

## raPId™ Flex Heater Dielectric

ARLON® raPId™ polyimide substrates are comprised of a revolutionary new construction that incorporates the benefits of polyimide heater dielectrics with the flexibility and usability of a silicone adhesive system. This combination greatly reduces cure temperatures, pressures, and cycle times.

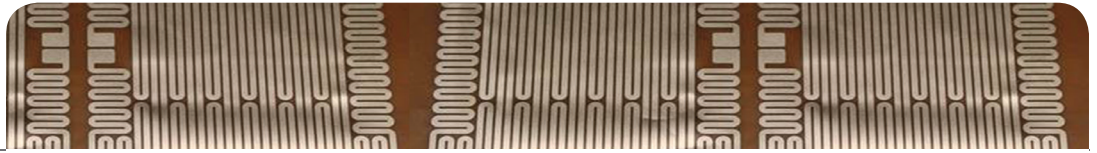
Typical Properties	
Temperature Range	-58°F to 450°F (-50°C to 232°C)
Dielectric Strength	9.5 kV
Flame Rating	UL HB
UL RTI	302°F (150°C)
Ply Adhesion	6.0 lbf/in (1050 N/mm)

Performance Advantages
Cure Cycle Times - Under 20 minutes
Press Cure Temperatures as low as 250°F (121°C)
Can be used for both foil etched and wire wound flex heater constructions
Formulated to eliminate voids, blisters and bubbles with low/no pick off
Superior thermoset bonding properties with no circuit swimming and very low outgassing
Available in both generic polyimide and Kapton® brand polyimide

Adhesive Technology	Time (min)	Temperature °F (°C)	Pressure PSI (kPA)
<b>raPId Substrate</b>	5 - 10	248° (120°)	15 - 50 (103 to 345)
Acrylic	60 - 120	360° - 390° (182° - 199°)	200 - 400 (1379 to 2758)
Fluoropolymer (FEP)	60	536° - 572° (280° - 300°)	10 - 50 (69 to 345)

### Applications

- Replacement for acrylic or FEP adhesives in polyimide flexible heaters
- Maintain temperatures in analytical test equipment with a chemical-resistant heater
- Outdoor electronics requiring cold weather operation via ultra-low profile heater constructions
- Low-weight heaters for aerospace applications to protect devices against cold temperatures at high altitudes
- Medical equipment requiring faster response rate heating systems



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## Process Recommendations for Foil-Etched Flex Heaters

1. Print I##C28N005 to desired circuit using photolithography techniques and etch with ferric chloride or other suitable solvent.
2. Prime etched circuit with Dow Corning PR-2260, Lord Chemlok 607 or other suitable primer according to manufacturer's recommendations.
3. Remove polyethylene release liner from another piece of ARLON raPId substrate and laminate rubber to rubber taking care to avoid air entrapment. Use of a squeegee or nip roller will aid air removal.
4. Use platen press or vacuum bag to thermally cure the laminate at 248°F (120°C) and 17.5 psi (103 kPA) for 15 minutes.

## Process Recommendations for Wire-Wound Flex Heaters

1. Wind resistance wire on pin board to form desired circuit.
2. Remove polyethylene release liner from ARLON raPId substrate and lay over circuit.
3. Using a roller transfer circuit by rolling Arlon raPId substrate onto the pin board.
4. Peel ARLON raPId substrate away from pin board to pick up circuit.
5. Remove polyethylene release liner from another piece of ARLON raPId substrate and laminate rubber to rubber taking care to avoid air entrapment. Use of a squeegee or nip roller will aid air removal.
6. Use platen press or vacuum bag to thermally cure the laminate at 248°F (120°C) and 17.5 psi (103 kPA) for 15 minutes.

		Cap Construction			
		2.0 mil 0.05 mm	2.0 mil 0.05 mm	2.0 mil 0.05 mm	
Base Construction	Polyimide	---	3.0 mil 0.075 mm	5.0 mil 0.127 mm	
	Silicone	---	7.0 mil 0.175 mm	9.0 mil 0.227 mm	
	---	7.0 mil 0.175 mm	10.0 mil 0.3 mm	12.0 mil 0.302 mm	
	2.0 mil 0.05 mm	3.0 mil 0.075 mm	9.0 mil 0.227 mm	12.0 mil 0.302 mm	14.0 mil 0.354 mm
<b>Finished Heater Thickness</b>					