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Technical Data | August 2020

3M™ Plastic Bonding Adhesive (PBA) 2665B, Black

Product Description

3M™ Plastic Bonding Adhesive (PBA) 2665B is a one-component, moisture curing, hot-melt urethane adhesive with unique pressure sensitive adhesive (PSA) properties. After dispensing the molten adhesive, the adhesive remains tacky like a PSA yielding high performance peel properties. While it can be used as a traditional hot melt polyurethane, it can also be used using traditional PSA lamination where part assembly occurs after solidification of the molten adhesive. As a traditional hotmelt polyurethane, this low viscosity adhesive has an intermediate open time and is ideal for structural bonding of plastics. 3M adhesive 2665B yields thin bond lines when used with appropriate dispensing equipment and is black in color.

Key Features and Benefits

- 100% solids
- One component
- Low viscosity
- Narrow width high aspect ratio adhesive beads achievable through adhesive stacking
- PSA-like tack
- High strength bonding to plastics
- Immediate handling strength with PSA lamination
- Color: Black
- No part clamping needed when using PSA properties
- Low temperature reworkability
- Excellent temperature & humidity resistance

Package Size

30 mL syringes, 295mL cartridges

Typical Uncured Liquid Adhesive Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ Plastic Bonding Adhesive (PBA) 2665B Property	Value
Application Temperature	110°C (230°F)
Viscosity (@110°C/230°F)[1]	4,000 - 9,000 cP
Color	Black
Open Time[2]	1.5 - 4 minutes

[1] Measured on a Brookfield viscometer with Thermosel using spindle #27 at 10 rpm in accordance with ASTM D4878.

[2] The upper time limit for bonding a 1.5 mm bead of molten adhesive on a plastic substrate in a room temperature environment. Open time is related to the solidification of the molten adhesive. Higher temperatures will lengthen open time while lower environmental temperatures will shorten open time.

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Typical Uncured (Solidified) Pressure Sensitive Adhesive Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Property	Value
PSA Open Time[3]	1 – 30 minutes
Optimal PSA Open Time[4]	10 – 20 minutes
Initial Peel Strength[5]	1.3 N/mm (7.5 lb/in)

[3] The time in which the solidified adhesive exhibits PSA-like properties (tacky to a gloved finger).

[4] The open time that yields the highest initial peel strength tested in accordance with ASTM D3330 Test Method A. Substrates are 5 mil polycarbonate film bonded to polycarbonate coupon.

[5] The peel strength 5 minutes after lamination with an open time of 10 minutes tested in accordance with ASTM D3330 Test Method A. Substrates are 5 mil polycarbonate film bonded to polycarbonate coupon.

Applications

- Cover glass bonding on electronic devices
- Plastic to plastic bonding

Application Techniques

- Apply 3M™ Plastic Bonding Adhesive 2665B to clean, dry surfaces. Remove oil, grease and other contaminants by wiping with isopropyl alcohol.*
    - For materials that are often contaminated with mold release agents, it is recommended that the surface be solvent wiped, abraded with fine grit abrasive, and solvent wiped again. * Allow solvent to evaporate before bonding. For optimal performance, heptanes may be used.*
    - For plastics, wipe with isopropyl alcohol-soaked cheesecloth.* Allow solvent to evaporate before bonding. For optimal performance, heptanes may be used. Note: 3M™ Plastic Bonding Adhesive 2665B is not recommended for bonding untreated polyolefins.
    - For metals, wipe with methyl ethyl ketone-soaked cheesecloth, abrade with fine grit abrasive, wipe with methyl ethyl ketone-soaked cheesecloth.* Allow solvent to evaporate before bonding.
    - For glass, wipe with methyl ethyl ketone-soaked cheesecloth.* Allow solvent to evaporate before bonding. Priming may be necessary on glass if subject part will be subjected to hot/humid conditions.

*Note: When using solvents, extinguish all ignition sources and follow the manufacturer's precautions and directions for use.

- For best results, heat the syringe a minimum of 30 minutes at 110°C (230°F) before using.
- Apply an adequate amount of adhesive to one of the substrates to be bonded. Join the substrates within the adhesive's open time and hold the bonded part until the adhesive has adequately set.
- For cleanup, allow product to solidify. Remove uncured waxy material (usually within the first 20 minutes after application) by scraping with a putty knife or similar tool. For cured material, remove by cutting or sanding. **Do not use heat or flame to remove the adhesive.**

Typical Cured Physical Properties and Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is shipped with the commercialized product.

Overlap Shear Strength (OLSS) tested @ 23°C (73°F), Thermal Shock (TS)[6] and Temperature/Humidity (TH)[7]:

Substrate	OLSS @ 23°C (73°F) (MPa)	OLSS After TS (MPa)	OLSS After TH (MPa)
Polycarbonate	5.9	8.3	6.6
Acrylic	4.4	3.8	2.3
Stainless Steel	1.1	1.2	1.6

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***Tested in accordance with ASTM S1002-72.**

[6] Conditions for thermal shock testing: cycle -40°C to 85°C, 85°C to -40°C with 30-minute ramps between temperature extremes and with 30-minute dwells at temperature extremes. Testing was 1 hour after removal from testing chamber.

[7] Conditions for temperature/humidity testing: 68°C/95% relative humidity for 3 days. Testing was 1 hour after removal from testing chamber.

3M™ Plastic Bonding Adhesive 2665B Rate of Overlap Shear Strength (OLSS) Build-up @ 23°C (73°F)/50% Relative Humidity		
Substrate	Dwell Time (hrs)	OLSS (MPa)
Polycarbonate	0.25	0.41
	0.50	0.41
	1	0.62
	2	0.90
	3	1.38
	24	4.83
	168	5.86

3M™ Plastic Bonding Adhesive 2665B Cured Physical Properties Tested @ 23°C (73°F)		
Property	**Method***	**Value**
Young's Modulus (MPa) [8]	ASTM D638-10	34
Tensile Elongation at Break (%)[9]	ASTM D638-10	770
Tensile Strength at Break (MPa)[9]	ASTM D638-10	25
Hardness (Shore D)	ASTM D2240-04	35 - 36

*Methods listed are tested in accordance with the ASTM method noted.

[8] Young's modulus was measured on long, thin film strips measuring approximately 90mm x 12.1mm wide x 0.38mm thick as a modified Type I specimen. Each sample was measured precisely when tested and the precise measurements were used in calculating the reported value. The pull rate was 50.8 mm/min.

[9] Tensile strength and tensile elongation were measured with Type V dog bones stamped from cured films approximately 20 microns thick. Each sample was measured precisely when tested and the precise measurements were used in calculating the reported value. The pull rate was 50.8 mm/min.

Cure Time

The cure rate will vary depending on air temperature, relative humidity, substrate type and bond line thickness.

Dispensing Equipment

To ensure safe handling, 3M™ Plastic Bonding Adhesive 2665B can be dispensed using either a time/pressure dispense system with luer lock needle tips or a positive displacement or gear metering valve to yield thin adhesive lines. Please contact your local technical team for more application support.

Safety Information

Warning: Hot syringes are a possible burn or rupture hazard.

To ensure safe handling of 3M™ Plastic Bonding Adhesive 2665B syringes:

1. Do not remove the aluminum label from the syringe. It is designed to make the temperature of the syringe uniform.
2. The syringe heater must have an opening sufficient to accommodate easy insertion and removal of the syringe including the aluminum label.
3. Do not exceed 110°C (230°F) syringe temperature. Failure of the syringe could result.
4. Do not exceed 4.1 bar (60 psi) dispensing pressure. Failure of the syringe could result.
5. Remove air pressure from the dispensing unit before removing the syringe from the heater.
6. Use only dry air for dispensing to prevent premature curing of the product.

7. Adhesive dripping is sometimes caused by a cured adhesive skin at the syringe back and can be dislodged using a probe. It is not necessary to remove the skin completely, merely breaking the seal to the syringe barrel normally resolves the problem.
8. Use gloves and personal protective equipment when handling hot syringes to help prevent burns or injury.

Storage and Shelf Life

The shelf life of 3M™ Plastic Bonding Adhesive 2665B is 12 months from the date of manufacture when stored in the original packaging materials and stored at 16-27°C (61-81°F), indoors and protected from exposure to moisture.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and deemed commercially available from 3M. The COA contains the 3M test methods, specifications limits and test results for the product's performance attributes that the product will be supplied against. Contact your local 3M representative for this product's COA.

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Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

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