

In critical applications where material failure can result in extreme loss of resources or even life, material integrity is essential. Traditional lamination technologies can produce materials that delaminate under unfavorable conditions or with extended use. For mission critical or life-sustaining applications, the highest performance solutions are required.

Fralock manufactures highly durable and rugged all-polyimide laminated materials constructed with our proprietary **Adhesiveless Lamination Technology (ALT)**.

We use this technology to laminate layers of polyimide film and other materials - such as metal foils - to produce a monolithic material that is able to operate in extreme environmental conditions for extended time without cracking or delaminating. **ALT** material is ideal for critical applications in industries such as aerospace, military, defense, medical, industrial, and energy.



ALT DURA™ PRODUCTS

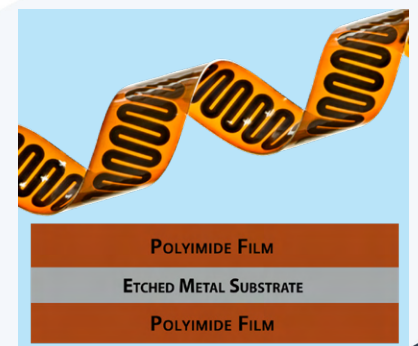
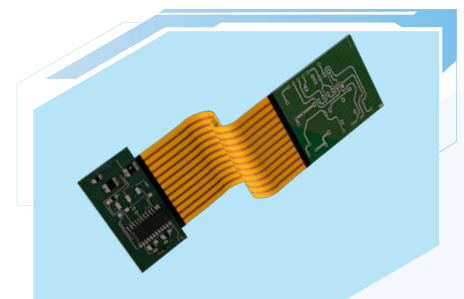
Fralock ALT Dura™ products are components made using **ALT**, which include **flexible circuits** and **heaters, components made with DuPont™ Cirlex®**, metal encapsulated heaters, and **other electronic components**. Fralock is solely licensed by DuPont™ to manufacture Cirlex®.

Fralock manufactures custom ALT Dura™ components to satisfy the requirements of your most demanding applications.

Flexible Interconnect Products

ALT Dura™ Flex Circuits are fully encapsulated with polyimide to protect the metal foil traces from environmental damage and degradation. Laminated **without adhesives**, these flex circuits, harnesses and heaters can withstand delamination in demanding use cases such as hard creasing, repetitive flex cycles and cryogenic environments.

ALT Dura™ flex products offer superior resistance to trace swimming under high temperatures and 30% reduction in mass compared with traditional flex products laminated with temperature-limiting adhesives. ALT Dura™ circuits also exhibit a wide temperature operational tolerance, from -269°C to 350°C (-452°F to 662°F).



DuPont™ Cirlex®

DuPont™ Cirlex® is a rugged thick polyimide that is suitable for a variety of applications requiring chemical, physical, and thermal stability in extreme environments. It is highly machinable and used as a stiffening material in components, and for thermal and electrical insulation. Cirlex® is operational from -452°F to 664°F (-269°C to 351°C), is UL® 94V0 rated, and is resistant to radiation and most organic chemicals, solvents, fuels, and lubricants.

Cirlex® Products include:

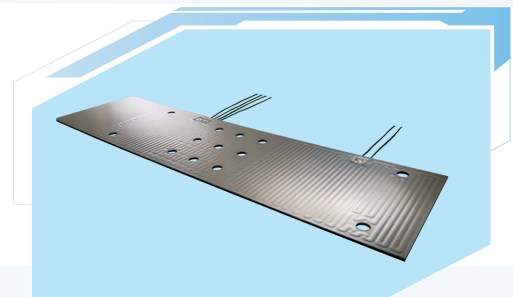
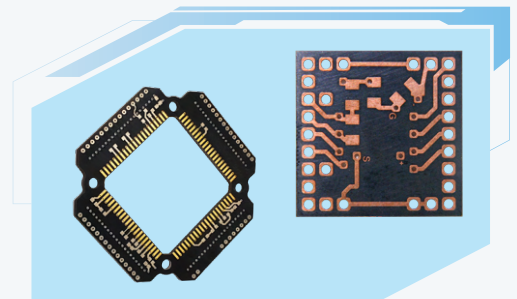
- Encapsulated Shims
- Gaskets and Seals
- Electrical Insulators
- Standoffs and Spacers
- Electrostatic Chucks
- Component Stiffeners
- Thermal Barriers
- Sealing Shims
- Lid Rings
- Washers with Adhesive
- Thermal Shields



Other Applications using Adhesiveless Lamination Technology

A wide variety of electronic components can be made with **ALT** including:

- Flexible board-to-board connectors - rigid-flex design allows multiple layers of polyimide and metallization
- Flex-to-board connectors, BGA and LGA sockets - provides high-reliability and performance in molding operations
- All-polyimide circuit boards
- Interposers for semiconductor packaging
- High-powered bus bars and magnetics
- Polyimide heaters encapsulated with metal (Al, Cu, stainless steel)
- Medical diagnostic instruments



Cirlex® is a registered trademark of affiliates of DuPont de Nemours, Inc. used under license by Fralock.

Get in touch with us to discuss your project

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