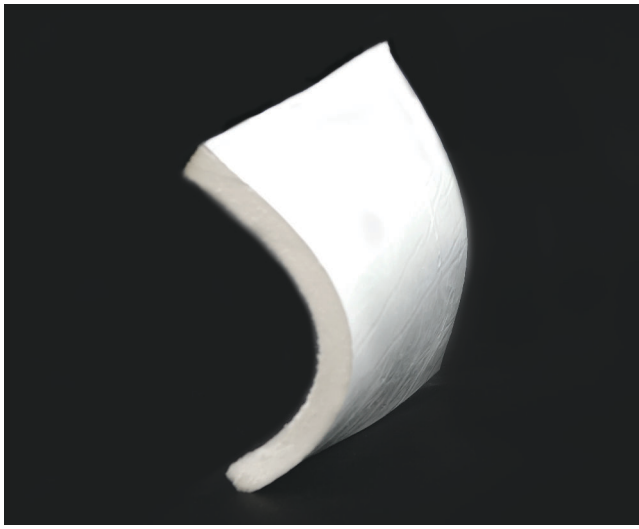
Product Information Sheet

ALKEGEN

AlkeGel Glacier™
Aerogel Technology BY ALKEGEN

INTRODUCTION

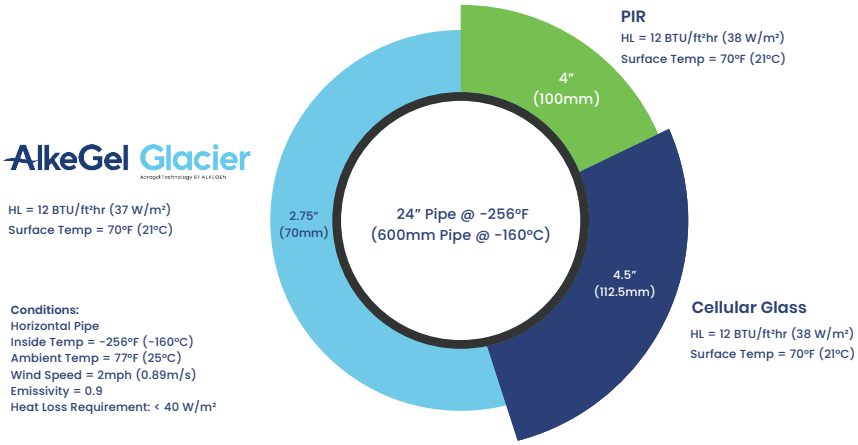
AlkeGel Glacier™ is part of a new portfolio of ultra-low-dust aerogel insulating technology materials engineered to minimize heat transfer and liquid boil-off in cryogenic applications. These fiber-enhanced aerogels offer advantages in their improved product handleability, fire resistance and acoustical performance.



AlkeGel Glacier is developed for LNG and other cryogenic applications for use on small and large bore pipe, as well as large process vessels. AlkeGel Glacier has a zero-permeability integral vapor barrier that meets LNG requirements. Compared to traditional aerogel blankets, Alkegen's aerogel technology has 80% less dust and can be installed up to 20% faster. AlkeGel Glacier helps improve energy efficiency, and lower greenhouse gas emissions. It also protects assets from fire, ice, mechanical damage, and corrosion under insulation (CUI).

KEY CHARACTERISTICS

- ASTM C1728 Compliant, Type IV, Grade 1A
- 80% less dusty than traditional aerogel blankets
- Available in 5mm & 10mm thicknesses
- ISO 22899 J180 Jet Fire Protection
- Made In The USA



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TYPICAL PRODUCT PARAMETERS

AlkeGel Glacier	
Physical Properties	
Color	White
Material	Flexible Aerogel Blanket Insulation
Classification (ASTM C1728)	Type IV, Grade 1A
Minimum Use Temperature, (ASTM C1728), °F (°C)	-321 (-196)
Maximum Use Temperature, (ASTM C411 & C447), °F (°C)	482 (250)
Density, lb/ft³ (kg/m³)	10 (160)
Hydrophobic	Yes

Permanent Linear Shrinkage (ASTM C356)	
Linear Shrinkage Under Soaking Heat (ASTM C356), @ 482° F (250° C)	<2%

Thermal Properties	
Thermal Conductivity (ASTM C177)	
Mean Temperature, °F (°C)	Thermal Conductivity, Btu in/hr ft² °F (W/m-K)
-256 (-160)	0.089 (0.013)
-200 (-129)	0.096 (0.014)
-100 (-73.3)	0.11 (0.016)
0 (-17.8)	0.12 (0.018)
75 (23.9)	0.13 (0.019)
100 (37.8)	0.14 (0.020)
200 (93.3)	0.15 (0.022)
300 (149)	0.17 (0.025)
400 (204)	0.19 (0.027)

Corrosion & Chemical Properties	
Insulation Influence on Stress Corrosion Cracking of Austenitic Stainless Steel (ASTM C795, C692)	Pass
Corrosiveness to Steel (ASTM C1617)	Pass
Water Vapor Sorption (ASTM C1104 / C1104M)	< 5.0%
Water Absorption by Immersion (ASTM C1763)	Pass, < 5.0%
Fungal Resistance (ASTM C1338)	No growth
Vapor Barrier - Water Vapor Transmission (ASTM E96-A)	≤ 0.00 Perms

Fire Protection	
Hot Surface Performance & Maximum Exothermic Temperature Rise (ASTM C411)	Pass
Surface Burning Characteristics (ASTM E84, EN13501, CAN/ULC-S102, Mounting E2231)	Flame Spread Index ≤ 0 Smoke Developed Index ≤ 25
Jet Fire Protection for 180 min (J180) (ISO-22899)	Pass
Flame Spread Rating (UL 94)	V-0

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Mechanical Properties	
Compression Strength @ 10% Deformation (ASTM C165), psi (kPa)	> 5 (34.5)
Flexibility Classification (ASTM C1101, C1101M)	Flexible

Acoustical Properties	
Acoustic Insulation For Pipes, Valves & Flanges (ISO 15665)	Class A2, B2, C2 & D2 system configurations available

AVAILABILITY

Thickness, in (mm)	Width, in (mm)	Standard Roll Length, ft (m)	Jumbo Roll Length, ft (m)
0.20 (5)	60 (1524)	300 (91.4)	600 (183)
0.40 (10)	60 (1524)	150 (46)	300 (91.4)

AlkeGel Blankets are produced and distributed worldwide; however, packaging, density, and thickness may differ based on regional needs. To obtain information on specific packaging options please reach out to your nearest Alkegen representative.

BENEFITS OF AEROGEL INSULATION

- Superior thermal insulators (extremely low thermal conductivity)
- Hydrophobic
- Defends & protects against corrosion under insulation (CUI)
- Pool & jet fire protection
- Thermal shock resistance
- Light weight Flexible & resilient
- Simple blanket wrap install
- Acoustic properties to reduce sound transmission

ADVANTAGES OF ALKEGEL GLACIER

- 80% less dusty than traditional aerogels
- Easy to cut and handle
- Superior heat flow uniformity

Competitive Aerogel

Excessive dust

AlkeGel Glacier™

Minimal dust

Cutting aerogel, exposed edge fraying

Cutting AlkeGel, clean precise cut, no fraying

TYPICAL INDUSTRIES & APPLICATIONS

Liquified Natural Gas (LNG) & Other Cryogenic Applications

- Terminal Pipelines
- Liquification & Regasification Installations
- Marine LNG Fuel Tanks
- Storage Vessels

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INSTALLATION OVERVIEW

Precise cutting of AlkeGel is achieved using common tools. We recommend the following tools at the installation site:

- Scissors
- Utility Knife
- Electric Shears
- Slitters
- Measurement Tools
  (Tape measure, straight edge, set square)
- Markers / Pens

Our material can also be processed in a shop environment on CNC and water jet cutting tables.

NOTE: Please contact Alkegen Application Engineering office to discuss key application details including project specific procedures and required cutting.

SAFETY & STORAGE

Installer safety and cleanliness is what sets AlkeGel ahead of existing aerogel blankets. Handling AlkeGel will produce considerably less dust and irritation in the workplace. As a general guideline, we recommend the following PPE when working with AlkeGel:

1. Safety Eyewear
2. Work gloves

Please refer to the material safety data sheet (SDS) for more detailed work practices and other EH&S information.

HEALTH AND SAFETY INFORMATION

SDS is available on our website
Safety Data Sheets - CLICK HERE

AlkeGel is suitable for application on:

1. Single Wrap Pipe
2. Multi-Layer Pipe
3. Pipe Elbow & Bends
4. Flanges, Valves, & Fittings
5. Small-bore Pipe

AlkeGel rolls should always be stored on their side. Avoid orienting rolls in an "upright" position for storage, as this can affect the edges of the rolls. Ensure material is stored in a dry, clean environment.

Information on other applications is available upon request. Any new and/or special use of these products, whether in an application listed in our literature, is advised to be submitted to our Alkegen Application Engineering department for review and guidance on material selection.

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The test data shown are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes. Product Information Sheets are periodically updated by Alkegen. Before relying on any data or other information in this Product Information Sheet, you should confirm that it is still current and has not been superseded. A Product Information Sheet that has been superseded may contain incorrect, obsolete and/or irrelevant data and other information.

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