

Advanced solutions
for chemical process
industries

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Morgan Advanced Materials makes critical components for tough assignments in the global petrochemical industry.

The oil and gas industry present some of the world's harshest operational environments for equipment and people. Our materials and products are routinely chosen to fulfill critical applications on and offshore in exploration, drilling and downstream processing.

It is the resistance of our materials to chemical and physical wear, corrosion and extreme heat that makes them ideally suited for use in these severe-duty applications. We use them to engineer furnace lining systems, hard-wearing parts for pumps, drilling machinery, specialist fluids handling equipment and complete fire protection systems.

The integrity of the systems we manufacture is often fundamental to the safety and efficiency of high-value hydrocarbon extraction and processing operations. For example, our precision machining of silicon carbide composite mechanical seals dramatically reduces interface leakage in demanding conditions, allowing operators to work at elevated contact pressures.


Our high temperature insulating fibre for furnaces and ducts provide excellent resistance to demanding atmospheres and mechanical stresses to extend furnace life and improve energy efficiency.



Typical applications:

- Ammonia Reformers
- Ethylene Furnaces
- Fire Protection
- Fired Heaters
- Fluid Catalytic Cracking Units
- Furnaces
- Mineral Insulated Cables
- Process Heaters
- Engineered Insulation Solutions





We offer a range of products and systems for fire protection of process equipment in chemical processing and oil and gas production facilities both onshore and offshore

Hydrocarbon processing industries

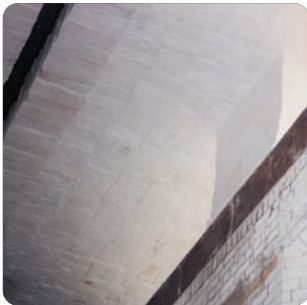
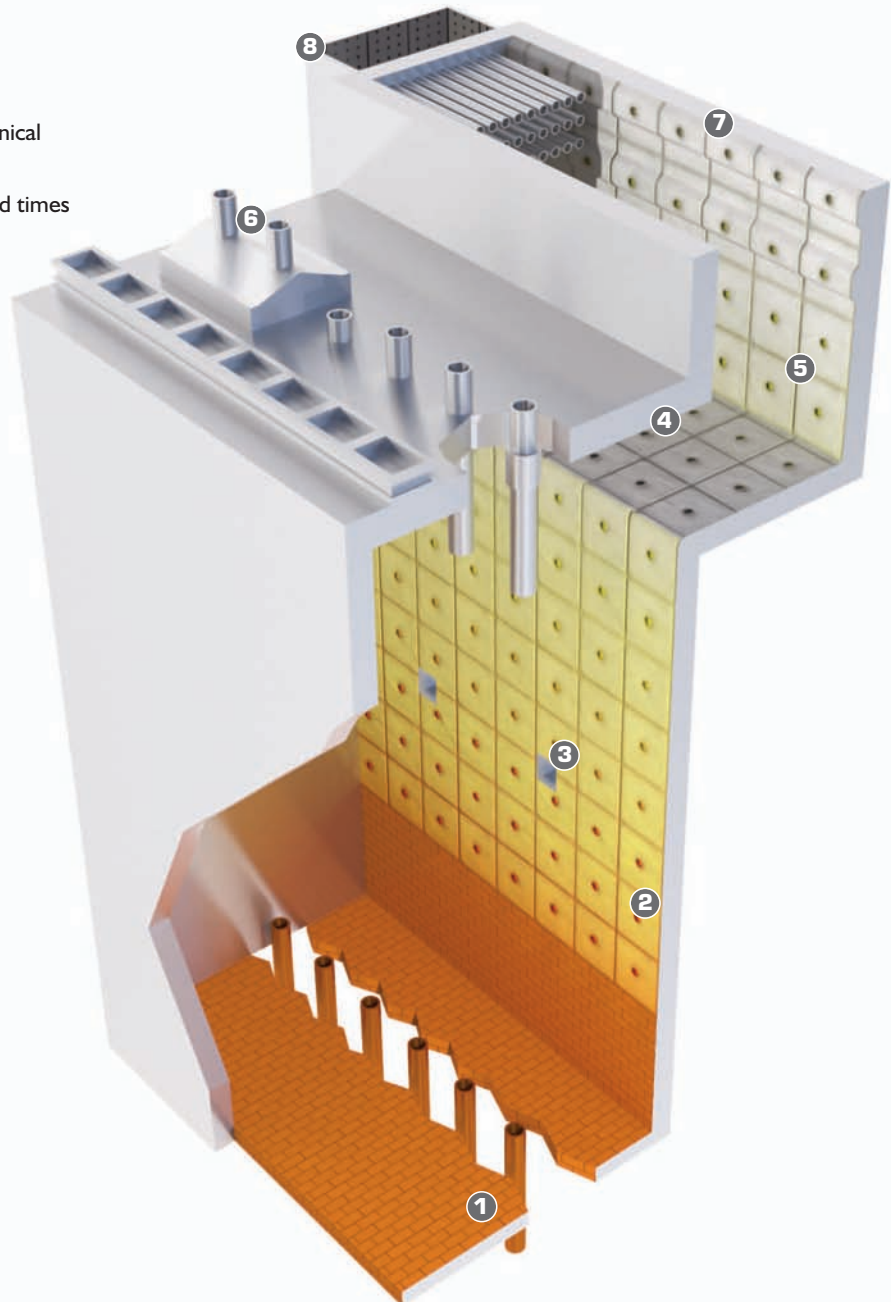
Thermal Ceramics has provided innovative, engineered solutions for reducing energy usage and maintenance costs for more than 75 years.

With manufacturing sites and sales/marketing offices in more than 30 countries, we are uniquely positioned to supply the global petrochemical market with the optimal system of refractory and insulation products for the job, anywhere around the world. Thermal Ceramics can also provide the necessary engineering support to go with our world-class products to fill customer needs in all kinds of petrochemical projects, from hot spot repairs to major turnarounds and new unit constructions.

Whether the application is in fired heaters, sulfur recovery units, FCCU or boilers, we can supply the Hydrocarbon Processing industries with the worlds leading brands including: Superwool® insulating fibre products, Pyro-Bloc® fibre modules, Kaowool®, Cerablanket® and Cerachem® ceramic fibre bulk and blanket, K®, JM™ and TJM™ brand insulating firebrick, SR® and Moral® dense firebrick, Kaolite®, Firelite® and Tri-Mor® insulating castables, Kaocrete® Firecrete®, Tri-Mor, Kao-Tab®, Kao-Tuff® dense and special duty castables.

We offer the following features and benefits:

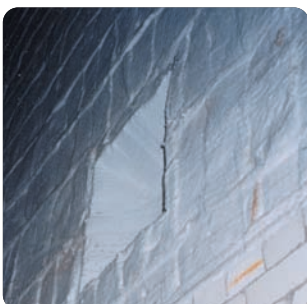
- Superior insulating value = Lower fuel costs
- Quick material installation = Shorter downtimes
- Excellent resistance to high temperatures and mechanical stresses = Extended service life
- Fast deliveries around the world = Shorter order lead times
- Responsive service = Satisfied customers worldwide



Radiant arch/
transition



Transition/
convection section



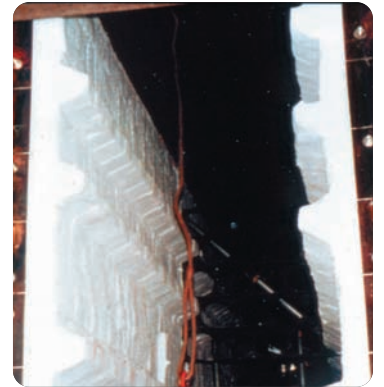
Pyro-Bloc
radiant wall

Fired heaters-process heaters, reformers, pyrolysis

The fired heater is the 'central processing unit' in many refineries and petrochemical plants. Thermal Ceramics offers a total package of insulation linings for use in fired heaters, from the floor to the walls to the convection section to the stack and any ductwork in between.

- Our conventional insulating materials - K, JM, TJM insulating firebrick and Kaowool, Cerablanket fibre layered constructions, are true worldwide industry standards with more than 30 years of service.
- High quality castable products such as Kaolite, Firelite, Tri-Mor insulating castables offer superior heat savings and long service life in heater floors, walls, convection sections, ductwork and stacks.
- Easy-to-install insulation designs like Pyro-Bloc and our folded module systems offer an unparalleled combination of thermal efficiency and quick installation.

Several other innovative products for fired heaters are also available from Thermal Ceramics like Pyro-Log® log insulation for easily applied floor insulation, high thermal efficiency microporous insulation in radiant walls and specially engineered Pyro-Bloc and vacuum formed shapes for burner blocks and peepsites.



Corbels - Pyro-Bloc module

1 Radiant Floor

- Dense Castables (Kaocrete, Firecrete)
- Insulating Castables (Kaolite, Firelite, Tri-Mor)
- Pyro-Log Floor System
- Superwool Blok, TR-19™ and TR-20™ Insulating Block
- K, JM and TJM Insulating Firebrick
- Microporous BTU-BLOCK and WDS

2 Radiant Walls

- Pyro-Bloc Module Systems (Pyro-Fold™, Unibloc, Pyro-Stack™, Z-Blok®)
- Fibre Layered Blanket Systems
- Kaowool Board/Blanket Systems
- K, JM and TJM Insulating Firebrick
- Superwool Blok, TR-19 and TR-20 Insulating Block
- Insulating Castables (Kaolite, Firelite, Tri-Mor)
- Microporous BTU-BLOCK and WDS

3 Burner Blocks/Peepsites

- Kaowool and Detrick™ Vacuum Formed Shapes
- Pyro-Bloc Module Systems
- Pre-Cast Shapes (Kaocrete, Firecrete, Kaolite, Firelite)
- K, JM and TJM Insulating Firebrick Shapes

4 Radiant Arch

- Pyro-Bloc Module Systems
- Kaowool Layered Blanket Systems
- Kaowool Board/Blanket Systems
- Insulating Castables (Kaolite, Firelite, Tri-Mor)
- K, JM and TJM Insulating Firebrick

5 Convection Section

- Superwool Blok, TR-19 and TR-20 Insulating Block
- Pyro-Bloc Module Systems
- Kaowool Layered Blanket Systems
- Insulating Castables (Kaolite, Firelite, Tri-Mor)
- K, JM and TJM Insulating Firebrick

6 Tubeseals

- Kaowool/Kao-Tex™ Engineered Systems

7 Corbels

- Pyro-Bloc Module Systems
- Insulating Castables (Kaolite, Firelite, Tri-Mor)
- K, JM and TJM Insulating Firebrick

8 Stack

- Pyro-Bloc Module Systems
- Dense Castables (Kaocrete, Firecrete)
- Insulating Castables (Kaolite, Firelite, Tri-Mor)



Pyro-Bloc module

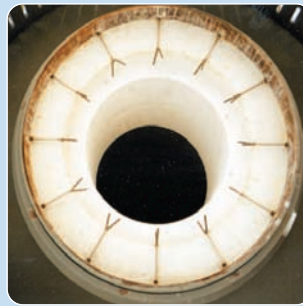
Secondary ammonia reformer

Hydrogen transfer lines and secondary ammonia reformers present very tough service conditions for refractory materials due to the high pressure, high hydrogen environments.

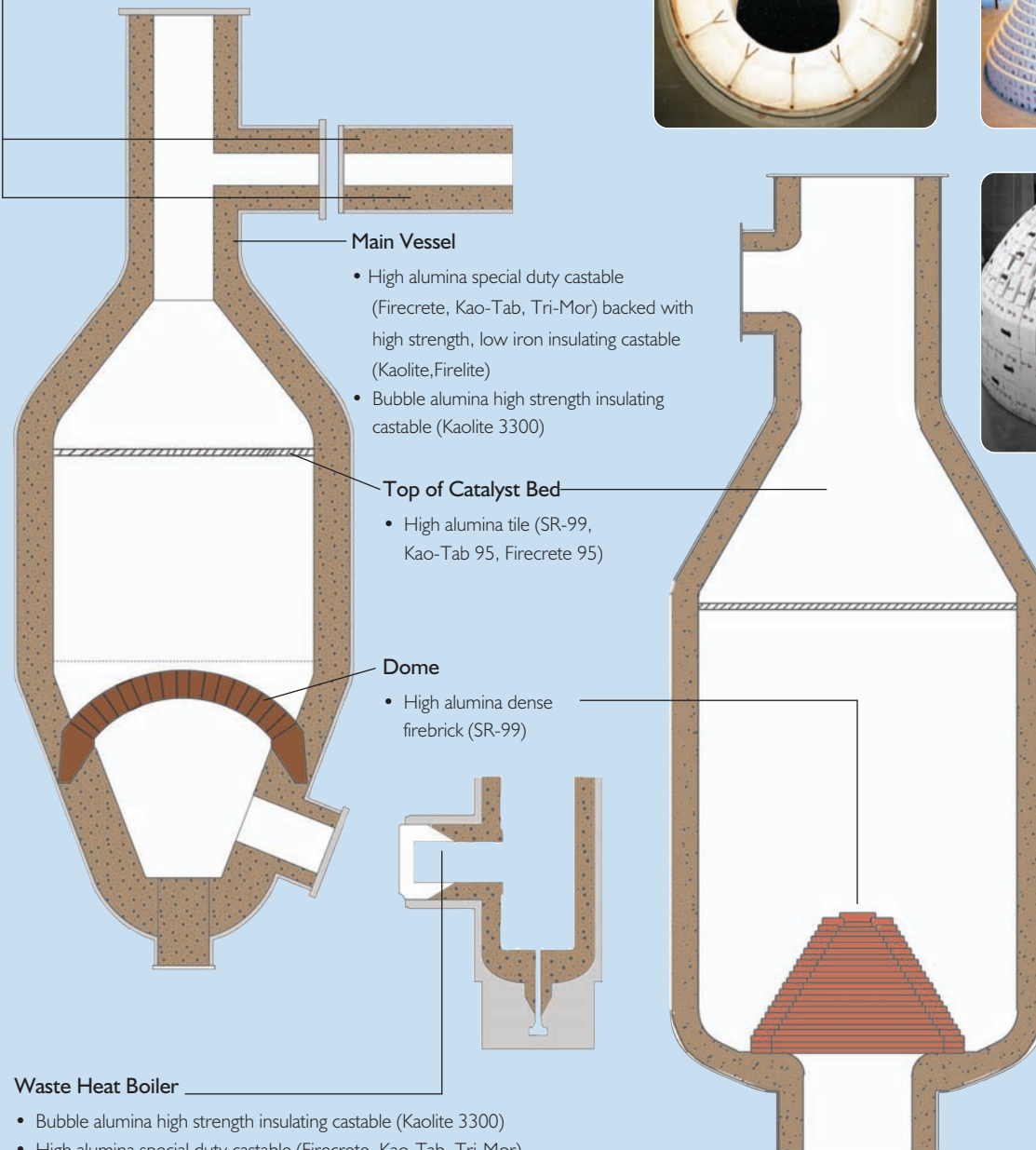
Thermal Ceramics has high purity/low silica hot face lining materials that are well suited for these harsh conditions including high alumina composition Kao-Tab 95, Firecrete 95, Tri-Mor 1800 special duty castables and Kaolite 3300 bubble alumina insulating castable. For backup insulation where very low iron products are necessary, Kaolite, Firelite castables are well suited to do the job. And in catalyst support domes and checkers, high alumina composition SR-99 brick offers ultra-high purity, excellent dimensional tolerances and fired strengths.

Transfer Lines

- High alumina special duty castable (Firecrete, Kao-Tab, Tri-Mor) backed with high strength, low iron insulating castable (Kaolite, Firelite)
- Bubble alumina high strength insulating castable (Kaolite 3300)



Inside views of transfer line

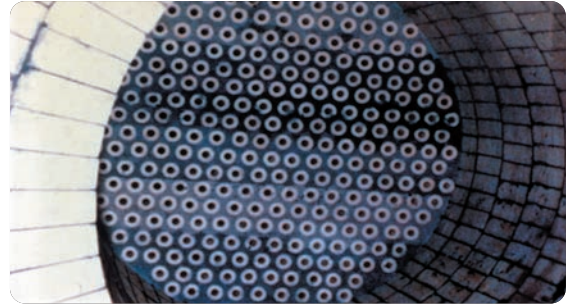


Sulphur recovery unit

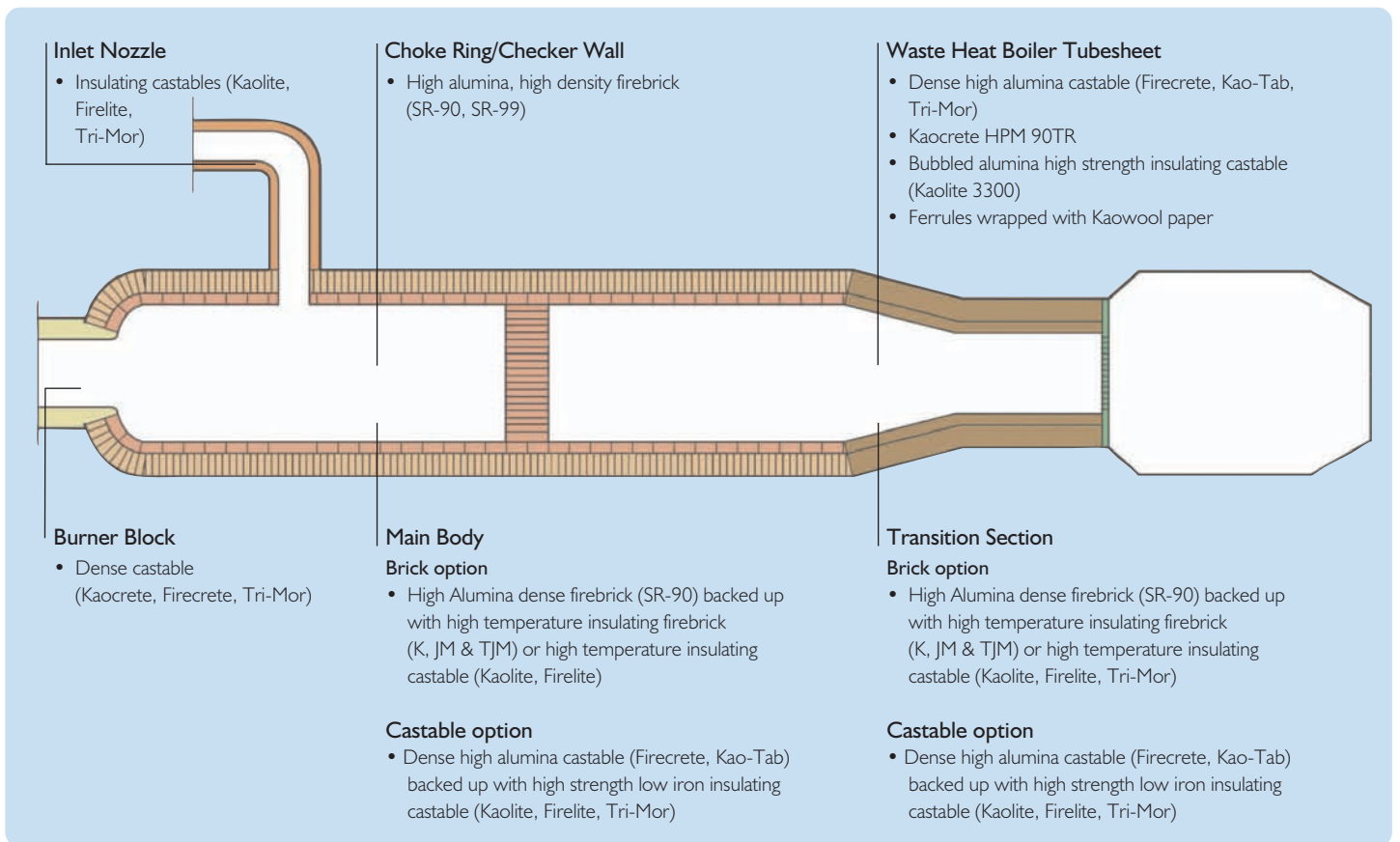
Sulphur recovery units (SRUs) operate under severe conditions of high temperatures and corrosive atmospheric conditions.

Thermal Ceramics offers products that have exhibited long service life in both standard fired and the more severe oxygenen rich SRU applications.

For hot face use, high alumina, high hot strength SR-90 and brick can do the job. For backup insulation, K, JM and TJM insulating firebrick present a good combination of structural strength and low thermal conductivity.



Sulphur recovery unit



Sulphur recovery unit - head



Tri-Mor Monolithics

Fluid catalytic cracking unit

A fluid catalytic cracking unit (FCCU) has many different operating parameters and thus refractory lining requirements vary throughout the entire unit.

High thermal efficiency Kaolite insulating castables from Thermal Ceramics are well proven for use in regenerators and reactors.

They are easy-to-install products whether by casting, pumping, traditional or wet gunning. Kao-Tuff 110, available in both cast and gun versions is ideal as a single component, semi-insulating refractory for applications in spent catalyst lines, regenerated catalyst and flue gas lines. It is a best of class product with an unparalleled combination of strength, abrasion resistance and insulating value.

Lastly, a unique lining for regenerator linings, Pyro-Bloc HS offers the heat savings and thermal shock resistance of fibre with the strength required in the application.



Hot spot repairs

Thermal Ceramics offers a complete line of pumpable repair products to eliminate hot spots in furnaces, vessels and boilers from deteriorated backup insulation.

These versatile products can be used while the unit is in-service or off, which provides high flexibility in planning the repair and can save significant money by not necessarily having to bring the unit off-line.

Kaofil® and Cer-Wool® Pumpables
Therm-O-Hot Patch™

- Ready to use premium mixture for hot or cold repairs
- Excellent insulating properties
- Continuous use limits up to 2400°F (1316°C)
- Therm-O-Hot Patch has unlimited shelf life
- Economical and highly insulating repair products



Kaowool pumpable being pumped to repair hot spot



Gunning application



Pumping application

Fluid catalytic cracking unit

Flue Gas Lines

Dual Component

- Special duty abrasion resistant castable (Kao-Tuff) backed with high strength insulating castable (Kaolite)

Single Component

- Special duty abrasion resistant insulating castable (Kao-Tuff I 10)

Regenerator

- High strength insulating castable (Kaolite)
- Pyro-Bloc HS

CO Boiler

- Special duty abrasion resistant insulating castable (Kao-Tuff I 10)
- Dense, low iron castable (Kaocrete, Firecrete, Tri-Mor) backed with high strength, low iron insulating castable (Kaolite, Firelite, Tri-Mor)

Seal Tanks

- Dense thermal shock resistant castable (Kaocrete, Firecrete)

Riser Line

External

- Special duty abrasion resistant castable (Kao-Tuff, Morflow)

Internal

- Kaocrete HPM 90TR

Reactor

- High strength insulating castable (Kaolite)
- Special duty abrasion resistant castable (Kao-Tuff I 10)

Cyclones

- Kaocrete HPM 90TR

Reacted Vapor Line

- High strength insulating castable (Kaolite)
- Special duty abrasion resistant insulating castable (Kao-Tuff I 10)
- Kaocrete HPM 90TR

Stripper

- Kaocrete HPM 90TR
- Special duty abrasion resistant insulating castable (Kao-Tuff I 10)

Air Ring

- Kaocrete HPM 90TR

Spent Catalyst Line

- Special duty abrasion resistant insulating castable (Kao-Tuff I 10)

Regenerated Catalyst Line

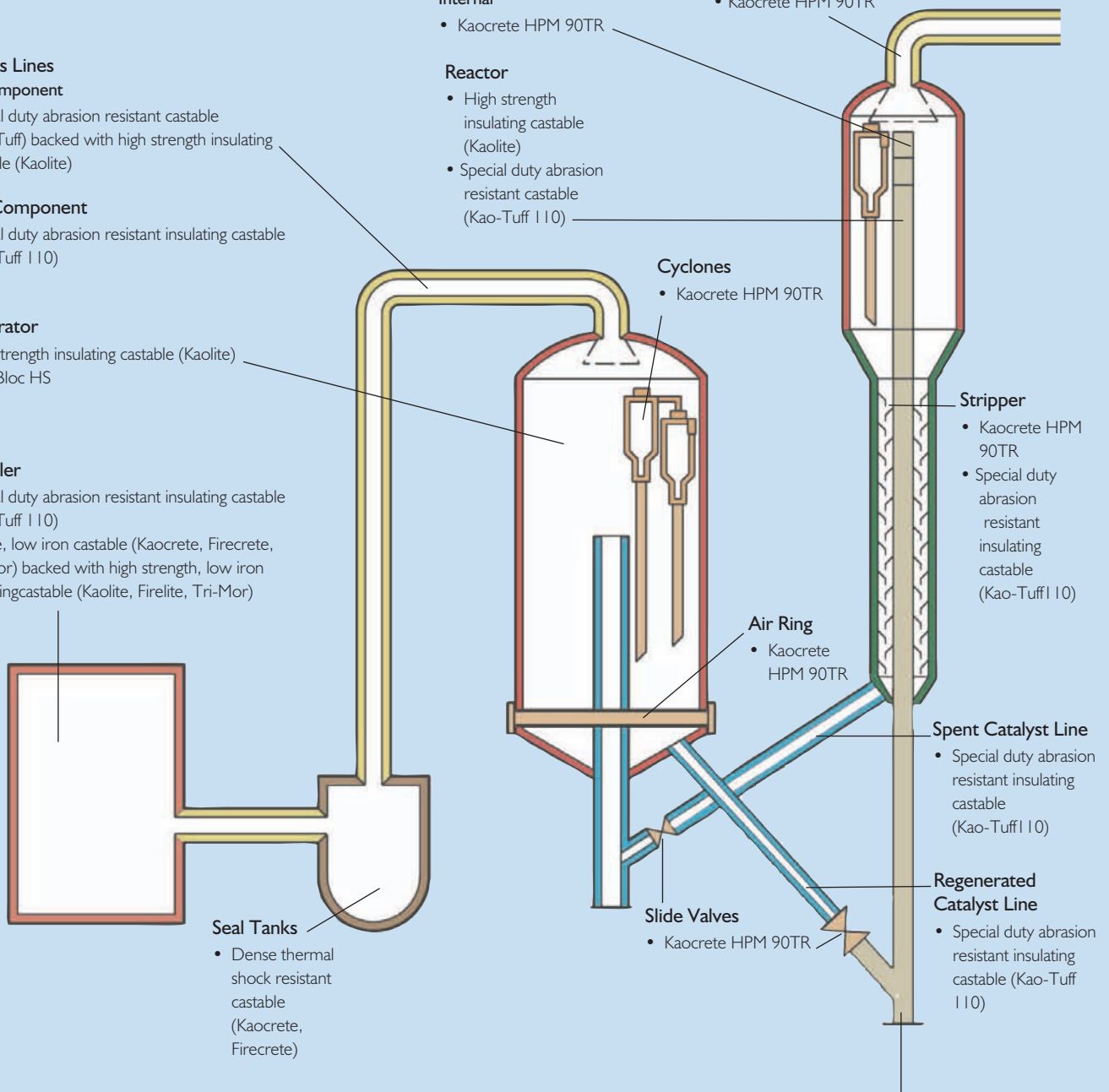
- Special duty abrasion resistant insulating castable (Kao-Tuff I 10)

Slide Valves

- Kaocrete HPM 90TR

"Y" Section

- Kaocrete HPM 90TR
- Special duty abrasion resistant castable (Kao-Tuff, Morflow)
- Kaowool ceramic fibre paper



Fire protection applications

Our Thermal Ceramics FireMaster® line of products are dedicated to the fire protection market.

These products were developed to meet industry needs for high quality, reliable, true fire protection materials. FireMaster systems provide fire protection for:

- Cable Trays
- Tanks and Vessels
- Pipework
- Structural Steel

The products used in these fire protection applications meet strict manufacturing tolerances and rigorous quality control inspections in order to ensure conformance and certification capability to national testing laboratory standards.

These procedures ensure that the outstanding fire performance properties of each FireMaster product are maintained for all life safety applications.

FireMaster blanket

- Lightweight, non-combustible, high-temperature fibre blanket
- Can be used as fireproof covering or pipe wrap
- Unaffected by oil or water

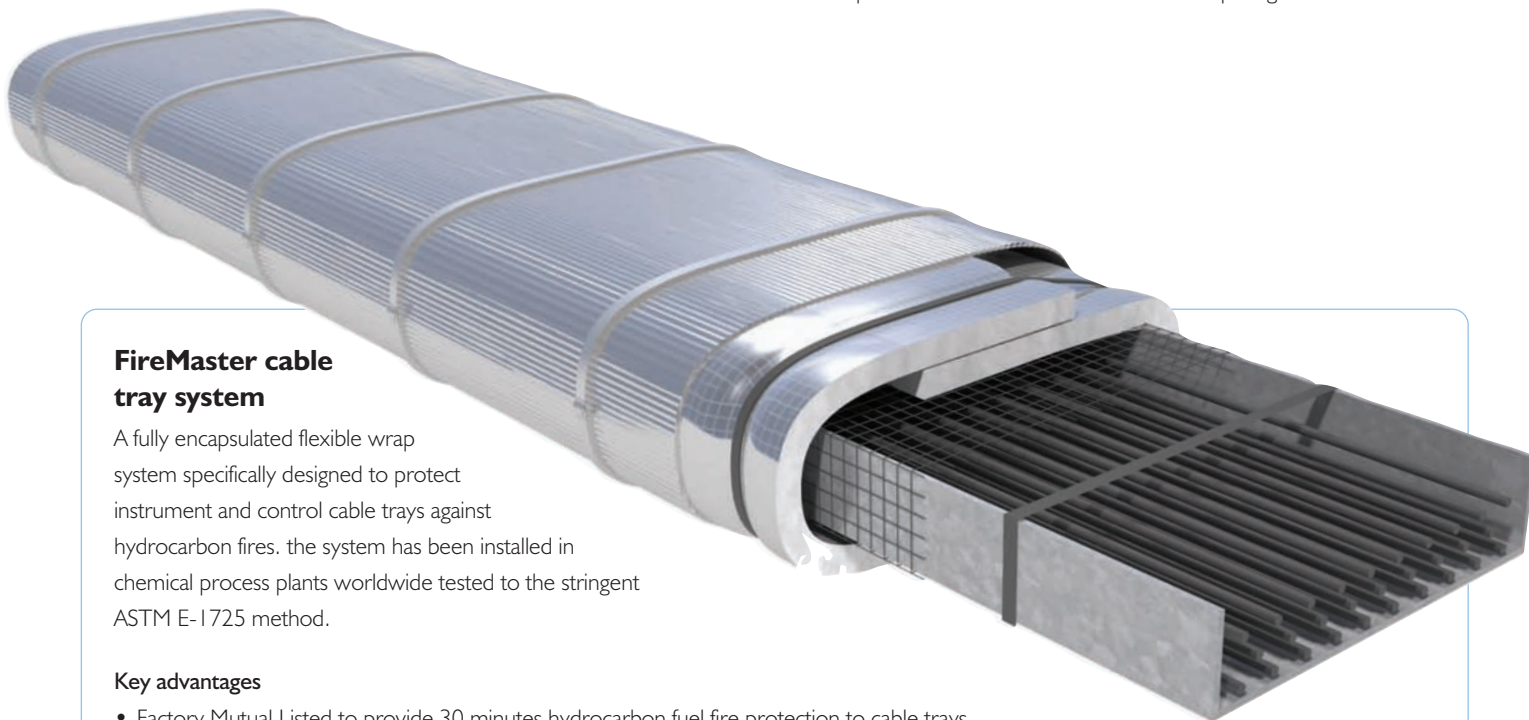


FireMaster encapsulated/faced blanket

- Reduces risk of physical damage
- Protects against weathering

FireBarrier® 135 and 110

- High strength, high temperature castable
- Offers superior resistance to thermal shock and spalling



FireMaster cable tray system

A fully encapsulated flexible wrap system specifically designed to protect instrument and control cable trays against hydrocarbon fires. The system has been installed in chemical process plants worldwide tested to the stringent ASTM E-1725 method.

Key advantages

- Factory Mutual Listed to provide 30 minutes hydrocarbon fuel fire protection to cable trays
- Can be installed in one single layer reducing installation time and can be easily removed if retrofitting of cables is required
- Minimal weight addition to overhead cable tray structures
- With the addition of cladding systems, can also provide weather protection

FireMaster Vessel system

FireMaster® Marine Plus blanket is applied to process vessels (flare drums, separator vessels etc) to ensure they retain structural integrity in hydrocarbon pool or impinging jet. The system uses a substrate of wire mesh fixed to the vessel, with strands of the mesh cut to form anchor pins over which the FireMaster® blanket is impaled. The mesh is fixed to the vessel by twisting adjacent sheets together, an important feature as welded fixings are not allowed.

Key advantages

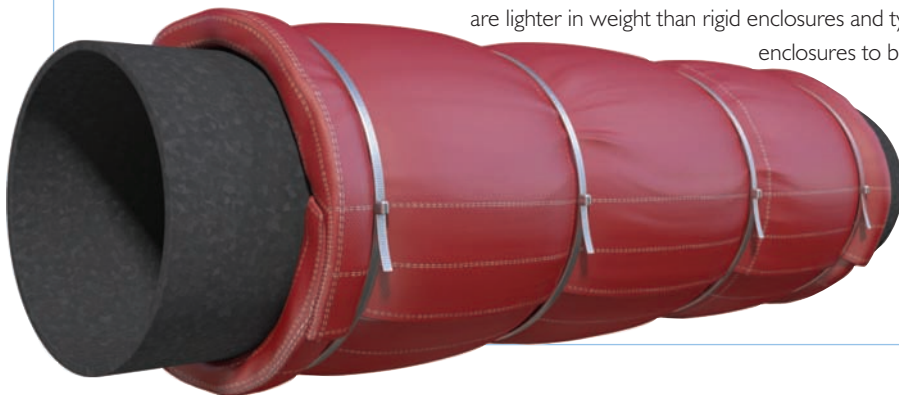
- Process vessel protection against hydrocarbon or jet fires
- Non welded fixing system protection



Above ground storage tank

FireMaster JetWrap

The FireMaster® FlexiJet system is a flexible jacket system comprising FireMaster Marine Plus blanket, temperature resistant textiles and a weather resistant outer textile material. It is used for the fire protection of structural items such as steel pipes or structural steel against jet fires. Flexible systems are lighter in weight than rigid enclosures and typically used where regulations do not require metallic enclosures to be fitted but an easily removable system is still desired.



Key advantages

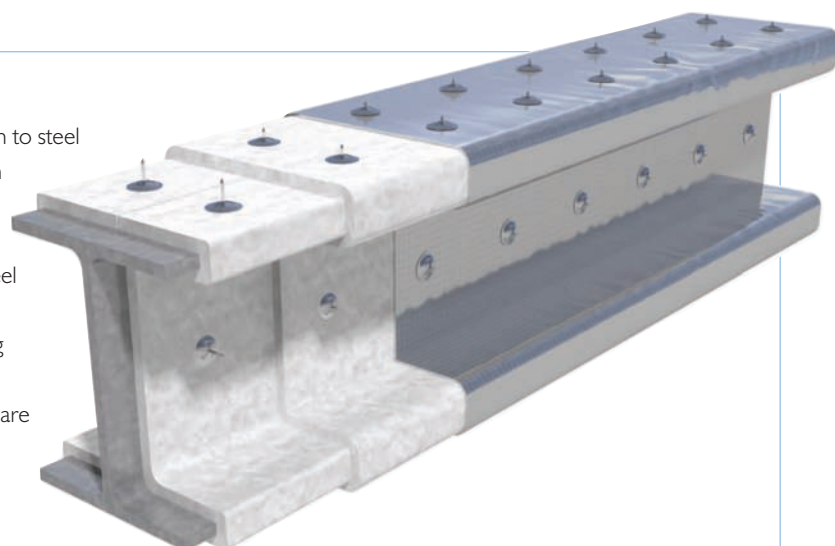
- Jet and Hydrocarbon fire protection of pipework
- Tested to ISO 22899-1 standard
- Simple system with a choice of 2 grades of steel cladding
- Flexible jacket version available

FireMaster Structural Steel fire protection

FireMaster® blanket and FireBarrier™ products provide fire insulation to steel beams and columns to ensure they maintain load-bearing capacity in a fire, thus preventing collapse of the structure they are supporting. Traditionally, fire insulation is required to ensure the steel temperature does not exceed 550°C (1022°F), the point at which steel retains 60% of its room temperature structural strength. However, different maximum temperatures are often specified, taking into account temperature profile and load on the sections. Critical temperatures ranging between 400°C (752°F) and 620°C (1148°F) are common, with 400°C (752°F) widely used in the offshore industry.

Key advantages

- Fast and simple to install using welded pins
- Ideal for complex shapes with low waste due to minimal cutting to fit complex structures



ABOUT MORGAN ADVANCED MATERIALS



Morgan Advanced Materials is a global engineering company offering world-leading competencies in materials science, specialist manufacturing and applications engineering.

We focus our resources on the delivery of products that help our customers to solve technically challenging problems, enabling them to address global trends such as energy demand, advances in healthcare and environmental sustainability.

What differentiates us?

Advanced material science and processing capabilities. Extensive applications engineering experience.

A strong history of innovation and reinvention. Consistent and reliable performance.

A truly global footprint. We find and invest in the best people.

For all enquiries, please contact our specialist sales and manufacturing sites:

Europe

Morgan Advanced Materials
Morgan Drive
Stourport-on-Severn
Worcestershire DY13 8DW
United Kingdom
T +44 (0) 1299 872210
F +44 (0) 1299 872218
europesales@morganplc.com

North America

Morgan Advanced Materials
4000 Westchase Boulevard
Suite 170
Raleigh, NC 27607
USA
T +1 (855) 809 9571
F +1 (706) 622 4424
nasales@morganplc.com

South America

Morgan Advanced Materials
Avenida do Taboão 3265
São Bernardo do Campo
SP CEP 09656000
Brasil
T +55 (21) 3305 0400
F +55 (21) 2418 1999
sasales@morganplc.com

Asia

Morgan Advanced Materials
150 Kampong Ampat
05-06A, KA Centre
368324
Singapore
T +65 6595 0000
F +65 6595 0005
asiasales@morganplc.com

Thermal Ceramics is a business of Morgan Advanced Materials
Quadrant, 55-57 High Street,
Windsor, Berkshire, SL4 1LP. United Kingdom

www.morganthermalceramics.com
www.morganadvancedmaterials.com