heat insulation materials

CARBOSYSTEM®

***Our experience** ensures the best solutions...*

Specialists in high purity advanced materials, based on: carbon fiber, graphite fiber, graphite felt, carbon-carbon composites (CFC), etc.

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heat insulation materials for many applications

We produce high purity carbon fiber, graphite felt, graphite insulation cylinders and carbon-carbon composites (CFC). Mainly used as insulator in Vacuum Furnace, multicristalline casting furnace and inert atmosphere furnaces. This type of high-vacuum is widely used for metal heat treatment, meticulous and ceramic sintering, different kinds of crystallization production, sintering monocrystalline silicon for semiconductors.
Since these furnaces work at extremely high temperatures, it is necessary to have insulation material that can withstand such high temperatures. Moreover, for energy conserving purposes, quality heat isulation material is the best choice. We pride ourseves on the ability to offer first class technical backup to our customer base and over the years we have developed close technical partnerships with major fields including Aerospace, Semiconductor, Solar Ingots, Specialized Castings, Metal Composites, Crystal Growing, Hard Metal Sintering and the Heat Treat Sectors.

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carbon-graphite fiber felt

PAN carbon fiber felt

Polyacrylonitrile base (PAN) carbon felt is light in quality, small in specific heat capacity, soft in texture, good in adiathermancy and convenient in operation, which can save great energy. Therefore, thermal insulation of the polyacrylonitrile base is extremely superior in vacuum or inert atmosphere, in particular, performance of the polyacrylonitrile base is stable under high temperature condition, and it is the excellent thermal insulation material for Vacuum Furnace.

PAN graphite fiber felt

Polyacrylonitrile base plumbago felt is formed by subjecting the high quality polyacrylonitrile base carbon felt to pyrographite treatment. It is light in quality, good in flexibility, high in carbon content high temperature resistant, without volatilization under high temperature, corrosion resistant and small in heat conductivity coefficient and high in shape retention. It is fine heat insulator for polysilicon and monocrystalline silicon preparation furnace, also the corrosion resisting filter material.

carbon-graphite fiber felt

rayon carbon - graphite fiber felt

Rayon-based carbon felt, graphite felt have good character of light, soft, high carbon content, non-volatile, therefore mainly used in aerospace industry as resistant ablative materials and ultra-high-temperature vacuum metallurgical equipment, insulation materials and other composite materials, can also be used for high-performance body far-infrared heat.

PRODUCT		Rayon-based Carbon Felt	Rayon-based Graphite Felt	PAN-based Carbon Felt	PAN-based Graphite Felt
Grade Name		CB160	CB161	CB162	CB163
Material		RCF		PAN-CF	
Carbon Content	%	≥ 98,5	≥ 99,0	≥ 98,5	≥ 99,0
Ash Content	%	≤ 0,05	≤ 0,005	≤ 0,05	≤ 0,005
Bulk Density	g/cm^3	0,10~0,12	0,08~0,10	0,14~0,17	0,12~0,14
Crushing Stress at 10%	N/cm^2	6~10	5~8	8~12	8~10
Tensile Strength	MPa	0,13	0,10	0,15	0,14
Thermal Conductivity 1.150 ºC	W/mºC	0,08~0,15	0,06~0,14	0,12~0,18	0,08~0,14
Working Temperature (Air)	ºC	≤ 400			
(Vacuum)	ºC	≥ 1.500	≥ 2.300	≥ 1.500	≥ 2.300
(Inert Atmosphere)	ºC	≥ 2.300	≥ 3.300	≥ 2.300	≥ 3.300

Dimensions	Length (m)	16 – 18	9 - 12
	Wide (mm)	1.000 – 1.300	
	Thickness (mm)	3, 5, 8, 10, 12	

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hard composite felt

hard composite graphite fiber felt

The material is formed by integrating graphite foil, carbon felt and carbon cloth, and then subjecting them to secondary high temperature purification treatment. The material is superior in ablation resistance performance, thermal shock resistance perforance, airflow washing proof performance and thermal insulation performance. It is mainly used for vacuum high pressure air quecning furnace, low pressure fritting furnace, pressurization vacuum sintering furnace temperature, solar industry, vacuum furnace, single crystal furnace, multicrystalline Dss.

hard composite felt

hard composite carbon fiber felt

PRODUCT		High Temperature		High Purity	
		Carbon Felt (cover with graphite foil)	Carbon Felt (cover with CFC)	Carbon Felt (cover with graphite foil)	Carbon Felt (cover with CFC)
Grade Name		CB164	CB165	CB166	CB167
Material		PAN-CF			
Carbon Content	%	≥ 98		≥ 99	
Ash Content	ppm	≤ 500		≤ 200	
Bulk Density	g/cm^3	0,25 ~ 0,30		0,25 ~ 0,28	
Folding Strength	MPa	1,5 ~ 3,2	1,8 ~ 3,4	1,3 ~ 3,0	1,75 ~ 3,2
Flexural Strength	MPa	1,0 ~ 2,5	1,5 ~ 3,0	1,0 ~ 2,5	1,5 ~ 3,0
Thermal Conductivity 1.150 ºC	W/mºC	0,25 ~ 0,35		0,20 ~ 0,30	
Working Temperature (Air)	ºC	≤ 400			
(Vacuum)	ºC	≥ 1.800		≥ 2.200	
(Inert Atmosphere)	ºC	≥ 3.200			

Plate Dimensions	Length (mm)	1.500 – 1.800
	Wide (mm)	1.000 – 1.300
	Thickness (mm)	20 - 350

Cylinder/Tube Dimensions	Diameter (mm)	Ø200 – Ø1.500
	Heigh (mm)	300 – 2.000
	Wall Thickness (mm)	30 - 120

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carbon-carbon composites (CFC)

carbon fiber reinforced carbon composite

C/C composite materials (CFC) are the use of polyacrylonitrile-based carbon fibers (PAN-CF) through a special process composite, curing, sedimentation, purification treatment made with high strength, high steel, high density, high thermal conductivity, expansion of small, high temperature, corrosion-resistant, wear-resistant rub, thermal shock resistance and stability properties, particularly suitable for high temperature vacuum heat to do physical, fasteners, transmission parts, support materials, such as high temperature structural plate. In addition to the field of aerospace has been successfully applied, in a vacuum metallurgy, new materials, chemical, atomic energy, semiconductor, electronics and other fields of new energy sources is also a wide range of applications.

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carbon-carbon composites (CFC)

GRADE NAME		CB153
Carbon Content	%	≥ 98
Ash Content	%	≤ 0,05
Bulk Density	g/cm^3	1,43 ~ 1,57
Flexural Strength	MPa	200 ~ 300
Tensile Strength	MPa	250 ~ 380
Electric Resistivity	$\Omega mm^2/m$	35 ~ 45
Thermal Conductivity	W/mºC	20 ~ 40
Co-eff. Thermal Expansión	10^{-6}/ºC	0,5 ~ 2,0
Working Temperature (Air)	ºC	≤ 400
(Vacuum)	ºC	≥ 1.800
(Inert Atmosphere)	ºC	≥ 3.300

Plate Dimensions	Length (mm)	2.000 máx.
	Wide (mm)	1.200 máx
	Thickness (mm)	1,5 - 220

Cylinder/Tube Dimensions	Diameter (mm)	Ø230 – Ø1.500
	High (mm)	2.000 máx
	Wall Thickness (mm)	6 - 80

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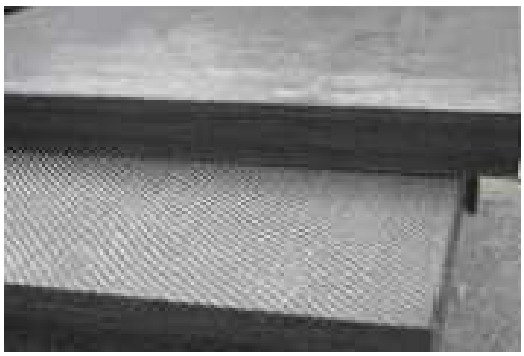
industries & applications

Vacuum and High Pressure Sintering Industry:	**Heat Insulation for** Hard Metal Sintering, Non Oxide Ceramics, Tungsten Carbide manufacturing.
Vacuum Treatment Industry:	**Heat Insulation for** Commercial Heat Treat Furnaces, Hardening,Tempering, etc.
Crystal Growing Industry:	**Heat Insulation for** Silicon, SiC, Indium Phosphide, Gallium Arsenide, Sapphire, Optical Crystals, Solar Ingots.
Special Castings Industry:	**Heat Insulation for** precision casting of DS/SC turbine engine components and Metal Matrix Composites.
Graphitising/CVD Applications:	**Heat Insulation for** High Modulus Carbon Fiber Production, Halogen Purification Furnaces.
Electronic/Semiconductor Industry:	**Heat Insulation for** Materials for various precursor applications.
Solar cells:	PAN Graphite felt electrode in the vanadium redox flow battery.

quality and service



- ***Advanced materials***
- ***We help improve your process***
- ***We help increase your production***
- ***We help reduce your costs***
- ***We offer you the best price, technical support and quality***

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