



# Structural Bonding Tapes

9244 • 9245 • 9246

Technical Data

January, 1998

**Product Description** 0.010 in. (0.25 mm) Structural Bonding Tape **9244**  
0.020 in. (0.5 mm) Structural Bonding Tape **9245**  
0.040 in. (1.0 mm) Structural Bonding Tape **9246**

Structural Bonding Tapes 9244, 9245, and 9246 are pressure sensitive adhesive tapes which, after being used to bond two surfaces together, can then be thermally cured to develop structural strength. They combine the immediate adhesion and handling of a tape with the high bond strength of a liquid adhesive.

Structural Bonding Tapes are ideal for bonding glass, ceramics, and most metals, and will find use in many interior and exterior industrial applications. In many situations, they can replace screws, rivets, spot welds, liquid adhesives, and other permanent fasteners.

- Product Features**
- Immediate adhesion and easy handling
  - No clamping or fixturing of parts during cure
  - No mixing, mess, or clean-up
  - Faster cure than many liquid adhesives
  - Consistent bond line thickness and uniform stress distribution
  - Die-cuttable

Construction	Product	Structural Bonding Tapes
Adhesive Type		Acrylic/Epoxy Hybrid
Approximate Thickness	Tape:	0.010 in. (0.25 mm) <b>9244</b> 0.020 in. (0.5 mm) <b>9245</b> 0.040 in. (1.0 mm) <b>9246</b>
	Liner:	0.004 in. (0.1 mm)
Tape Color		Black (Uncured) Gray (Cured)
Release Liner		Green Plaid Paper
Format		Rolls or Die-Cut Parts
Sizes Available		Maximum Width: 22 in. Minimum Width: 1/4 in.
Normal Slitting Tolerance		± 1/32 in. (0.8 mm)
Core Size (ID)		3.0 in. (76.2 mm)

**Shelf Life** Structural Bonding Tapes 9244, 9245, and 9246 should be stored in the original cartons at a cool temperature to retain their performance. If properly stored at the following temperature or colder, they have the following shelf life from the date of manufacture:

Room Temperature (72°F/22°C): 6 months  
Refrigerated (40°F/4°C): 12 months

Structural Bonding Tapes must be brought to room temperature prior to use.

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<b>Surfaces</b>	Suggested:	Glass Ceramics Most Metals
	Possible:	Painted Metals Coil-Coated Surfaces Polyesters Polyamides
	Not Recommended:	Most Plastics

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## Surface Preparation & Application

Correct surface preparation and tape application are important to obtaining the maximum bond performance from Structural Bonding Tapes 9244, 9245, and 9246. The surfaces should be dry and clean, and light abrading of most surfaces (particularly plastics and painted metals) can greatly improve bond strength. The surfaces should be cleaned with a solvent such as acetone or a 50:50 isopropyl alcohol/water mixture to remove contaminants such as oil, grease, and dirt.\* The tape should then be applied at room temperature, taking care to minimize the amount of air entrapped while applying the tape to both surfaces.

**\*Note:** Be sure to follow the solvent manufacturer's precautions and directions for use when using solvents.

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## Curing

Structural Bonding Tapes 9244, 9245, and 9246 must be thermally cured (typically in a forced convection oven\*) to achieve a structural strength bond. The tape itself must reach a temperature high enough to cure the adhesive. Normally, the parts do not need to be fixtured or clamped together during the cure, although overall performance can be improved by providing pressure during cure.

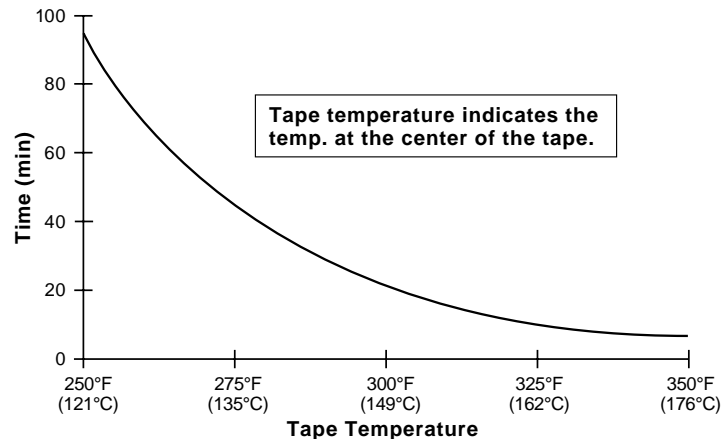
**\*Note:** Curing ovens and devices must be exhausted to the outdoors or a suitable emission control device.

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### Cure Time vs Temperature:

Time required at indicated tape temperature to achieve cure.	250°F (121°C)	95 min
	275°F (135°C)	42 min
<b>Note:</b> The presence of large heat sinks or insulating materials may significantly change the required cure time.	300°F (149°C)	20 min
	325°F (162°C)	10 min
	350°F (176°C)	6 min

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In addition to oven curing, Structural Bonding Tapes 9244, 9245, and 9246 can also be quickly cured using direct contact heating. For example, a hot laminating bar at 450°F (218°C) can bond (under pressure) a thin metal part to glass in about 2 minutes.

**Note:** Tests specific to each application need to be performed to determine the best temperature and pressure conditions required for direct contact curing.

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## Typical 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.**

### Uncured Properties

Peel Adhesion:	Tape 9244	Tape 9245	Tape 9246
To Stainless Steel	7.0 lb/in (125 N/100 mm)	10.0 lb/in (175 N/100 mm)	12.0 lb/in (210 N/100 mm)
To Glass	8.0 lb/in (140 N/100 mm)	11.0 lb/in (190 N/100 mm)	14.0 lb/in (245 N/100 mm)
Room Temperature 90° Peel Jaw Speed 12 in/min (305 mm/min)			

### Static Shear:

To Stainless Steel	72°F (22°C)	250g
0.5 in <sup>2</sup> (3.23 cm <sup>2</sup> ) Overlap	120°F (49°C)	100g
Will hold listed weight for 10,000 minutes with essentially no creep.		

### Dynamic Shear:

To Stainless Steel	80 lb/in <sup>2</sup>
1 in <sup>2</sup> (6.45 cm <sup>2</sup> ) Overlap	(550 kPa)
Room Temperature Jaw Speed 0.5 in/min (12.7 mm/min)	

### Properties During Cure

#### Load Support:

To Stainless Steel	100g
0.5 in <sup>2</sup> (3.23 cm <sup>2</sup> ) Overlap	
Will hold listed weight in static shear during an oven cure at 250-350°F (121-176°C) with essentially no creep.	

### Cured Properties

Overlap Shear:		Stainless Steel	FPL Etched Aluminum
0.5 in <sup>2</sup> (3.23 cm <sup>2</sup> ) Overlap	<b>9244</b>	850 lb/in <sup>2</sup> (5850 kPa)	800 lb/in <sup>2</sup> (5500 kPa)
Room Temperature	<b>9245</b>	1400 lb/in <sup>2</sup> (9650 kPa)	1600 lb/in <sup>2</sup> (11,050 kPa)
Jaw Speed 0.1 in/min (2.54 mm/min)	<b>9246</b>	850 lb/in <sup>2</sup> (5850 kPa)	1000 lb/in <sup>2</sup> (6900 kPa)
- Unclamped		1100 lb/in <sup>2</sup> (7600 kPa)	1300 lb/in <sup>2</sup> (8950 kPa)
- Clamped		850 lb/in <sup>2</sup> (5850 kPa)	1100 lb/in <sup>2</sup> (7600 kPa)
		1100 lb/in <sup>2</sup> (7600 kPa)	1300 lb/in <sup>2</sup> (8950 kPa)

### T-Peel:

	Tape 9244	Tape 9245	Tape 9246
180° Pull on FPL Etched Aluminum	18 lb/in (75 N/25 mm)	18 lb/in (75 N/25 mm)	32 lb/in (140 N/25 mm)
Room Temperature Jaw Speed 10 in/min (254 mm/min)			

### Solvent and Fuel Resistance:

Approximate amount of overlap shear performance retained after solvent or fuel exposure at room temperature; tested immediately upon removal from solvent or fuel.	Water (3 day soak)	90%
	Salt Water (3 day soak)	85%
	Gasoline (3 day soak)	10%
	MEK (3 day soak)	0%
	90°F/90% Humidity (30 days)	60%

### Temperature Performance:

0.5 in <sup>2</sup> (3.23 cm <sup>2</sup> ) Overlap	300°F
Maximum temperature where tape supports 2.2 lb (1.0 kg) in static shear for 10,000 minutes.	(149°C)

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## Cured Properties (continued)

### Overlap Shear vs Temperature:

To Stainless Steel  
0.5 in<sup>2</sup> (3.23 cm<sup>2</sup>) Overlap  
Unclamped During Cure  
Jaw Speed 0.1 in/min (2.54 mm/min)

Temperature (°F)	Temperature (°C)	Overlap Shear (lb/in <sup>2</sup> )		
		Tape 9244	Tape 9245	Tape 9246
-40	-40	1000	900	650
72	22	850	850	850
180	82	190	150	125
250	121	105	80	80
300	149	60	45	45

## Application Equipment

Structural Bonding Tapes 9244, 9245, and 9246 can be dispensed and cut to the desired length or shape needed for each specific application. Some standard equipment available to improve the accuracy and speed of tape application include the following:

- M-89 Cut-to-Length Dispenser
- T-653 Continuous Laminator

## Precautionary Information

Read the product label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or 612-737-6501.

## For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550. Address correspondence to: 3M Bonding Systems Division, 3M Center, Building 220-7E-01, St. Paul, MN 55144-1000. Our fax number is 612-733-9175. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-809-750-3000. In Mexico, phone: 5-728-2180.

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