NanoPolar

Experience the Future of High-Performance Insulation

NanoGels
ADVANCED MATERIALS

PRODUCT DATA SHEET

NanoPolar is a high-performance, flexible silica aerogel blanket with a factory-integrated aluminium foil facing. Engineered specifically for cold-service and extreme cryogenic insulation applications, NanoPolar fully meets ASTM C1728 Type I Grade 1B for flexible aerogel insulation.
NanoPolar combines a proprietary nano-porous silica aerogel matrix with a high-performance special fiber through composite technology. The flexible blanket delivers exceptional thermal performance down to cryogenic temperatures while maintaining mechanical flexibility and ease of installation.
Designed for harsh cold-service environments, NanoPolar minimizes heat ingress, prevents condensation and frost formation, and reduces the required insulation thickness compared to conventional materials (e.g., cellular glass, polyurethane, or PIR). The superior hydrophobicity of the product mitigates corrosion under insulation (CUI) and maintains R-value.



SPECIAL FEATURES & KEY DIFFERENTIATORS

- **Extreme Cryogenic Performance:** Stable and flexible down to -196°C (LNG temperature).
- **Ultra-low Thermal Conductivity:** ≤ 0.012 W/m·K at cryogenic temperatures;can achieve up to 3 times the thermal insulation performance of conventional materials.
- **Thin and Space-Saving:** Equal thermal resistance at a fraction of thickness, freeing up valuable design space.
- **Hydrophobicity (>99%):** Repels liquid water, ensuring no condensation / ice bridging under low temperatures. Factory-applied aluminum foil layer further guarantees prevention against moisture penetration. The moisture permeability coefficient is much lower than that of traditional foam materials, thereby prevents the risk of corrosion under insulation (CUI).
- **Ease of Installation:** Less time and less labour to install, saving both time and cost.
- **Low Chlorides / Halogens:** Safe for austenitic stainless steel (no stress corrosion cracking risk)
- **Long service life:** Much lower cryogenic shrinkage rate compared to organic foam products, with an effective service life of more than 25 years.
- **Superior Fire Resistance:** Inorganic aerogels are best for asset safety against fire hazards, eliminating combustion risks associated with organic foam materials.
- **Dust Control:** Non-toxic, recyclable, and extremely low dust creating a safe work environment.

APPLICATIONS

Ideal for insulating low-temperature and cryogenic pipelines / equipment down to -196°C (-320°F), manifolds in chemical and electronics industries, and in high-clean environments like cold storage, pharma, data centers etc.

TYPICAL PROPERTIES

Test Method	Property	Result
ASTM C1728, Type I, Grade 1B	Standard specification for flexible aerogel insulation	Complies
ASTM C447	Estimating the max. use temperature	+125°C
ASTM C411	Hot surface performance	Pass
ASTM C165	Compressive strength	≥ 9.3 psi (64 kPa) at 10% deformation ≥ 25.5 psi (176 kPa) at 25% deformation
ASTM C303	Nominal Density	200 kg/m³
ASTM C356	Linear shrinkage under soaking heat	< 1 %
ASTM C795	Insulation for use in contact with austenitic stainless steel	Pass
ASTM C1101	Classifying the flexibility of blanket insulation	Flexible
ASTM C1104	Water vapor sorption	≤5% (by weight)
ASTM C1338	Fungi resistance	Pass
ASTM C1617	Corrosiveness of carbon steel	Pass
ASTM C1763	Water absorption	Pass
ASTM E84	Surface burning characteristics	Flame Spread Index = 0 Smoke Developed Index = 10
EN 13501-1:2018	Reaction to fire	Pass

THERMAL CONDUCTIVITY (ASTM C518)

Mean Temperature	-160	-129	-73.3	-17.8	+23.9	+37.8	+93.3	+149	[°C]
Thermal Conductivity (≤)	0.009	0.014	0.015	0.016	0.017	0.017	0.019	0.019	[W/(m·K)]

DIMENSIONS

Thickness	5 mm	10 mm	20 mm
Dimensions W x L (m)	1.5 x 38	1.5 x 42	1.5 x 13
Sqm/roll	57.0	63.0	19.5
Tolerances			
Thickness		±10%	
Width /Length		±5%	
Other dimensions		Available on request	

KEY INFORMATION

Package Type	Shrink wrapped
Storage	Store indoors in cool, dry, and sealed conditions away from direct sunlight.
Shelf-Life	Maximum 3 years. Once installed, can last over 20 years
Installation	Refer to our application manuals. Please contact our technical team for more information and support on installation.
Safety	Please refer to the Safety Data Sheet and product label prior to using this product.

The product technical information and all related data described above are based on test values obtained from our company's trials. They are supplied as a technical service and are subject to change without notice. They are for reference only and do not constitute legal interpretations or guarantees. Before use, please test and confirm according to your company's required working conditions. Any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk.
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