

MECH-TOOL ENGINEERING

**Modular microporous
thermal defence insulation**
for all naval vessels



Thermal Defence Products

MTE's thermal defence products are designed for use in extreme environments and suited to defence and specialist industrial applications requiring high thermal performance within space and weight constraints.

Using innovative microporous insulation materials our non-metallic system provides exceptional thermal performance for a wide range of applications where specialist insulants are required.

Developed for high specification defence applications, MTE's system can also protect industrial assets and its workers, improve process efficiency and conserve energy.

Using the company's extensive experience and specialist design and engineering skills, MTE offers a full turnkey service to produce custom made products to meet individual customer specifications.



The complete solution

Our Thermal Defence products are designed to meet the most stringent levels of quality, weight, budget, thermal and mechanical performance, whilst conforming to environmental and legislative requirements.

- Professional end-to-end project managed service
- Design, fabrication, delivery and installation
- Quality Accreditation to ISO 9001: 2015
- Health and Safety Accreditation to OHSAS 18001
- Water ingress testing in accordance with BS EN 60529:1992+A2:2013 Levels IPX3, IPX4, IPX5, IPX6

Industries

Thermal defence products are suitable for a wide range of high temperature environments which include:

- Marine
- Aerospace
- Nuclear

Applications

MTE's thermal defence products are suitable for various applications which include:

- Large/small vessels
- Large/small bore pipework
- Small components
- Defence vehicles, land, sea & air



Design & Testing

The MTD team includes the in-house design personnel, knowhow and experience to fully develop, test and qualify these highly efficient thermal insulation systems.

From providing detailed thermal calculations in support of reducing surface heat loss and/or temperatures to client required levels, through to qualification support in terms of structural stability for through life resistance to shock and vibration.

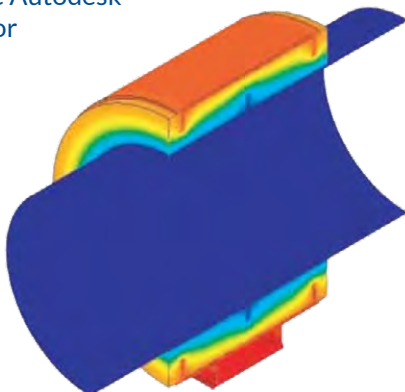
The design team has proven these systems perform to the required thermal and structural levels, whilst meeting all other important design requirements, such as, protecting complex geometry, using only controlled materials with highly restricted levels of Fluorine, Chlorine and Sulphur.



The product is also thermally conditioned prior to delivery to ensure in-service performance does not release unsafe levels of toxic gas or Volatile Organic Compounds (VOC's).

The MT-TD design team has access to a range of both in-house developed software and industry standard design packages (for example Autodesk Inventor & Nastran) for complex thermal and structural design checks.

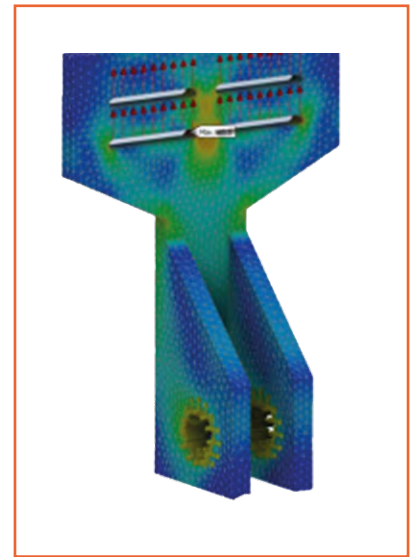
Excellent links are also maintained with independent testing facilities, if future of further testing is deemed necessary.



Extensively Tested

To meet the specific requirement for existing clients the products have already successfully passed the following tests:

- System Thermal Conductivity Validation
- Fluid Resistance / Water-Proof – IPX6
- Shock & Vibration
- Foot Traffic & Impact
- Environmental (Humidity & Mould Growth)
- Fire - Propagation BS476 Part 6:1989 + A1:2009
- Fire - Spread of Flame BS476 Part 7:
- Fire - Toxicity / Smoke Density & Oxygen Index



Fully Qualified

The Thermal Defence product range is fully verified and qualified for use in extremely demanding and challenging environments. In addition to the testing performed the products also satisfy the following requirements:

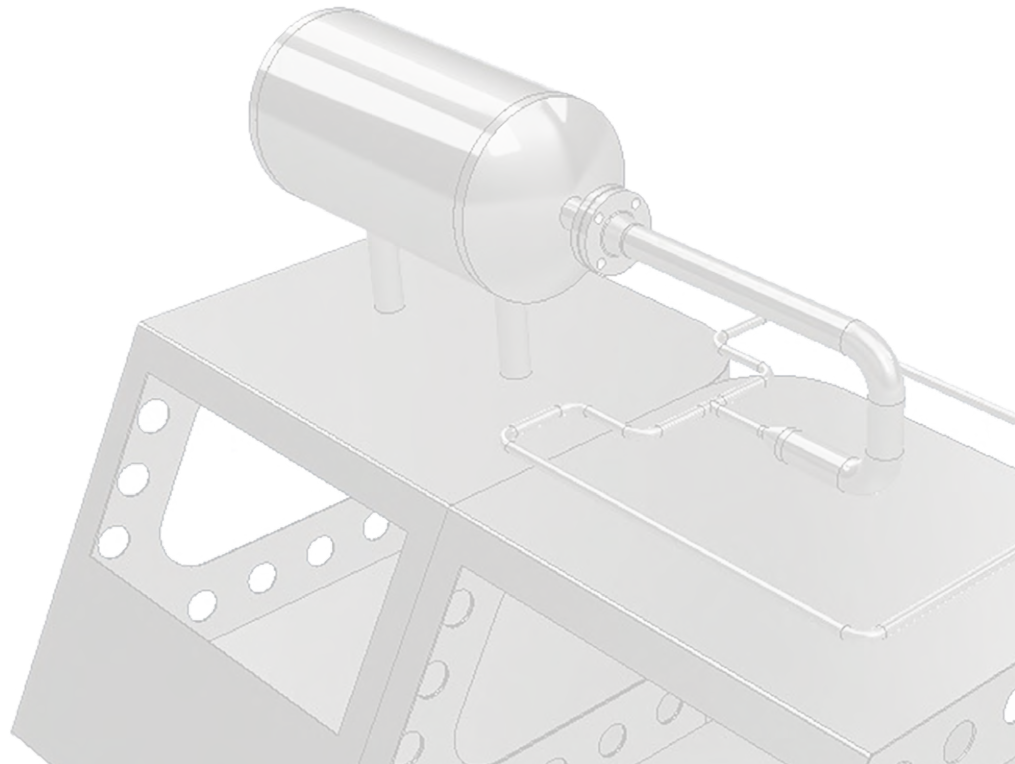
- Design Life (+30 Years)
- Extreme Thermal Efficiency – saving 50% on weight *
- Extreme Thermal Efficiency – saving 50% on space *
- Every Part - Fully Traceable back to Datasheets & MSDS
- Easily Demountable – for inspection purposes.
- Ergonomic Panel Sizes – easy to install & remove
- Non-metallic, robust and easily cleaned outer surface

*when compared against traditional insulation materials.

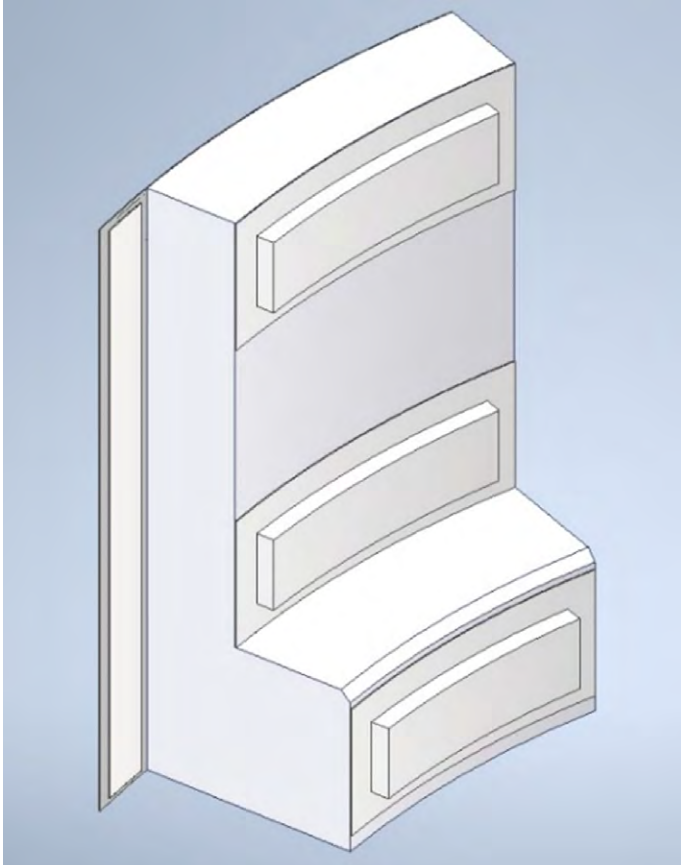
Engineering

The MTD Team includes in-house Design Engineering personal, with a wealth of product knowledge and experience, MTD can provide engineering solutions for a wide range of thermal defence applications ranging from bespoke complex parts to standard off the shelf parts.

MTD have access to industry standard Design Engineering software such as Autodesk Inventor which enables our engineers to create detailed 3D designs which can be exported directly to our CNC and Laser machines at MTD's production facility.



MTD 3D MODEL



MTD 3D PANEL



The Thermal Defence facility

Working out of a brand new facility built specifically for the Thermal Defence products we manufacture using precision machinery.



Manufacturing equipment

Using a combination of laser cutting and CNC routing the board materials are machined and associated encapsulation materials are cut to shape.





Machine Sewing manual and Fully Automated



The component parts are assembled by skilled operatives

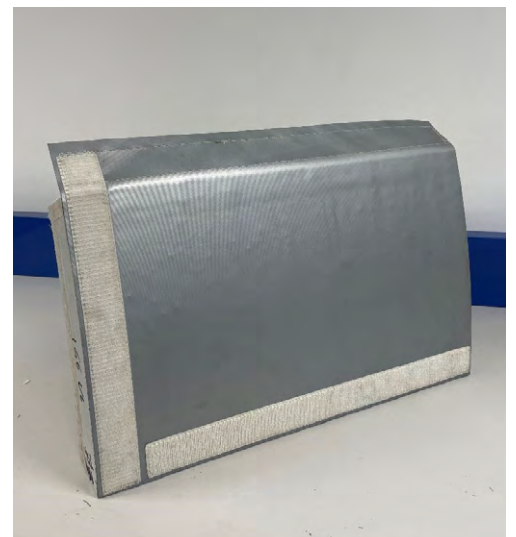
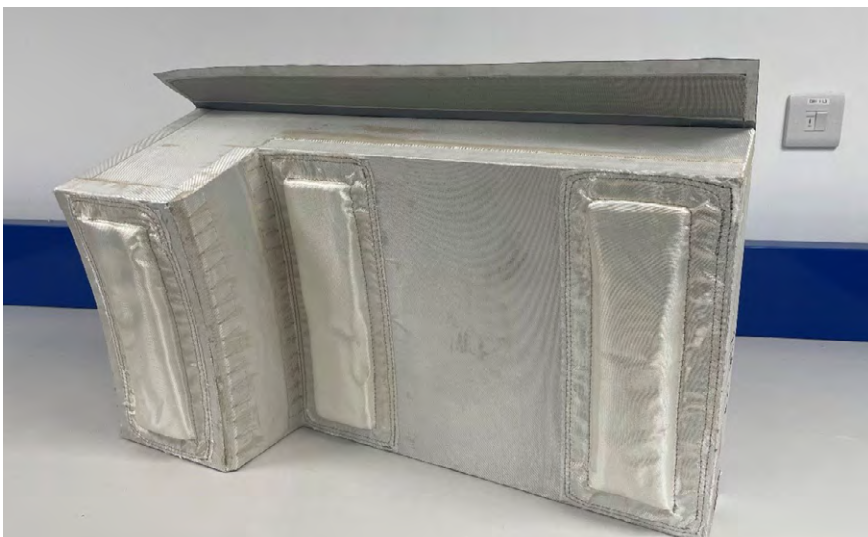


Inhouse Off Gassing facilities



Product types

The product can be supplied in many shapes either panel or formed pipe sections





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Fully tested, certified fire and blast rated products and quality approved systems.