

> FM[®] 57 POLYIMIDE FILM ADHESIVE

TECHNICAL DATA SHEET



DESCRIPTION

FM[®] 57 film adhesive is a condensation polyimide adhesive supplied as a supported film with woven fiberglass carrier. FM 57 does not contain methylene dianiline (MDA). It is suitable for bonding metallic and non-metallic substrates as well as honeycomb structures.

FM 57 film adhesive can be processed at 350°F (177°C) with a free-standing post-cure at 550°F (288°C). This adhesive film provides a service temperature of -67 to 550°F (-55 to 288°C) and can be used for repair and radar applications.

FEATURES & BENEFITS

- Condensation polyimide
- 550°F (288°C) service temperature
- 350°F (177°C) processing
- Does not contain MDA
- Suitable for honeycomb structure bonding

SUGGESTED APPLICATIONS

- Honeycomb sandwich construction
- Metallic bonding
- Non-metallic bonding

CHARACTERISTICS

Table 1 | Product Description: FM 57 film adhesive

Weight	0.10 ± 0.010 psf (490 ± 49 g/m ²)
Volatiles	25 to 30% [30 minutes at 400°F (204°C)]
Color	Brown
Shelf Life	6 months from date of shipment at recommended storage
Shop Life	15 days at or below 75°F (24°C)
Recommended Storage	Store at or below 0°F (-18°C)

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Table 2 | Product Description: BR[®] 57 primer

Color	Tan
Solids	8 – 10% [30 minutes at 400°F (204°C)]
Density	7.6 lb/gallon
Shelf Life	6 months from date of shipment at recommended storage
Shop Life	10 days at or below 85°F (29°C)
Recommended Storage	Store at or below 0°F (-18°C)
Application	Spray
Dry Primer Thickness	0.0003 – 0.0007 inches
Recommended Cure	Air dry 30 minutes at ambient Cure 60 minutes at 400°F (204°C) Post-cure 60 minutes at 550°F (288°C)

PROPERTIES

Table 3 | Mechanical Performance: FM 57 film adhesive on titanium substrate¹

Property	Test Condition	Result
Tensile Shear, psi (MPa)	75°F (24°C)	3600 (24.8)
	350°F (177°C)	3100 (21.4)
	450°F (232°C)	2500 (17.2)
	500°F (260°C)	2200 (15.1)
	550°F (288°C)	1650 (11.4)

Table 4 | Mechanical Performance: FM 57 film adhesive on titanium substrate after thermal aging¹

Property	Aging	Tested at 75°F (24°C)	Tested at 500°F (260°C)
Tensile Shear, psi (MPa)	None	3600 (24.8)	2200 (15.1)
	1000 hours at 500°F (260°C)	2780 (19.2)	-
	2000 hours at 500°F (260°C)	2300 (15.9)	2067 (14.2)

¹ Substrate: 0.050 in. (1.27 mm) thick 6 Al-4V titanium finger panel
Surface Prep: Grit blast, solvent wipe, no primer

Table 5 | Mechanical Performance: FM 57 film adhesive on composite substrate²

Property	Test Condition	Result
Tensile Shear, psi (MPa) On precured PMR-15 graphite	75°F (24°C)	3520 (24.3)
	350°F (177°C)	3275 (22.6)
	500°F (260°C)	2600 (17.9)

² Substrate: CYCOM[®] 3006 graphite fabric composite, 0.125 in. (3.175 mm) thick, grit blasted, solvent wiped

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Table 6 | Mechanical Performance: FM 57 film adhesive sandwich bonding

Property	Test Condition	Result
Flatwise Tensile ¹ , psi (MPa)	75°F (24°C)	890 (6.2)
	350°F (177°C)	665 (4.6)
	500°F (260°C)	280 (1.9)
Honeycomb Sandwich Peel ² , ipp3iw (Nm/m)	75°F (24°C)	22 (32.6)

¹ Face sheets: CYCOM[®] 3002 precured polyimide/glass composite, grit blast, solvent wiped
Core: HRH-327, 3/16 in., 8pcf

² Face sheets: 0.020 in. (0.50 mm) 2024-T3, FPL etched
Core: 0.25 in. (6.35 mm) 0.004 5052 NP, aluminum, 7.9 pcf

APPLICATION NOTES

Recommended Cure Cycle

Autoclave	Apply full vacuum plus 25 psi (0.17 MPa) pressure Heat up at 4.5°F/min (2.8°C/min) to 350°F (177°C) Hold for 90 minutes at 350°F (177°C) Cool to 150°F (66°C) under pressure
Press	Apply 40 psi (0.28 MPa) pressure Heat up at 4.5°F/min (2.8°C/min) to 350°F (177°C) Hold for 90 minutes at 350°F (177°C) Cool under pressure
Post Cure	Freestanding in oven Oven ramp to 550°F (288°C) Hold for 2 hours at 550°F (288°C) Cool at 5 to 7°F/min (3 to 4°C/min) to below 150°F (66°C)

PRODUCT HANDLING AND SAFETY

Cytec Engineered Materials recommends wearing clean, impervious gloves when working with polyimide resin systems to reduce skin contact and to avoid contamination of the product.

Materials Safety Data Sheets (MSDS) and product labels are available upon request and can be obtained from any Cytec Engineered Materials Office.

DISPOSAL OF SCRAP MATERIAL

Disposal of scrap material should be in accordance with local, state, and federal regulations.

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