DANISH GRAPHENE

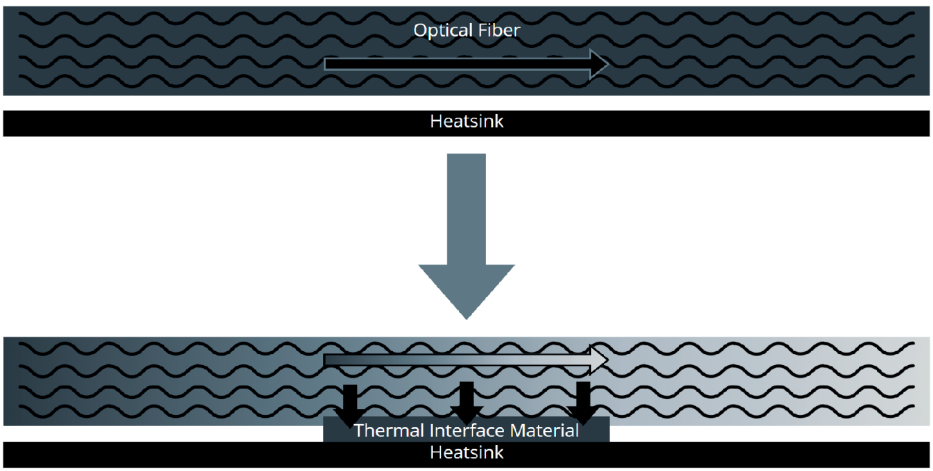
Space Laser
Thermal Management Showcase

danishgraphene.com | contact@danishgraphene.com

Graphene-Enhanced Thermal Management

In the demanding area of space technology, efficient thermal management is crucial, as extreme temperature fluctuations can damage critical components leading to satellites malfunctioning. In fiber optics for advanced laser systems excessive heat from high intensity light can damage the system if not managed properly.

Danish Graphene is pioneering graphene-enhanced thermal management solutions that are transforming passive cooling for the space industry. Utilizing graphene's exceptional thermal conductivity, we have developed user-friendly solutions specifically for space applications. Our technology integrates effortlessly into existing systems, delivering an innovative approach to managing temperature in space technology.



Optical fiber with a high intensity light increases the temperature and can damage the system. Efficient transfer of the heat into a heatsink or structural component at key points along the fiber can significantly reduce risk of failure and improve performance.

Danish Graphene's thermal management solutions are distinguished by their low density, high conductivity, minimal thermal resistance, and ultra-thin bond line thickness. These features not only prevent overheating but also unlock new possibilities for reimagining core systems.

Showcase

TRL SPACE

As part of the company strategy, TRL Space showcase has carried on an internal development project aiming at developing a space laser source based on fibre laser technology. The laser source is intended as a building block for various space applications such as LiDARs or optical communication terminals, among others.

The developed hardware is called Lidar Laser Demonstrator (LLD) and the reached TRL was 6.

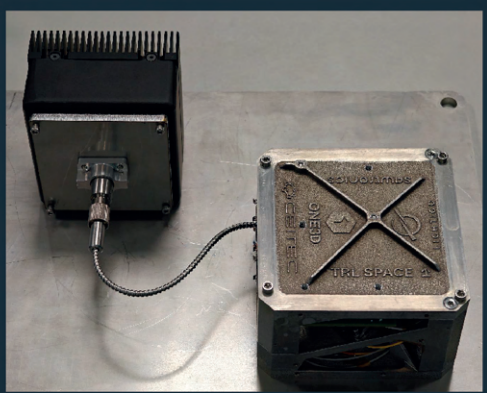
The development went through several stages and development models culminating with a Qualification Model (QM) and a Flight Model (FM).

"**The Danish Graphene adhesive solution** was a good fit for our needs. It provided the thermal and cleanliness properties required by our project while being easy to use due to the delivery method and room temperature curing. The communication with the company was smooth and the delivery quick and reliable."

Iulian Emil Juhasz, Space Product Assurance & Technical Advisor, TRL Space Systems

The reason for choosing the Danish Graphene thermal adhesive was that the hardware design and operation required an adhesive with the thermal conductivity with 1 W/m·K or better while meeting the cleanliness requirements for space equipment. At the same time, other factors like the ease to use and the room temperature curing played an important role in the selection.

During the qualification phase the LLD went through the standard space qualification tests: EMC, vibration, thermal vacuum cycling and shock while keeping full functionality of the subsystems.



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