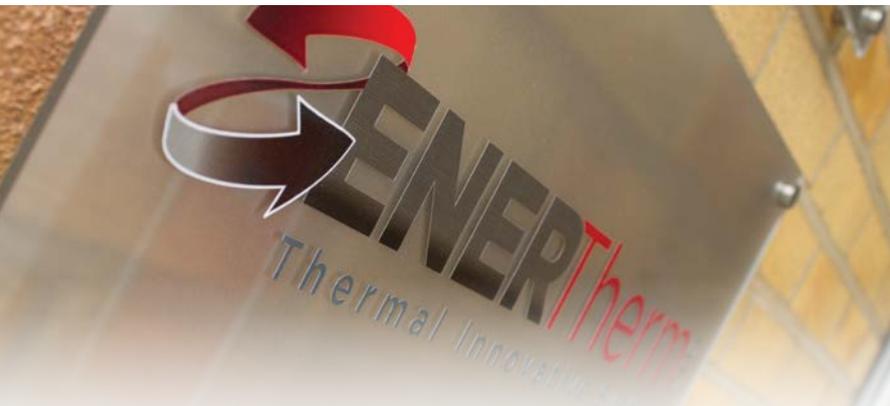


Advanced Sprayable Insulating Coating



Based in Peterborough EnerTherm was established in 2014 and occupies a 7,000 square feet premises including offices, shop- floor and laboratory. We are a leading solution provider to the food and mineral processing, manufacturing, nuclear, and waste management industries.

We focus on reducing energy use, carbon footprint and improving production efficiency. Our ethos is to offer a turnkey solution, by providing a number of varied services, from data capture and analysis, to design and integration of energy efficient technologies. As part of the EnerTherm Ltd technology portfolio, they have developed a number of bespoke thermally insulating coating systems

Ti220 Performance and Specification

EnoTherm Ti220 was designed in response to all the restrictions of other Thermal Insulation coating on the market.

Very Low thermal conductivity

Extremely low conductivity achieved by its raw material properties and the foam-like structure encapsulating air 'bubbles' ($k = 0.036W/m.K$).

Patented pump system allows to achieve consistent low thermal conductivity.

Elastomeric

Its structure and material properties allow the coating to be elasto-memory through a wide range of temperature (-180°C to +250°C). For this reason, Ti220 can also be pumped into cavities easily without atomisation.

Low Overall Heat Transfer Coefficient

Large film thicknesses can be sprayed without the need of mesh and support, therefore achieving similar U values to traditional insulation materials.

No Discolouration

Ti220 has been tested to 250°C but can be operating continuously at 220°C without discolouring.

Hygrophobic/Waterborne

Ti220 has Hygrophobic properties which makes it a true CUI protection coating. It is also a waterborne coating which makes it sprayable and friendly in many environments.

Volumetric Capacity

Its volumetric heat capacity (ability of a material to store energy thermally – the greater the value the more energy can be stored) is similar to the value of Microtherm / Mineral Wool.

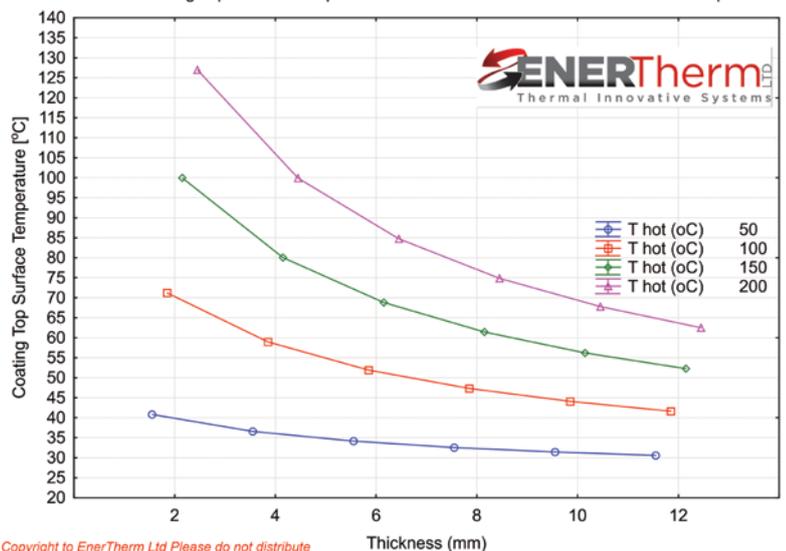
Thermal Diffusivity

The thermal diffusivity of theTi220 (ability of a material to conduct relative to its ability to store energy) is extremely low and lower than fibrous insulation.



Material	Vol. Heat Capacity (J/m ³ .K) [*10 ⁶]	Th. Diffusivity (m ² /s) [*10 ⁻⁶]
Stainless Steel	3.76	3.95
Microtherm	0.17	0.12
Min Wool	0.19	0.24
Carbon Steel	3.41	17.75
Copper	12.13	31.74
Ti220	0.53	0.06

EnoTherm Ti220 Coating Top Surface Temperature Versus Thickness and Heated Surface Temperature



Current issues with existing available thermal coatings.

EnerTherm evaluated both in their lab and at site over 10 different Thermal Coatings in the market place and found the following issues:

- Limited temperature range max 180°C
- Discolouration of coating under long time heat exposure
- Non-flexible product
- E.g. Epoxy based coating break under thermal cycling
- Maximum coating thickness applied
 - *U-Value greatly reduced because of low film build capability*
 - *Non-consistent thermal performance*
 - *Sprayed versus brushed applied thermal performance varies greatly*
 - *Limited throughput of product during application. The structure of the Ti220 allows for higher film build.*

Application method

The EnoTherm Ti220 is unique requiring a pump that has been designed specifically to ensure spraying consistency. This type of application achieves lowest thermal conductivity together with lowest density, resulting in lowest specific heat and thermal diffusivity. The continuous spraying system is clean allowing for up to 10mm WFT to be applied at one time without the need for any meshes or support.

Storage

The Ti220 is a two - components system which requires to be pre - mixed prior to spraying. The two components can be stored for 16 months without mixing in a conventional storage facility with temperatures above 5°C. No flash point.

Mixing

The two parts are mixed with a paddle mixer without additional water nor solvent. For best thermal performance, mixing can be done continuously ideally prior to spraying or a couple of hours prior to spraying.



Containment

Depending on orders (25l Tub), IBC

How is it applied

Requires a specifically designed pump system. 5-10 mm can be applied at one time and allowed to tack, before re-coating.

Cure Time

Drying time depends on ambient conditions. In non-ventilated environments it is recommended to use a de-humidifier. Gentle heat (up to 100°C will help reduce cure time. E.g. 10mm is expected to fully cure After 3 weeks and get to its optimum thermal conductivity.

Product Certification

Initially, EnoTherm Ti220 was developed to be used in the process industry, where product safety and fire safety are the main concerns. Other certifications are currently being sought.

Food Safety

- British Standard, Sensory Analysis - Methodology - Triangle Test, BS EN ISO 4120: 2007 (Pass)
- Odour Transfer Method to food substrate

Fire Safety

- British Standard, Spread of Flame - BS 476 part 7 (Cat 4)
- FM Global, Convective Flame Spread - (Pass)
- ASTM E-84/87, Surface burning characteristics

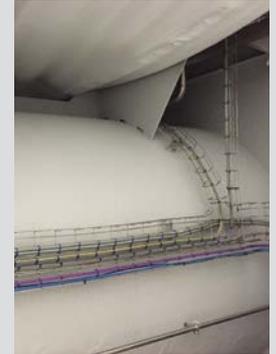
Case Study Results

Large Incinerator, Heat Exchanger, and fryer system (180m²).
Project timeline in 3 days.
7% energy savings

Before



After



Large Incinerator (160m²).
Project time line 3 days.
3.5% energy savings

Before



After



Large Industrial oven. Project time line 3 days.
14% energy savings

Before



After

