

Multilayer Insulation (MLI)

for Satellites, Subsystems, Payload Equipment,
Instruments, Ground Facilities



HPS is a German/Portuguese supplier of Multilayer Insulation (MLI) for different type of applications. Our service include systems engineering, lay-up definition, thermal analysis, venting analysis, blanket design, blanket manufacturing, performance testing, acceptance testing and final integration on the satellite or respective hardware.

The manufacturing of the blankets is performed inside our cleanrooms in Porto, Portugal (ISO6/class 1.000 down to ISO5/class 100). Our product portfolio ranges from highly clean MLI for optical instruments up to large scale MLI for LEO/GEO satellites.



Mission references are e.g.:

Alphasat (external instrument MLI), eROSITA (X-Ray telescope MLI), ExoMars (EDM internal & external MLI, NOMAD and CaSSIS instrument MLI), SENTINEL-4 (instrument MLI), Solar Orbiter (thermal dummies MLI), Meteosat 3rd Generation (telescope optics MLI), Heinrich Hertz (antenna MLI), EnMAP (FAD mechanism MLI), CHEOPS (telescope MLI), GRACE-FO (instrument MLI), EUCLID (Sunshield MLI, Antenna MLI), Juice (MagBoom MLI).



HPS GmbH

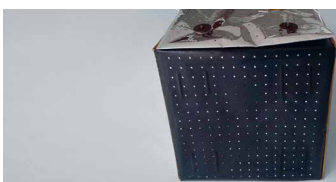
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MATERIAL EXAMPLES



Black Kapton MLI

Used for long term missions where low aging effects of the surfaces are needed.



Two Side Aluminised Kapton MLI

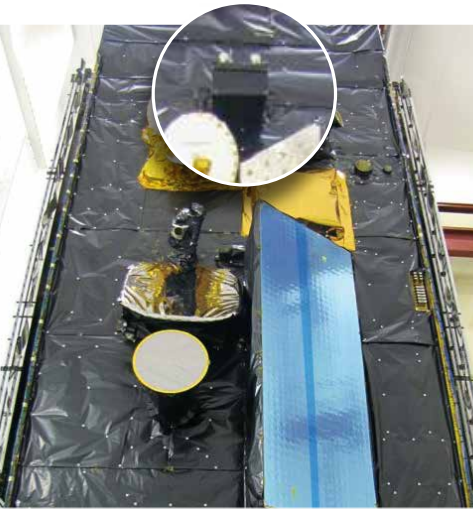
Used if a low emissivity is needed, e.g. for internal or non-illuminated areas.



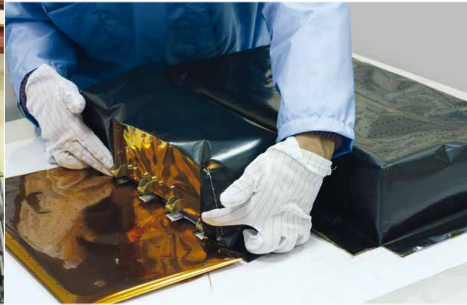
One Side Aluminised Kapton MLI

Used if a good alpha /epsilon ratio is needed, e.g. at external appendices.

Mission References



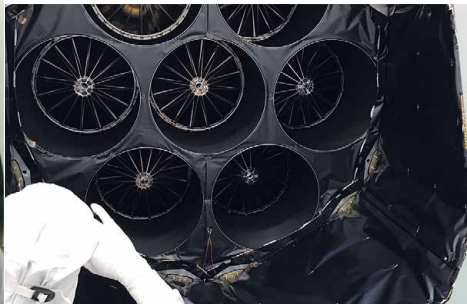
ALPHASAT TDP8-MLI



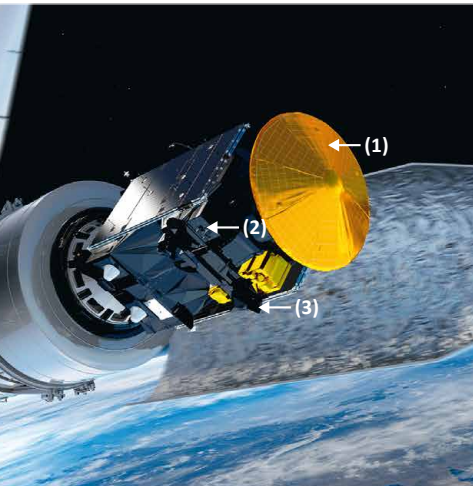
- MLI for the environmental testing and radiator sensor instrument TDP-8 onboard Alphasat
- Design & MAIT: 2009-2011
- Qualification supervision by ESA
- 6 blankets
- 2,5 m² total area
- Cleanliness class 10.000 (ISO7)
- **Launch: July 2013**
- Customer: EFACEC (PT), ESA.



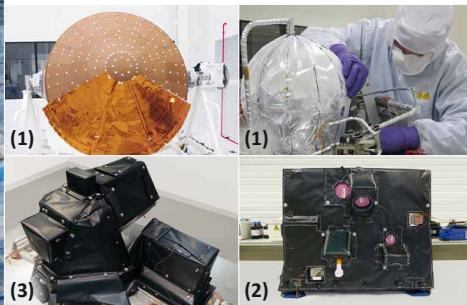
eROSITA TELESCOPE-MLI



- MLI for a 3m high space telescope
- 115 blankets per model
- 50m² total area
- Cleanliness class 1.000 (ISO6)
- Design: 2010-2011
- EQM MAI: 2012
- FM Manufacturing: 2014-2015
- FM Integration: 2016
- **Launch: 2018** (onboard russian satellite Spectrum-X-Gamma to Lagrange point L2)
- Customer: Max-Planck-Institute (D), DLR.



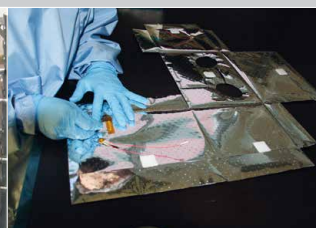
EXOMARS 2016 MLI



MLI for Orbiter Instruments:

- MLI for all internal and external areas of the descent module (EDM)
- NOMAD (Customer Aeronomie (B))
- CaSSIS (Customer Uni Bern (CH))
- 320 blankets
- 35m² total area
- Cleanliness class 1.000 (ISO6) and under planetary protection measures
- Design: 2012-2013
- Manufact. & Integration: 2014-2015
- **Launch: March 2016**
- Customer: TAS (I), ESA.

TYPICAL MLI HARDWARE MANUFACTURING FLOW



Template Campaign

Foil Cutting

Blanket Finishing

Packaging

Integration