FRALOCK® *Leading the Way in Advanced Materials Solutions*

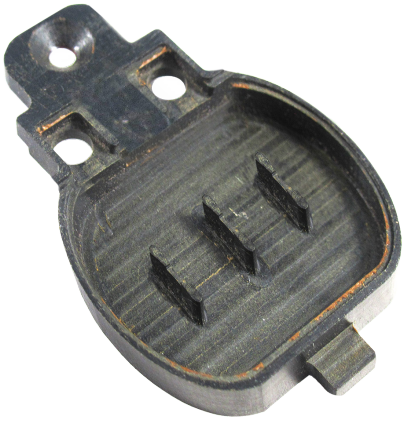
CIRLEX® ENGINEERED THICK ALL-POLYIMIDE MATERIAL

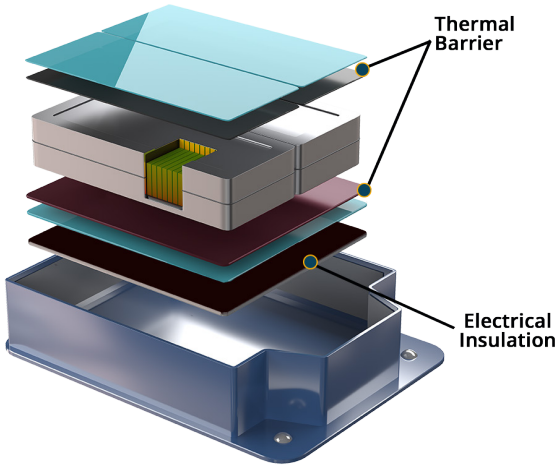
Cirlex® is an all-polyimide material that provides outstanding physical, electrical, and chemical performance and is ideal for high-reliability applications in harsh environments. Cirlex® - made with DuPont™ Kapton® - outperforms other materials such as laminated constructions with adhesives. It is well-suited for thermal blocking, electrical isolation, compression resistance and other applications.

Cirlex® is exclusively manufactured by Fralock and is available in a wide range of thicknesses up to 125 mil. It is fabricated with our pioneered Adhesiveless Lamination Technology (ALT), producing a monolithic polyimide construction.

Applications

- Thermal Barriers
- Thermal Shields
- Electrical Isolation
- High-Voltage Applications
- Component Stiffeners
- Gaskets and Seals





Features

- Maintains integrity at extreme temps from -269°C (-452°F) to 351°C (664°F)
- Low CTE, 30 ppm in-plane at -273°C (-459.67°F) (ASTM E831)
- Chemically inert
- Abrasion resistant
- Dielectric strength > 2790 volts/mil
- High Compression Strength
- Low thermal conductivity: 0.17 W/mK
- Tested and meets specifications:
  - NASA outgassing requirements
  - Flammability rating UL94V-0
- Inherently halogen free
- Glass transition temperature 351°C/663°F
- Micro-hole machining capability

Manufacturing Capabilities

Fralock produces Cirlex® to satisfy your specifications in a wide variety of applications. Our advanced capabilities enable custom fabrication to produce various shapes and sizes as needed.

Available in standard thicknesses of 10 mil (0.254 mm) and 20 mil (0.508 mm), and custom thicknesses from 8 mil (0.102 mm) to 125 mil (3.175 mm) in 1 mil (0.0254 mm) increments. If additional thickness is required, please contact Fralock. Assembly and packaging services available with in-house clean rooms certified to ISO 14644-1, class 5 (100) to class 7 (10,000) standards.

Ordering Information

Material Reference Number: Cirlex-XXX (–XXX = thickness in mils)

Example: to request 40 mil thick Cirlex®, the reference # is Cirlex-040

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MECHANICAL

	Temperature	ASTM	Units	Typical Values
Ultimate Compressive Strength	23°C (73.4°F)	D695-15	kpsi	45.26
	100°C (212°F)			42.79
	200°C (392°F)			35.61
Ultimate Tensile Strength	23°C (73.4°F)	D638	kpsi	32.49
	100°C (212°F)			21.40
	200°C (392°F)			17.40
	250°C (482°F)			16.50
Tensile Modulus	23°C (73.4°F)	D638	kpsi	330
	100°C (212°F)			488
	200°C (392°F)			402
	250°C (482°F)			381
Tensile Yield @ 3% Elongation	23°C (73.4°F)	D638	kpsi	6.11
	200°C (392°F)			5.49
Shear Strength	23°C (73.4°F)	D3846	kpsi	-
	100°C (212°F)			6.40
	200°C (392°F)			5.40
	250°C (482°F)			5.00
Poisson's Ratio	23°C (73.4°F)	D3039-17	-	0.329

THERMAL

	Temperature	ASTM or Test Method	Units	Typical Values
Thermal Conductivity	-	-	W/m K	0.17
Glass Transition, Tg	-	-	°C	351
Specific Heat	-	-	J/g K	1.09
UL Rating	-	UL File # - E39505	-	UL 94V-0
CTE In-plane	(23° – 350° C)	ASTM E831	µm/m °C	30
CTE Thru-thickness	(23° – 350° C)	ASTM E831	µm/m °C	118
Outgassing TML	-	ASTM E595	-	0.50%
Outgassing CVCM	-	ASTM E595	-	<0.01%
Outgassing Water Vapor Regain	-	ASTM E595	-	0.42%

ELECTRICAL

	Temperature	ASTM	Units	Typical Values
Dielectric Strength	-	-	V/mil	2790
Dielectric Constant DC @ 10KHz	25°C	ASTM D150	KHz	3.45
Dielectric Constant Dissipation Factor	-	ASTM D150	-	0.004

PHYSICAL

	Temperature	ASTM	Units	Typical Values
Surface Roughness Average	-	-	µin	Ra ≤ 32
Specific Gravity	-	-	-	1.42