

# Solutions for High Reliability Applications

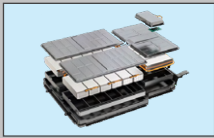
Fralock is a valued partner of OEMs in a variety of high-reliability markets. We provide custom engineered flex and rigid-flex circuits, electronic assemblies, tapes, adhesives, precision ceramics, custom ceramic heaters, and flexible heaters.

- Flex and Rigid-Flex Circuits
- Electronic Assemblies
- Flexible Heaters
- Ceramic Heaters
- Precision Structural Ceramics
- Adhesive Solution

**Certifications:**

ISO 9001  
AS 9100  
ISO 13485  
NAICS

## Applications



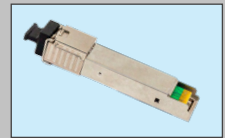
Rechargeable Batteries



3-D Printers



Power Converters



Telecom



Audio Equipment



Oil & Gas - Downhole



Specialty Engineered Materials Solutions



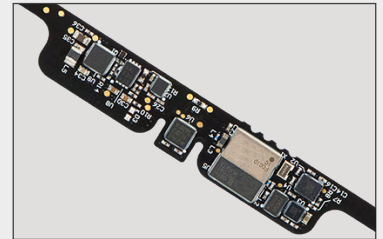
Robotics

## Capabilities

### Flex, Rigid-Flex, and Custom Bare Board Solutions

We deliver a wide variety of circuit solutions with extensive manufacturing capabilities:

- Trace / Space 37um (1.5 mil)
- Micro / Vias Min 50u (2 mil)
- Blind/Buried Vias (2 mil)
- Laser- Precision Drilling / Excising<50um (2 mil)
- Unsupported Traces / Cantilever Leads
- Controlled Impedance Routing Capabilities
- In-House Surface Finishing
- Liquid Soldermask Thickness 25um (1 mil)
- Photo Imageable Coverlay Min 25um (1 mil)
- RoHS & Non RoHS PCB/Flex Circuit Manufacturing
- Automated Optical Inspection (AOI)
- Electrical Testing (Flying Probe, and Hi-Pot continuity)
- Hi-temp capable, including autoclave sterilization



### Electronic Assemblies

We provide the following assembly capabilities for your Flex, Rigid-Flex, and PCB requirements:

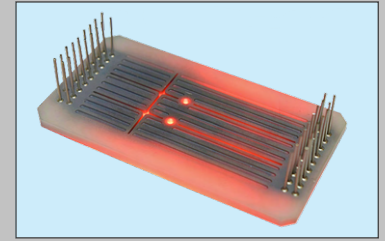
- Multiple SMT Lines
- Real Time X-ray
- Automated Solder Paste Printer
- In-Line Cleaning
- Wave Solder (Leaded & Lead Free)
- Inline Circuit Testing
- 3D AOI Automated Optical Inspection
- Laser Selective Soldering Machine With Preheat Oven



## AlN Ceramic Heaters

Our Aluminum Nitride (AlN) ceramic heaters are among the highest performance heaters available in the market today with extremely rapid thermal cycling capabilities.

- Internal Tungsten heating traces
- Internal cooling channels
- Integrated temperature sensing with tight control
- Anti-fluorescing capabilities
- 3-D multi-layer stacking
- Uniform thermal control
- Rapid heating up to 300°C/second



## Polyimide Heaters and Flat Flex Cables

Polyimide heaters are thin, flexible, and lightweight, and deliver reliable and precise heat when and where you need it.

- Unique adhesiveless constructions - eliminates cracking and operates in extreme environments
- Chemically inert, abrasion resistant
- Flexible heater traces in CuNi715, Constantan, Inconel, and Monel
- High reliability over a wide temperature range -269°C to +220°C
- Meets flammability requirements of UL94V-0
- Multiple heating zones



## Precision Ceramics

We provide engineered solutions for complex designs and assemblies encompassing all forms of ceramics, zirconia, glass and sapphire. Our advanced in-house manufacturing technology enables us to press ceramic powders, machine, fire, and post-fire machine to achieve final dimension and assembly requirements.

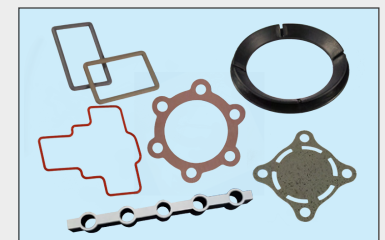
- We hold .002"/inch from green machining through firing
- Finish lapping and polishing tolerances to .00002" in diameters and .00001" in flatness
- Complete ceramic solutions from prototypes to production quantities



## Specialty Engineered Materials Solutions

We offer precision die-cutting, UV and CO<sub>2</sub> laser cutting slitting, and laminating capabilities. Applications include:

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Breathable films, non-wovens</li> <li>• Device attachment</li> <li>• Silicone transfer adhesives</li> <li>• Other specialty adhesives</li> <li>• Multi layer laminates</li> </ul> | <ul style="list-style-type: none"> <li>• Thermal interface material solutions</li> <li>• Thermally and electrically insulative materials</li> <li>• Thermally conductive gap fillers</li> <li>• Electrodes</li> <li>• EMI/RFI shielding</li> </ul> |
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## Engineering and Manufacturing Services

Fralock offers customized engineering services to support your specific needs, including:

- Design for Manufacturability
- Customized engineering design and layout services
- Production & manufacturing support
- Turnkey manufacturing
- Full production and assembly capability
- Electrical and electronics testing

