

# Cryogel<sup>®</sup> x201

## FLEXIBLE INSULATION FOR SUB-AMBIENT AND CRYOGENIC APPLICATIONS

Cryogel<sup>®</sup> x201 is flexible aerogel blanket insulation engineered to deliver maximum thermal protection with minimal weight and thickness.

Cryogel<sup>®</sup> x201's unique properties – extremely low thermal conductivity, superior flexibility, compression resistance, hydrophobicity, and ease of use – make it essential for those seeking the ultimate in thermal protection for sub-ambient and cryogenic applications.

Using patented nanotechnology, Cryogel<sup>®</sup> x201 insulation combines a silica aerogel with reinforcing fibers to deliver industry-leading thermal performance in an easy-to-handle and environmentally safe product.

Cryogel<sup>®</sup> x201's extremely low thermal conductivity reduces heat gain and liquid boil-off, its minimal weight and thickness help maximize tanker storage capacity, and its hydrophobic nature makes it resistant to condensate formation.



### Physical Properties

Thicknesses*	0.2 in (5 mm)	0.4 in (10 mm)
Material Form*	58 in (1,450 mm) wide x 245 ft (75 m) long rolls	58 in (1,450 mm) wide x 130 ft (40 m) long rolls
Max. Use Temp.	194°F (90°C)	
Color	White	
Density*	8.0 lb/ft <sup>3</sup> (0.13 g/cc)	
Hydrophobic	Yes	

\* Nominal Values

### Advantages

#### Superior Thermal Performance

Up to five times better thermal performance than competing insulation products

#### Reduced Thickness and Profile

Equal thermal resistance at a fraction of the thickness

#### Less Time and Labor to Install

Easily cut and conformed to complex shapes, tight curvatures, and spaces with restricted access

#### Physically Robust

Soft and flexible but with excellent springback, Cryogel<sup>®</sup> x201 recovers its thermal performance even after compression events as high as 250 psi

#### Shipping and Warehousing Savings

Reduced material volume, high packing density, and low scrap rates can reduce logistics costs by a factor of five or more compared to rigid, pre-formed insulations

#### Eliminates Contraction Joints

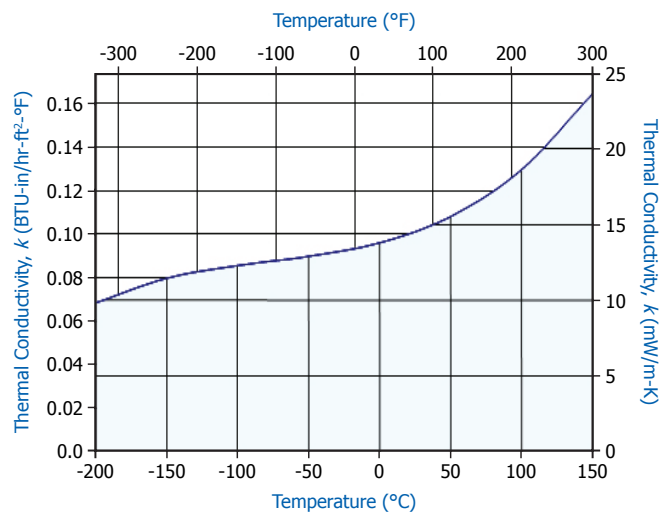
Because it remains flexible even at cryogenic temperatures, Cryogel<sup>®</sup> x201 eliminates the contraction joints used to prevent compressive failure in other insulation materials

#### Environmentally Safe

Landfill disposable, shot-free, with no respirable fiber content

### Thermal Conductivity<sup>†</sup>

ASTM C 177 Results



Mean Temp.	°C	-200	-150	-100	-50	0	50	100	150
	°F	-328	-238	-148	-58	32	122	212	302
<i>k</i>	mW/m-K	9.8	11.4	12.3	12.9	13.8	15.5	18.6	23.6
	BTU-in/hr-ft <sup>2</sup> -°F	0.0681	0.0793	0.0852	0.0894	0.0956	0.1076	0.1291	0.1637

<sup>†</sup> Thermal conductivity measurements taken at a compressive load of 2 psi.

**Specification Compliance and Performance**

Test Procedure	Property		Inch-Pound	Metric
ASTM C 165	Compressive Resistance at room temperature: 73.4°F (23°C)	@ 10% compression @ 25% compression	7.7 psi 18.9 psi	52.9 kPa 130 kPa
ASTM C 165	Compressive Resistance at cryogenic temperature: -319°F (-195°C)	@ 10% compression @ 25% compression	8.4 psi 21.7 psi	58.0 kPa 150 kPa
ASTM C 795	Insulation for Use Over Austenitic Stainless Steel	Conforms		
ASTM C 1101	Classifying the Flexibility of Insulation Blankets at room temperature: 73.4°F (23°C)		Flexible	
ASTM C 1101	Classifying the Flexibility of Insulation Blankets at cryogenic temperature: -319°F (-195°C)		Flexible	
ASTM C 1104	Water Vapor Sorption of Unfaced Insulation, Procedure A		< 0.5%	
ASTM C 1511	Liquid Water Retention after Submersion in Water (Water Repellency)		< 2%	
ASTM E 84	Surface Burning Characterization	Class A Flame Spread Smoke Developed	< 25 < 50	
ASTM E 228	Coefficient of Thermal Expansion [-256°F (-160°C) to 68°F (20°C)]		7.1 x 10 <sup>-6</sup> /°F	13.1 x 10 <sup>-6</sup> /°C
UL 1709	Rapid Rise Fire Tests of Protection Materials for Structural Steel			

**Characteristics**

Cryogel® x201 can be cut using conventional cutting tools including scissors, tin snips, razor knives, and hot knives. The material can be dusty, and it is recommended gloves, safety glasses, and dust mask be worn when handling material. See MSDS for complete health and safety information.

**Other Available Materials**

Aspen Aerogels® produces several types of flexible aerogel blanket materials for hot and cold applications. Please contact us for additional information on these products.

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