BRONX

Witness the most
COMPREHENSIVE
Nanotechnology

WIPO | PCT
The International Patent System

ASTM INTERNATIONAL
Standards Worldwide

CERTIFIED ISO 9001:2015 COMPANY

CERTIFIED ISO 14001:2015 COMPANY

CERTIFIED ISO 45001:2018 COMPANY

About Us

Bronx holding Pte Ltd has developed world leading products in thermal insulation solution offers **“Oryza” Aerogel.** Our manufacturing arm delivers high tech insulation aerogel made from waste and recycled materials of Oryza Sativa providing **environmentally safe, green sustainability and energy efficient** than other conventional products.

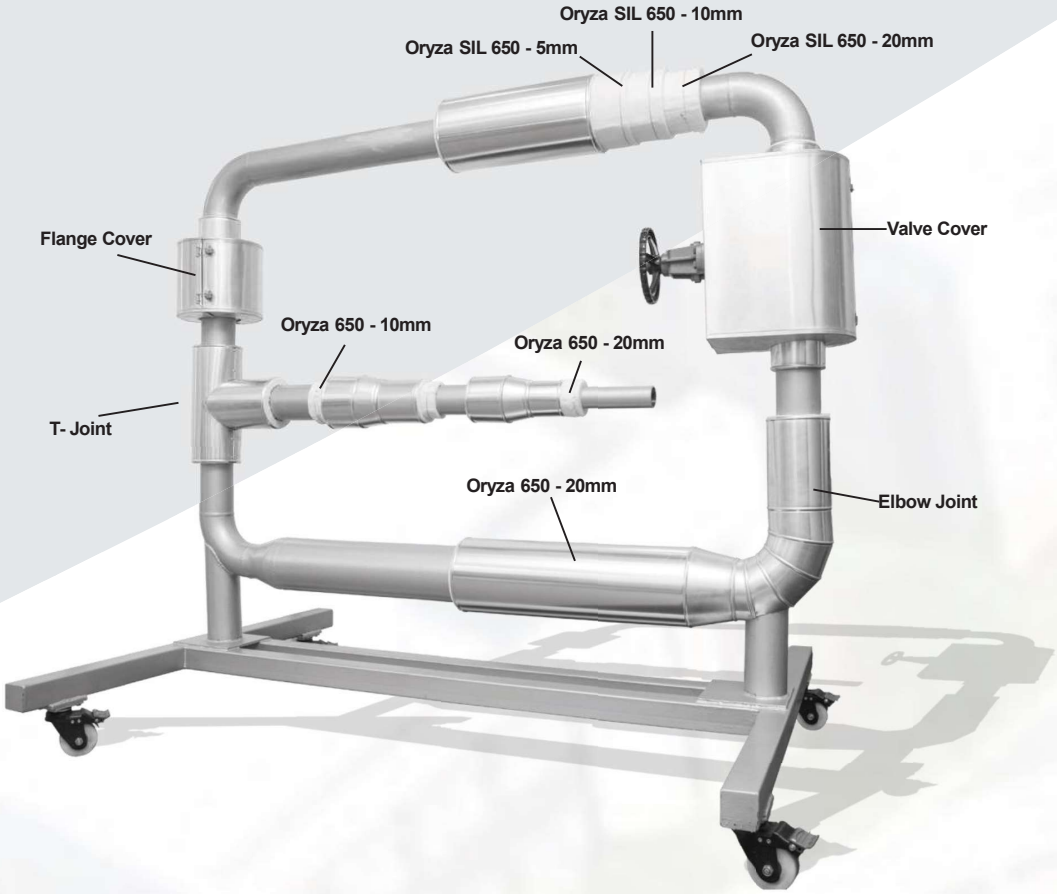
The product range offers wide applications in **fire technology, thermal management, and EV thermal barriers.**

Low dust technology, EV Safe Technology and building Green Technologies enables a large proportion of the worlds carbon emission and consumption of materials are from the built environment.

MADE IN SINGAPORE

Experience Centre

Welcome to our **Nanotechnology** Experience Center, where innovation, efficiency, and sustainability converge to redefine insulation solutions. Step inside and immerse yourself in the world of cutting-edge technology and unmatched thermal performance. Our center is a testament to our commitment to revolutionizing the way we insulate our living and working spaces.



This Rig demonstrates Oryza Aerogel's versatility for a wide range of applications, from small - bore pipe to different shapes and sizes, thickness to the largest process vessels and equipment

Dust Test Insulation With Bronx Oryza-SIL 650

EN13051-1:2018 Reaction to fire Classification: A1

Jet Fire Test Performed according to the ISO 22899-1: 2007

Oryza-SIL 650

The Oryza-SIL 650 Aerogel blanket insulation is developed as high temperature insulation materials for various energy industrial products. In addition, it offers excellent protection to pipeline system against corrosion under insulation (CUI) due to its exceptional hydrophobicity and breathability and fire protection from hydrocarbon fire.

Oryza-SIL650's high temperature performance insulation is designed to meet the needs of various industrial applications such as petroleum, petrol chemical industry, steam pipeline, tankage, vessel, boiler and heat exchanger cold chain. It complies with ASTM C1728, Type III, Grade 1A standard.

Properties:

- EN13051-1:2018 Reaction to fire Classification: A1
- High temperature application up to 650˚C
- Excellent low thermal conductivity
- Hydrophobic and breathable
- Exceptional low dust

Benefits:

- Corrosion Under insulation (CUI) Defense
- Environmental and human safety
- Reduced insulation thickness
- Labour cost savings
- Durable and longevity

TECHNICAL PARAMETERS

Industry Applications
Energy sector, Petochemical, Marine etc.

Nominal Thickness	3mm, 5mm, 10mm, 15mm 20mm
Density	180 kg/m³
Operational Temperature	650 °C
Fire Rating	Class A1
Thermal Conductivity@24°C	0.019 W/mK
Colour	White
Hydrophobicity	98%

Oryza-LTG

The Oryza-LTG is a highly porous, light weight material that is produced using specialized manufacturing process. The resulting composite material possess good flexibility, low thermal conductivity, excellent mechanical strength and outstanding water repellency.

Due to these superior properties, the Oryza-LTG can be used effectively in sub-ambient and cryogenic insulation applications such as in LNG pipeline, storage and transport. It also provides a low dust handling experience. It complies with ASTM C1728, Type I, Grade 1B standard.

Properties:

- High temperature application up to up to 450˚C–195 ˚C
- Excellent low thermal conductivity
- Hydrophobic and breathable
- Exceptional low dust
- Low density

Benefits:

- Durable and soft at cryogenic temperature
- Corrosion Under insulation (CUI) Defense
- LNG liquefaction and regasification
- Environmental and human safety
- Labour cost savings

TECHNICAL PARAMETERS

Industry Applications
Energy sector, LNG vessel, Cryogenic equipment's etc.

Nominal Thickness	5mm, 10mm, 15mm , 20mm
Density	180 kg/m³
Operational Temperature	450 °C – 195 °C
Fire Rating	Class A
Thermal Conductivity@24°C	0.017 W/mK
Colour	White
Hydrophobicity	98%

Oryza-SEA

The Oryza Sea Aerogel insulation system is specifically designed to offer optimal performance for subsea pipe-in-pipe application.

Thee proprietary "infusion" manufacturing process ensures optimal void ratio within the reinforced mat, thereby providing consistency in thermal performance throughout the material.

We understand the importance of creating a product that offers efficacy, ease of installation and protection for customers' assets through our extensive site experience. The low thermal conductivity of the Oryza-SEA insulation provides superior thermal performance and ensures minimal heat loss for extra-long tiebacks on subsea application.

Properties:

- High temperature application up to up to 350˚C
- Excellent low thermal conductivity
- Hydrophobic and breathable
- Exceptional low dust
- Low density

Benefits:

- Space saving due to reduced insulation thickness
- Corrosion Under insulation (CUI) Defense
- Superior long-term aging performance
- Environmental and human safety
- Labour cost savings

TECHNICAL PARAMETERS

Industry Applications
Energy sector, Subsea flowlines

Nominal Thickness	5mm, 10mm , 15mm
Density	160 kg/m³
Operational Temperature	350 °C Fire
Rating	Class A
Thermal Conductivity@24°C	0.015 W/mK
Colour	White
Hydrophobicity	98%

Oryza-PSI

Oryza PSI aerogel composite is a prefabricated highly porous ,light weight material that is produced using a specialized manufacturing process and customized to fit the required pipe section with specific sizes. The resulting composite material is known to possess good flexibility, low thermal conductivity, excellent mechanical strength and outstanding water repellency.

With these superior properties, the Oryza PSI Aerogel Composite can effectively used in high temperature insulation applications such as oil & gas pipeline, oil & gas processing plant, thermal power plant, chemical plant.

Properties:

- EN13051-1:2018 Reaction to fire Classification: A1
- Versatile insulation technology for both hot and cold
- Able to fabricate different thickness and quantities
- Fit around pipe section precisely
- Hydrophobic

Benefits:

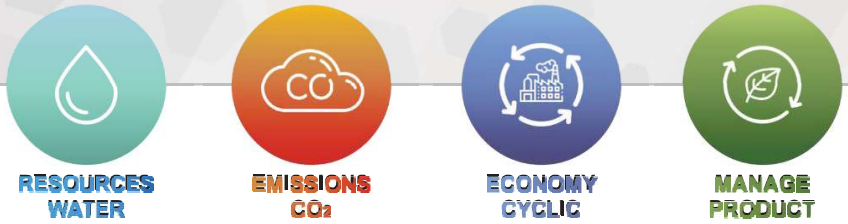
- Without creating thermal leak & aesthetic issue
- Especially useful for wrapping of small pipes
- Corrosion under insulation (CUI) Defense
- No manual cutting and wrapping required
- Labour and installation cost savings

TECHNICAL PARAMETERS

Industry Applications
Cryogenic insulation, Building & Construction, Packaging, Industrial Thermal Insulation

Internal Dimension (inches)	0.5, 0.75, 1, 2, 3, 4, 5, 6
Density	180 kg/m³
Operational Temperature	650 °C
Fire Rating	Class A1
Thermal Conductivity@24°C	0.019 W/mK
Colour	White
Hydrophobicity	98%

POSITIONED TO CAPTURE
ESG OPPORTUNITY



Nanotechnology: A Quantifiable Advantage for Top Executives to Achieve ESG Goals

Aerogels are a class of ultralight, porous materials with remarkable thermal and acoustic insulation properties. They are derived from gels in which the liquid component is replaced with a gas, typically air. This results in a solid material with a density that can be as low as 0.16 grams per cubic centimeter, making it the lightest solid material known to science.

Aerogels offer a number of unique advantages over traditional insulation materials, including:

Superior thermal insulation: Aerogels have the lowest thermal conductivity of any known material, at around 0.01 W/(m·K). This is up to 100 times lower than traditional insulation materials, such as fiberglass and rockwool.

Lightweight: Aerogels have a density of around 0.16 g/cm3, which is up to 100 times lower than traditional insulation materials.

Durable: Aerogels are very durable and can withstand harsh environmental conditions, such as extreme temperatures and pressures.

Non-toxic and non-flammable: Aerogels are non-toxic and non-flammable, making them safe for use in a variety of applications.

Nanotechnology has the potential to revolutionize a wide range of industries, including construction, manufacturing, transportation, and energy. In particular, aerogels can play a significant role in helping businesses and organizations achieve their ESG goals.

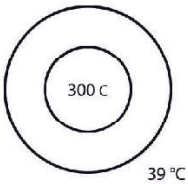
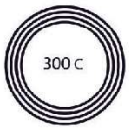
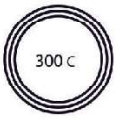
Overall, **Nanotechnology** can help businesses and organizations achieve their ESG targets more quickly and effectively than rockwool. Aerogels offer superior performance, durability, and sustainability, making them a more sustainable and cost-effective choice in the long term.

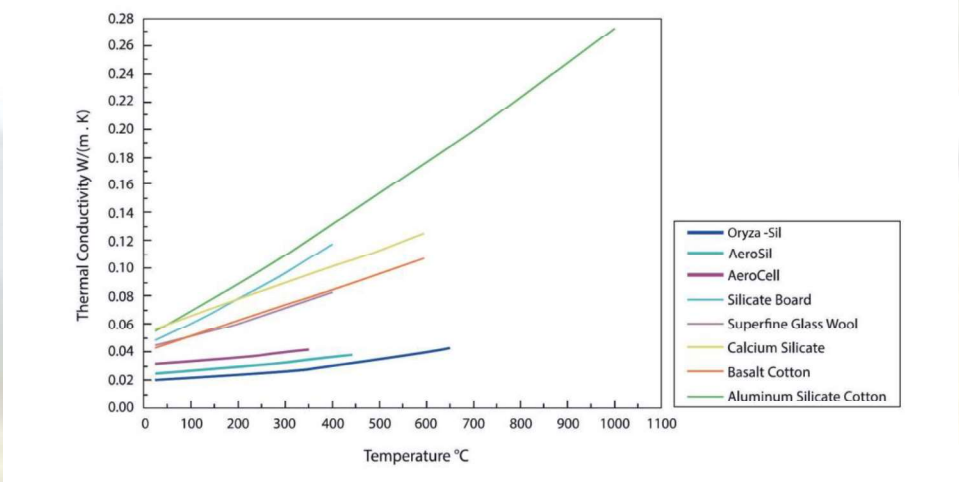
Comparison of Thermal Insulation of Aerogel and others.

With only a fraction of thickness, Oryza's Aerogel can archieve the same effect of heat insulation compared to conventional materials. The result is lower heat loss and insulation material volume, leading to lower energy comsumption and higher space utilization rate.

Aerogel based panels have significantly lower thermal conductivity compared to conventional insulation materials and has a comparable working temperature range, sufficient for most applications. Increased service lifetime, ease of installation and effectiveness contributes to costs savings in various applications.

Comparison of Thermal Insulation of Oryza Aerogel and others

Pipe diameter 150mm Temperature 300 °C Horizontal tube Emissivity 0.9 Ambient Temperature 25 °C Wind speed 1m / s	Others  39 °C	Oryza Aerogel OyzaSil 650  39 °C	Oryza Aerogel OryzaSil 650  50 °C
Tube Diameter (mm)	150	150	150
Total Diameter (mm)	350	210	190
Insulation Material Thickness (mm)	100	30	20
Surface Temperature (° C)	39	39	50
Heat Loss (W/m)	285.7	171.4	285.7
Relative Insulation Volume	1	0.216	0.136



Aerogel Applications

Oil and Gas Industry

Aerogel thermal insulation material has high flexibility, low thermal conductivity and are strongly hydrophobic, easy to install and durable, making them a very good solution for heat loss management in the oil and gas industry.

Aerospace, Marine and Transportation

Aerogel thermal insulation material have excellent thermal insulatio, fire resistant and acoustic insulation properties, allowing it to provide the best thermal protection for high speed rail, refrigerator, trucks, consumer vehical, ships, planes and spacecraft.

Heat and other Heating Appliances

Aerogel thermal insulation material can be used for electrical applicance that requires thermal insulation, such as ovens, heaters and water heaters. At the same time, it provides thermal insulation in tight space for electronic applications, achieving the best thermal insulation effect while significantly reducing the material thickness and energy consumption, ensuring a safe working environment.

Fireproofing and Energy Conservation

A material that is both fire resistant and thermally insulating has always been the ultimate goal of building industry. Aerogel thermal insulation material not only achieves these requirements, but the effective reduction of the insulation material thickness increases the space utilization of the building, enabling safe, low-carbon and energy efficient buildings.

Aerogel Applications

Piping and Storage Tanks

The introduction of aerogel thermal insulation materials will usher in new developments for energy conservation in industrial piping and storage tanks, while promoting the global push for low-carbon economy.

Furnace and Metallurgical Applications

The use of aerogel thermal insulation allows one to achieve the same amount of thermal insulation while significantly reducing the thickness of the furnace walls, increasing the effective furnace capacity without increasing the exterior size. At the same time, optimization of the thermal insulation can lend to lower energy consumption.

Cryogenic Applications

Compared to traditional thermal insulation materials, aerogel insulation materials are advantageous in the fact that they have extremely low thermal conductivity and are primarily made from inorganic materials. This increases their service life and enables application with vacuum in further increase their effectiveness.

Prefabricated Thermal Insulation Pipe

Prefabricated thermal insulation pipes are primary used in the underground district heating networks, offshore and oil drilling stream pipes. The advantages are: reduction in the amount of steal required for the outer jacket due to thinner insulation material. Facilitate the insulation process by reduction in the weight and volume of the piping. Reduction of maintenance costs due to increase in service life of the piping.

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