

The FlexShield product in the Lydall thermal products family is a thermal encapsulation that serves to protect sensitive components from heat radiated by the exhaust line and maintains thermal calories in the exhaust line to facilitate catalyzation and filtration processes. A low thermal conductivity fiber sewn into two woven fabric layers and placed in direct contact with the exhaust line component. FlexShield is an complementary product to iso flux and leverages low tooling investment and short industrialization lead times.

Woven Fabric Layers

(e) XYZ

- Coated
- Aluminized
- Silicon
- Nonan
- Miss it

Insulation Layer

(n) Fiber

- 2D mat thickness ranges from 1 mm to 25 mm
- Low thermal conductivity
- Low shot content - excellent mechanical durability
- High Operating temperature ~1100 °C

Thermal Performance

- Low emissivity surfaces for high IR environments + low thermal conductivity
- Combined functions: thermal shielding and isolation
- Homogenous temperature distribution in exhaust component

Acoustical Performance

- Decoupling of exhaust component with the engine compartment
- Marked noise absorption on fiber side
- Option to pierce/perforate the metallic layer to increase noise absorption

Assembly

- In-house: hemming, spot welding or mechanical fasteners
- Delivered ready to assemble – through similar or customer specific methods

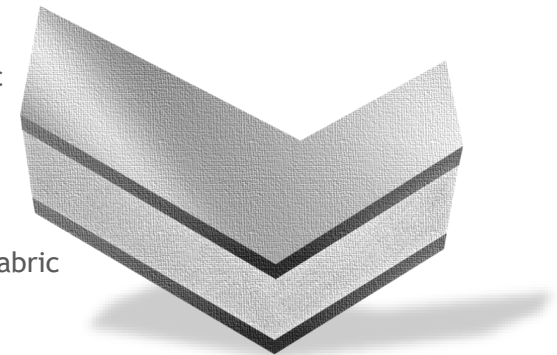
Applications

- Turbochargers – Improved operation through homogenized temperatures
- Catalytic Converters – Improved oxidation at start-up
- Manifolds for improved scavenging
- No_x Filters – More efficient regeneration cycles

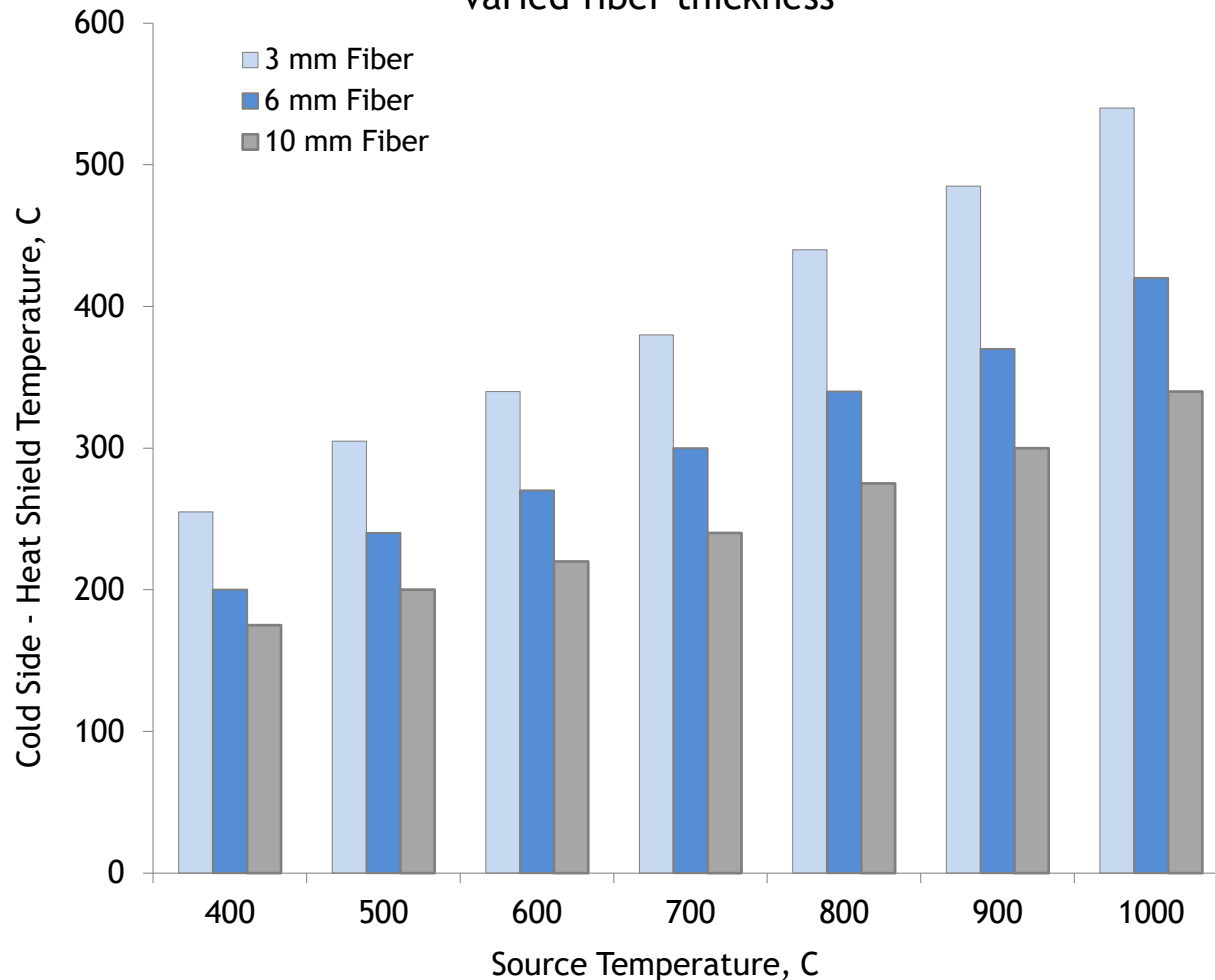
Durable + resistant woven fabric

Low thermal conductivity fiber

Durable + resistant woven fabric



Heat shield skin temperature of an isolation shield with varied fiber thickness



Design Considerations

- Low tooling investment and lead times
- Coatings...
- Assembly....
- Unshielded exhaust components will have a skin temperature roughly 70% of exhaust gas temperature; with FlexShield, the skin temperature will increase to 85% to 95% of the gas temperature depending on the composite thickness
- Average exhaust gas temperature will increase proportionally
- Ambient air temperature and convection effects play a large role in component and shield temperatures
- Consider the application area and distinguish between Underbody and Underhood applications
- Distance plays a fair role in determining thermal responses, but influences temperatures only across large incremental changes
- Contact us for applications support; we are quietly keeping it cool