer UV-1600（made by Shimadzu Corporation ）

2)Test method

2 pieces of soda glass(0.7t) was laminated with TB1630 (30t) and then UV-cured and measured.

The measurement results are those when air was used as the reference.

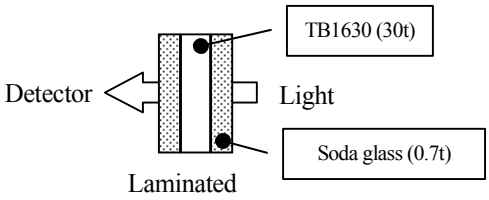

Fig. 6 Testpiece

3)Testpiece fabrication conditions

The standard fabrication condition

4)Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm wavelength measuring)

Ultraviolet irradiator: UVC-2539 (Ushio Inc.) metal halide lamp 160W/cm

6.Usage

6.1 Usage

(1) Cut TB1630 (30t) to the size of the target surface to be bonded.

(2) Peel off separator film and transfer to the adherend by heat and pressure.
For transferring, we recommend the use of a roll laminator.

(3) After transferring, return the temperature of the adherend to room temperature and then peel off substrate film.

(4) Thermal compression bond the TB1630 (30t) transferred adherend to the desired adherend. To obtain a bubble-free adhesive layer when laminating, we recommend the use of the vacuum laminator.

(5) Irradiate with an ultraviolet irradiator to complete curing.

6.2 Recommended processing conditions

1) Transfer conditions

80ºC x 0.1Mpa x 0.3m/min (roll laminator)

2) Laminating conditions (vacuum laminator)

Laminating temperature: 80ºC

Vacuum: 150Pa

Press pressure: 95kPa

Press holding time: 3min

3) Curing conditions

Cumulative amount of light: 30kJ/m^2 (365nm measuring) or more

7.Handling Cautions

(1)Inhaling or drinking the adhesive is strictly prohibited. Do not inhale or drink the adhesive because it is harmful to the human body. Should it be mistakenly drunk, immediately seek medical treatment.

(2) Do not directly touch the adhesive or inhale it because it is harmful. If it sticks to your skin, it may cause inflammation. If this happens, immediately remove the adhesive with a cloth or paper and wash the exposed area with soap and water. If it enters the eyes, flush the eyes with fresh water for about 15 minutes and seek medical treatment. Those who are allergic or have sensitive skin should avoid handling the adhesive.

(3) The adhesive should be stored and used in locations not accessible to infants and children.

(4) If you feel any abnormality, stop using the adhesive immediately and seek medical treatment.

(5) To prevent dew condensation, the adhesive should be returned to room temperature before opening the packaging.

(6) Since the curing speed differs depending on the type of light source and irradiating distance, carefully check the application conditions before use.

(7) The areas not exposed to ultraviolet rays and shaded areas will not cure as a rule. Carefully check if the application method is suitable before use.

(8) Some products may deteriorate depending on their composition. The adhesive's effect on products should be investigated in advance, and if there is any problem, do not use it.

(9) Since there is a possibility that gas will be generated during the work as well as during ultraviolet curing, forced ventilation should be provided at the work site and ultraviolet irradiating site. Use only in a location equipped with local ventilation and wear a mask, goggles and gloves (impervious).

(10) Once the separator is removed, it should not be put back on or other separator should not be laminated because there is the possibility of foreign material entering it.

(11) For the adhesive's harmfulness and hazardousness, refer to the Material Safety Data Sheet (MSDS).

8. Storage conditions

Since this product has ultraviolet curing properties, it should be stored in a cool, dark place at a temperature of -5 to 10ºC.

9. Disposal condition

Please consign the disposal of this commodity to the industrial waste disposer who has the exclusive knowledge.

10.Precautions

Industrial Use **(Do not use for home applications)**

This product was developed for normal industrial applications. When using this product, pay close attention to the following points.

- The technical data described in this document are examples of measured values using test methods specified by our company and are not guaranteed values.
  The applications introduced in this document do not guarantee that no intellectual property rights have been violated.
- When using this product, check the suitability and safety of the application before use, as the user assumes all responsibilities and risks during use.
  Never use it for imbedding and/or injection into a human body or for medical implant applications where there is a possibility that it could remain in the body.
- Our company assumes no responsibity for any injury or damage due to wrongful handling of this product.
  If the characteristics of the target surface or use methods are unknown, do not use it .
- For detailed safety information on the product, please refer to the Material Safety Data Sheet (MSDS).
  To acquire the MSDS, please contact our sales office or customer service desk.
- The contents of this document are subject to change without notice as we deem necessary .