

Fire & Blast Wall
Systems

Mech-Tool Engineering



www.mechtool.co.uk



For over five decades, Mech-Tool Engineering Ltd (MTE) has set the global benchmark in high-performance Fire and Blast Wall Systems, delivering proven protection solutions to offshore and onshore industries worldwide.



Statkraft Sheringham Shoal

Pictured: MTE provided a complete Fire and Blast protection solution, designing, manufacturing, and supplying Fire Walls, Blast Walls, and Blast Relief systems for two renewable substations.

Certified Performance & Proven Engineering Excellence

MTE Fire & Blast Systems have earned independent type approval from Lloyd's Register and DNV GL, following rigorous witnessed testing conducted in 2014 and 2015 at the Exova Warrington Fire Testing Facility in the UK.

Certified Testing & Advanced Design Methodology

MTE Fire & Blast Systems have been rigorously tested and certified to meet international fire safety standards. Fire testing was conducted in accordance with **IMO Resolution MSC.307 (88), Annex 1: Part 3**, achieving fire ratings of **A0, A60, H0, H60, and H120** as specified by **Safety of Life at Sea (SOLAS)** regulations.

Fire ratings are defined by two key performance criteria: **integrity** and **insulation**.

- For all **A-rated** fires, integrity must be maintained for a minimum of **60 minutes**.
- For all **H-rated** fires, a minimum of **120 minutes** is required.

In addition, **Jet Fire testing** was successfully conducted at **DNV GL Spadeadam** against **ISO 22899-1**, achieving a **120-minute jet fire rating**. Jet fire performance is assessed solely on **integrity**, with **no thermal insulation requirement**.

Advanced Blast Wall Design

MTE's blast wall systems are engineered using proprietary software, based on **non-linear elasto-plastic single degree of freedom analysis**, referencing "*Introduction to Structural Dynamics*" by **John M. Biggs**. The methodology aligns with **SCI-P-112** incorporates **FABIG Technical Note 5**.

Validated through **100+ full-scale hydrocarbon explosion tests**, the software—**verified by Lloyd's Register**—accurately simulates **overpressure, pulse, and shock wave loading**. This enables detailed analysis of **deflection and reflection limits**—ensuring safe, optimised design solutions.

- Fire Walls**
- Blast Walls**
- Jet Fire Walls**
- Hybrid Walls**
- Sandwich Panels**
- Acoustic Cassettes**



Engineered Protection: Fire & Blast Wall Systems

MTE offers two core wall system types; each tailored to specific structural and safety requirements:

- **Non-Load Bearing Walls** – Designed to resist fire, blast, and environmental loads without transferring structural forces.
- **Stressed Skin Walls** – Provide both operational protection and structural support, eliminating the need for additional bracing and reducing wall zone footprint.

Deck to Deck Systems

Ideal for traditional platforms, this configuration minimises moment and reaction transfer into structural steel, offering versatile application across offshore and onshore installations.



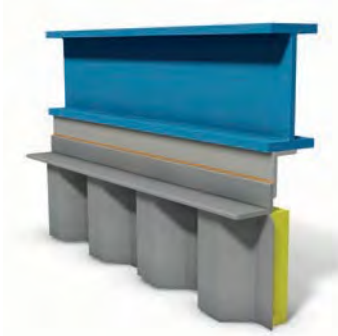
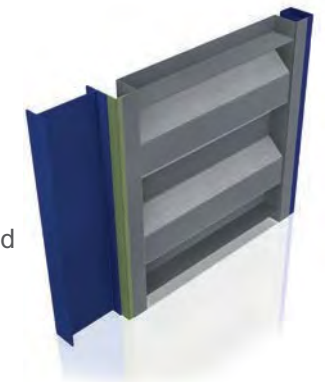
Overclad Systems

Designed for Living Quarters and sensitive areas, Overclad solutions protect structural steel without requiring Passive Fire Protection (PFP), significantly reducing fireproofing costs.



Post & Panel Configuration

This system features horizontally spanning wall panels mounted to vertical structural posts, engineered to withstand high blast loads across large spans. Ideal for process areas, it offers a robust solution where both blast resistance and wide coverage are critical.



Connections Options

MTE provides welded or bolted connections, engineered to meet specific fire and blast load conditions. Each connection type is tailored to project requirements, ensuring structural integrity and compliance.



BP Clair Ridge Overclad System

MTE delivered a **blast-rated stainless steel Overclad System** for BP's Clair Ridge Living Quarters, located **75km west of the Shetland Islands**. The solution provided enhanced blast protection while eliminating the need for Passive Fire Protection (PFP).



Maersk Al-Shaheen Traditional Build

MTE delivered a complete **Deck-to-Deck Fire & Blast Wall System** for Maersk's Al-Shaheen development, located off coast of Qatar. This project showcases MTE's capability in traditional build environments with optimised structural integration.

Optimised Performance, Reduced Weight

MTE's proven prefabricated systems have consistently delivered performance, efficiency, and reliability across global projects.

Comprehensive Support with Tangible Benefits

Beyond expert design, engineering, and site installation, MTE delivers a solution that sets the benchmark for performance and efficiency:

- **Exceptional Weight Savings** – Industry-leading prefabricated systems significantly reduce structural load.
- **Integrated Penetration Frames** – Seamlessly accommodate doors, removable panels, and other access points.
- **No Passive Fire Protection (PFP) Required** – Wall areas are engineered to eliminate the need for additional fireproofing.
- **Low Operational Costs** – Minimal maintenance requirements translate into reduced OPEX over the platform's lifecycle.

Proven Performance in Harsh Environments

MTE has executed a range of global projects in demanding conditions, showcasing the durability and efficiency of its prefabricated fire and blast wall systems. The following case studies highlight the substantial weight savings achieved compared to traditional flat plate (FP) systems.

These prefabricated stainless steel wall systems are designed for longevity, requiring little to no maintenance throughout the platform's operational life:

Contract	Area (m ²)	MTE Total Weight (kg)	MTE Average (kg/m ²)	FP Total Weight (kg)	FP Average (kg/m ²)	Weight Saving (kg)	Percentage Saving
Hebron	11660	426255	36.6	928272	79.6	502017	54%
Martin Linge	5918	357060	60.3	649785	109.8	292726	45%
Valhall	4984	97068	19.5	295938	59.4	198870	67%
Sakhalin	13393	281264	21	855649	63.9	574384	67%
Mariner	6112	126326	20.7	387023	63.3	260697	67%

Design Validation & Structural Integrity Assurance - MTE provides comprehensive design calculations to validate fire and blast protection solutions. These include structural analyses to ensure the integrity of systems under known environmental conditions, supporting safe and optimised engineering outcomes.

Design Consultancy & Engineering Optimisation

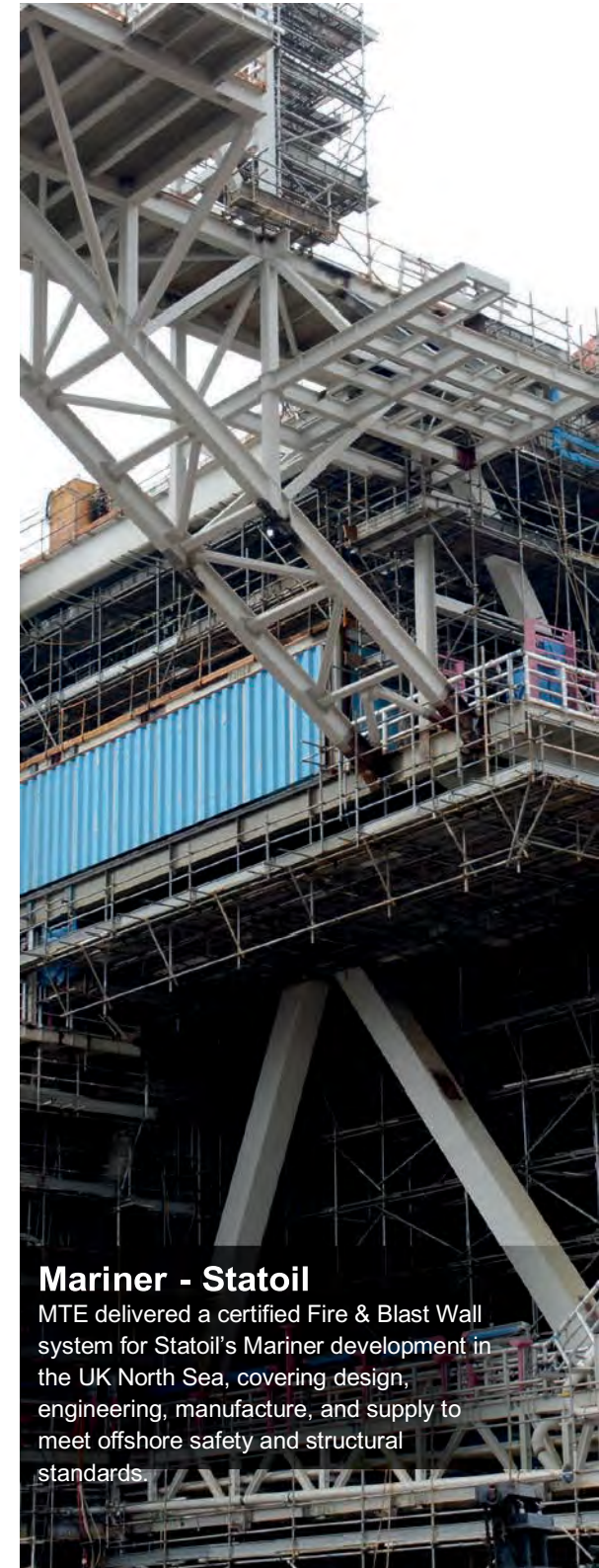
With over four decades of specialist experience, MTE’s Design Consultancy combines advanced computer-based tools with deep industry knowledge to solve complex thermal, mechanical, and structural challenges through precise and reliable calculations.

Our expertise is backed by extensive practical testing, including multiple jet fire trials and over 100 full-scale fire and blast tests. This proven capability enables us to deliver a complete end-to-end solution—whether as a stand-alone consultancy service or integrated within turnkey Fire & blast projects.

All MTE products are certified by Lloyd’s Register and DNV, ensuring compliance and performance. Our consultancy team supports every stage of the project lifecycle—from design evaluation and feasibility studies to FEED and manufacturing design—optimising engineering outcomes while delivering significant weight and cost savings.

Pre-Engineering	Design	Engineering
Feasibility	Structural	3D Modelling
Pre - Feed	Fire (A, H & J Rated)	Structural detailing
Feed	Blast	Fire & Blast Detailing
Surveys	Seismic	Concept GA Drawings
Blast Study Reports	Thermal Analysis	

Smart Protection Engineered for Safety — Lower Weight, Lower Cost, Maximum Efficiency

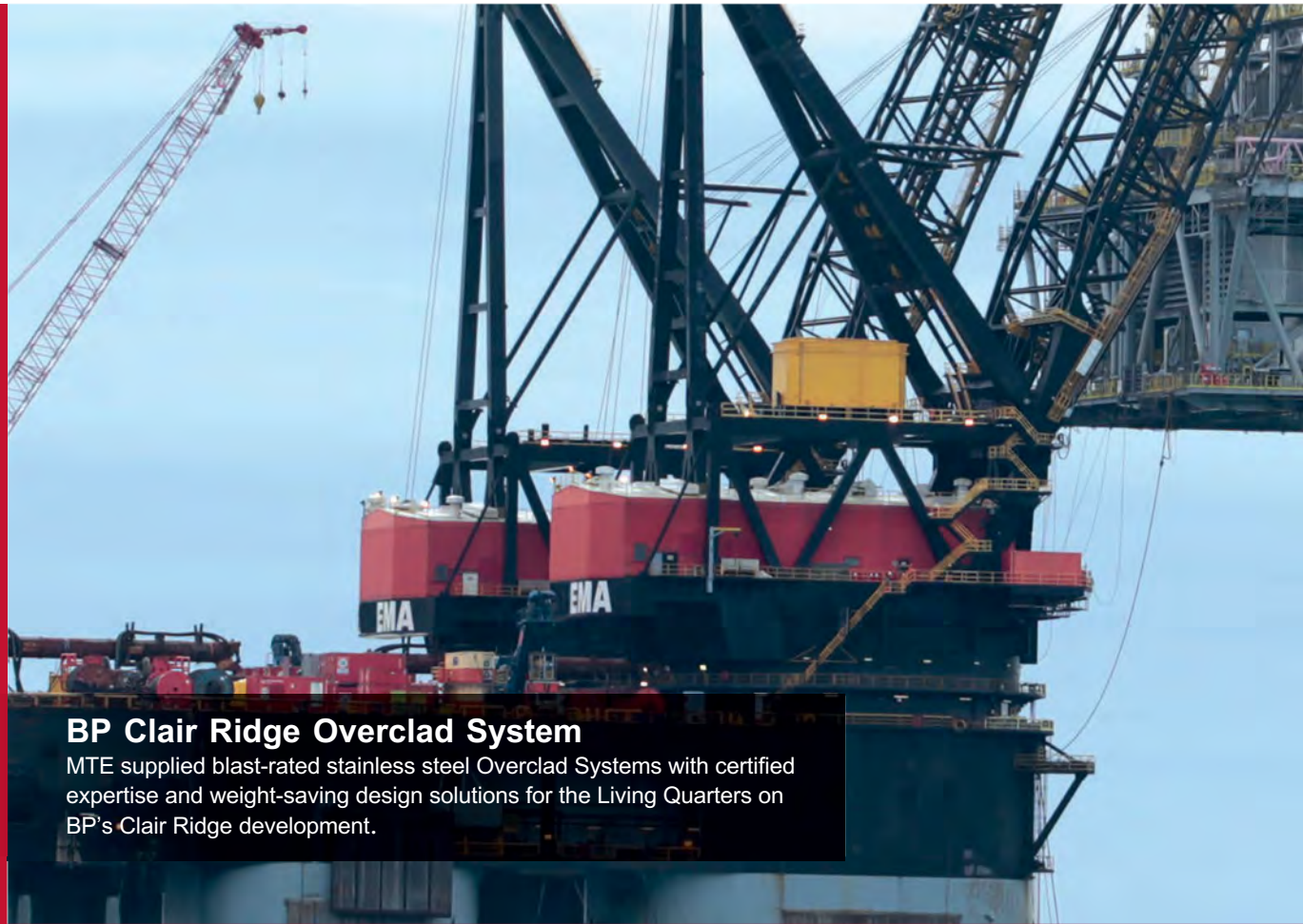


Mariner - Statoil

MTE delivered a certified Fire & Blast Wall system for Statoil’s Mariner development in the UK North Sea, covering design, engineering, manufacture, and supply to meet offshore safety and structural standards.

Material and Construction Expertise

High-performance carbon or stainless steel delivers a robust, economical solution with excellent corrosion resistance and reduced structural weight.



BP Clair Ridge Overclad System

MTE supplied blast-rated stainless steel Overclad Systems with certified expertise and weight-saving design solutions for the Living Quarters on BP's Clair Ridge development.

High Grade carbon steel or stainless steel grade **316L, 2205 & 2304**

Material thickness of wall to be **1.5mm** for stainless steels and **3mm** for carbon steels as a minimum

Fire and Blast wall profiles from **60mm up to 600mm** deep profile design

Rated panels are pre-pinned to suit MTE **type certification**

Insulation to suit **Fire and Thermal Requirements**

Mariner – Statoil

MTE supported the Mariner development in the UK North Sea with certified Fire & Blast Wall systems, applying our proven design expertise and weight-saving solutions.



Protective Liner systems & Acoustic Cassettes

can be included as an optional extra

Carbon steel panels can be **shot blasted and painted** to suit client specification

Stainless steel panels are **passivated** in a natural finish

A **Peel Guard** option can be supplied for protection of panels during site installation

All Panels are **individually marked** for ease of identification and installation

Proven Applications

Offshore Living Quarters

Production Process Areas

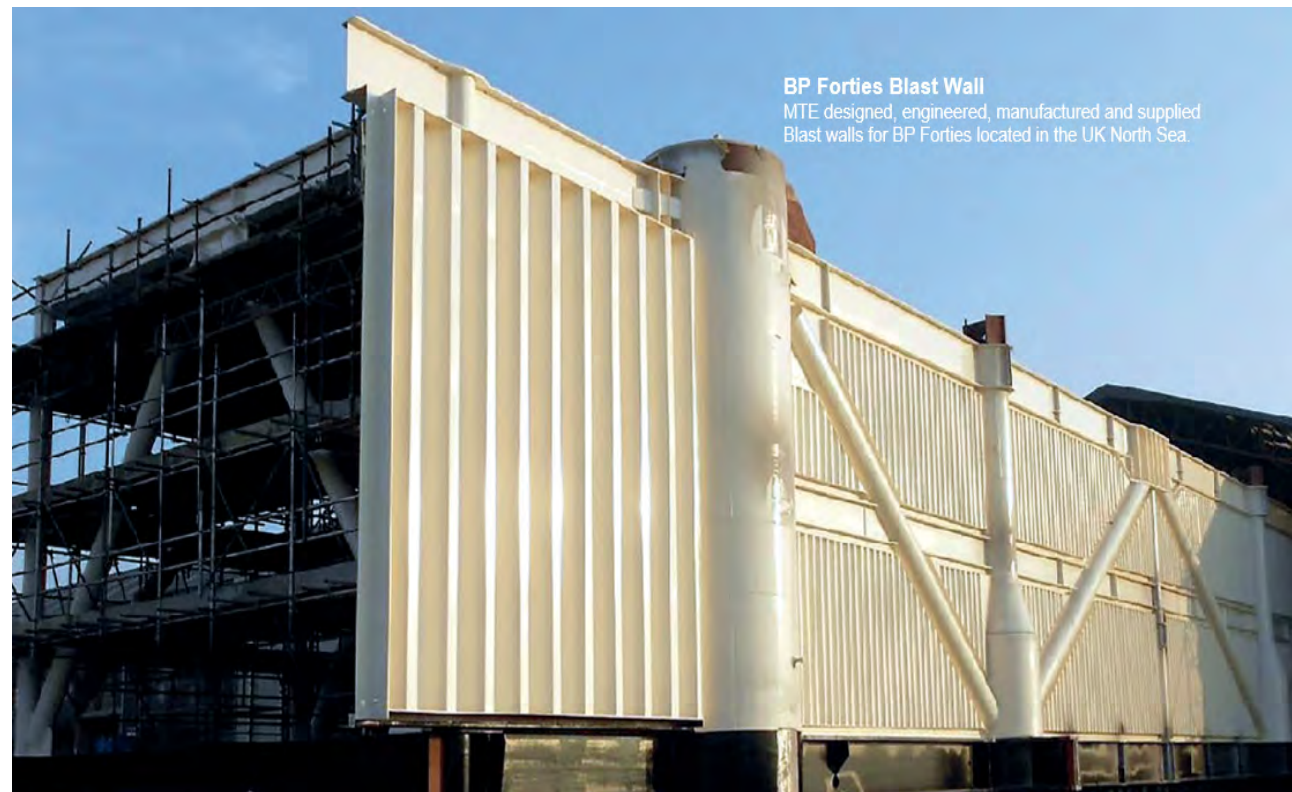
Drilling Platforms

Renewable Energy Substations

Floating Production Storage and Offloading (FPSO) Units

Onshore Industrial Facilities

Nuclear and Thermal Installations



BP Forties Blast Wall

MTE designed, engineered, manufactured and supplied Blast walls for BP Forties located in the UK North Sea.

Certified Fire & Blast Wall Systems – Performance Overview

MTE's Fire & Blast Wall Systems are engineered to meet the most demanding offshore and onshore safety standards, with certified performance across three key fire classifications:

- A-Rated (Cellulosic Fire)
- H-Rated (Hydrocarbon Fire)
- J-Rated (Jet Fire)

These ratings are achieved through rigorous testing in accordance with SOLAS (Safety of Life at Sea) regulations and international fire safety standards, including IMO Resolution MSC.307(88) and ISO 22899-1 for jet fire resistance



Project Highlight: Vattenfall Thanet Substation – Kent, UK

Mech-Tool Engineering Ltd (MTE) was commissioned to deliver a comprehensive fire and blast protection solution for the Vattenfall Thanet Substation, located in Kent, United Kingdom. The scope of work included:

- *Design, engineering, and manufacture of high-performance fire walls and blast walls.*
- *Integration of louvres and certified doors tailored to site-specific safety and operational requirements.*
- *Delivery of prefabricated systems optimised for structural integrity, corrosion resistance, and minimal maintenance.*

This project exemplifies MTE's capability to support renewable energy infrastructure with certified protection systems that meet international safety standards and client-specific performance criteria.

Engineered Penetration Solutions

Structural

Removable Panels

Fire-Rated Doors

Windows

HVAC Ducts

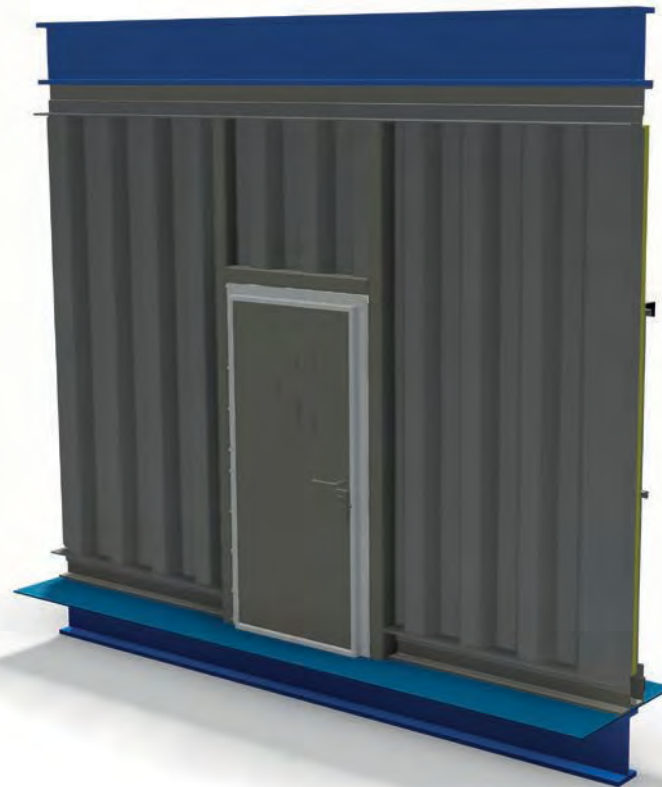
Electrical Cable Trays &
Conduits

Process & Utility Piping

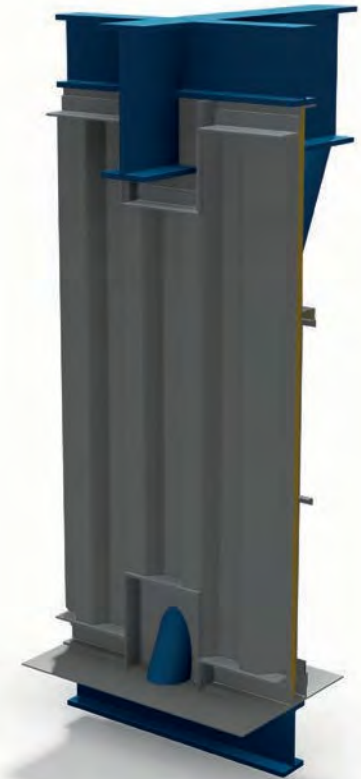
MTE offers a comprehensive range of engineered penetration frames designed for seamless integration into fire and blast wall systems. These solutions support various applications and can be supplied either as pre-installed systems or modular onsite kits, tailored to meet project-specific fire and blast ratings.

To ensure optimal safety and regulatory compliance, MTE advises minimising penetrations in blast-rated walls wherever possible. When required, penetrations are designed to maintain certified performance without compromising structural integrity.

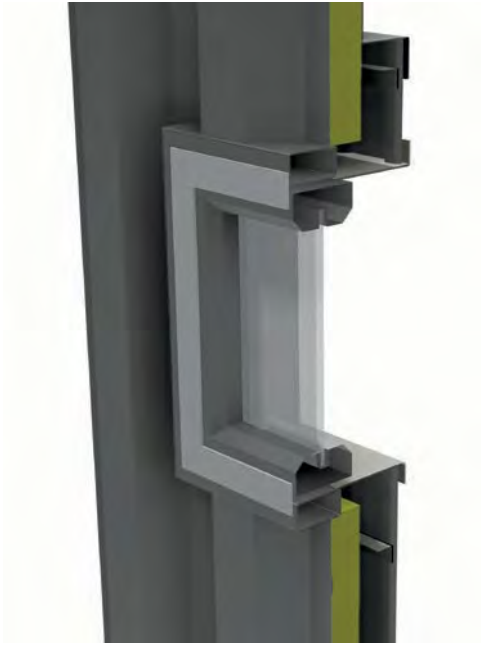
Working in collaboration with approved global partners, MTE also supplies windows, doors, and other access components, ensuring full compatibility with our protection systems and client specifications.



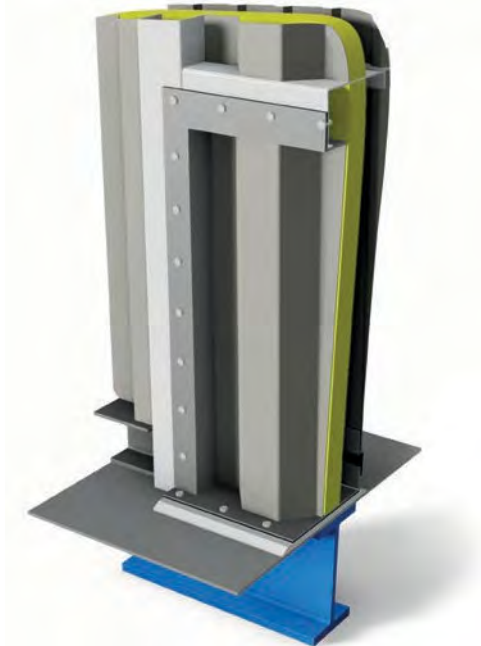
Door



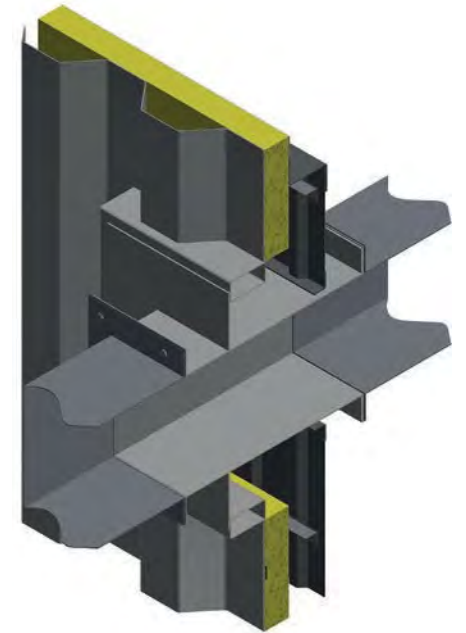
Structural



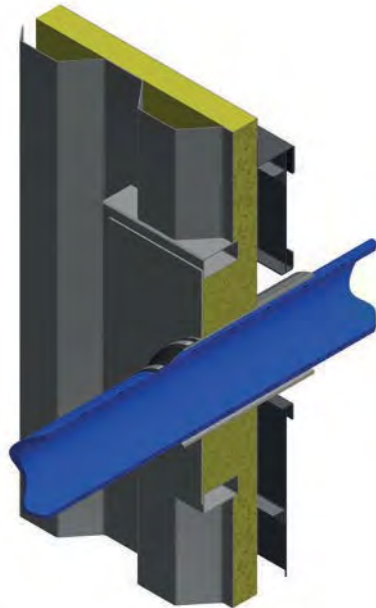
Window



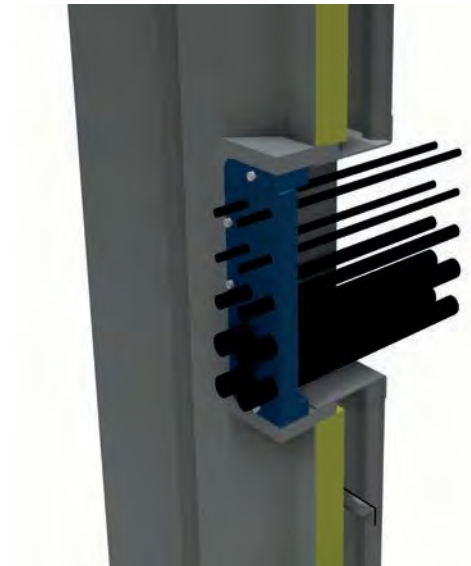
Removable Panel



HVAC



Pipe



Electrical

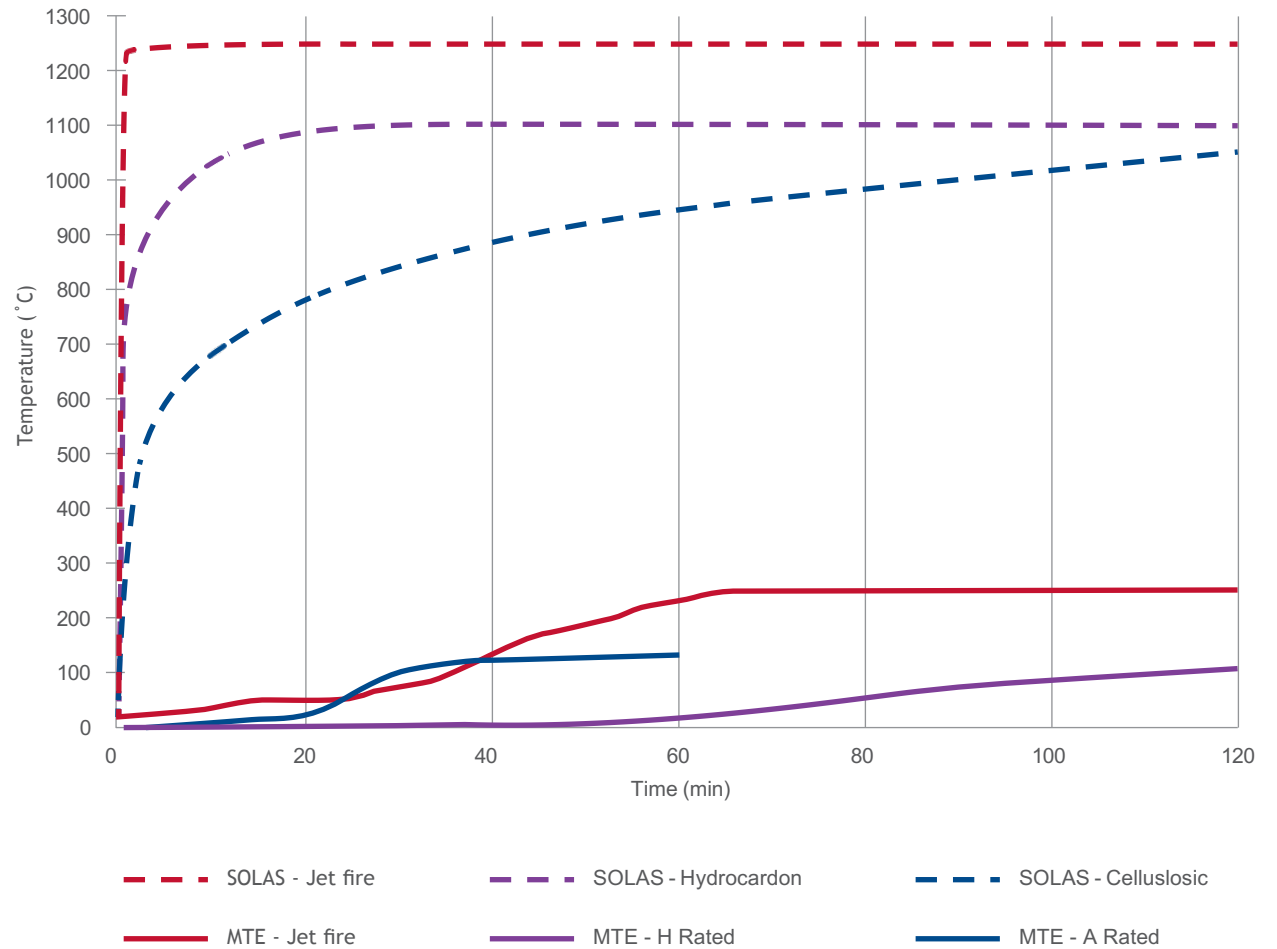
Fire & Blast Wall Performance Ratings

MTE Fire & Blast Wall Systems have been rigorously tested to ensure certified performance against:

- Cellulosic Fires (A-Rated)
- Hydrocarbon Fires (H-Rated)
- Jet Fires (J-Rated)

These classifications reflect MTE's commitment to safety and compliance with international standards, including SOLAS (Safety of Life at Sea) regulations and ISO 22899-1 for jet fire resistance. MTE fire-rated systems were specifically tested against SOLAS-approved fire curves, as defined within BS 476 – Fire Tests on Building Materials and Structures, ensuring validated performance under real-world fire scenarios.

Temperature - Time Graphs of SOLAS Fire Curves and MTE Test Data





Gaz De France - Cygnus

Offshore UK, MTE designed, engineered, and supplied certified fire walls, blast walls, and heat shields for the Cygnus development, delivering robust protection tailored to offshore safety standards.

Testing and Certification

- Lloyd's Register
- DNV GL
- ABS
- Norsok
- SOLAS
- EASC (Euro code)

System Features & Engineering Benefits



System Features & Engineering Benefits

- **Fully Welded Systems** All wall systems are fabricated using fully welded construction techniques, ensuring maximum structural integrity, leak-tight performance, and enhanced durability in high-risk environments.
- **Optimised Design Methodology** Leveraging advanced structural analysis tools and proprietary software validated by Lloyd's Register, MTE designs are optimised for blast resistance, thermal performance, and weight efficiency. This includes non-linear elasto-plastic SDOF analysis based on Biggs' methodology and FABIG Technical Note 5.
- **Compliance with SOLAS Regulations** Systems are tested and certified to meet SOLAS fire curve requirements, ensuring compliance for offshore installations and marine environments. Fire ratings include A0, A60, H0, H60, H120, and J120.
- **Tailored to Client Requirements** Each solution is custom-engineered to meet specific project needs, including wall configurations, material selection (carbon steel or stainless-steel grades 316L, 2205, 2304), and integration of access points such as doors, windows, and HVAC penetrations.
- **Capex/Opex Efficiency** MTE's prefabricated systems deliver significant cost savings:
 - **Reduced CAPEX** through lightweight design and elimination of Passive Fire Protection (PFP)
 - **Lower OPEX** via minimal maintenance requirements and long-term durability
- **Pressure Resistance** Systems are engineered to withstand blast pressures of up to **7 bar**, making them suitable for high-risk zones such as process areas, living quarters, and renewable substations.



HIGH INTEGRITY



CUSTOM PRE-ENGINEERED DESIGN



LIGHT WEIGHT & RIGID OPTIONS



COST OPTIMISATION



MAINTENANCE FREE STAINLESS STEEL SYSTEM



SIMPLE & QUICK TO INSTALL



KNOWLEDGE AND EXPERTISE



BP Clair Ridge Living Quarters

MTE designed, engineered, manufactured and supplied Fire & Blast walls



Over 50 Years of Proven Expertise in Fire & Blast Protection

With more than five decades of specialist experience, MTE is recognised globally as a leader in the design, engineering, and manufacture of high-performance fire and blast protection systems.



Proven Experience

With over 50 years of global expertise, MTE delivers proven fire and blast protection solutions tailored to high-hazard industries worldwide. Our end-to-end service covers every stage—from design, fabrication, and project management to testing, supply, and certification—ensuring performance, compliance, and peace of mind.

The MTE Advantage

- ✓ **Proven Performance** – Designed to meet your environmental requirements
- ✓ **Custom-Built Solutions** – Tailored to your project needs
- ✓ **Trusted Globally** – Installed in major energy and industrial facilities worldwide
- ✓ **Efficient Installation** – No specialist tools required

Your Safety. Our Priority.



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