

## Features, Benefits & Comparisons

### **Why is Super Mat an Overall Better Insulation Choice?**

- Super Mat and Super Mat STC are designed to thrive in the most hostile operating environments.
- The unbreakable, reusable Super Mat and STC are hydrophobic to 600F (315C) & thermally suitable to 1200F (649C).
- Cost of Ownership is reduced while providing measurable return on your investment as compared to other types of industrial insulation.
- Investment cost and schedule benefits accrue during project planning, construction, and over the working life of the asset (Lowest Cost of Ownership).
- Optional silicone topcoat provides considerable savings and PP.  
Super Mat is also available with a breathable silicone topcoat (called Super Mat STC) which, for certain areas of a facility, could be substituted for metal jacketing at a significant cost savings.

#### o Cost savings example:

- An FPSO which has only 5 more years to operate, is keenly interested in use of the top-coated version to entirely avoid the purchase and installation of SS jacket.
- They are very keen to use the silicon top-coated version and entirely avoid the purchase and installation of SS jacket.

#### o Personnel protection

- In areas where personnel protection is required, the non-metallic surface of Super Mat STC is especially beneficial.
- According to thermesthesiometer measurements per ASTM C1057, a single 8 mm thick layer of Super Mat STC applied to a 315C steel surface allows for a 5 sec. skin contact equivalence of only 49C.
- Non-metallic materials have a very low-energy transfer characteristic and allow for less thickness of insulation vs. that required when a metal jacket is used.

### **Where is Super Mat Approved?**

Super Mat is specified or highly encouraged for use at Chevron, ExxonMobil, and Marathon, and is being used and tested at Valero, Shell, PBF, Phillips 66, Todd Energy, Modec offshore New Zealand and numerous other facilities.

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### **Nil Dust**

Super Mat, unlike Pyrogel XTE, consists only of PTFE and glass fiber. There is no particulate matter, hydrophobe or other additives to escape as respirable dust. This means that when Super Mat is cut and handled, there is no aerogel powder/particulate to escape into the air or cling to skin and clothing.

#### Super Mat respiratory testing in USA:

- Two separate installation demonstration mock-ups were conducted by a global oil and gas company at one of the facilities on the US Gulf Coast.
- Respiratory dust values on personal monitors were well under the 3 mg/m<sup>3</sup> OEL/TWA. Values for respirable glass fiber content were also below the 1 f/cc OEL/TWA

#### Pyrogel XTE respiratory testing in Europe:

- In December 2018, a global oil and gas company based in Europe conducted an in-depth evaluation of respiratory dust exposure to workers during 4 shifts of mounting and de-mounting of Pyrogel XTE on full-size pipe mockups inside an enclosure with good access and that was shielded from outside weather. A fifth shift of demolition of scaffolding was also monitored.
- As excerpted by the report: ... *insulators working with Pyrogel XTE are exposed to dust concentrations considerably exceeding the [Company's] OEL, both for total dust (average 24 mg/m<sup>3</sup>, STD 10, OEL 6 mg/m<sup>3</sup>) and respirable dust (average 11 mg/m<sup>3</sup>, STD 4, OEL 3 mg/m<sup>3</sup>).*

### **No skin dryness**

Super Mat contains no hydrophobe constituent to cause the very dry feeling on the skin. Another HSE benefit.

### **Easier to cut**

Super Mat is much easier to cut than Pyrogel XT-E. This again, is due to the fact that knife blades cutting through aerogel powder embedded within the E-glass fibres of the blanket.

Cutting Super Mat is something like slicing through sourdough bread with a serrated knife. The high resilience of Super Mat and the ease of cutting can reduce fabrication cost.

### **Effortless Fabrication**

Ease of cutting and no-aerogel dust allows for onsite fabrication. Nuisance dust becomes nil.

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### **Competitive Material Cost**

Super Mat's cost is comparable to calcium silicate and 25% / 30% lower than aerogel blankets.

### **CUI Mitigation**

Super Mat's properties of hydrophobicity and breathability ensure any water ingress is quickly released into the atmosphere as a vapor.

Please see the video below demonstrating the breathability of Super Mat.

<https://www.youtube.com/watch?v=AVqJfwkmKx8>

### **Labor Savings**

- Easier and faster to transport and stage at site.
- Easier and faster to handle and fabricate due to ease of cutting compared to aerogel blanket.
- Faster application, especially on large-bore pipe and vessels.
- Shorten project duration.

### **Thickness Diversity**

Super Mat is currently being manufactured in four standard thicknesses: 8mm, 16mm, 20mm, and 25mm.

Use of the 25mm thickness allows the number of layers of Super Mat to be fewer than required to achieve thermal equivalence of Pyrogel XTE.

For example, on a recent quote for a high temperature pipeline project, the quotation for Super Mat provided for 7 layers total vs. the 10 layers specified for 10mm Pyrogel case.

This results in reduced labor as well as schedule compression.

### **Reusable – One-time Purchase:**

Super Mat's rugged construction properties allow infinite re-use.

### **Reduced Logistics Cost**

- Streamlined planning, supply chain, and logistics. *“One size fits all.”*
- Reduced waste. Less inventory required. No breakage.
- Reduced transport costs. Standard rigid product volumes are 5 times greater.
- Less storage footprint required.

**SUPER MAT****Features, Benefits & Comparisons****Durability**

- Resilient and tough enough to resist damage and maintain thermal performance even after compression and mechanical abuse.
- Sustained long-term performance.
- Enables pre-insulation of piping and equipment prior to transportation.

**Immediately Accommodate Project Scope Changes**

No waiting on specific sizes to be delivered.

See below comparison chart.

# SUPER MAT

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### Insulation Comparison

	Super Mat	Aerogel Blanket	US Expanded Perlite	Calcium Silicate	Mineral Wool
CUI Mitigation -- Hydrophobic	<b>Yes to 315C</b>	Yes to 315C	Yes to 204C	No	No
Cost Comparison to Super Mat (US\$)	-	Higher	Higher	Comparable	Lower
Nuisance Dust	<b>Best</b>	Poor	Fair	Fair	Fair
Cutting for Fabrication	<b>Best</b>	Good	Fair	Fair	Good
Mechanically Durable, Will Not Break	<b>Yes</b>	Yes	No	No	No
Re-usable	<b>Yes</b>	Yes	No	No	No
One Size Fits All	<b>Yes</b>	Yes	No	No	No
Pre-insulation at Fabricator	<b>Yes</b>	Yes	No	No	No
Favorable Logistics-- Planning, Ordering, Delivery, Transportation, Storage	<b>Yes</b>	Yes	No	No	No
Available w/ Weather Barrier Coating (Super Mat STC)	<b>Yes</b>	No	No	No	No
Shorter Project Schedule <ul style="list-style-type: none"> <li>• Faster startup</li> <li>• Less crane and scaffolding rental</li> </ul>	<b>Yes</b>	Yes	No	No	No