

CryoMLI® 101 Technical Datasheet

Vacuum Multilayer Insulation — Aluminum Foil + Fiberglass Paper
High-Performance Foil & Paper MLI for Extreme Cryogenic Applications



Compliance: GB/T 31480-2015 · GB/T 31481-2015 (ISO 201010:2014) · NB/T 47059-2017 · GB/T 18443-2010 · ASME BPVC Section VIII

PRODUCT STRUCTURE

Structure:Aluminum Foil + Fiberglass Paper

Operating Temperature: 4K (–269°C) to 623K (350°C)

KEY PROPERTIES

- ✓ Fire resistant, flame barrier
- ✓ Low thermal conductivity / thermal insulating
- ✓ Suitable for temperatures down to 4K (–269°C)
- ✓ Easy to wrap, shape or cut
- ✓ Excellent chemical stability
- ✓ Exceptionally resistant to thermal shock
- ✓ Oxygen compatibility

TECHNICAL DATA

Parameter	Unit	Specification
Fiberglass Paper basis weight	g/m²	13 ±0.5
Fiberglass Paper thickness	mm	0.06 ±0.01
Fiberglass Paper moisture content	%	< 0.2
Fiberglass Paper loss on ignition	%	< 0.2
Fiberglass Paper thermal conductivity	W/(m·K)	< 0.029
Fiberglass Paper outgassing rate	Pa·m³/(s·g)	< 1.0×10 ^{–8}
Aluminum foil basis weight	g/m²	17 ±1
Aluminum foil thickness	mm	0.0065
Aluminum foil emissivity	ε	0.028 (@87K, NASA GRC)
Thermal shrinkage rate (180°C, 30min)	%	≤ 0.5
Spacer Gas Permeability	—	Moderate (paper barrier, slower pump-down)
Tensile strength	kN/m	≥ 0.4
Apparent thermal conductivity	W/(m·K)	< 9.14×10 ^{–5}
Leak outgassing rate	Pa·m³/(s·g)	< 4.0×10 ^{–9}
Reference Heat Flux (40 layers, 78K–293K)	W/m²	~0.5 (ref: NASA C108)
Operating Vacuum Requirement	—	< 1×10 ^{–4} Torr

CUSTOMIZATION & PROCESSING

Item	Details
Composite Layer Configurations	5/5, 10/10, 20/20 (mature); custom available
Recommended Layer Density	1.5 – 2.5 layers/mm
Roll Material — Max Layers	Up to 10/10
Processing Capabilities	Rewinding, sewing, cutting, lamination
Production Method	Fully automated mechanical production

Standard Widths: **90 / 100 / 200 / 300 / 910 / 1310 / 1800 mm**Max Production Width: **1800 mm**Custom Width: **Available (MOQ applies)**

TARGET APPLICATIONS & MARKETS

- Spacecraft
- MRI
- Cylinders
- ISO containers
- Microbulk
- Dewar
- Semitrailer / Rail tanks
- Storage tanks
- Cryogenic transfer line
- Superconducting cables
- Nuclear fusion cryogenic modules

Technical Note: Aluminum foil may generate standing waves under acoustic and vibrational modes within blanket geometry. NASA reports this characteristic as a reason aluminum foil is no longer used in spacecraft MLI applications. (Source: NASA TFAWS — Multilayer Insulation for In-Space Cryogenic Applications)

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Custom widths, shapes, dimensions, and layer counts available. Contact sales for details.