

# Morgan Hong Kong Product Data Brochure



Insulating Our World

### **Morgan Thermal Ceramics solutions**

Morgan Thermal Ceramics' world leading products offer a diverse, strongly branded product range that combines quality with consistency and reliability. Morgan Thermal Ceramics leads the way in bringing technical solutions to all problems of heat containment.

Morgan Thermal Ceramics supply optimum engineered insulation solutions to a diverse range of markets and end users; we are the market leaders in core products of insulating fibres, insulating fire bricks and monolithics. Our aim is to provide not only the products, but engineered solutions which satisfy your needs.

**Blanket products** - These highly versatile Superwool® fibre and refractory ceramic fibre products are lightweight, have low thermal conductivity, low heat storage and excellent resistance to thermal shock. They are available in a variety of densities, thicknesses and temperature capabilities.

**Bulk products** - A complete line of Superwool® fibre and refractory ceramic bulk fibres each of which offers its own unique combination of properties. These bulk fibres are produced by varying composition, fibre length, compressed density, fibre content, fibre diameter and lubricity, available in chopped, un-chopped, lubricated and non-lubricated.

**Module, Log, and Block products** - A unique solution to high temperature insulation needs in industrial heaters, boilers and furnaces as well as many other applications. These are easy-to-install, high-temperature, Superwool® fibre and refractory ceramic fibre module systems featuring Pyro-Bloc®, Pyro-Fold™ and Pyro-Stack™ design. Pyro-Bloc® is proven monolithic furnace insulation that installs faster than any other ceramic fibre module on the market.

**Vacuum Formed and Shape products** - Fibre board and shape products have been engineered to meet a wide range of temperature requirements. They offer good strength and low thermal conductivity values.

**Paper and Felt products** - Thin sheet products including millboard, paper, and felt are suitable for a variety of insulation and filtration applications. Many special grades offer properties such as no binder outgassing, low shot content and high strength.

**Mastics** - Mastic insulation from Morgan Thermal Ceramics complement our full line of refractory and insulation products. This extensive offering includes pumpables, mouldable, cements, and coatings, and is manufactured specifically to aid in efficient furnace, kiln, and boiler operations.

**Insulating Fire Brick and Mortar** - JM™, K®, TC® and TJM™ insulating fire bricks offer superior insulating properties, minimising energy use, combined with the ability to withstand chemical attack and high heat conditions. Both wet and dry mortars are available that are matched for use with the Morgan Thermal Ceramics IFB range.

**Insulating, Dense and Special Duty Monolithics** - Tri-Mor® Monolithics offer a full range of products for applications requiring high resistance to corrosion, abrasion and reducing atmospheres. They are particularly suited to applications where fast turn around of installation and repairs is important.

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● *Superwool<sup>®</sup> is a low biopersistent material*

● *RCF is a refractory ceramic fibre material*

The values given herein are **TYPICAL AVERAGE VALUES** obtained in accordance with accepted test methods and are subject to normal manufacturing variations.

Actual use limit depends on application, construction, fibre thermal stability, anchoring system, etc.

They are supplied as a technical service and are subject to change without notice.

Therefore, the data contained herein should not be used for specification purposes.

Check with your Morgan Thermal Ceramics office to obtain current information.

SUPERWOOL<sup>®</sup> is a patented technology for high temperature insulation wools which have been developed to have a low bio persistence (information upon request).

This product may be covered by one or more of the following patents, or their foreign equivalents:

SUPERWOOL<sup>®</sup>PLUS™ products are covered by patent numbers: US5714421, US5994247, US6180546, US7259118, and EP0621858.

SUPERWOOL<sup>®</sup>607<sup>®</sup>HT™ products are covered by patent numbers: US5955389, US6180546, US7259118, US7470641, US7651965, US7875566, EP0710628, EP1544177, and EP1725503

A list of foreign patent numbers is available upon request to The Morgan Crucible Company plc.





**Superwool**<sup>®</sup>  
Insulating fibre

The leading brand in high temperature low biopersistent fibre insulation.

## SECTION I

# Blanket products

### Superwool® blanket products

Superwool® 607® Blanket

Superwool® 607® HT™ Blanket

Superwool® Plus™ Blanket

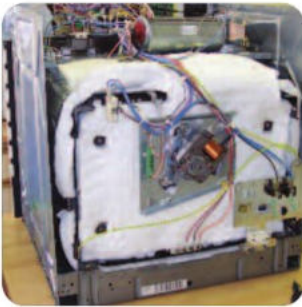
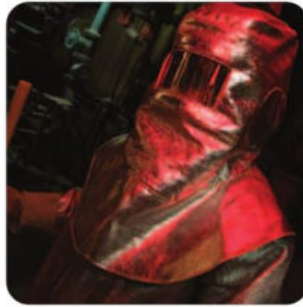
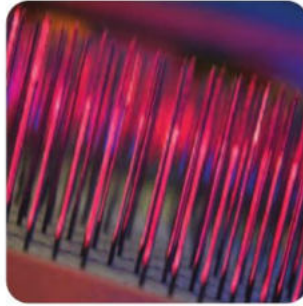
### Refractory ceramic fibre (RCF) blanket products

Cerablanket®

Cerachem® Blanket

Kaowool® S Blanket

Maftec® Blanket



## Blanket products overview

### Introduction to our blanket products

High temperature insulation wool is a material for use in high temperature applications such as the insulating lining of metallurgical ovens and furnaces, petrochemical heaters, and ceramic kilns etc.

### Morgan Thermal Ceramics high temperature insulation wool (HTIW) includes:

- AES wools (alkaline earth silicates): **Superwool® fibre**
- RCF wools (aluminosilicates) and polycrystalline wools: **Cera® & Kaowool®**
- HTIW are used in applications from 600°C up to 1800°C

### In use high temperature insulation wool will:

- Contribute to protecting people and property from excessive heat
- Reduce greenhouse gas emissions
- Reduce energy usage
- Improve efficiency of furnaces and process equipment

### Typical applications for high temperature insulation wool – blankets:

- Power generation especially HRSG duct insulation
- Chimney insulation
- Process heater linings
- Pipe wrap
- Annealing furnace linings
- Furnace & kiln back-up insulation
- Storage heater insulation
- Domestic oven insulation
- Automotive exhaust heat shields
- Aluminium transfer launder covers
- Welding stress relief

### Blanket

A mat of bulk wool is converted to blanket by “needling”. The needles are pushed into the mat and withdrawn which produces a coherent blanket. Blanket can be folded, compressed and encapsulated to produce modules.





## Superwool® fibre

Superwool® fibre is a high-temperature insulating wool composed of man-made vitreous silicate fibres. Superwool® fibre is exonerated from the carcinogen classification in the European Union under the terms of NOTA Q of European Directive 67/548/EEC.

Superwool® fibre has been developed to show improved high temperature characteristics required to act as an alternative to RCF. The Superwool® fibre family of products offer a versatile alternative to traditional insulation solutions for commercial, industrial, and transportation applications.

Morgan Thermal Ceramics Superwool® fibre patented technology is available in a variety of forms including bulk, blanket, boards, felt, paper, vacuum-formed, pyro-logs, pyro-blocs, z-blocs and mastic products.

## Superwool® blanket - grades available:

### Superwool® 607® fibre: classification 1100°C

Invented with patented technology by Morgan Thermal Ceramics, successfully in operation for over 10 years.

### Superwool® 607® HT™ fibre: classification 1300°C

The only low biopersistent fibre available with a classification temperature of 1300°C.

### Superwool® Plus™ fibre: classification 1200°C

An engineered solution which saves energy and respects the environment.

#### Benefits:

- Excellent thermal insulation properties
- Free of binder or lubricant
- Thermal stability
- Low thermal conductivity
- Good resistance to tearing
- Excellent thermal shock resistance
- Low heat storage capacity
- Inorganic - smoke free
- Flexible and resilient
- Immune to thermal shock
- Good sound absorption
- Exonerated from any carcinogenic classification under NOTA Q of European Directive 97/69 E

## Refractory ceramic fibre (RCF)

RCF – man made vitreous fibres (MMVF); chemical constituents are predominantly alumina and silica. Such MMVF's are classified in the EU as category 2 carcinogens.

RCF is a highly versatile material which can be spun or blown into bulk and air-laid into blanket, folded into modules, converted into papers, boards, and shapes.

Morgan Thermal Ceramics fibre blanket products are available in a wide range of chemistries, densities and thicknesses. Blankets are air laid into a continuous mat and mechanically needled for added strength and surface integrity.

## RCF blanket - grades available:

### Cerablanket®: classification 1260°C

### Cerachem®: classification 1425°C

Excellent chemical stability compared with their raw materials, they have excellent strength before and after heating. They have superior acoustic as well as thermal insulation characteristics.

### Kaowool® S Blanket: classification 1260°C

Made from bulk fibres produced by the most modern spinning process, giving exceptional length & uniform distribution which are ideal for manufacturing blanket of controlled density, high tensile strength and resiliency.

### Maftec® Blanket: maximum continuous use 1600°C

Made from pure mullite fibre only, needled on both sides and contains no binder or other added constituent. More resistant to acid and alkaline solutions than conventional alumino-silicate fibre blankets, being virtually free of shot, it has exceptionally good thermal insulation characteristics.

#### Benefits:

- Excellent insulating performance
- Excellent thermal stability: fibres have good resistance to devitrification
- Low heat storage
- The combination of long spun fibres and the needling operation produce tough, resilient and strong blankets, which resist tearing both before and after heating
- Resistance to thermal shock
- Good acoustic properties
- Excellent thermal shock resistance
- No smoke emission due to binder burn out
- Easy to install

## Blanket products

	Superwool® 607® Blanket				Superwool 607 HT™ Blanket				Superwool Plus Blanket			
Classification Temperature, °C	1100				1300				1200			
Colour	white				white				white			
Density, kg/m <sup>3</sup>	64	96	128	160	64	96	128	160	64	96	128	160
Tensile Strength kg/m <sup>3</sup> , ENV (1094-7)kPa												
128 kg/m <sup>3</sup>	90				30	50	75	95	75			
Permanent Linear Shrinkage, %, ENV (1094-7)												
after 24 hours @ 1000°C	-				-				<1			
after 24 hours @ 1100°C	<1				-				-			
@ 1200°C	-				-				<1			
@ 1300°C	-				<2				-			
Thermal Conductivity, W/m•K ENV (1094-7)												
	64 kg/m <sup>3</sup>	96 kg/m <sup>3</sup>	128 kg/m <sup>3</sup>	160 kg/m <sup>3</sup>	96 kg/m <sup>3</sup>	128 kg/m <sup>3</sup>	64 kg/m <sup>3</sup>	96 kg/m <sup>3</sup>	128 kg/m <sup>3</sup>	160 kg/m <sup>3</sup>		
Mean Temperature @ 200°C	0.07	0.06	0.06	0.06	0.05	0.04	0.06	0.05	0.05	0.05		
@ 300°C	0.09	0.08	0.08	0.07	-	-	-	-	-	-		
@ 400°C	0.12	0.11	0.10	0.09	0.10	0.08	0.10	0.09	0.08	0.08		
@ 500°C	0.17	0.14	0.13	0.12	-	-	-	-	-	-		
@ 600°C	0.22	0.17	0.16	0.15	0.19	0.14	0.17	0.14	0.12	0.11		
@ 800°C	-	0.24	0.23	0.17	0.32	0.23	0.26	0.21	0.18	0.16		
@ 1000°C	-	0.34	0.29	0.25	0.48	0.34	0.38	0.29	0.25	0.22		
@ 1200°C	-	-	-	-	0.69	0.48	-	-	-	-		
Chemical Composition, %												
SiO <sub>2</sub>	62 - 68				70 - 80				61 - 68			
CaO	26 - 32				-				26 - 32			
MgO	3 - 7				18 - 25				3 - 7			
Others	< 1				< 3				< 1			



## Blanket products

		Cerablanket®	Cerachem® Blanket	Kaowool S Blanket	Mattec®	
Maximum Continuous Use Temperature, °C		-	-		1600	1600
Classification Temperature, °C		1260	1425	1260	-	-
Colour		white	white	white	white	white
Density, kg/m <sup>3</sup>		64-160	64-160	64-160	96	128
<b>Tensile Strength kg/m<sup>2</sup>, ENV (1094-7)kPa</b>						
Blanket Density	64 kg/m <sup>3</sup>	30	30	25	-	-
	96 kg/m <sup>3</sup>	70	70	65	93	-
	128 kg/m <sup>3</sup>	90	90	85	-	103
	160 kg/m <sup>3</sup>	110	110	90	-	-
<b>Permanent Linear Shrinkage, %, ENV (1094-7)</b>						
after 24 hours	@ 1000°C	1.5	-	1.8	-	-
	@ 1100°C	2.2	-	2.6	-	-
	@ 1200°C	3.0	1.0	3.2	-	-
	@ 1300°C	5.5	2.0	-	0.3	
	@ 1400°C	-	3.5	-	0.8	
	@ 1500°C	-	-	-	0.9	
	@ 1600°C	-	-	-	1.0	
<b>Thermal Conductivity, W/m•K ENV (1094-7)</b>						
Mean Temperature	@ 200°C	0.07	0.06	0.06	0.07	-
	@ 260°C	-	-	-	-	-
	@ 300°C	-	-	-	-	-
	@ 400°C	0.12	0.11	0.10	0.12	0.08
	@ 500°C	-	-	-	-	0.10
	@ 600°C	0.20	0.16	0.15	0.16	0.13
	@ 700°C	-	-	-	-	0.17
	@ 750°C	0.30	0.23	0.20	-	-
	@ 800°C	-	-	-	0.24	0.19
	@ 900°C	-	-	-	-	0.23
	@ 1000°C	0.43	0.32	0.27	0.30	0.27
	@ 1200°C	-	-	-	-	0.39
	@ 1400°C	-	-	-	-	0.58
<b>Specific Heat Capacity, kJ/kg•K</b>						
	@ 1090°C	1.13	1.13	1.13	1.25	
<b>Chemical Composition, %</b>						
	SiO <sub>2</sub>	56	50	45.1	28	
	Al <sub>2</sub> O <sub>3</sub>	44	35	53.4	72	
	CaO+MgO	0.05	0.09	-	trace	
	Cr <sub>2</sub> O <sub>3</sub>	-	-	-	-	
	ZrO <sub>2</sub>	-	15	-	-	
	Fe <sub>2</sub> O <sub>3</sub>	-	-	-	0.03	
	Na <sub>2</sub> O+K <sub>2</sub> O	0.10	0.10	0.3	0.13	
	Leachable Chlorides	-	-	-	-	
	Others	-	-	-	-	



**Superwool**<sup>®</sup>  
Insulating fibre

The leading brand in high temperature low biopersistent fibre insulation.

## SECTION 2

# Bulk products

### Superwool® bulk products

Superwool® 607® Bulk

Superwool® 607® HT™ Bulk

Superwool® Plus™ Bulk

### Refractory ceramic fibre (RCF) bulk products

Cerafibre®

Cerachem®

Kaowool® S





## Bulk products overview

### Introduction to our bulk products

High temperature insulation wool is a material for use in high temperature applications such as the insulating lining of metallurgical ovens and furnaces, petrochemical heaters, and ceramic kilns etc.

### Morgan Thermal Ceramics high temperature insulation wool (HTIW) includes:

- AES wools (alkaline earth silicates): **Superwool® fibre**
- RCF wools (aluminosilicates) and polycrystalline wools: **Cera® & Kaowool®**
- HTIW are used in applications from 600°C up to 1800°C

### In use high temperature insulation wool will:

- Contribute to protecting people and property from excessive heat
- Reduce greenhouse gas emissions
- Reduce energy usage
- Improve efficiency of furnaces and process equipment

### Typical applications for high temperature insulation wool – bulk:

- Raw material for the manufacturing of finished products such as boards, paper, shapes, yarns etc
- Vacuum forming feedstock
- Textile manufacturing
- Chimney fill
- Fire door infill
- Kiln car infill
- Packing expansion joints (e.g. carbon baking pits)
- Loose insulating fill for complex spaces and areas where access is difficult
- Reinforcement for insulating concretes and cements
- Precursor for engineered fibres

### Bulk

Consists of a loose mass of randomly orientated normally long, fluffy cotton wool like fibres collected after fiberisation and not further altered.

#### Bulk can be:

- needled into a blanket
- converted into boards and shapes
- die-cut into gaskets
- woven into rope and cloth
- blended into liquid binders for coatings and cements

#### Grades available: Lubricated Bulk

- For packing expansion joints and voids
- For infill in the roofs and walls of certain types of kilns
- For seals around penetrations in furnaces, such as burner tubes, site holes etc, areas in refractory constructions

#### Un-Lubricated Bulk

- un-chopped fibre
- coarse chopped
- fine chopped fibre
- Un-lubricated fibre is used in vacuum forming processes, mastics, mouldables sprays and coatings
- Selection of different fibre lengths controls the properties of the final product

## Superwool® fibre

Superwool® fibre is a high-temperature insulating wool composed of man-made vitreous silicate fibres. Superwool® fibre is exonerated from the carcinogen classification in the European Union under the terms of NOTA Q of European Directive 67/548/EEC.

Superwool® fibre has been developed to show improved high temperature characteristics required to act as an alternative to RCF. The Superwool® fibre family of products offer a versatile alternative to traditional insulation solutions for commercial, industrial, and transportation applications.

Morgan Thermal Ceramics Superwool® fibre patented technology is available in a variety of forms including bulk, blanket, boards, felt, paper, vacuum-formed, pyro-logs, pyro-blocs, z-blocs and mastic products.

### Superwool® bulk - grades available:

#### Superwool® 607® fibre: classification 1100°C

Invented with patented technology by Morgan Thermal Ceramics, successfully in operation for over 10 years.

#### Superwool® 607® HT™ fibre: classification 1300°C

The only low biopersistent fibre available with a classification temperature of 1300°C.

#### Superwool® Plus™ fibre: classification 1200°C

An engineered solution which saves energy and respects the environment.

#### Benefits:

- Superwool® Bulk is virtually immune to thermal shock
- The fibres are opaque to infra-red and so maintain their low thermal conductivity to high temperature
- The fibres absorb very little energy on heating
- The fibres are high purity and non-corrosive
- The fibres are resilient and also resistant to mechanical damage
- No reaction with alumina based bricks in application in the range of typical use temperature
- Exonerated from any carcinogenic classification under NOTA Q of European Directive 97/69 E

## Refractory ceramic fibre (RCF)

RCF – man made vitreous fibres (MMVF); chemical constituents are predominantly alumina and silica. Such MMVF's are classified in the EU as category 2 carcinogens.

RCF is a highly versatile material which can be spun or blown into bulk and air-laid into blanket, folded into modules, converted into papers, boards, and shapes. Morgan Thermal Ceramics has a complete line of refractory bulk fibres, each of which offers its own unique combination of properties. These bulk fibres are produced by varying composition, fibre length, compressed density, fibre content, fibre diameter, and lubricity to serve a wide range of customer needs.

### RCF blanket - grades available:

#### Cerafibre®: classification 1260°C

Spun refractory fibres, made from electrically melted alumina and silica.

#### Cerachem®: classification 1425°C

Spun refractory fibres, made from electrically melted alumina, silica and zirconia.

#### Kaowool® S: classification 1260°C

Spun or blown refractory fibres, made of electric fused high purity kaolin.

#### Benefits:

- Excellent resistance to chemical attack
- Unaffected by oil, water or steam
- Very low thermal expansion
- Excellent shock and good corrosion resistance
- Low moisture absorption
- Low electrical conductivity
- Good tensile strength
- Constant coefficient of friction
- Refractoriness: the fibres are stable up to elevated temperatures
- Low thermal conductivity: the fibres are opaque to infra-red radiation and so maintain their low thermal conductivity up to high temperature

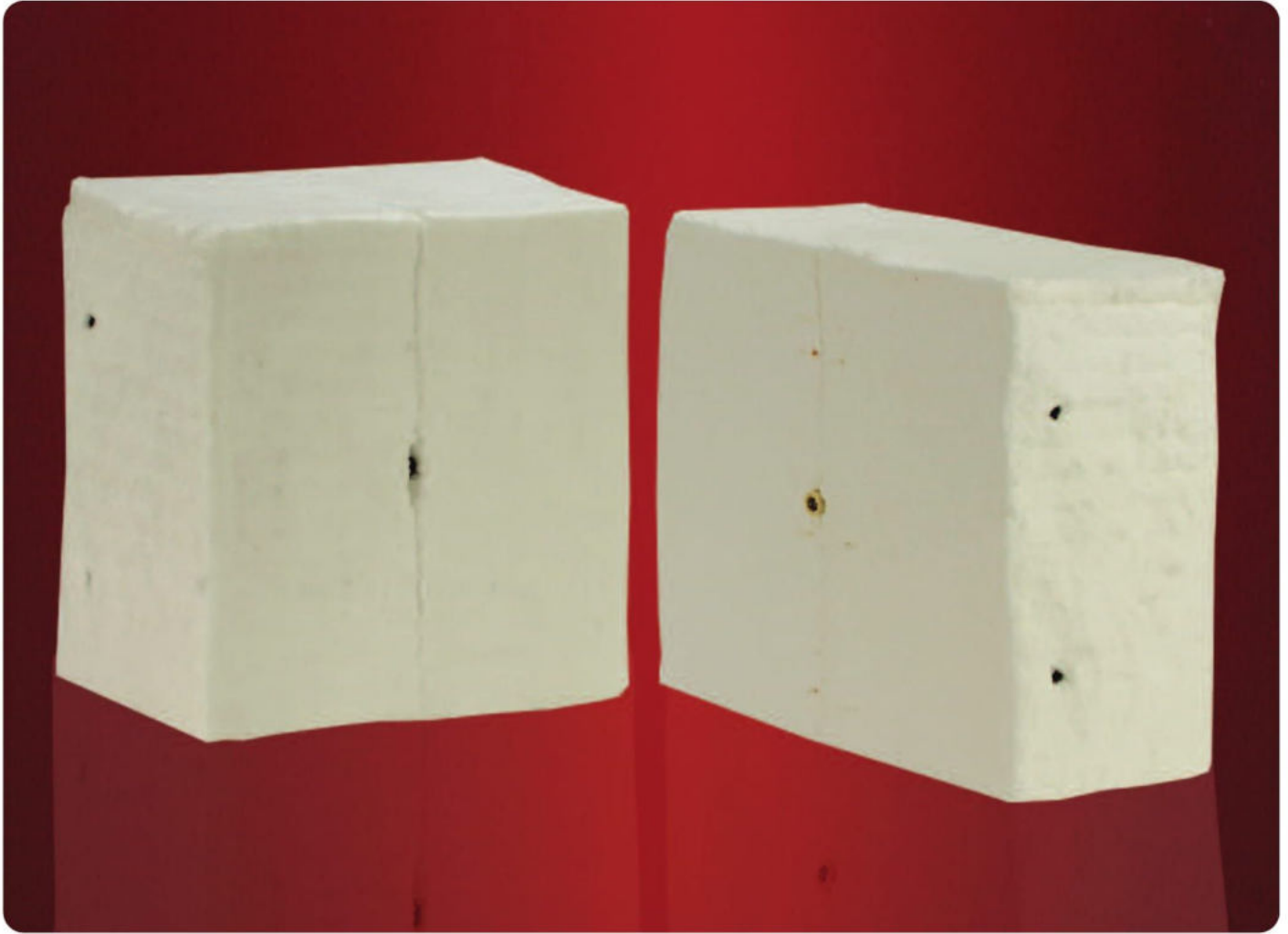
## Bulk products

	Superwool® 607® Bulk	Superwool 607 HT Bulk	Superwool Plus Bulk			
Classification Temperature, °C	1100	1300	1200			
Colour	white	white	white			
Specific Gravity, g/cm <sup>3</sup>	2.50	2.50	2.65			
<b>Beaker Value (fibre length), ml</b>						
Unchopped	-	650	-			
Coarse chopped	-	200	-			
Fine chopped	-	130	-			
Fibre Diameter, *mean, micron	-	-	-			
<b>Specific Heat Capacity, kJ/kg•K</b>						
@ 540°C	-	-	-			
@ 1090°C	1.13	1.22	-			
<b>Thermal Conductivity, W/m•k</b>			64 kg/m <sup>3</sup>	96 kg/m <sup>3</sup>	128 kg/m <sup>3</sup>	160 kg/m <sup>3</sup>
200°C	-	-	0.06	0.05	0.04	0.05
400°C	-	-	0.10	0.09	0.08	0.08
600°C	-	-	0.17	0.14	0.12	0.11
800°C	-	-	0.26	0.21	0.18	0.16
1000°C	-	-	0.38	0.29	0.25	0.22
<b>Chemical Composition, %</b>						
SiO <sub>2</sub> (*on calcine product)	60 - 70	70-80	62 - 68			
Al <sub>2</sub> O <sub>3</sub>	< 0.2	-	-			
CaO + MgO	25 - 40	18-25	26 - 32			
MgO	-	-	3 - 7			
Cr <sub>2</sub> O <sub>3</sub>	-	-	-			
ZrO <sub>2</sub>	-	-	-			
Fe <sub>2</sub> O <sub>3</sub>	-	-	-			
Na <sub>2</sub> O + K <sub>2</sub> O	trace	-	-			
Others	-	<3	<1			



## Bulk products

	Cerafibre® Bulk	Cerachem® Bulk	Kaowool S Bulk
Classification Temperature, °C	1260	1425	1260
Colour	white	white	white
Specific Gravity, g/cm <sup>3</sup>	2.65	2.65	2.56
Beaker Value (fibre length), ml	-	-	-
Bulk unchopped	-	-	360
Coarse chopped	-	-	260
Medium chopped	-	-	150
Fine chopped	-	-	100
Fibre Index	-	-	-
Fibre Diameter, *mean, micron	3.5	3.5	2.5
Hardness, MOH °C	-	-	-
Tensile Strength, MPa	-	-	-
Specific Heat Capacity, kJ/kg•K	-	-	-
@ 980°C	-	-	1.07
@ 1090°C	1.13	1.13	1.13
Melting Point °C	-	-	>1650
Chemical Composition, %			
SiO <sub>2</sub> (*on calcine product)	56.0	50.0	52.7
Al <sub>2</sub> O <sub>3</sub>	44.0	34.9	45.3
CaO + MgO	0.5	0.09	-
Cr <sub>2</sub> O <sub>3</sub>	-	-	-
ZrO <sub>2</sub>	-	15.2	-
Fe <sub>2</sub> O <sub>3</sub>	0.15	0.15	0.30
Na <sub>2</sub> O + K <sub>2</sub> O	0.10	0.10	0.25
TiO <sub>2</sub>	-	-	-
Alkali/Alkali Earth	-	-	-
Leachable Chloride	-	-	≤10ppm
B <sub>2</sub> O <sub>3</sub>	-	-	-



The leading brand in high temperature low biopersistent fibre insulation.

## SECTION 3

# Modules, Logs & Block products

### Refractory ceramic fibre (RCF) products

Pyro-Bloc® Modules

Pyro-Log®

Z-Blok 1 Modules

Z-Blok 3 Modules

Pyro-Stack® Modules

Unifelt® Modules





## Modules, Logs & Block products overview

### Introduction to our Modules, Logs & Block products

**High temperature insulation wool** is a material for use in high temperature applications such as the insulating lining of metallurgical ovens and furnaces, petrochemical heaters, and ceramic kilns etc.

#### Morgan Thermal Ceramics high temperature insulation wool (HTIW) includes:

- RCF wools (aluminosilicates) and polycrystalline wools: **Cera® & Kaowool®**
- HTIW are used in applications from 600°C up to 1800°C

#### In use high temperature insulation wool will:

- Contribute to protecting people and property from excessive heat
- Reduce greenhouse gas emissions
- Reduce energy usage
- Improve efficiency of furnaces and process equipment

#### Typical applications for high temperature insulation wool – Modules, Log & Block:

##### Ceramic & Glass

- Kiln lining
- Low mass kiln cars
- Furnace doors

##### Refining

- Distillation heater lining

##### Heat Treatment/Metal working

- Heat treatment lining

##### Non Ferrous

- Annealing furnace
- Heat treating furnace

##### Power Generation/Boilers

- Cogeneration ducts and silencers

##### Iron & Steel

- Walking beam furnace skid rail insulation

- Re-heat, Strip-annealing, Rotary Hearth and Roller Hearth Furnaces, Carbonizing and Lift-off Furnaces

#### Petrochemical

- Process heaters, reformers, ductwork pyrolysis heaters

#### Homogenizing furnaces

#### Process heaters

#### Thermal oxidizers

#### Engineered shapes

### Modules

**A unique solution to high temperature insulation** needs in industrial heaters, boilers and furnaces as well as many other applications. Morgan Thermal Ceramics exclusive Pyro-Bloc® products have set the standard for quality and versatility in furnace lining systems. Pyro-Bloc® modules are the only 'monolithic' fibre modules on the market. Manufactured from Pyro-Log®, they are fabricated into modules that offer superior performance and durability.

### Logs

**An uncompressed monolithic mass of fibre.** Pyro-Log® fibre is the basic building block for all Pyro-Bloc® applications. All Pyro-Log® fibre is produced with a special lubricant that allows the fibre to be intensely needled to attain varying densities. At moderate temperatures this lubricant burns out and the fibre becomes rigid enough to stand on. This feature, unique to Pyro-Log® fibre, assists during installation and provides the durability and toughness necessary for long life.

### Blocks

**Made from high temperature fibres,** mineral fibres and a small amount of organic binder. Due to the high fibre content, Bloc sheets are strong, lightweight and thermal shock resistant.

## Refractory ceramic fibre (RCF)

RCF – man made vitreous fibres (MMVF); chemical constituents are predominantly alumina and silica. Such MMVF's are classified in the EU as category 2 carcinogens. RCF is a highly versatile material which can be spun or blown into bulk and air-laid into blanket, folded into modules, converted into papers, boards, and shapes.

Pyro-Bloc® modules are available in uncompressed module varying densities and in three grades:

- R Grade: alumina - silica
- ZR Grade: alumina - zirconia - silica
- C Grade: alumina - silica - chromia

## RCF Modules, Logs & Block - grades available:

### Pyro-Bloc®:

classification 1260 - 1425°C

Lightweight with low heat storage providing a durable service with all the advantages of our standard ceramic fibre blanket products in a pre-compressed modular form and offer non-exposed anchoring, economical installation and a positive mechanical attachment.

### Pyro-Log®:

maximum continuous use 1260 - 1425°C

Pyro-Log® is the only 152mm thick, high purity, needled blanket available in standard uncompressed densities up to 240kg/m<sup>3</sup>. Vertically-fiberized Pyro-Log® fibre is of exceptional uniformity of dimensions and of naturally low shot content.

### Z-Blok 1 & 3:

maximum continuous use 1260 - 1600°C

Folded modules available in two design configurations; Z-Blok 1 has a slide channel that runs perpendicular to the folds, it slides onto a disc or clip that has been attached to the steel casing. Z-Blok 3 has a C-Channel that runs parallel to the module folds and is typically attached to the steel casing with a welded stud and nut.

### Pyro-Stack®:

maximum continuous use 1260 - 1600°C

High quality spun-fibre blanket, compressed & banded with plastic strips, including two stainless steel tubes mounted transversely through the strips remote from the hot face. They can be anchored to the furnace casing in any one of four standard versions, Y, M, T and Eye-bolt.

### Unifelt®:

classification 1260 - 1700°C

Vacuum-Formed from controlled mixtures of Kaowool® and SAFFIL® fibres, the ratio of the fibres are adjusted to produce the different temperature grades. Edge-stacked strips of Unifelt sheet, bonded under pressure, with a semi-elastic organic binder.

## Benefits:

- Fast one step installation
- All welds automatically torque tested
- Lubricated fibre allows increased compression and tight joints
- Hardening effect on first firing gives a tough hot face
- Resistant to mechanical damage and gas flow abrasion
- Anchorage remote from the hot face protects steel work

## Modules, Logs & Block products

	Pyro-Bloc® Modules						Pyro-Log						
	Standard Fibre R-grade			Zirconia Fibre Zr-grade			Standard Fibre, R Grade			Zirconia Fibre, Zr Grade			
Classification Temperature, °C	1260			1425			1260			1425			
Colour	White			White			White			White			
Density, kg/m <sup>3</sup> (*uncompressed)	*160	*192	*240	*160	*192	*240	*160	*192	*240	*160	*192	*240	
Specific Heat Capacity, kJ/kg•K													
@ 540°C	-						-						
@ 1000°C	1.13						-						
@ 1080°C	-						1.13						
@ 1090°C	-						-						
Loss of Ignition after 2 hours @ 800°C	<0-25						<0-25						
Permanent Linear Shrinkage, %, ENV (1094-7)													
@ 1000°C	-			-			1.6			0.6			
@ 1100°C	-			-			2.3			1.0			
@ 1200°C	3			1.6			3			1.6			
@ 1300°C	-			-			-			3.2			
@ 1400°C	-			3.0			-			3.0			
Thermal Conductivity, W/m•K													
								Blanket - Laid			Edge - Grain		
Mean Temperature @ 400°C	0.11	0.10	0.09	0.11	0.10	0.09	0.08	0.10	0.07	0.10	0.10	0.09	
@ 600°C	0.18	0.16	0.14	0.18	0.16	0.14	0.12	0.11	0.10	0.17	0.16	0.14	
@ 800°C	0.25	0.23	0.20	0.25	0.23	0.20	0.17	0.15	0.13	0.25	0.23	0.20	
@ 1000°C	0.34	0.31	0.28	0.34	0.31	0.28	0.22	0.19	0.17	0.34	0.31	0.28	