

## Flexible Aerogel Insulation for Industrial Applications

### Optimal thermal performance in service up to 650°C (1200°F)

Pyrogel® HPS is engineered to provide optimal thermal performance and value at service temperatures up to 650°C (1200°F). With its extremely low thermal conductivity, Pyrogel HPS is up to 75% thinner than competing insulation materials. This makes it ideal for installation in congested areas or near mechanical clashes, increasing both plant safety and efficiency. Reduced insulation thicknesses also supports faster, easier application—saving time and expense.

Pyrogel HPS is tough and durable, delivering consistent performance without cracking, sagging, or settling. It can be re-used after maintenance or inspection, minimizing the time and expense required to stage replacement insulation. Pyrogel HPS is ideal for use in the fabrication of removable insulation pads. It maintains its shape and location, even after vibration or exposure to high temperatures. As with all Pyrogel products, Pyrogel HPS is hydrophobic and breathable, resisting liquid water and avoiding the damaging effects of wet insulation. These unique characteristics combine to minimize heat loss and provide the ultimate protection for process units and high-pressure steam pipes.

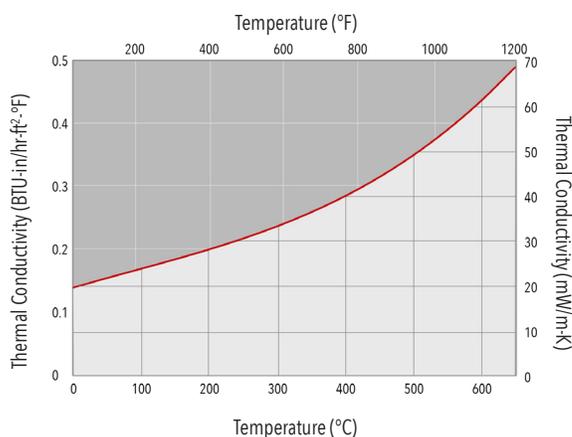
Pyrogel HPS aerogel insulation is designed to provide long-term performance for the ultimate in safety, process efficiency, and stability, in the power generation, refining, and chemical processing industries.

#### THERMAL CONDUCTIVITY†

Tested in accordance with ASTM C177

Mean Temp. °F / °C	k BTU-in/hr-ft <sup>2</sup> -°F / mW/m-K
32 / 0	0.14 / 20
212 / 100	0.17 / 24
392 / 200	0.20 / 28
572 / 300	0.23 / 33
752 / 400	0.28 / 40
932 / 500	0.34 / 49
1112 / 600	0.43 / 62
1202 / 650	0.48 / 69

†Thermal conductivity typically measured at a compressive load of 2 psi.



#### ADVANTAGES

- **Optimized thermal conductivity in high-temperature service**
- **Faster application, especially on large-bore piping and vessels**
- **Addresses tight, hard-to-insulate spaces with outstanding thermal efficiency**
- **Flexible blanket material won't crack, sag, or settle in high-temperature service**
- **Stands up to vibration, footfalls, and tool strikes**
- **Tough enough for reuse after removal and inspection**
- **Hydrophobic and breathable, Pyrogel resists liquid water and avoids the damaging effects of wet insulation**
- **Versatile format can be fitted to any piece of piping or equipment, greatly simplifying material management**
- **Higher packing density reduces shipping and storage costs by up to 90%**

## PYROGEL® PRODUCT FAMILY – PRODUCT USE AND SPECIFICATIONS

PRODUCT	PYROGEL XTE		PYROGEL HPS	PYROGEL XTF
MAX. USE TEMP.	650°C (1200°F)		650°C (1200°F)	650°C (1200°F)
OPTIMAL USE	Thermal Insulation Acoustics		Thermal Insulation Lower Thermal Conductivity in High Temperature Service	Thermal Insulation Passive Fire Protection Acoustics
APPLICATIONS	CUI Service District Energy Distillation		High Pressure Steam Gas and Steam Turbines Delayed Coking	Pool Fire and Jet Fire Protection Relief Systems Sizing (API 521)
COLOR	Maroon		Grey	Grey
DENSITY*	12.5 lb/ft <sup>3</sup> (0.20 g/cc)		12.5 lb/ft <sup>3</sup> (0.20 g/cc)	12.5 lb/ft <sup>3</sup> (0.20 g/cc)
THICKNESS*	5 mm (0.2 in)	10 mm (0.4 in)	10 mm (0.4 in)	10 mm (0.4 in)
ROLL SIZE*	1,500 sqft Bulk Rolls	850 sqft Bulk Rolls 80 sqft Pony Rolls**	850 sqft Bulk Rolls 80 sqft Pony Rolls**	850 sqft Bulk Rolls

\*Nominal Values.

\*\*Pony Rolls are cut from ASTM C1728 compliant material.

## PYROGEL® HPS SPECIFICATION COMPLIANCE AND PERFORMANCE

TEST PROCEDURE	PROPERTY	RESULTS
ASTM C1728, Type III, Grade 1A	Standard Specification for Flexible Aerogel Insulation	Complies
ASTM C165	Compressive Resistance <sup>†</sup>	≥ 3 psi (20.7 kPa) @ 10% deformation
ASTM C356	Linear Shrinkage Under Soaking Heat	<2% @ 650°C (1200°F)
ASTM C411	Hot Surface Performance	Pass
ASTM C447	Estimation of Maximum Use Temperature	650°C (1200°F)
ASTM C795	Insulation for Use Over Austenitic Stainless Steel	Pass
ASTM C1101/1101M	Flexibility of Blanket Insulation	Flexible
ASTM C1104/1104M	Water Vapor Sorption	≤ 5% (by weight)
ASTM C1338	Fungal Resistance of Insulation Materials	No Growth
ASTM C1617	Corrosiveness to Steel	Pass
ASTM C1763	Water Absorption by Immersion	Pass
ASTM E84	Surface burning Characteristics	Flame Spread Index ≤ 5 Smoke Developed Index ≤ 10

<sup>†</sup>Compressive Resistance measured using a pre-load of 2 psi.

## THE AEROGEL ADVANTAGE

Aerogel is a lightweight solid derived from gel in which the liquid component of the gel has been replaced with air. The process of creating aerogel results in a material with extremely low density and the lowest thermal conductivity of any solid. These remarkable properties make aerogel one of the world's most efficient insulating materials. Our patented process integrates this unique aerogel into a fiber-batting to create flexible, resilient, and durable aerogel blankets with superior insulating performance.

## WORKING WITH PYROGEL

Clean, flush, and accurate cutting of Pyrogel can be achieved using conventional cutting tools such as scissors, tin snips, or razor knives. As with all technical insulation materials, appropriate personal protective equipment (PPE) should be worn when handling, cutting and installing Pyrogel. See SDS/AIS for complete health and safety information. Pyrogel HPS is designed for use with a properly installed jacketing system. Refer to the Pyrogel HPS Installation Guide for details.

## TECHICAL SERVICES

Pyrogel HPS insulation is optimized for use in high temperature services. It is engineered to withstand the harsh environments common to high temperature service, while minimizing total installed costs and facilitating long-term operating cost savings. Our Technical Services team offers comprehensive assistance for your project, from initial design and specification, through to training and site start up.

## MORE INFO



### PRODUCT WEB PAGE

Scan with mobile device or go to [aerogel.com/pyrogel](http://aerogel.com/pyrogel)

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