Phase Change Material (PCM) Heat Exchangers

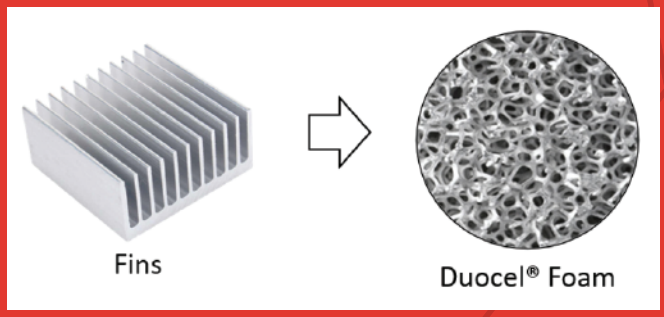
ERG materials & aerospace

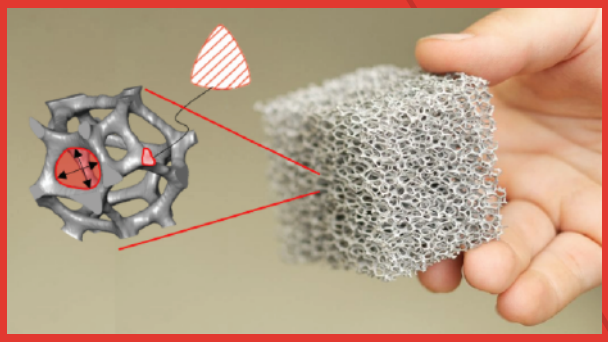
Meet Duocel® Metal Foam

- Compact, high performance designs
- Highly customizable for all modes of heat transfer
- Tunable for a wide range of heat fluxes
- Easy to manufacture into conformal shapes
- Can be brazed and bonded for excellent thermal interfaces
- Decades of design and testing data

Duocel® in PCM Heat Exchangers

The foam's 3D matrix of ligaments enhances the thermal conductivity by reducing the distance heat has to travel into the PCM, resulting in more complete transfer of heat from the source to the PCM.





Customize Duocel® Properties

ERG controls the foam's base material, pore size, ligament thickness, and compression to optimize Duocel® and maximize heat transfer.

Manufacturing Advantage

Unlike other metal foams, Duocel® has open cells, which makes it possible to fill with PCM, and solid ligaments, which result in better heat transfer.

Since Duocel® is not 3D printed, it does not have the common structural flaws associated with 3D printed metals, such as voids or boundary layers.

Duocel® is proven in the aerospace and defense industries. Some of our customers include:

BOEING AIRBUS BLUE ORIGIN PRATT & WHITNEY DEPENDABLE ENGINES NASA L3 Technologies

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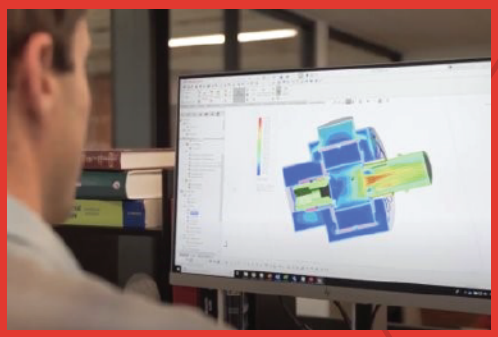
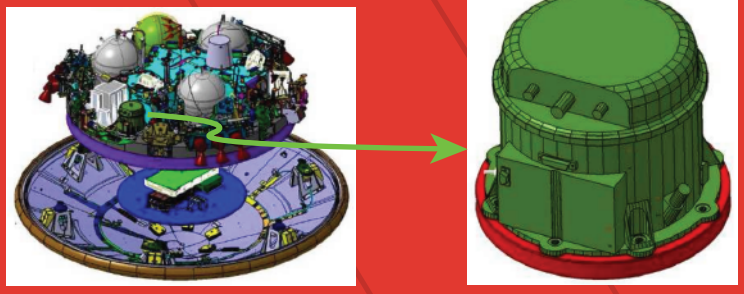


ERG Design and Production Support

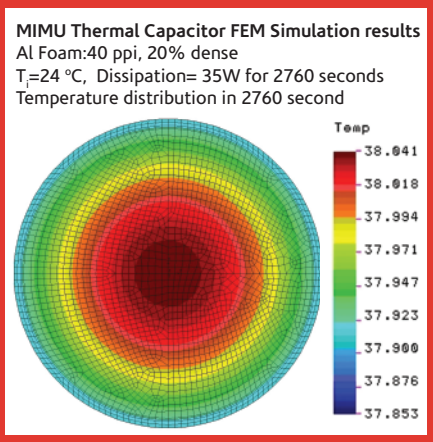
ERG is equipped to provide full lifecyle support for your project. We offer engineering design, thermal modeling, thermal testing, prototyping, and production support.

Case Study: ESA ExoMars Lander

ERG designed and delivered 3 Duocel®-based PCM heat exchangers for the European Space Agency's 2016 ExoMars program.



This particular heat exchanger was designed to manage 35W of heat for 46 minutes during landing to maintain a critical operating temperature of 40°C. The foam-based heat exchangers performed as expected in design and flight, exhibiting a uniform temperature across the thermal interface.



The use of Duocel® foam:

- Increased the bulk conductivity by 10x
- Resulted in very low variation in temperature across the heat exchanger
- Greatly reduced the radiator surface requirement
- Provided structural support

SDVOSB Service Disabled Veteran Owned Small Business cVE

AS9100D CERTIFIED ISO 9001

RoHS compliant

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