ENGINEERED FIRE PROTECTION

THERMAL LIMITEC

A GARDYON COMPANY

Project & Contract Management | Engineering Services | Licensed Manufacturer

Engineered Thermal Protection Solutions & Technologies

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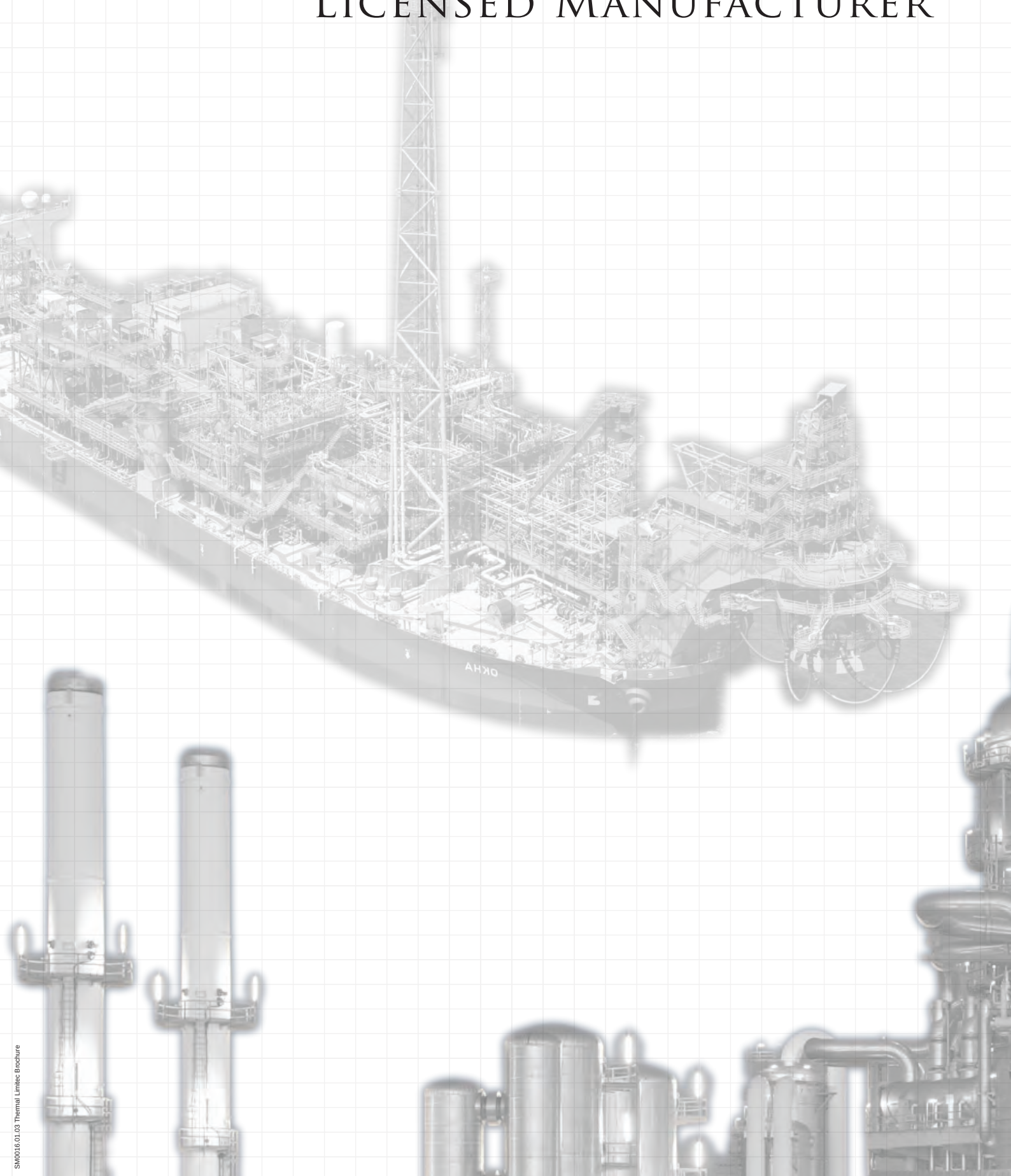
# Project & Contract Management
# Engineering Services
# Licensed Manufacturer



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# Ensuring Safety

## Ensuring Peace of Mind

"Thermal Limitec is a trusted specialist turnkey engineering contractor in the Oil & Gas industry, renowned for its technical ability and reliability. Attention to detail and delivering beyond expectations is essential in every project we set forth upon as we strive to always provide World Class Service and World Class Products."

David M. Thomas
CEO & Managing Director

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Thermal Limitec inherited its values almost 50 years ago as part of one of the oldest and most respectable contracting businesses in Singapore and the Region, servicing the Marine industry in the field of Thermal Insulation and Refractory Linings.

Within a short period of time, services were extended to the Petroleum industry and various plants in the industrial and manufacturing sectors. Thermal Limitec's ranges of services were also expanded into being a Specialist Contractor in the field of Thermal Insulation, Refractory Linings, Fire Protection, and Asbestos Removal & Abatement, Acid/Proof/Chemical Resistant applications for the Oil & Gas, Petrochemical, and Marine & Offshore industries.

Continuously transforming itself, Thermal Limitec has transitioned from an essentially fire and insulation manufacturer and installation company, to a major worldwide engineering company reputed for its capabilities that include first principle engineering, CAD and graphic document production, manufacture, installation and project & contract management.

Today, Thermal Limitec, a subsidiary of the Gardyon Group, is a recognised global leader in Engineered Thermal Protection Solutions & Technologies, continuously striving to provide innovative and quality tested & certified fire protection systems and services to the Offshore, Refining and Petrochemical industries on a worldwide basis.

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# Ensuring Quality

## Our Technological Expertise

Thermal Limitec is reputed for its core capabilities that include Project & Contract Management, Engineering Services and Licensed Manufacturing, which offer our clients and partners a comprehensive execution plan from inception to commercialisation.

### PROJECT & CONTRACT MANAGEMENT

Our extensive technical knowledge and experience in Project and Contract Management have resulted in a successful and expanding customer base, which already includes oil and gas majors such as BG, BP, ConocoPhillips, ExxonMobil, Petrobras, Pemex, Shell and, Total, and operators of offshore installations such as SBM.

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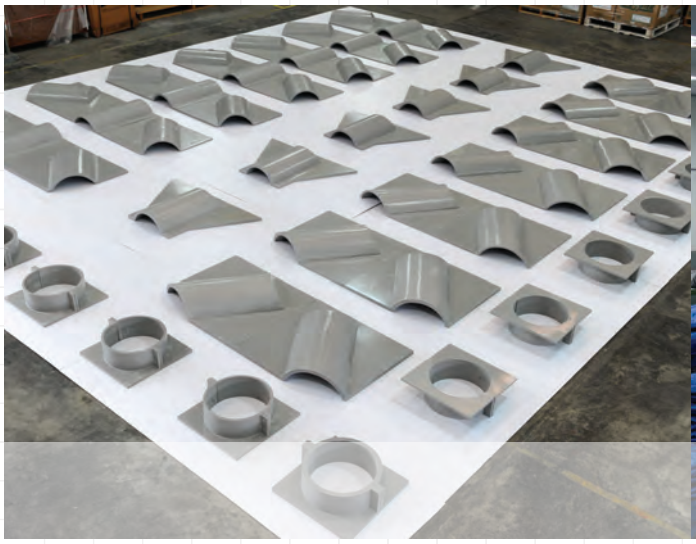
## ENGINEERING SERVICES

We strive to provide our customers with world class engineering services and innovative solutions where the circumstances require more than just the standard industry solution. This is made possible through our Product & Engineering Division (P&ED) which is an in-house engineering resource that supports both distribution and construction activities.

The P&ED team comprises talented and experienced individuals from diverse engineering backgrounds, many of whom are distinguished individuals in their respective fields. From inception to commercialisation, Thermal Limitec combines its innovative engineering services and experience to provide cost-effective solutions.



## LICENSED MANUFACTURER

As a Licensed Manufacturer for Gardyon, Thermal Limitec brings together the manufacturing technology, assets, experience and scale necessary to successfully compete in the fire protection business, which is a fast growing market segment. We also work closely with various internationally recognised partners to provide engineered fire protection systems, which systems are currently certified for Hydrocarbon Fire 120 mins & Jet Fire 180 mins.

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# Ensuring Service

## Our Technical Ability & Reliability

As a trusted specialist turnkey engineering contractor in the Oil & Gas industry, the different components of Thermal Limitec's technological expertise complement each other in proving the Company's world renowned technical ability and reliability.

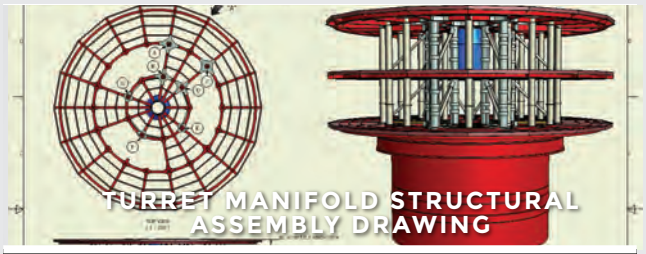
Thermal Limitec combines its Project & Contract Management knowledge and experience with its innovative Engineering Services to provide cost effective Engineered Thermal Protection Solutions & Technologies. This has resulted in the development of engineered jet fire protection systems for onshore & offshore installations such as bulkheads & underdecks, cable trays & enclosures, fire divisions, pipes, equipment & fittings, structural steel members, valves & actuators, and vessels. These systems are certified with fire ratings from A60 to H120 and Jet Fire, and as a Licensed Manufacturer for the Gardyon Group, Thermal Limitec is able to manufacture and supply these systems to our international clients and partners.

INTERNAL SUPPORTING FRAMEWORK DESIGN

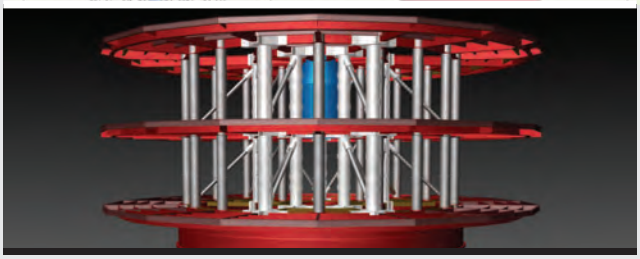
DESIGN OF FIRE PROTECTION SPECIAL SHAPES FOR STRUCTURAL CONNECTIONS

### DESIGN CAPABILITIES

Thermal Limitec's engineering and design has access to literally hundreds of formulations and applications for applying solutions to problems, many of these systems are fully tested and certified by internationally recognised institutions. Equipped with these capabilities and resources, our team is able to design and engineer fire protection solutions that meet the customer's design criteria of any fire protection and/or insulation problem.



TURRET MANIFOLD STRUCTURAL ASSEMBLY DRAWING



### COMPUTER MODELLING

Thermal Limitec's computer modelling techniques incorporate comparative fire tests of a variety of protective materials in our computer modelling techniques. This programme is based on material data, with corroboration by full scale fire testing. This modelling has been accepted by insurance underwriters and other groups as an acceptable substitute for fire testing under specific applications.

## STANDARDS COMPLIANCE

Supported by our parent company, Gardyon, Thermal Limitec has a unique and in-depth knowledge of the driving forces behind the use and application of fire protection systems. We understand the need to innovate and develop safer and more efficient solutions and hence, work closely with customers in the development and application of protection criteria, and also provide technical expertise focused on applying standards to site conditions and applications.

## RISK & FIRE HAZARD SURVEYS

Thermal Limitec staff is available for onsite field analysis where our analytical methods provide careful consideration of objectives and expectations for fire protection materials.

## LOGISTIC MANAGEMENT

Thermal Limitec specifies and provides materials to the fire protection market. Our development teams work to offer innovative and effective services where materials are unavailable to solve specific problems.

## TURNKEY INSTALLATION PROJECTS

Thermal Limitec provides a full service programme of engineering, design, manufacture, and installation of its systems and products. Our staff works with local contractors of our customer's staff, providing onsite training for field applications and installation details.

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www.charcast7.com

Charcast® 7

Engineered by GARDYON

# ENSURING PERFORMANCE

## Our Innovative Technologies & Solutions

## Charcast®7 Engineered Jet Fire Panel System

A Fire Protection System Designed, Tested, & Certified: Jet Fire | Rapid Rise Hydrocarbon | Cellulosic | Weatherability

Charcast®7 panels are engineered, designed and manufactured by Gardyon. In a global agreement with International Paint LLC, Gardyon is the exclusive manufacturer of Charcast®7.

Charcast®7 is specifically designed for maximum thermal performance, light-weight and rapid 'dry-fit' installation. This engineered panelled (or pre-cast epoxy intumescent) material gives an alternative solution in areas where conventional spray or trowel fire protection application methods are not feasible or desirable.

This unique fire protection system can be installed quickly and simply over what is already there - bulkheads, underdecks, and structural members.

Charcast®7 has undergone an extensive fire test programme including jet fire testing up to 4 hours in accordance, with what is now the industry de facto standard, namely, ISO 22899. Certification from Lloyd's Register is now in place, as well as ABS approval.

## FEATURES & BENEFITS

- Versatility – Applicable to onshore and offshore facilities
- State of the art technology – Specifically designed for maximum thermal performance, light-weight and rapid 'dry-fit' installation
- Extensive testing includes:
  - Jet fire ISO 22899
  - UL 1709
  - IMO Resolution A.753(18) (Plastic Pipe Protection – level 1)
    - IMO Resolution MSC.307(88)-HC Time Temperature, BS 476 and ISO 834
  - NFPA 58 (hose stream)
  - Lloyd's Register certification issued
- Research & development – Unique offering of engineering & design for individual applications
- Efficient to install – Panel system provides fire protection in "ready-made" form with faster & less onerous installation, eliminating the need for grit blasting, priming, and liquid-applied materials which require restrictive worksite conditions and expertise
- Can be installed quickly and simply over what is already there - bulkheads, underdecks, and structural members, and can be done in virtually any climate & weather condition, day or night
- Allowance for future inspection & maintenance
- High durability & weatherability – Proven field functionality with decades of use in harsh offshore environments
- Long term reliability & environmentally suitable
- Installation & operational life cycle value added

## APPLICATIONS

DIVISIONS

- Walls
- Bulkheads
- Decks
- Deckheads

STRUCTURAL STEEL SECTIONS

- Columns
- Beams
- Girders
- Sections: "I", "H" and Hollows & Tubulars

EQUIPMENT & FITTINGS

- Vessels
- Valves
- Actuators
- Cable trays
- Flanges
- Pipings
- GRE Spools

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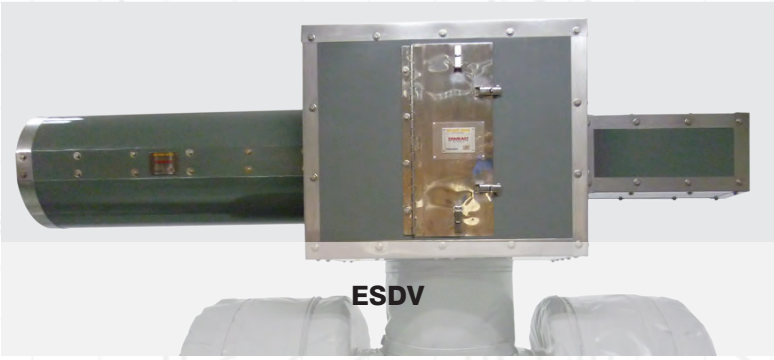
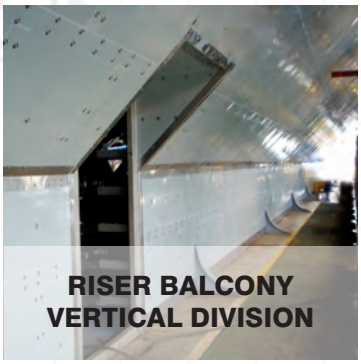
# SOLUTION HIGHLIGHTS

FULLY TESTED & CERTIFIED TO JET FIRE ISO 22899



ESDV

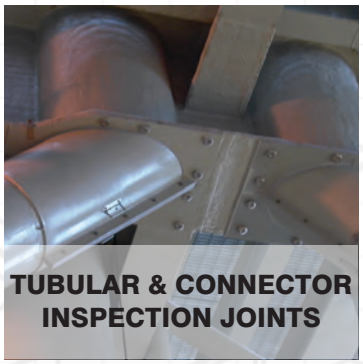


RISER BALCONY VERTICAL DIVISION

STRUCTURAL NODE CONNECTION

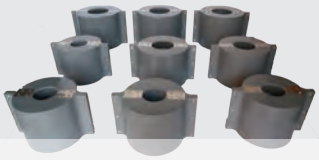
INSTALLATION OF ACCOMMODATION MODULES & BLOCKS

PROTECTION OF PLASTIC PIPE

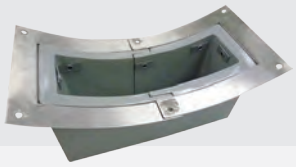


TUBULAR & CONNECTOR INSPECTION JOINTS

VESSEL SADDLE SUPPORT

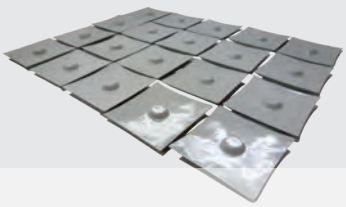


FLANGES



SPECIAL SHAPES

SPECIAL SHAPES



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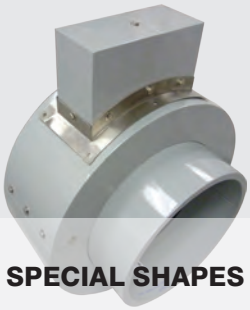

SPECIAL SHAPES

SPECIAL SHAPES

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www.iso-jf180.com

GARDYON FLEXIBLE

ISO JF180
Jet Fire Jacket System

Engineered by GARDYON

# ENSURING PERFORMANCE

## Our Innovative Technologies & Solutions

## ISO-JF180 Engineered Jet Fire Flexible Jacket System

A Fire Protection System Designed, Tested, & Certified: Jet Fire | Rapid Rise Hydrocarbon | Cellulosic | Weatherability

The Gardyon ISO-JF180 Jet Fire Jacket System is a premier fire protection solution that is manufactured using a combination of quality materials, reinforced with a fine gauge stainless steel mesh which ensures a highly flexible and adaptable system. This flexibility enables efficient installation in areas where access is difficult or where the shapes of the protected item make conventional systems impossible to install. It is also designed for ease of handling and is totally demountable and reusable. The system can withstand the harsh environmental conditions experienced by offshore installations located in any part of the world.

In addition, the stainless mesh system ensures that the day to day knocks are absorbed without detriment to the integrity of the system's mechanical strength.

The Gardyon ISO-JF180 Jet Fire Jacket System can be designed to withstand any fire scenario envisaged by the safety case or demeaned required by a regulatory authority because the jacket system has been tested to the most onerous of fire test standards, namely, ISO Jet Fire test standard 22899 and certified by Lloyd's Register.

## FEATURES & BENEFITS

- Uses a combination of quality materials, reinforced with a fine gauge stainless steel mesh to ensure flexibility and adaptability
- Meets strict fire resistance standards:
  - Can be designed to withstand any fire scenario
  - Meets requirements of regulatory authorities
  - Certified by Lloyd's Register to:
    - Jet Fire ISO 22899
    - Pool Fire UL 1709

    } for up to 3 hours
  - Blast Pressure 2.5 Bar
- Ability to withstand harsh environmental conditions
- Mechanically durable – Durable design and high mechanical strength withstands day-to-day knocks and handling
- Design enables efficient installation - Simple to install, easy disassembly & re-assembly
- Accommodates difficult to access locations
- Accommodates irregular shapes where traditional systems are not suitable
- Tailor made with full technical support
- Track record
- Specific design to the fire type, duration, limiting unexposed temperature
- Inspection hatches, etc can be incorporated

## APPLICATIONS

- Piping – services, risers, hydrants etc.
- Flanged joints
- Valves & actuators
- Junction boxes & control cabinets
- Structural steelwork
- Cable trays
- Conduits
- Riser balconies
- Pipe supports
- Vessels & tanks
- Manways
- Inspection hatches

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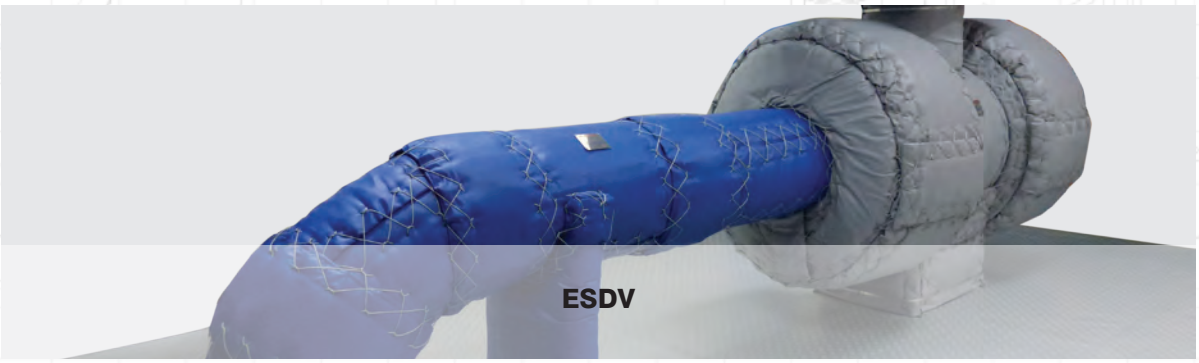
# SOLUTION HIGHLIGHTS

CERTIFIED TO JET FIRE ISO 22899

GARDYON MANUFACTURING FACILITIES



ESDV

STRUCTURAL SUPPORTS

STRUCTURAL SUPPORTS

STRUCTURAL SUPPORTS

PIPE SUPPORTS

RISERS

STRUCTURAL STEEL

VALVES & PIPEWORK

FIRE WATER SYSTEMS

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# Ensuring Trust

## Our Global Operations

DEEP PANUKE (PFC) OFFSHORE GAS DEVELOPMENT PROJECT (CANADA)


BP PASCAGOULA (USA)


FPSO ASENG (EQUATORIAL GUINEA)

FPSO CIDADE DE ANCHIETA (OFFSHORE BRAZIL)

FPSO CIDADE DE PARATY (OFFSHORE BRAZIL)


FPSO ESPIRITO SANTO (OFFSHORE BRAZIL)

PETROBRAS FPSO CIDADE DE SAO MATEUS (OFFSHORE BRAZIL)


CHEVRON FPSO FRADE (OFFSHORE BRAZIL)

PETROBRAS P-57 PROJECT (OFFSHORE BRAZIL)

FPSO CIDADE DE ILHABELA (OFFSHORE BRAZIL)

SHELL E.A. DEVELOPMENT PROJECT (E.A. FIELD, OFFSHORE NIGERIA)

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ENGINEERED FIRE PROTECTION
THERMAL LIMITEC
A GARDYON COMPANY

FPSO QUAD 204
(OFFSHORE UNITED KINGDOM)

BP SKARV DEVELOPMENT PROJECT
(OFFSHORE NORWAY)

ESSO FPSO ERHA
(OFFSHORE NIGERIA)

BALAL FIELD DEVELOPMENT PROJECT
(OFFSHORE IRAN)

BOHAI PHASE 2 DEVELOPMENT PROJECT
(OFFSHORE CHINA)

BRITISH GAS TAPTI PLATFORM
(INDIA)

ENGINEERED FIRE PROTECTION
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SINGAPORE

EXXONMOBIL FPSO FALCON
(OFFSHORE NIGERIA)

MALAMPAYA FIELD DEVELOPMENT
(OFFSHORE PHILIPPNES)

TOTAL FPSO GIRASSOL
(OFFSHORE ANGOLA)

TOTAL FPSO N'KOSSA
(CONGO)

WOODSIDE CWLH REDEVELOPMENT FPSO OKHA
(AUSTRALIA)

Legends: Thermal Limitec Office | Gardyon Offices | Project Achievements

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