

Fire & Blast Wall
Systems

Mech-Tool Engineering

www.mechtool.co.uk



Fire & Blast
Solutions





For over 50 years
Mech-Tool Engineering
Ltd [MTE] has been the
global leader in Fire &
Blast Wall Systems to the
worldwide offshore and
onshore market.



Statkraft Sheringham Shoal

MTE designed, manufactured and supplied Fire Walls, Blast Walls and Blast Relief systems on two renewable substations.

MTE Fire & Blast Systems have been independently type approved by Lloyd's Register and DNV GL following witnessed testing in 2014 and 2015 at Exova Warrington fire testing facility, UK.

Fire testing was conducted against IMO Resolution MSC.307 (88), Annex 1: Part 3 and fire ratings of A0, A60, H0, H60 & H120, specified by Safety of Life at Sea (SOLAS), have been achieved.

Fire ratings are split into two main requirements, integrity and insulation performance. For all A rated fires, integrity must be maintained for a minimum of 60 minutes and for all H rated fires, a minimum of 120 minutes is required.

Jet fire testing was conducted at DNV GL Spadeadam against ISO 22899-1 and a 120 minute jet-fire rating has been achieved. Jet fire is tested on integrity only, with no thermal requirement.

MTE blast wall design is produced via MTE software which comprises a computerised non-linear elasto-plastic equivalent single degree of freedom analysis based on "Introduction to structural dynamics" by John M Biggs, and observing recommendations set out in the SCI-P-112 "Interim Guidance Notes

for the Design and Protection of Topsides Structures against Explosion and Fire", with reference to FABIG technical notes, most particularly technical note 5.

MTE has also carried out over 100 hydrocarbon explosion tests on various products and where appropriate, the collated data has been incorporated into our proprietary design software, verified by Lloyds Register.

The highly comprehensive software can be used to design any form of overpressure, pulse or shock wave type loading. Analysis will determine both deflection and reflection limits, allowing for optimised design.

Fire Walls

Blast Walls

Jet Fire Walls

Hybrid Walls

Sandwich Panels

Acoustic Cassettes



Fire & Blast Wall Systems

Fire and Blast walls can be generalised into two main types of system, Non-load bearing and stressed skin.

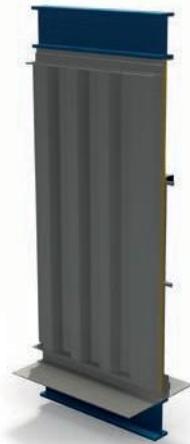
Non-load bearing walls are designed solely against operational loads such as fire, blast and environmental conditions. The design is chosen to any structural loads that would be transferred into.

Stressed skin walls are designed to withstand operational loads whilst providing structural support. The design removes the need for additional bracing which can minimise the required wall zone of the product.

There are many different iterations of fire and blast wall solutions which can be categorised as:

Deck to Deck

The traditional deck to deck system can be used in most applications and reduces the transfer of moment and reaction into structural steel. Deck to deck systems can typically be used in traditional platforms.

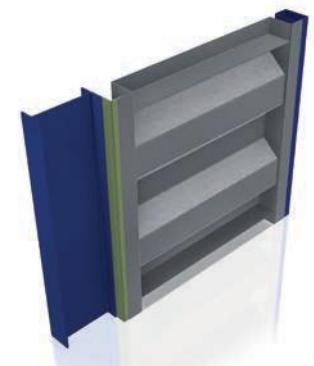


Overclad

Overclad systems provide suitable protection for structural steel, removing the need for the application of PFP, significantly lowering the cost of fire protection. Overclad systems are typically used in Living Quarters design.

Post & Panel

The post & panel application uses horizontally spanning walls, connected to vertical posts. This system is suited for blast instances where both a large span and large blast load are required typically in process areas.



Connections

Welded or bolted connections can be designed and provided for various fire and blast conditions, dependant on the loads involved.



BP Clair Ridge Overclad System

MTE designed, engineered, manufactured and supplied blast rated stainless steel for the LQ Overclad System on BP Clair Ridge's Development located 75km to the west of the Shetland Islands.



Maersk Al-Shaheen Traditional Build

MTE designed, engineered, manufactured and supplied the Deck to Deck System for Maersk's Al-Shaheen located off the north east coast of Qatar.

Weight Saving and Optimised Solutions

For many years MTE have highlighted the benefits of their prefabricated fire and blast wall system.

In addition to the support offered via design, engineering and site installation, the MTE solution offers:

- Industry-leading weight savings
- Integrated penetration frames, including doors and removable panels
- No need for PFP to wall areas
- Minimal OPEX costs

MTE have selected a range of worldwide projects in harsh environments to act as case studies. The table below clearly highlights the significant weight saving benefits offered by the MTE prefabricated fire and blast wall system compared to the traditional flat plate (FP) system.

The project examples highlighted have either been fully designed and installed. Prefabricated walls in stainless steel require little or no maintenance during the design life of the platform.

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%

MTE offer design calculations to prove validity of fire and blast solutions, as well as structural calculation to prove the integrity of the design for any known environmental factors.

Our design consultancy – and the computer based tools and systems crafted from more than four decades of design experience and knowledge – means we can solve the most complex thermal, mechanical and structural challenges with the very best in accurate calculations.

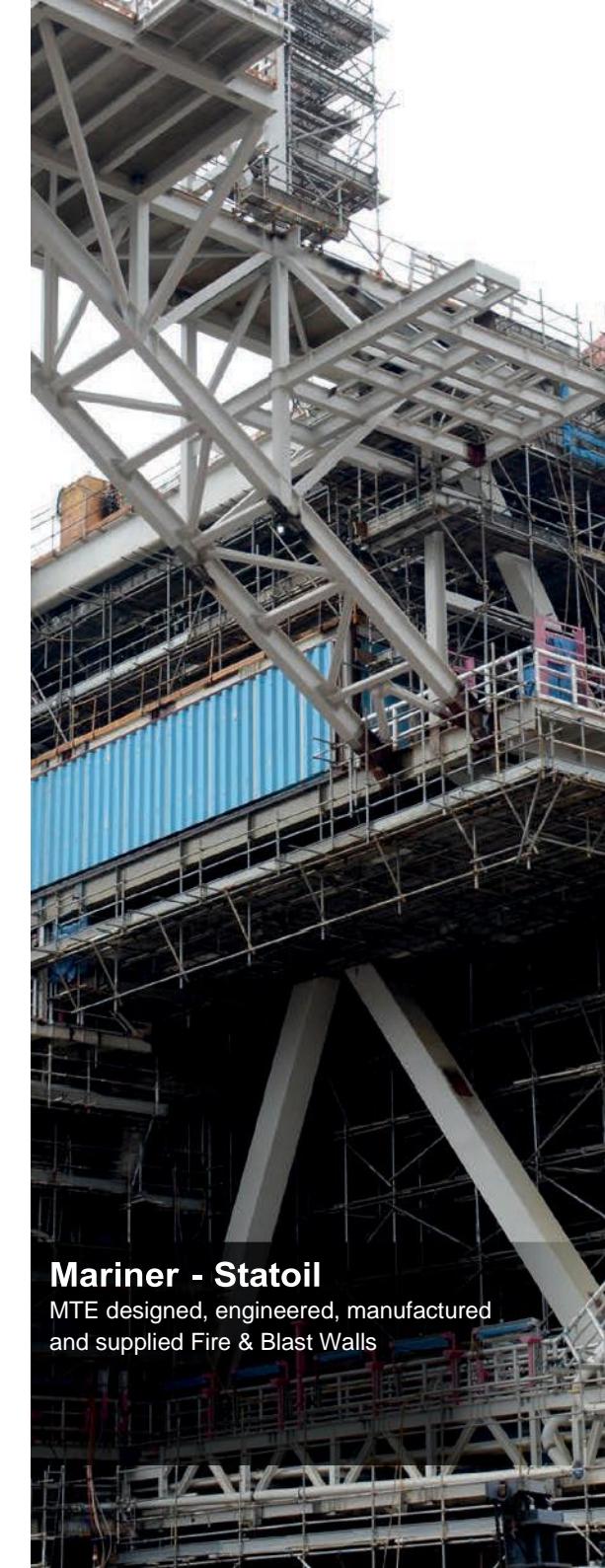
Our extensive industry knowledge is underpinned by experienced, practical testing including several jet fire tests and more than 100 full scale fire and blast tests. Providing a complete end to end solution, MTE's design consultancy delivers

specialist support as a stand-alone service or as part of a full turnkey project alongside all Fire and Blast and Modular solutions.

With all products certified by Lloyds or DNV, the involvement of MTE's Design Consultancy team at design evaluation, feasibility study, FEED and design for manufacturing stages will guarantee optimisation of engineering alternatives whilst, importantly, combining significant weight and cost saving benefits.

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	

Weight and cost saving, fully certified fire and blast systems.



Mariner - Statoil

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

Material and Construction

High performance carbon or stainless steel construction providing a durable, economic, corrosion resistant and lightweight solution.

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**



BP Clair Ridge Overclad System

MTE designed, engineered, manufactured and supplied blast rated stainless steel for the LQ Overclad System on BP Clair Ridge's Development located 75km to the west of the Shetland Islands.

Mariner – Statoil

MTE designed, engineered manufactured and supplied blast walls, fire walls for the project based in offshore UK North Sea.



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

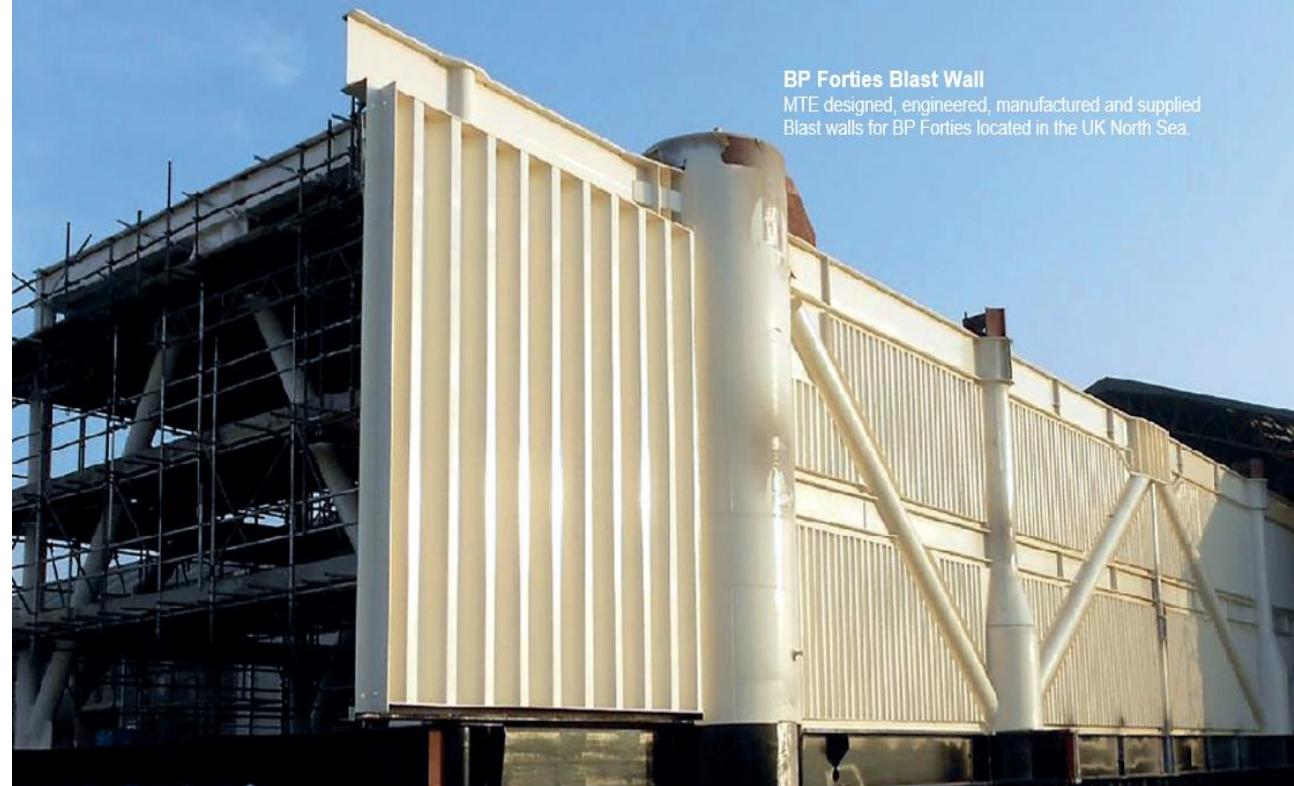
Typical Applications

Living Quarters

Production Process and Drilling Platforms

Renewable Substations

Floating Production & Off Loading Systems



A, H, J



To meet SOLAS regulations



Up to 7 barg



Fully welded systems



To meet client requirements



Optimised design



Capex/Opex efficient



Vattenfall Thanet substation

Located in Kent UK, MTE designed, engineered, manufactured and supplied fire walls, blast walls, louvres and doors.

Typical Penetration

Structural
Removable Panels
Doors
Windows
HVAC
Electrical
Piping

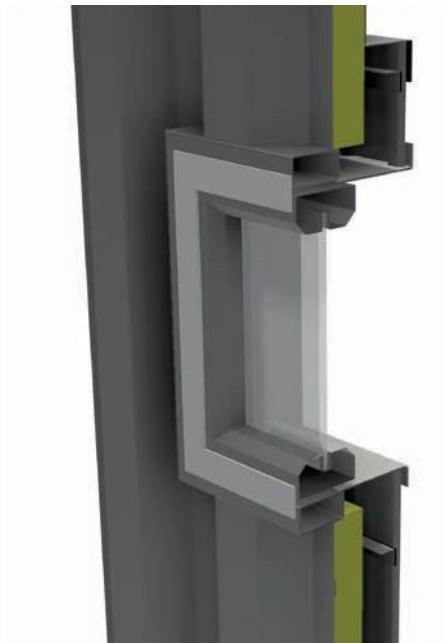
MTE penetration frames can be used for numerous applications and can be supplied as either a pre-installed system or as an onsite installed penetration kit. It is advised that the client avoid penetrations in blast rated walls wherever possible. MTE can supply all windows and doors working in conjunction with our approved global partners.



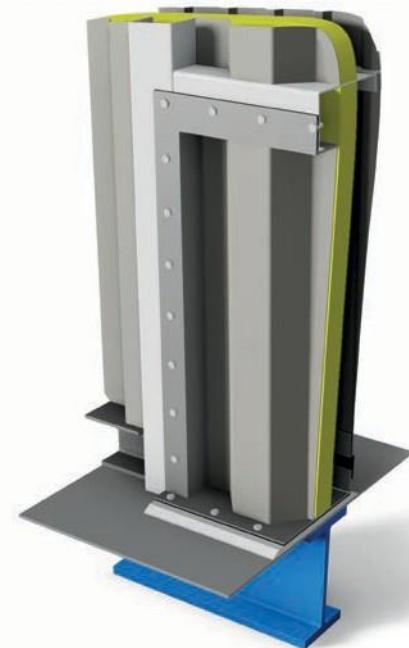
Door



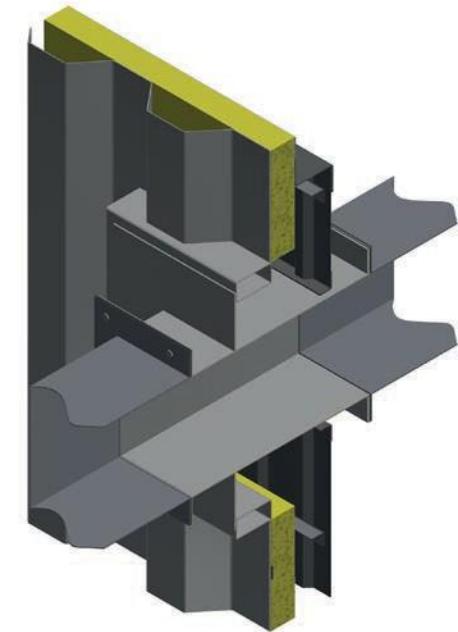
Structural



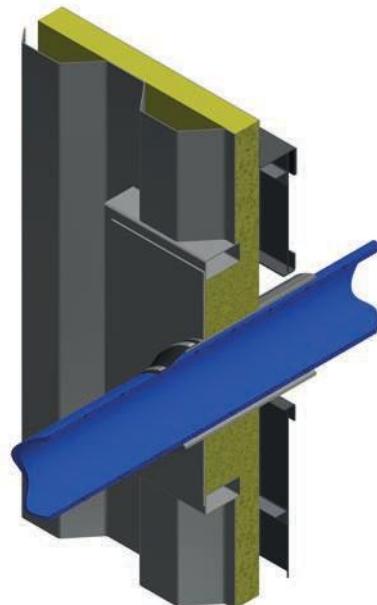
Window



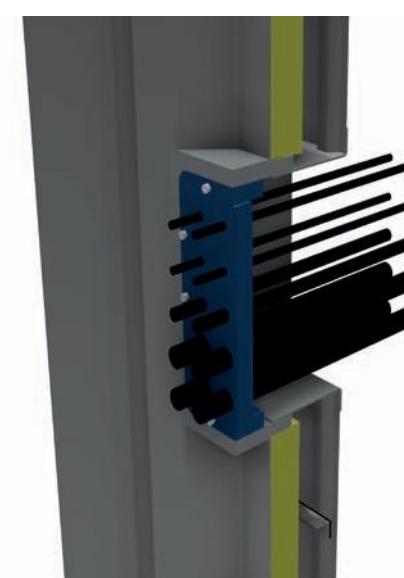
Removable Panel



HVAC



Pipe



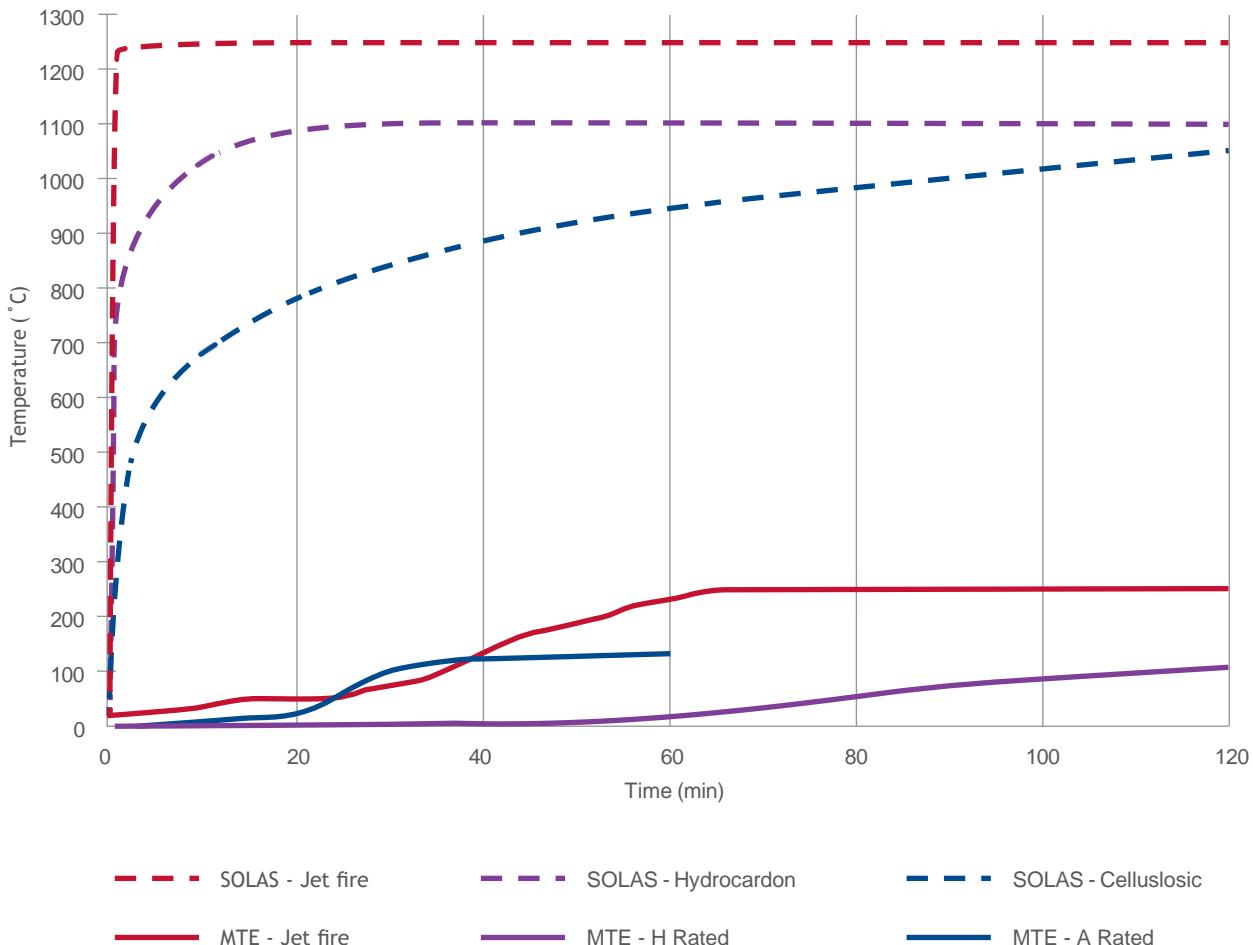
Electrical

Performance Criteria

Fire & Blast Walls have been fully tested for response to cellulosic (A), hydrocarbon (H) and jet fires (J).

MTE fire rated systems were tested against the SOLAS approved fire curves as stated within BS 476 - Fire Tests on Building Materials and Structures.

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





Gaz De France - Cygnus

Located offshore UK, MTE designed, engineered, manufactured and supplied fire walls, blast walls, heat shields.

Testing and Certification

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

Benefits of a MTE Fire & Blast Wall System





HIGH INTEGRITY



CUSTOM PRE-ENGINEERED DESIGN



LIGHT WEIGHT & RIGID OPTIONS



COST OPTIMISATION



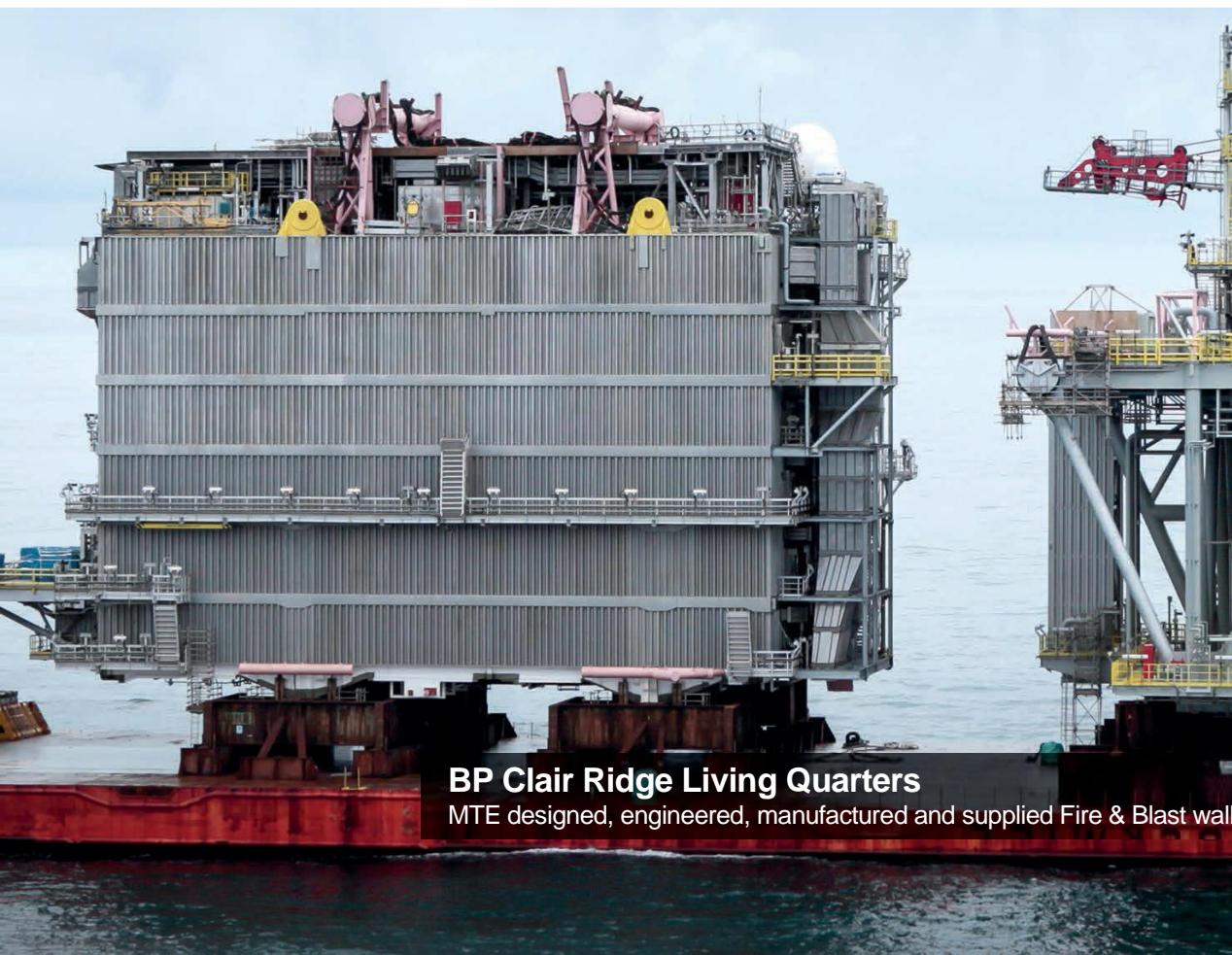
MAINTENANCE FREE STAINLESS STEEL SYSTEM



SIMPLE & QUICK TO INSTALL



50+
YEARS
KNOWLEDGE AND EXPERTISE



BP Clair Ridge Living Quarters

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

50 years knowledge
and expertise as the
global leader in the
design and build of
high performance
Fire and Blast
Protection Systems.



Proven Experience

Proven protection tailored to different high hazard industries worldwide backed by an end to end service: design, fabrication, project management, testing, supply and certification.

<https://mechtool.co.uk/news/>



Design Consultancy

Fire & Blast Solutions

Modular S

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