

AEROGEL SUPER-INSULATION BLANKETS



Main Properties



- ▶ Low thermal conductivity
- ▶ No glass transition temperature
- ▶ Excellent thermal shock resistance
- ▶ Low thermal expansion
- ▶ Highly hydrophobic
- ▶ Oleophilic
- ▶ Low density
- ▶ Low dielectric constant
- ▶ Energy Saving
- ▶ Cost effective
- ▶ Design freedom

AEROFLEX are synthetic, porous, ultralight materials offering exceptional properties suitable for highly performing insulation applications.

AEROFLEX nanoporous structures are based on monolithic aerogels, thus presenting intrinsic advantages over competing solutions such as lower density and particle shedding as well as higher thermal insulation and smaller bending radius.

AEROFLEX thermal conductivity, along with other tailorable properties, presents exceptional advantages for space applications where thermal insulation is critical, namely in launchers, entry probes, landers, rovers, and balloons. AEROFLEX materials are particularly suitable to provide thermal protection in harsh planetary environments.

Applications

AEROFLEX main application is for thermal insulation of:

- ▶ Launchers and rockets
- ▶ Spacecraft and re-entry probes
- ▶ Rovers and landers for planetary exploration
- ▶ Stratospheric balloons
- ▶ Cryogenic tanks
- ▶ Helium storage
- ▶ Aircrafts

Integration

Easy installation and integration adapted to each application:

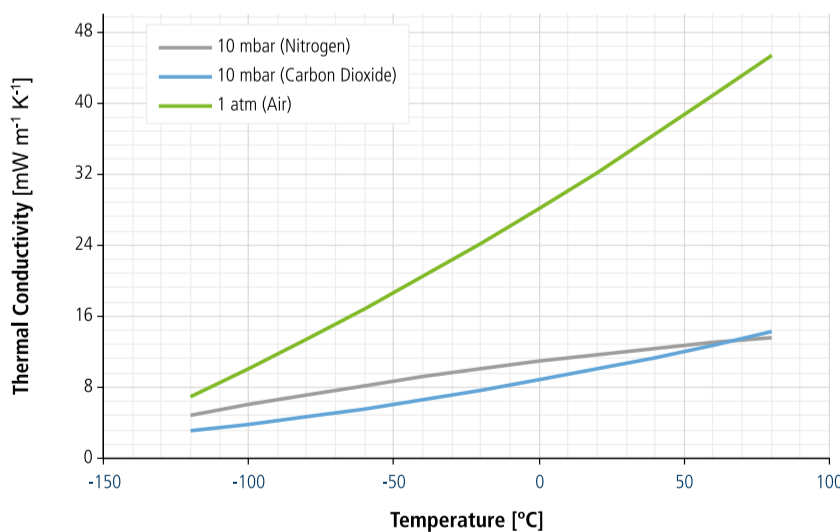
- ▶ Custom-made aerogel blankets
- ▶ Compressibility
- ▶ Velcro interfaces
- ▶ Filter vents for outgassing and contamination prevention
- ▶ Handling

Size range

AEROFLEX is available in 3 sizes:

- ▶ 300x300x10 (mm)
- ▶ 300x300x20 (mm)
- ▶ 875x500x10 (mm)

Thermal conductivity EN12667



Physical Properties

Density [kg m ⁻³]	110 ± 10
Thickness [mm]	8 – 30
Service temperature [°C]	-250 to 350
Thermal conductivity [mW m ⁻¹ K ⁻¹] Atmospheric pressure, 10 °C EN 12667:2001, HFM 436/3/1 Lambda, NETZSCH	26
Coefficient of thermal expansion [10 ⁻⁶ K ⁻¹] -120 °C, TMA 402 F3, NETZSCH	1.1
Flexural modulus [kPa] ASTM D790-10	51
Tensile strength [kPa] ISO 1798:2008	85
Crude oil absorption	10x its weight
Hydrophobic	✓
Outgassing 125°C, 24 h, 10 ⁻⁵ mbar - ECSS-Q-ST-70-02	✓
Thermal cycling -100 to 100 oC, 10 ⁻⁵ mbar – ECSS-Q-ST-70-04	✓
Radiation ⁶⁰ Co Source, Total Ionising Dose – 5 KGy, Dose Rate – 17 Gy/h	✓
Relative permittivity (Mutual Impedance method)	1.18
Sound absorption coefficient EN ISO 10534:2:2001 Impedance tube, two microphones (transfer-function method)	0.02-0.9
Sound transmission loss [dB] Impedance tube, four microphones (Two-load method)	1.13-9.62