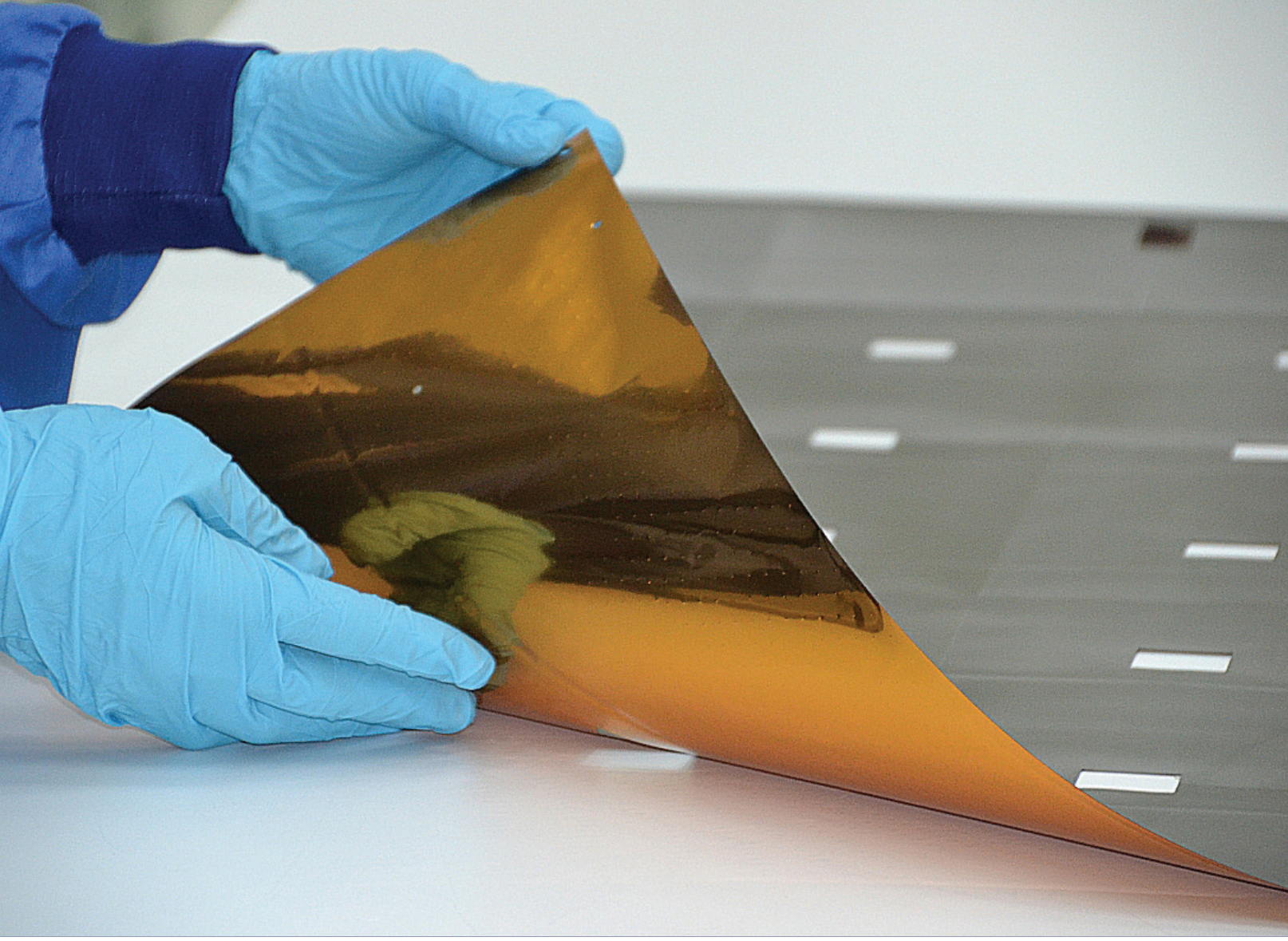


HiPeR; High Performance Radiator technology

Flexible film radiator technology for spacecraft thermal management

HiPeR is a high performance, customizable, low cost and easily installable flexible film radiator technology, optimized for application in space.

Building on a well-established heritage in spacecraft thermal management systems, Airbus has developed a highly conductive flexible film radiator as the key element of the HiPeR technology. Ranging from Thermal Straps (Flexlinks) to Radiator panels and doublers, HiPeR is optimized for space applications. It is a low cost, short lead time, late integration capable and sizeable solution that does not compromise on performance or mass. This allows for ideal system level trade-offs at various stages of a project.

All applications can be implemented separately or together in highly customizable thermal management systems.

We also have the knowledge of system level application in-house and are capable and willing to support our customers in every development phase, which allows HiPeR to also be considered as a problem solver in any phase of project or development. Several patent pending methods of embedding the technology on system level hardware have been developed by Airbus. Our flexible film radiator is similar in appearance to a single layer insulation (SLI) blanket and may be fixed to a supporting structure using appropriate standard methods.

Various designs are available as off the shelf products for minimal lead times. Ask us for more information.

AIRBUS

HiPeR; High Performance Radiator technology

Flexible film radiator technology for spacecraft thermal management

Flexibility and customization

- System level problem solver in any development phase
- Cost-effective for all applications, from nanosats (<10W) to very large (>>1kW) systems
- Short lead times & industrial production in place for Megaconstellation contract
- Compatible with curved spacecraft geometries
- Compatible with various optical coatings
- Use of off-the-shelf materials
- Allows fast and fool proof system level assembly
- Simple, generic fixation methods on made to fit interface brackets
- Simple non-destructive inspection methods

High Performance

- Patented flexible film radiator panel
- Scalable improved thermal performance with minimal mass impact.
- Up to ~80% lower mass
- Patented methods of heat pipe embedding

Low impact

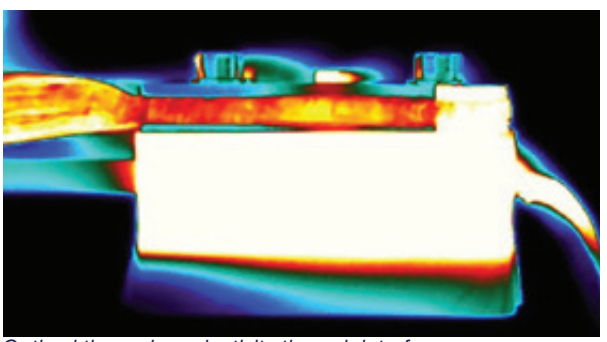
- Mass and mechanically neutral solution
- Virtually zero effective mass in mechanical vibration
- Cut-to-fit ability
- Folds away to allow access to underlying spacecraft structure
- Easily repairable / replaceable

HiPeR: Up to 50% lower specific price with 80% mass reduction compared to traditional solutions.

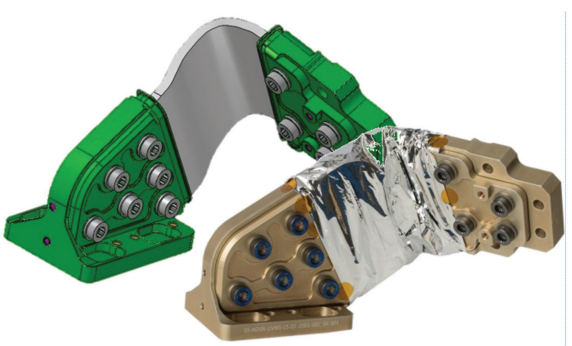
Example, for an East-/ West radiator on a telecommunications platform, the resulting benefit is a ~50% reduction both in total recurring cost per square meter and total system mass per square meter, while maintaining or even increasing thermal performance by up to 10% when compared 'pound-for-pound' to systems based on conventional aluminium / carbon fibre (sandwich-) panels.

Due to a proprietary design and careful selection of materials the recurring costs and thermal performance are extremely competitive while the strap's flexibility is unmatched (able to bend effortlessly over 180° and < 1 N/mm in-plane stiffness).

The high flexibility and high performance straps can be adapted to specific customer requirements with delivery within a couple of months.



Optimal thermal conductivity through interfaces



Sentinel 5 SWIR strap; 3D design and flight (inc. anti-contamination measures)

HiPeR Performance Data	
Heat rejection capability (at +50°C vapour temp., 1-side exposure)	>370 W/m^2
Radiator efficiency	>82 %
Panel in-plane thermal conductivity	>1400 W/mK
Optical surface coatings	Various incl. white paint, black paint, silvered FEP
Allowable temperature range	-60°C / +85°C (-75°C / 135° C pending)
Mass performance (excluding supporting structure / panel)	<3.5 kg/m^2 (~9 kg/kW)
Allowable launch environment	All major launchers

For further information please contact
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