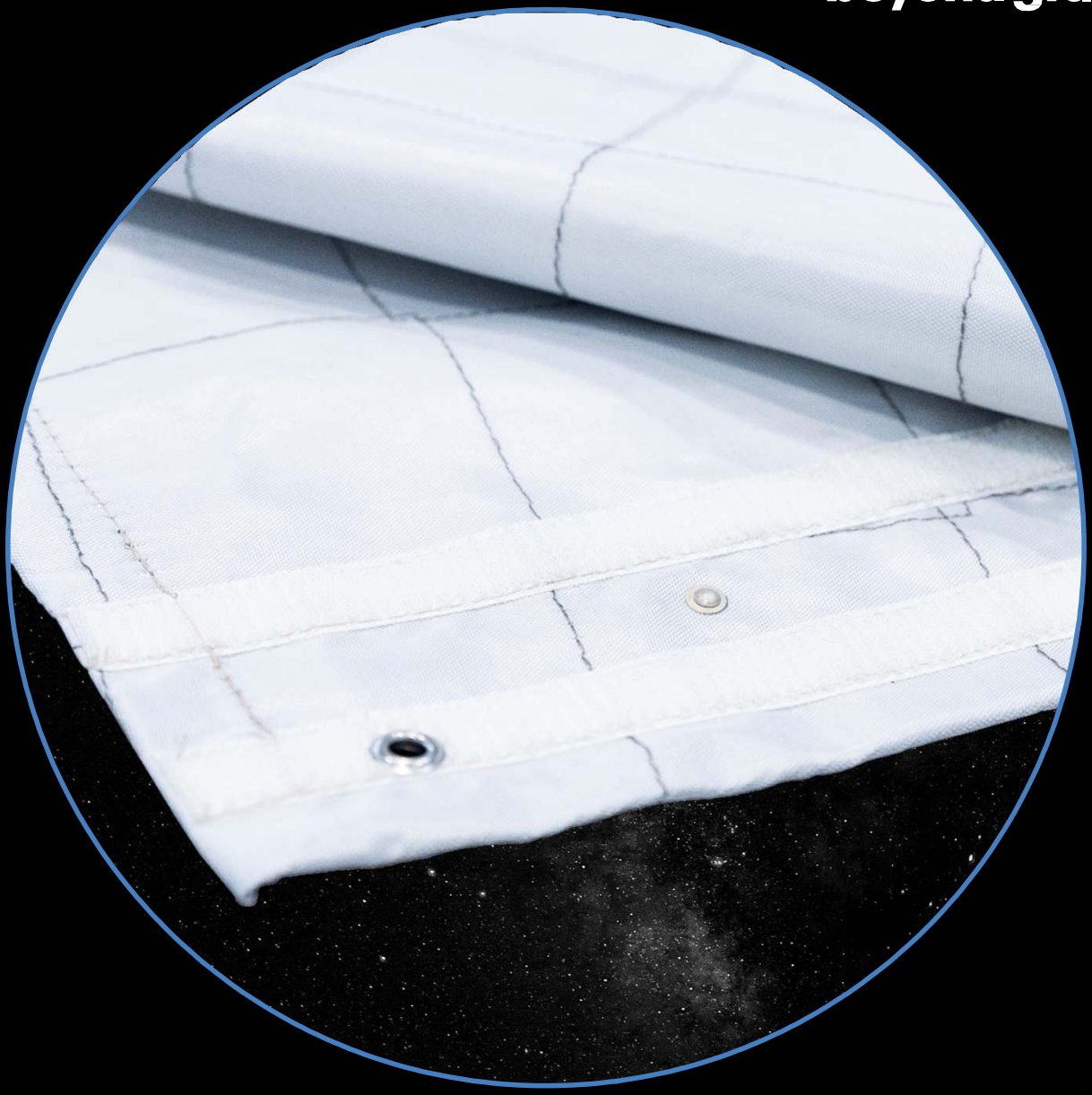
beyond gravity

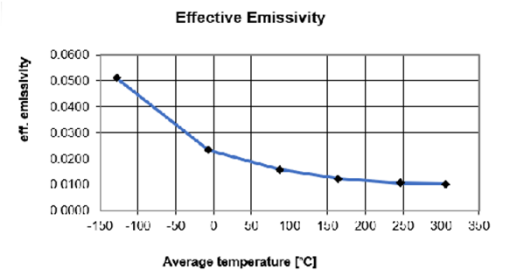


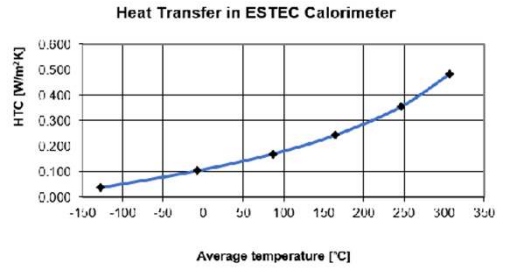
High Temperature Multi-Layer Insulation

This high temperature Multi-layer insulation (MLI) was developed by Beyond Gravity especially for the thermal insulation of launcher upper stages. It represents a cost-efficient alternative to insulations using ceramic fabrics.

Key Features and Options

- **Strong cost advantage over ceramic fabrics**
- **Useable in application with up to +500°C**
- **MLI is electrically conductive due to ESD grid in outer layer and conductive internal layers**
- **Contains no hazardous components**
- **More flexibility of MLI compared to rigid insulation**
- **Amount of layers can be varied to adjust performance to customer need**
- **Manufacturing of Multi-layer insulation blankets based on customer input**
- **We can provide design support or take over the design and qualification testing**
- **For the attachment of MLI blankets grommets and/or Velcros can be incorporated**





Specifications

Material Properties		
Material		
Conductive GlassFabric		
Polyimide foils (both sides coated)		
Glassfibre spacer GSW	**25g**	
Weight	**429 g/m² ± 5%**	
Thickness	**0,4 mm ± 5%**	

Available Dimension	
Width	**1,2 m**
Length	**10 m**

Properties			
Outgassing ECSS-Q-70-02A at +125°C:			
	Glass fibre	**PI Foil**	**GSW25g (at +350°C)**
TML	**0,11%**	**1,37%**	**0,12%**
RML	**0,04%**	**0,16%**	**0,02%**
CVCM	**0,01%**	**0,00%**	**0,01%**
Thermo-optical properties of outer layer			
Solar absorptance (α_s) 250-2500nm	**0,08**		
Thermal emittance (300K)- (ε) 3000-16700nm	**0,93**		
ESD grid			
ESD grid dimension	**108 x 108 mm**		