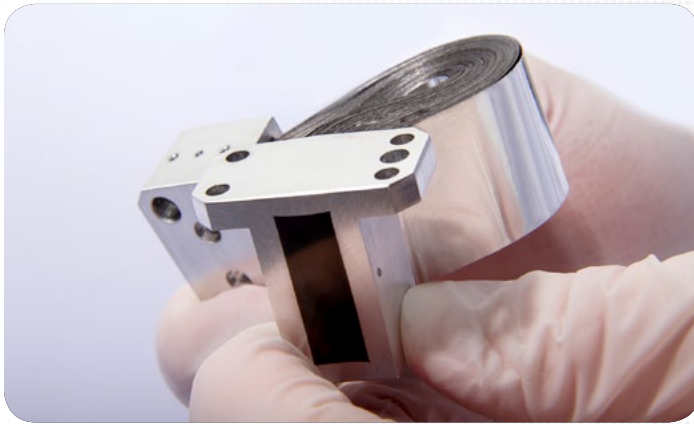


THERMAL STRAPS

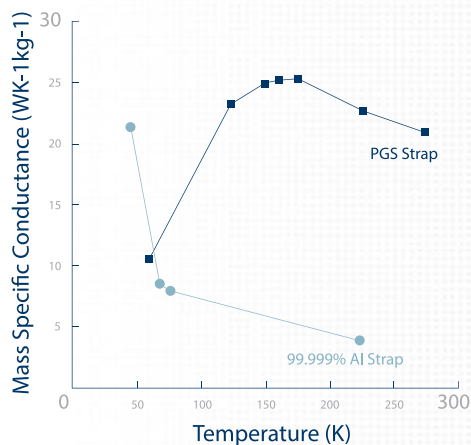
PYROLYTIC GRAPHITE SHEET



Thermal straps are used to cool sensitive spacecraft components by transferring heat while reducing the transfer of mechanical loads.

The Space Dynamics Laboratory (SDL) has developed new thermal straps using Pyrolytic Graphite Sheets (PGS) instead of standard metallic foils. Using PGS provides several benefits over metallics. PGS is six times more thermally conductive than aluminum at room temperature and is only 72 percent of the density. Our non-optimized prototype PGS thermal strap measured a mass-specific thermal conductance five times higher than the aluminum strap. This makes them the ideal option for mass sensitive spacecraft and application temperatures above 80K. SDL's PGS straps are currently at a Technology Readiness Level (TRL) 6.

MASS-SPECIFIC THERMAL CONDUCTANCE



Measured mass specific thermal strap conductance for 25 μ m PGS foil straps and 99.999% Al foil straps of similar geometry vs temperature.

FEATURES

- More flexible than their metallic counterparts
- Higher thermal conductance above 80K than metallic straps
- Lower density than metallic foils
- TRL-6
- Transfer lengths up to 8 inches
- Fabricated with processes proven through decades of extensive thermal strap experience

SPECIFICATIONS

- PGS strap cleanliness
 - No visible particles from the PGS after vibration testing
 - Effluent analyzed per IEST-STD-CC1246 E at Level 313 R1E-1 after standard cleaning at SDL
 - Outgassing per ASTM E595 measured 0.011% total mass loss (NASA requirement is <1%)
 - Filtered particle containment sleeve (PCS) design available for contamination-sensitive applications
- Vibration survivability
 - Survived exposure to twelve minutes of qualification-level loads/displacements (+/-0.155" in x, y, z and 12.2 GRMS)
 - Successful post-vibe conductance testing showed no change



SDL offers a complete suite of onsite fabrication, testing, engineering design, and analysis. SDL is ISO 9001:2015 certified and has been registered by DQS UL since 1999.

Space Dynamics
LABORATORY