

# Aspen Aerogels®

A 21<sup>st</sup> century solution to a decade old problem



## SIG Business Support

SIG has teamed up with a number of carefully selected third parties to offer our customers a combined, unique and market leading package of financial services. SIG customers can exclusively benefit from discounted rates and in some cases privileged access to business enhancing products not freely available elsewhere to help secure additional finance, increased cash flow and enhanced internal risk processes.

Visit us today at: [www.sigfinancetools.co.uk](http://www.sigfinancetools.co.uk) to find out how you can achieve competitive advantage and ensure your business is protected and financed for future growth.

For full technical advice, thermal calculations and support, please contact your local SIG Technical Insulation branch

**SIG** TECHNICAL INSULATION

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A new approach to corrosion under insulation



**ZEROHARM**

SIG is committed to the health, safety and wellbeing of our employees, customers and the general public. We operate a zero harm policy and have gained accreditation to FORS at all of our operating sites.



**SIG** FIXINGS

Don't forget your fixings... our branches offer a range of complementary fixings for your technical insulation needs



For more information please visit: [www.sigassured.co.uk](http://www.sigassured.co.uk)

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aspen aerogels®

# What causes corrosion under insulation?

Corrosion under insulation can be due to many causes, but the most common factor is the presence of water within the insulation system, with the use of water absorbent materials tending to contribute to the problem also. Maximum corrosion rates occur from ambient to 150°C and corrosion is minimal at temperatures above 150°C, unless the line is regularly shut down.

Despite the best efforts of operators and contractors to find ways to seal insulation systems, it is almost impossible to keep water out. This can lead to many different oxidation problems, including:

- Normal oxidation due to the presence of oxygen and water
- Oxidation caused by deposition of salts due to evaporation on hot surfaces
- Stress corrosion
- Galvanic corrosion due to dissimilar metals

These problems cost the industry tens of millions of pounds in repairs and lost time each year, as well as raising serious health and safety issues.



**SIG Technical Insulation, in exclusive partnership with Aspen Aerogels®, have a solution to the problem. Cryogel® and Pyrogel® are new and innovative Aerogel insulation products that actively reduce the impact of water ingress.**

# How do Aspen Aerogels keep insulation systems dry?

On hot pipes or equipment, Pyrogel® will resist water ingress but will allow evaporation from system leaks, effectively “pumping” the system dry. Recent corrosion under insulation (CUI) tests showed that Pyrogel® not only prevented the development of CUI, it also substantially improved CUI performance when used in conjunction with other insulation materials.

The conclusions drawn following recent CUI tests on Pyrogel® XT-E, which were carried out by a major refining company, were: **“No corrosion was visible on the pipe surface despite defects introduced”,** performance was **“above expectation”** **“Hydrophobic insulation materials are preferable as the layer in contact with the pipe coating”.**

**CAUSES OF CORROSION**

Dry insulation: Water tends to find gaps in insulation cladding caused by damaged or badly fitted joints. This water will then become trapped in the insulation system by the waterproof properties of the cladding.

Wet insulation: (Potential corrosion)

Damage to cladding joints (Water ingress)

Aspen Aerogels® materials are extremely hydrophobic yet water vapour permeable.

Extremely hydrophobic whilst allowing evaporation

Aspen Aerogels® strongly resist the ingress of liquid moisture

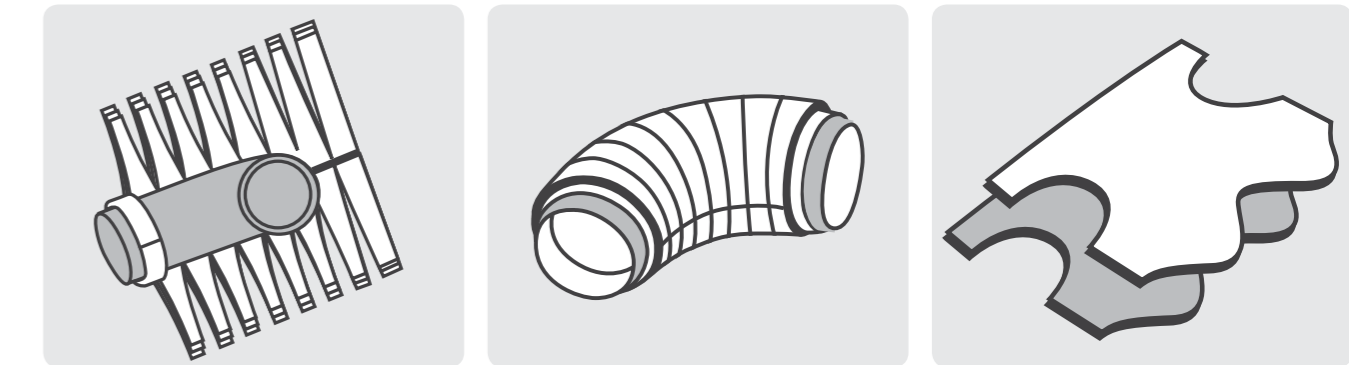
The hydrophobic and microporous nature of the product will ensure that the pipes stay dry

Pyrogel® XT-E - Physical properties		
Thicknesses	5mm	10mm
Material form	1.5m wide x 92.90m long rolls	1.5m wide x 52.65m long rolls
Max. use temperature	650°C	
Colour	Maroon	
Density	180 kg/m³	
Hydrophobic	Yes	

Cryogel® Z - Physical properties		
Thicknesses	5mm	10mm
Material form	1.45m wide x 92.90m long rolls	1.45m wide x 52.65m long rolls
Max. use temperature	125°C	
Colour	White	
Density	130 kg/m³	
Hydrophobic	Yes	

# Bends and fittings

Aspen Aerogels® materials are available as pre-cut bends, tees and fittings.



Pre-cut bends, tees and fittings drastically reduce site time whilst ensuring a neat fit. This time saving factor is particularly important in offshore installations where labour time and cost are at a premium.

# Aspen Aerogels® – the choice of industry experts

Recent users include:

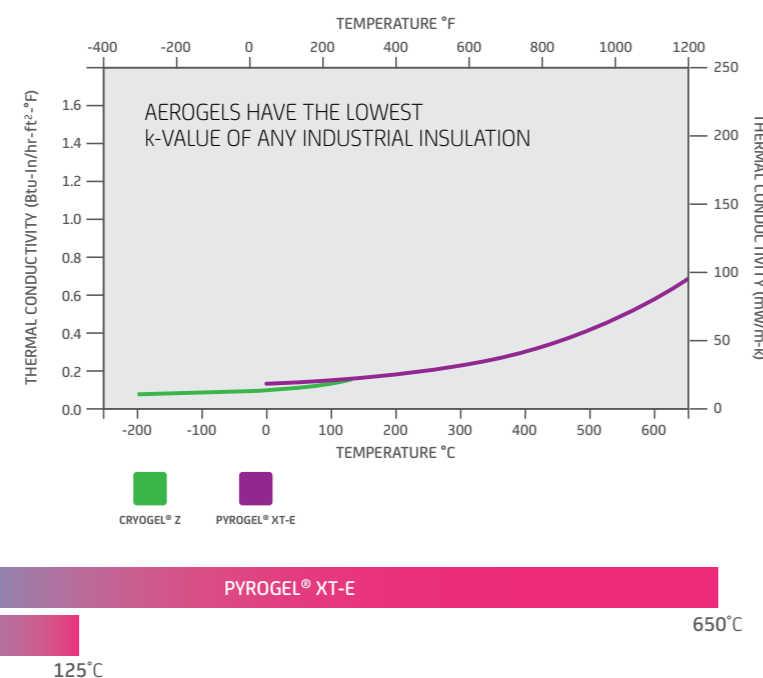
- Air Liquide
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- BP
- ExxonMobil
- Statoil
- Tullis Russel



For more information, please visit [www.sigtechnicalinsulation.co.uk](http://www.sigtechnicalinsulation.co.uk)

# What is Aerogel Insulation?

- A completely new concept in insulation technology
- The world’s most efficient thermal insulation material
- Highly hydrophobic
- Microporous - vapour permeable
- Fire safe
- Flexible/resilient
- Both low (Cryogel®) and high (Pyrogel®) temperature versions
- Wide combined temperature from minus 270°C to plus 650°C



## Corrosion under insulation (CUI) tests



90 day CUI tests with Pyrogel® XT on its own and in conjunction with other products

90 day CUI test sample with Pyrogel® XT and Mineral Wool

Final test result showing corroded pipe and undamaged area under Pyrogel® XT and Mineral Wool

Temperature range: -270°C to 650°C. Cryogel® Z is effective from -270°C to 125°C. Pyrogel® XT-E is effective from 0°C to 650°C.