

# LEO Satellite Application Breakdown



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Laird Confidential

\*All products mentioned in this presentation will need testing to be qualified into a space application as all space applications are unique.

LAIRD PERFORMANCE  
MATERIALS DELIVERS DESIGN  
ENGINEERING ANSWERS  
EARLY – THAT EFFECTIVELY  
KEEP EMI AND HEAT AT BAY.



PERFORMANCE  
MATERIALS

Performance  
Materials  
That Protect  
Electronics

### Thermal Interface Material

#### Tflex/Tpcm/Tputty

- Tpcm 780 and Tpcm 7000.
- Some Tflex Series meets NASA outgassing specs.
- Qualification testing is being done on our dispensable materials.

### EMI Shielding Gasket

#### Soft Contact SMD

## LEO Satellites\*



No public teardowns are available and current customer information is proprietary.

### RF and Microwave Absorbers

#### Eccosorb and others

- Eccosorb JCS and others.
- Our absorber products are currently used in many Aerospace applications and classified programs.

### Board Level Shields

#### Custom Precision Metals

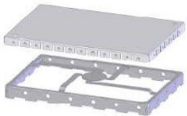
### Radomes

#### Radome5 Series

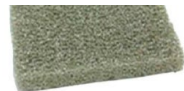
- Low Dk between 1-2.



Precision Metals



Thermal Interface Materials



Conductive Foam  
Seals/Gasketing



RF & Microwave Absorbers



Ece and NCE Elastomer  
Seals/Gasketing



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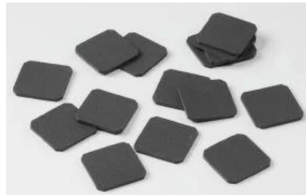
# Performance Materials Products



## RF & Microwave Absorbers

- Laird offers many different absorber solutions spanning across a wide frequency range from cavity resonance to free space applications:
  - Injection Molded, Cast Liquids, and Thermoplastics.
  - Low Loss Dielectrics.
  - Elastomers and Films.
  - Absorbing Foams.
  - Gap Fillers.
  - Custom Magnetic Absorbers.

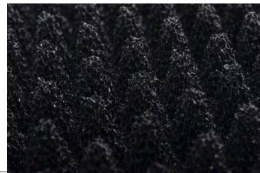
<https://www.laird.com/products/microwave-absorbers>



Eccosorb



Softzorb



Absorbing Foams



## Radomes

- Laird offers radome materials to enhance antenna signal performance and provide better impact resistance:
  - Radome5 LS.
  - Radome5 TP.
  - Radome5 Unity.
  - Radome Auto.
  - Rezorb.
- From injection molded material to custom made parts to fit an application, Laird has the capabilities to provide a solution for almost any antenna application.

<https://www.laird.com/products/multi-function-solutions-mfs-ise-integrated-solutions-engineered/structur-ise>



Radome5 Unity



Radome5 LS

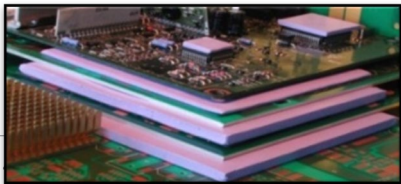
# Performance Materials Products



## Thermal Interface Materials

- As an industry leader in high-performance thermal interface materials, with new products released this year, Laird offers the following categories:
  - **Gap filler pads** now up to 34 W/mK thermal conductivity.
  - **Thermal putties** with dispensing options.
  - **Phase change materials** now up to 7.5 W/mK.
  - **Thermal greases** ranging from 1-4 W/mK.
  - **Thermally-conductive insulators.**
- Additionally, Laird has the capabilities to die cut materials and offer dispensing options.

<https://www.laird.com/products/gap-fillers-thermal-interface-materials>



Laird Co



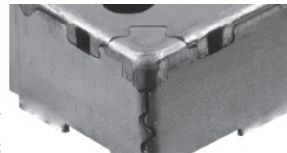
## Precision Metals

- Laird Performance Materials offers many different standard and custom lightweight precision metals such as:
  - **Board Level Shields** with lightweight and ultra low board level shields.
  - **Fingerstock and Spring Contacts.**
  - **Custom Metals** for structural support and/or EMI shielding.
- Added value capabilities with state-of-the-art software simulations to ensure product reliability.

<https://www.laird.com/products/enclosure-solutions/board-level-shielding-bls>

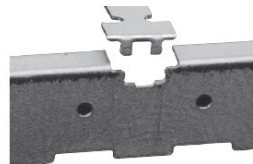
<https://www.laird.com/capabilities/precision-metals>

Recover Shield



Rigid Corner Patent

Removable Pick Bridge



Laird

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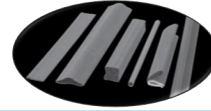
# Performance Materials Products



## Magnetic Ceramic Product

- There is a wide assortment of products within the Laird MCP line, our line includes:
  - Power inductors.
  - Common mode chokes.
  - Wireless charging coils & flexible ferrite sheets.
  - Ferrite chip beads.
  - Ferrite Cable Cores.
  - Baluns & Toroids.

<https://www.laird.com/products/inductive-components-emc-components-and-ferrite-cores>  
<https://www.laird.com/products/inductive-components-inductors-power-and-signal-lines>  
<https://www.laird.com/products/inductive-components-wireless-charging-coils>



## EMI Gasketing

- Laird offers EMI gasketing solutions for almost any application with high shielding effectiveness, our product line offers:
  - Conductive Foams (CF).
  - Fabric Over Foams (FOF).
  - Conductive Fabrics.
  - Electrically Conductive Elastomers (ECE).
  - Form In Place (FIP).
- There are many options for Laird gaskets from ultra soft materials (silicone or silicone free) to wire mesh materials.
  - All of which can come in custom profiles, die cut parts, or standard solutions.

<https://www.laird.com/sites/default/files/emi-cat-ece-080615.pdf>



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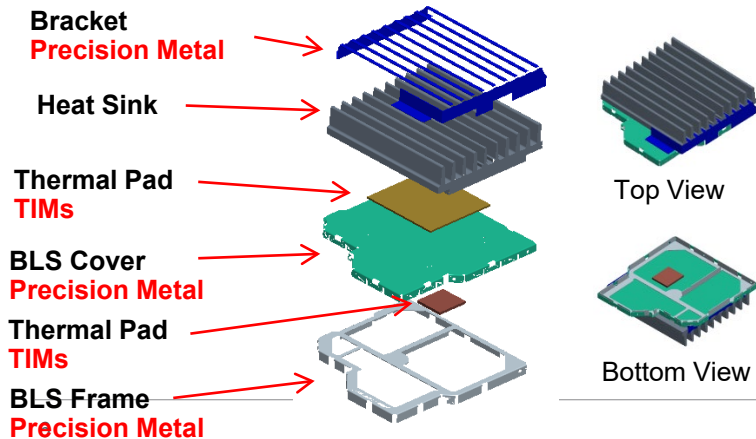
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# Performance Materials Products

## Multi-Functional Solution (MFS)

Laird offers MFS, showcased below, that combine multiple different product lines together to create a single package.

- **BLS + Insulation Layer** (Dielectric Coating).
- **BLS + Absorber.**
- **BLS + Graphite Heat Spreader.**
- **BLS + Thermal Interface Material.**
- **BLS + Black Paint** (aesthetic purposes).
- **BLS + Several Laird Components Combined.**



## Other Laird Product Offerings

Laird offers many different product spanning all electronic industries. Other product offerings that have not been discussed are listed below:

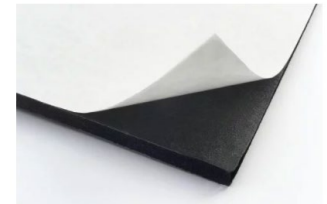
- **Dupont Kapton Films.**
- **EMI Tapes.**
- **Thermal Heat spreaders** (Graphite Over Foam).
- **Coolzorb** combines characteristics of our thermal and Absorber product lines into one.



Coolzorb Ultra Series



Graphite Over Foam (GOF)



Eccosorb SS Tape

**Laird**<sup>TM</sup>

The logo features the word "Laird" in a bold, sans-serif font. A trademark symbol (TM) is positioned to the upper right of the letter "d". A thick, dark gray swoosh underline starts beneath the "L", curves under the "i", "a", and "r", and then curves back up to end under the "d".