

PRODUCT DATA SHEET

DESCRIPTION

Toray MicroPly™ TC263 Blue is a toughened film adhesive for honeycomb core and laminate bonding. It features a 21-day out life and offers structural performance in a high peel strength adhesive. It may be used in low pressure vacuum only out-of-autoclave processes or in autoclave processes at 1 bar (15 psi).

FEATURES

- ▶ High peel strength
- ▶ May be cured in autoclave or under vacuum only pressure
- ▶ Good composite-to-composite bonding
- ▶ Good honeycomb-to-composite bonding

PRODUCT TYPE

Epoxy Film Adhesive

SERVICE TEMPERATURE

93°C (200°F)

CURE SCHEDULE

2 hours at 121°C (250°F)

SHELF LIFE

Out Life: 21 days out life ≤ 21°C (70°F) and ≤ 60% RH

Frozen Storage Life: 12 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

| | |
|---------------------|-----------------|
| Dielectric Constant | 2.97 at 10 GHz |
| Loss Tangent | 0.017 at 10 GHz |
| Outgassing (TML) | 0.34% |
| Outgassing (CVMC) | 0.03% |
| Outgassing (WVR) | 0.17% |

PHYSICAL PROPERTIES

| | |
|---|-------------------------------------|
| T _g by DMA (E' Onset) after 121°C (250°F) 2 hours cure | 110–115°C (230–239°F) |
| Tack Level | Low to medium |
| Supported Film Weights | 170 and 293gsm (0.035 and 0.06 psf) |

Also available unsupported at 70gsm (0.015 psf) nominal



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MicroPly™

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COMMON FILM WEIGHTS/CONFIGURATIONS

| Product Name | Carrier | Weight gsm/psf | Roll Quantity | Film Width |
|--|--------------|------------------|--|--------------|
| TC263U Blue, 0.015 psf, 0.91 m (36") | Unsupported | 70gsm/0.015 psf | 46.5 m ² (500 ft ²) | 0.91 m (36") |
| TC263 Blue, 0.035 psf, NWFG, 10gsm, 0.91 m (36") | Non-Woven Fg | 171gsm/0.035 psf | 46.5 m ² (500 ft ²) | 0.91 m (36") |
| TC263 Blue, 0.060 psf, NWFG, 10gsm, 0.91 m (36") | Non-Woven Fg | 293gsm/0.060 psf | 46.5 m ² (500 ft ²) | 0.91 m (36") |

MECHANICAL PROPERTIES ON SUPPORTED ADHESIVE

| Property | Condition | Method | Film Area Wt. | Cure A | | Cure B | |
|----------------------------|-----------|------------|------------------|------------------|------------------|------------------|---------------|
| Tensile Lap Shear Strength | RTD | ASTM D1002 | 170gsm/0.035 psf | 19.6 MPa | 2842 psi | 33.8 MPa | 4899 psi |
| Tensile Lap Shear Strength | ETD | ASTM D1002 | 170gsm/0.035 psf | - | - | 23.9 MPa | 3470 psi |
| T-Peel Strength | RTD | ASTM D1876 | 170gsm/0.035 psf | 55–67 N/25 mm | 12–25 lb f/in | - | - |
| Tensile Lap Shear Strength | RTD | ASTM D1002 | 293gsm/0.06 psf | - | - | 41.4 MPa | 6000 psi |
| T-Peel Strength | RTD | ASTM D1876 | 170gsm/0.035 psf | - | - | 103.0 N/25 mm | 23 lb f/in |

EDT = 90°C (180°F), Cure A - 2 hours at 121°C (250°F) under vacuum pressure, Cure B - 2 hours at 121°C (250°F) under 1 bar (15 psi) autoclave pressure

ADHESIVE CURE: 0.060 psf 106 F_g, 2 HOURS AT 121°C (250°F) UNDER 30 psi AUTOCLAVE PRESSURE

| Property | Condition | Method | Results | |
|--|------------------|-------------------------------------|---------|-----------|
| Flatwise Tensile | CTD ⁴ | ASTM C 297 25 mm x 25 mm (1"x1") | 73 MPa | 10607 psi |
| Flatwise Tensile | RTD | ASTM C 297 25 mm x 25 mm (1"x1") | 61 MPa | 8822 psi |
| Flatwise Tensile | ETD ⁴ | ASTM C 297 25 mm x 25 mm (1"x1") | 46 MPa | 6672 psi |
| Honeycomb ¹ Flatwise Tensile | CTD | ASTM C 297 50 mm x 50 mm (2"x2") | 7 MPa | 1037 psi |
| Honeycomb ¹ Flatwise Tensile | RTD | ASTM C 297 50 mm x 50 mm (2"x2") | 5 MPa | 740 psi |
| Honeycomb ¹ Flatwise Tensile | ETD ⁴ | ASTM C 297 50 mm x 50 mm (2"x2") | 5 MPa | 654 psi |
| Lap Shear Al-Al | CTD | ASTM D 1002 | 36 MPa | 5171 psi |
| Lap Shear Al-Al | RTD | ASTM D 1002 | 37 MPa | 5363 psi |
| Lap Shear Al-Al | ETD ⁴ | ASTM D 1002 | 23 MPa | 3387 psi |
| Lap Shear Al-Al | ETW ⁴ | ASTM D 1002 | 26 MPa | 3747 psi |
| Thick-Adherend Lap Shear Strength ² | CTD | ASTM D 5656 | 76 MPa | 11018 psi |
| Thick-Adherend Lap Shear Strength | RTD | ASTM D 5656 | 46 MPa | 6642 psi |
| Thick-Adherend Lap Shear Strength | ETD | ASTM D 5656 | 34 MPa | 4886 psi |
| Thick-Adherend Lap Shear Strength | ETW ⁴ | ASTM D 5656 | 21 MPa | 2992 psi |

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**ADHESIVE CURE: 0.060 psf 106 F_g,
2 HOURS AT 121°C (250°F) UNDER 30 psi AUTOCLAVE PRESSURE**

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| Property | Condition | Method | Results | |
|--|------------------|--------------|-----------------------|----------------------------|
| Thick-Adherend Lap Shear Modulus | CTD | ASTM D 5656 | 0.6 GPa | 0.088 Msi |
| Thick-Adherend Lap Shear Modulus | RTD | ASTM D 5656 | 0.4 GPa | 0.061 Msi |
| Thick-Adherend Lap Shear Modulus | ETD ⁴ | ASTM D 5656 | 0.2 GPa | 0.034 Msi |
| Thick-Adherend Lap Shear Modulus | ETW | ASTM D 5656 | 0.1 GPa | 0.014 Msi |
| T-peel | CTD | ASTM D 1876 | 81 N/25 mm | 18 lb/in |
| T-peel | RTD | ASTM D 1876 | 95 N/25 mm | 21 lb/in |
| T-peel | ETD | ASTM D 1876 | 80 N/25 mm | 18 lb/in |
| Floating Roller Peel | CTD | ASTM D 3167 | 100 N/25 mm | 23 lb/in |
| Floating Roller Peel | RTD | ASTM D 3167 | 221 N/25 mm | 50 lb/in |
| Floating Roller Peel | ETD ⁴ | ASTM D 3167 | 234 N/25 mm | 53 lb/in |
| G _{1c} DCB ³ | RTD | D6-83079-131 | 385 J/m ² | 2.20 in-lb/in ² |
| G _{2c} ENF (Pre-crack) ³ | RTD | D6-83079-132 | 1711 J/m ² | 9.78 in-lb/in ² |
| Lap Shear GrEp-GrEp ³ | CTD | ASTM D 1002 | 17 MPa | 2398 psi |
| Lap Shear GrEp-GrEp ³ | RTD | ASTM D 1002 | 19 MPa | 2721 psi |
| Lap Shear GrEp-GrEp ³ | ETD ⁴ | ASTM D 1002 | 11 MPa | 1600 psi |
| Lap Shear GrEp-GrEp ³ | ETW ⁴ | ASTM D 1002 | 4 MPa | 535 psi |

Notes: All aluminum surfaces have been FPL etched and BR127 primed

¹Plascore Aluminum core XR1-7.9-0.250-N-5052 0.5"t

²Bonded and tested at National Institute for Aviation Research (NIAR) Wichita, KS

³Bonded to grit a blasted standard-modulus graphite fabric with 121–135°C (250–275°F) final cure epoxy (HX42)

⁴CTD is 18°C (65°F), ETD is tested at 82°C (180°F), ETW is tested at 82°C (180°F) after 14 days 85% RH and 71°C (160°F) humidity exposure

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