

Heat Capacitors

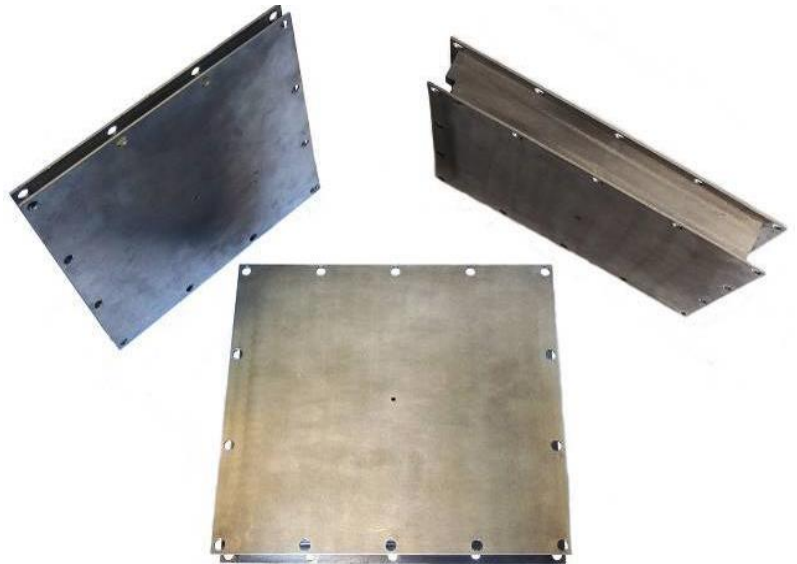
Heat Capacitors for Space Applications are heat absorbing devices based on Phase Change Materials (PCM). They absorb heat from a payload, limiting the temperature increase, to release it at a later point in the mission.

Ideal for both on-orbit (cyclic) operations, to limit the thermal system loads for high-power/short duty cycle payloads (such as transponders and observing payloads) and for launcher (single-shot) applications. This completely passive and reliable device allows for a critical simplification of the thermal control system of a satellite or launcher, reducing heater and radiator sizes

Under ESA support and funding, the team of Walopt, CRM group, and Azimut Space, in collaboration with the SONACA GROUP is currently developing a flight unit that will reach TRL 8 by 2022.

PCM-based heat capacitors substitute typically used Aluminum spreaders, with considerable advantages:

- Highly reliable and safe
- Fully passive
- Savings vs. Aluminum Spreaders:
 - Up to 80% on mass
 - Up to 30% on volume
- Higher temperature stability
- Rugged Design (Al or Mg casing)



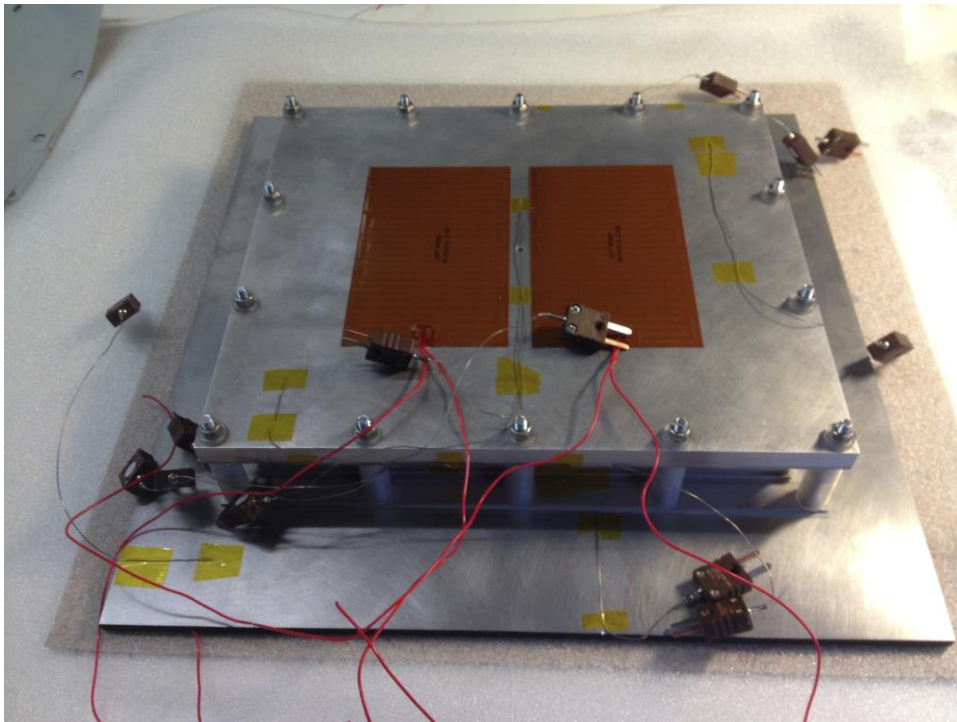
PCM-HSD Prototypes

The heat capacitors are tunable to:

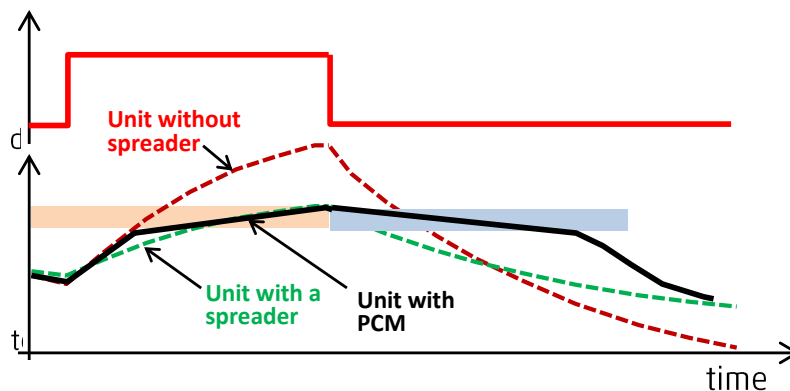
- Interfaces and sizes
- Heat flux
- Operational Temperatures
- Cyclic/one-shot operations
- Surface coatings

Example Models:

Model	Power (W)	Power Density (W/cm ²)	Mass/ T gain (Kg/K)	Duration (s)	Operations
C01	27.0	1.93	2Kg/15K	2700	Cyclic
C02	40.0	2.86	2Kg/15K	3420	Cyclic
S03	90.0	0.14	15Kg/30K	13500	One-shot
S04	170.0	1.19	>1Kg/30K	200	One-shot



PCM-HSD during testing (up to TRL 6)



Unit behavior with and without PCM capacitor

CUSTOMERS AND PARTNERS

ESA, DLR, Thales Alenia Space, AIRBUS D&S, OHB, TNO, Sonaca

THERMAL SOFTWARE

ESATAN-TMS, Thermal Desktop, StarCCM+, Thermica, Hyperworks, LabView

TEST FACILITIES

Thermal Lab with Medium thermal vacuum chamber;
Thermal cycling chamber for life cycling

LOCATION

Azimut Space GmbH
Carl-Scheele-Strasse 14
12489 Berlin - Adlershof
Germany

CONTACT:

Sales & Business Development
T: +49 30 63926071
sales@azimutspace.com
www.azimutspace.com