Zeta flux®

Multilayer Heat Shield
Durable - Acoustically Transparent

The zeta flux product in the Lydech flux product family is a multi-layer composite shield designed for application environments marked by aggressive vibration and noise generation. The composite material is designed to damp the vibration response across a broad band of frequencies which reduces mechanical stress resulting from inertial forces and essentially eliminates parasitic noise generation.

Viscoelastic Layer

Low Temperature (LT)

- $T_{shield} < 140\ ^\circ C$
- Laminated Polyethylene

Mid Temperature (MT)

- $T_{shield} < 220\ ^\circ C$
- Co-Laminated Acrylic

High Temperature (HT)

- $T_{shield} < 350\ ^\circ C$
- Co-Laminated Silicon

Metallic Layers

- Aluminum 1050-O or 1100-O depending on the market
- Gauges from 0.1 mm to 1.0 mm are possible
- 2 x 0.3 mm is a common composite and consistently provides desired results

Thermal Performance

- Low emissivity surfaces for high infrared radiation environments
- High lateral thermal conductivity to spread heat

Acoustical Performance

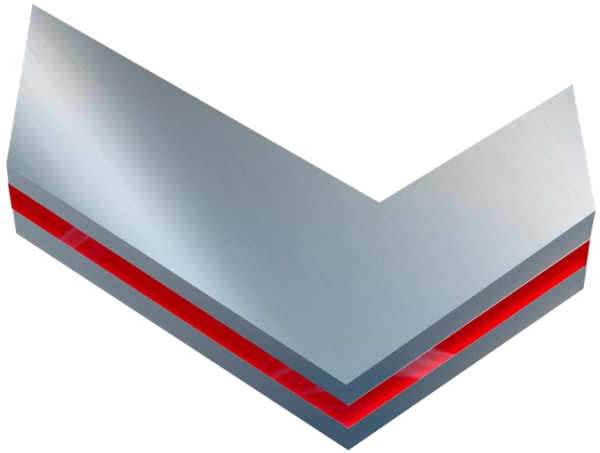
- High transmission loss for better acoustic isolation
- Marked vibration damping
- Essentially acoustically transparent – no contribution to noise levels
    - No cooling ping / No impact ring

Mechanical Performance

- Improved damping reduces the vibration response and transmissibility of the heat shield resulting in a decreased stress

General Performance Characteristics

- Resistance to all common automotive fluids
- Non-inflammable composite per FMVSS 302
- Long-Term high temperature resistance
- No delamination



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Lydech

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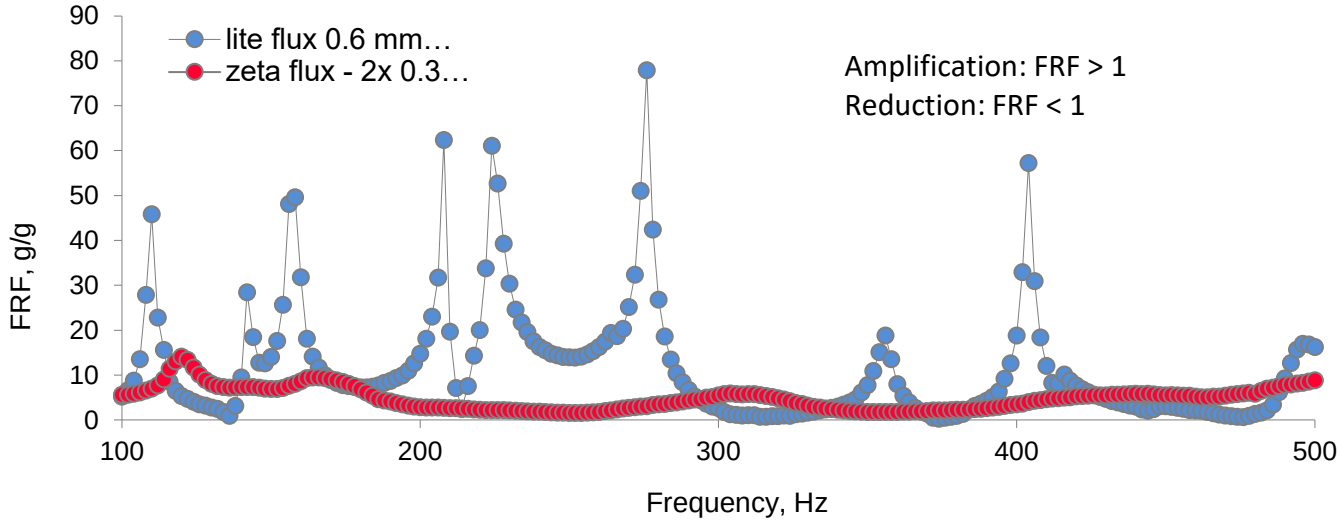
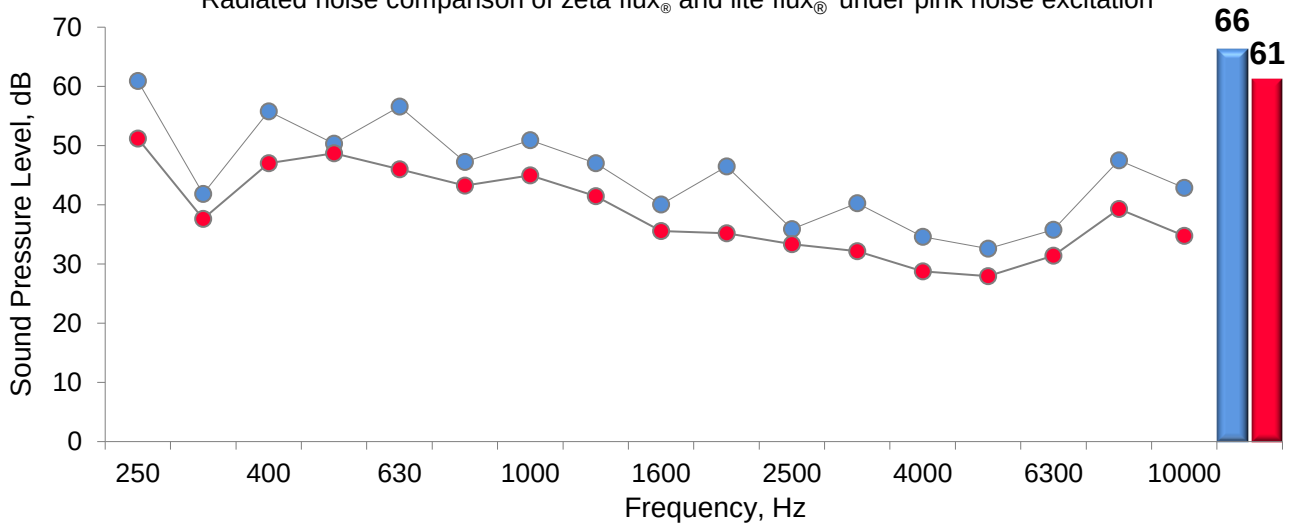
Frequency response function comparison of zeta flux® and lite flux® under pink noise excitation



Radiated noise comparison of zeta flux® and lite flux® under pink noise excitation



Design Considerations

- To optimize damping performance, the metallic layers should have identical thickness to ensure the neutral axis of the composite is centered in the VE layer
- The common design goal of achieving a minimum first resonant frequency is not applicable to this composite. Optimizing the metallic layer thickness to achieve durability testing requirements is the primary motivation for altering the metal gauge
- Metal gauge will not impact thermal performance and should only be considered for mechanical purposes
- Embossing facilitates the metal forming process and rigidifies the parent materials, but does not affect thermal performance
- Distance plays a fair role in determining thermal responses, but marked swings in temperature only occur across large incremental changes in distance
- The mechanical integrity of the shield is highly coupled to the location of lower order vibration modes and their amplification relative to the vibration input levels and frequencies
- Contact us for applications support; we are quietly keeping it cool

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