

## PRODUCT DATA SHEET

### DESCRIPTION

Toray MicroPly™ EX-1543 cyanate ester film adhesive has been formulated for use in specific applications where low moisture absorption and/or low dielectric constant/low loss are of the utmost importance. Furthermore, the preceding benefits do not come at the expense of adhesion properties. The resin system's strength and toughness when bonding solid, honeycomb, or foam core structures are comparable and often greater than high performance epoxy adhesives, especially at elevated temperatures.

Due to the cyanate ester resin system's inherently low shrinkage during cure, bonded structures will retain less inherent stress and will therefore remain dimensionally stable during thermal cycling. This factor is of extreme importance when bonding structures for use in space. Finally, like other cyanate ester based products, Toray MicroPly™ EX-1543 film adhesive displays low outgassing and microcracking properties to assure structural integrity even after severe environmental exposure.

### FEATURES

- ▶ **Low moisture absorption**
- ▶ **Excellent dielectric properties**
- ▶ **Compatible with Toray cyanate ester prepregs**

### PRODUCT TYPE

Toughened Cyanate Ester Film Adhesive

### TYPICAL APPLICATIONS

- ▶ Space structures
- ▶ Reflectors
- ▶ Radomes and antennae
- ▶ Radar transparent structures
- ▶ Low observables
- ▶ Aircraft structures

### SHELF LIFE

<b>Out Life:</b>	14 days out life ≤ 21°C (70°F) and ≤ 60% RH
<b>Frozen Storage Life:</b>	6 months at ≤ -18°C (≤ 0°F)

Out life is the maximum time allowed at 21°C (70°F) or below and 60% or less RH before cure, after a single frozen storage cycle in the original unopened packaging at -18°C (0°F) or below for a period not exceeding the frozen storage life noted above.

### TYPICAL NEAT RESIN PROPERTIES

Moisture Pickup (at saturation)	1.0–1.1%
Dielectric Constant (10 GHz)	2.72
Loss Tangent (10 GHz)	0.009
Outgassing (TML)	0.41%
Outgassing (CVCM)	0.02%
Outgassing (WVR)	0.35%

### SAMPLE CURED PROPERTIES

Dry T <sub>g</sub> (DSC) with 177°C (350°F) cure	191°C (376°F)
Dry T <sub>g</sub> (DSC) with 204°C (450°F) post cure	236°C (457°F)
Dry T <sub>g</sub> (DMA) with 204°C (400°F) cure	211°C (412°F)
Dry T <sub>g</sub> (DSC) with 218°C (425°F) cure/post cure	230°C (446°F)



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**MicroPly™**

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## PRODUCT DATA SHEET

### COMMON FILM WEIGHTS/CONFIGURATIONS

Product Name	Carrier	Weight gsm/psf	Roll Quantity	Film Width
EX-1543, 0.030 psf, NWFG, 914 mm (36")	10gsm Non-Woven Fg	146gsm (0.030 psf)	46.5 m <sup>2</sup> (500 ft <sup>2</sup> )	.91 m (36")
EX-1543U, 0.030 psf, 914 mm (36")	Unsupported	146gsm (0.030 psf)	46.5 m <sup>2</sup> (500 ft <sup>2</sup> )	.91 m (36")

### 0.030 PSF (146gsm) ADHESIVE BONDING 2024 ALUMINUM

Property	Support	Method	Results	
Tensile Lap Shear Strength	10gsm NWFG	ASTM D 1002	17.9 MPa	2.60 ksi
Tensile Lap Shear Strength	Unsupported	ASTM D 1002	16.8 MPa	2.44 ksi

### CURE SCHEDULE

- ▶ 2 hours at 177°C (350°F)
- ▶ Optional freestanding post cure: 2 hours at 204°C (400°F)

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