

COMPANY PROFILE

Ceramic Matrix Composite Materials Engineering

Carbon fiber web / Carbon fiber insulation / Carbon-Carbon Composite / Ceramic Matrix Composite

We manufacture Rigid felt ,CCM and CMC in the field of high-temperature application and CZ Si growing furnace.

KORCARB is the unique company in Korea that manufactures Carbon fiber felt, Carbon-Carbon Composite and Ceramic Matrix Composite.

- Carbon fiber web / Pre-ceramic
- Carbon fiber felt
- CCC (C/C Composite)
- CMC (C/SiC Composite, SiC/SiC Composite)



Company History

> Start 2003

Start for R&D of Carbon-Carbon Composite in Korea



> Since 2013 Manufacture and supply Rigid felt and CCC

Our rigid felt and CCC were sold throughout the country and exported to the global market of CZ Si growing furnace



> Since 2020

Component for Ceramic Matrix Composite(CMC).

- Pre-ceramic & carbon fiber web
- Technology of CVD&PIP

Parameter	Unit	Value
Bulk Density	g/m ³	1.5-2.4
PLS	Mpa	100-200
KIC	Mpa*m ^{0.5}	15-20

We have an integrated production system in Korea, produce core heat-resistant parts in the field of silicon single crystal furnace and high-temperature furnace insulation parts, and pioneer overseas markets such as Japan, China, India, and Russia.

In-House System

■ Certification

ISO 9001:2015 / ISO 14001:2015



Forming



Carbonization



CVI - Densification



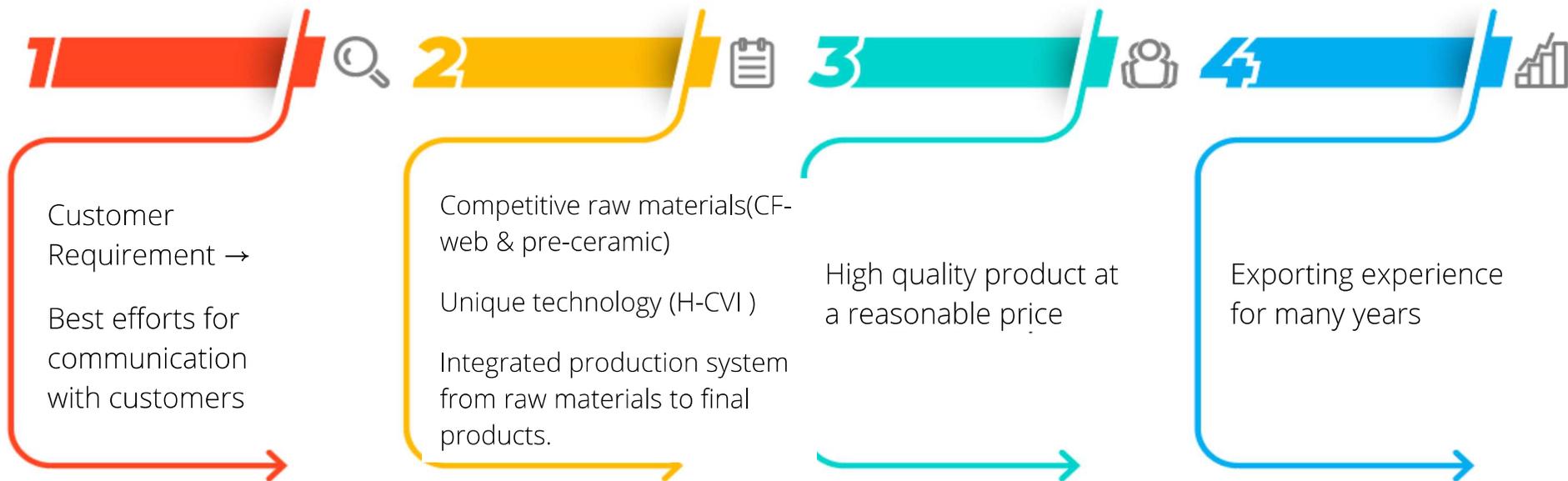
Graphitization



The principle of KORCARB is to supply the best products that customers want at the most reasonable price in a timely manner. we provide a fast and stable supply from raw materials to product shipments.

We manufacture the best products with the **core technologies** of the company :

- Raw material : Carbon fiber web and pre-ceramic materials
- Needle punching and H-CVI technology



Carbon fiber web

■ Main application

- CFRP :
EV parts, drone parts,
battery pack case for missile
- CCC :
high temperature insulation &
structural materials



KORCARB is only manufacturer of carbon fiber web with not only virgin carbon fiber but recycled carbon fiber in Korea.

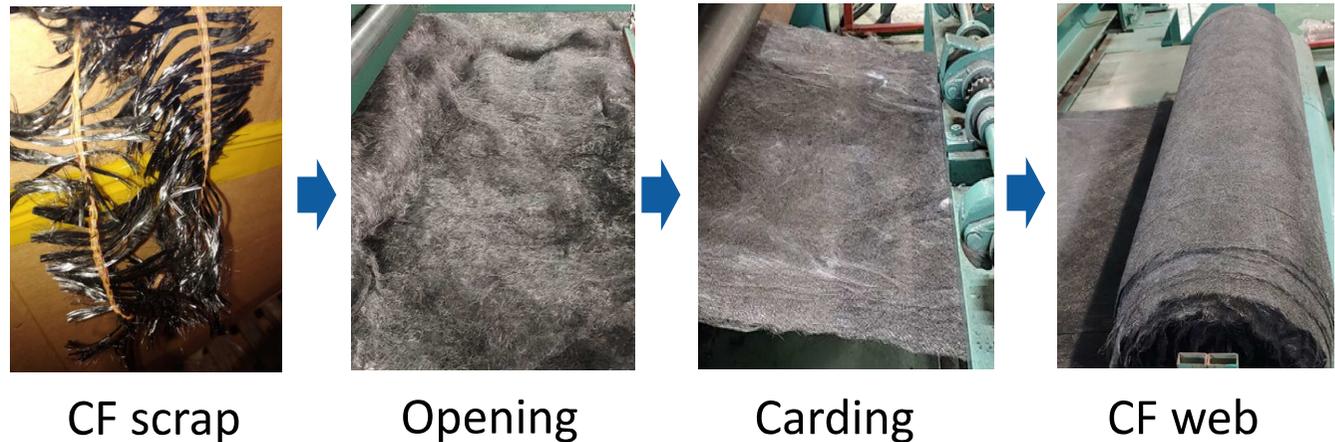
Recycled carbon fiber web is the most important technology because of global issue – Net Zero Carbon Emission. For example; Energy for producing 1 ton carbon fiber web.

	Virgin CF	Recycled CF
Energy	54,833 - 83,444kwh	4000kwh

Virgin CF requires 19 times more energy than Recycled CF

■ Manufacturing process

- Raw material : long fiber
- Dry carding &
Needle Punching



Pre-ceramic

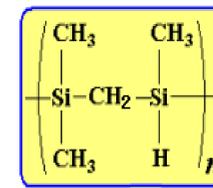
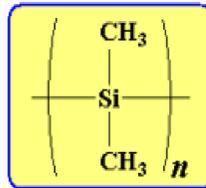
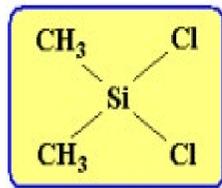
KORCARB continues to challenge and innovate to provide customers with the best solutions in the global ceramic composite material market.

-Pre-ceramic is for SiC fiber and gas turbine components for high temperature application

Reflux

Autoclave reactor

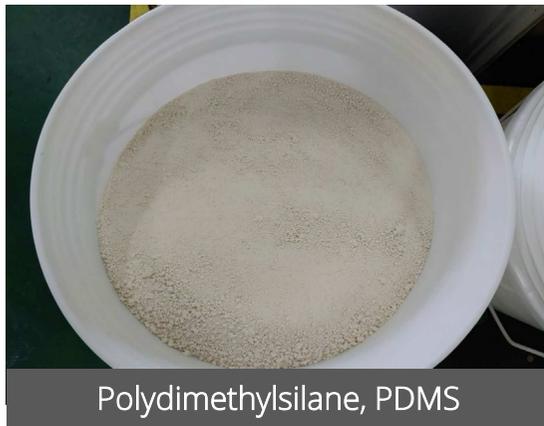
Melt spinning



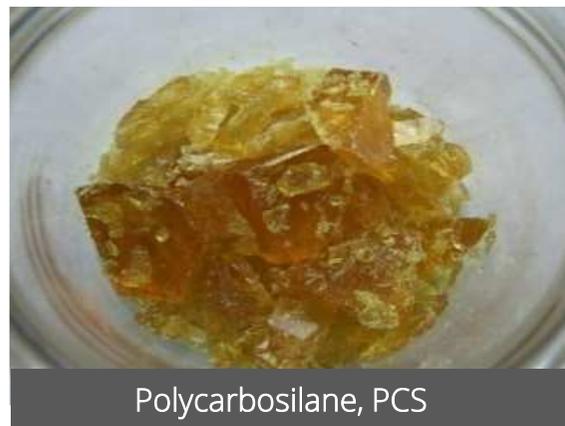
DDS
(Dichlorodimethylsilane)

PCS
(Polydimethylsilane)

PCS
(Polycarbosilane)



Polydimethylsilane, PDMS



Polycarbosilane, PCS



PCS fiber

Carbon fiber felt

Available dimensions

	Type	Dimension (mm)
Standard	Plate	W1,000 * L1,500 * T30/T40/T50
Order Made	Plate	Max. W1,000 * L1,500 * T300
	Cylinder	Max. Ø1,300 * H1,000

Manufacturing process

- Press & Curing
- Carbonizing
- Graphitizing
- Machining
- Surface treatment

Plate type



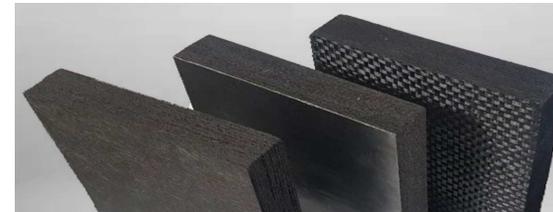
Cylinder type



Typical properties

Parameter	Unit	Value
Bulk Density	g/cm ³	0.13 - 0.20
Flexural Strength	Mpa	1-1.2
Compressive Strength	Mpa	6-8
Thermal Conductivity	W/m·k	0.14 @0.15g/cc, 25 °C
Electrical Resistivity	Ω·cm	0.35
Purity	PPM	5-200

Surface treatment



Model	Surface type
RNP-N	No Treatment
RNP-O	OS Coating of Both Side
RNP-F	Graphite Foil Laminating of Both Side
RNP-H	One Side G/Foil, Back side OS Coating
RNP-C	One Side G/Fabric, Back Side OS Coating

Carbon-Carbon Composite

Main application

- High temperature furnace
- CZ Si growing furnace



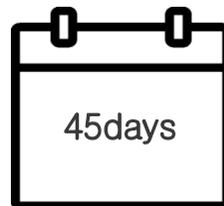
Manufacturing process

- Dry carding
- Needle punching(preform)
- Thermal gradient chemical Vapor infiltration(H-CVI)
- Graphitizing
- Machining
- Cleaning

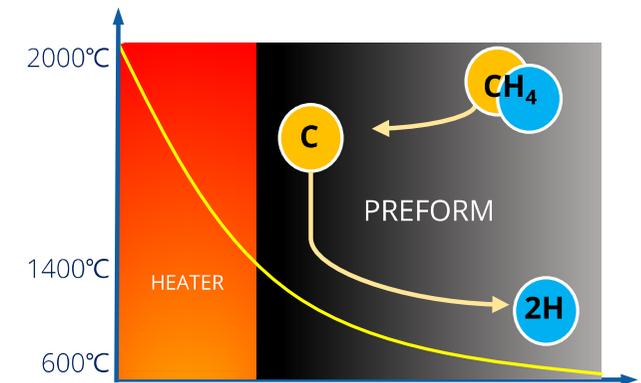
Carbon-Carbon Composite material of KORCARB, **shortens the material production period to 1/10** compared to other competitors through the H-CVI densification technology which is a core technology of our company.

It is possible to manufacture products that **meet the needs of customers**, such as crucible, tube, and block

Technology H-CVI



In 45 days after order, product is ready to ship from factory including machining.



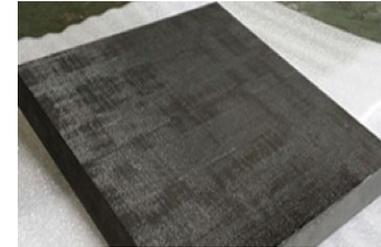
Available dimensions

Type	Dimension (mm)
Tube	Max. Ø1,000 x H2,000
Block	W500 x L2,000 * T300
Crucible	Max. Ø1,300 * H1,000

• Tube type



• Block type



• Crucible



Typical properties

Parameter	Unit	Value
Bulk Density	g/cm ³	1.5-1.7
Flexural Strength	Mpa	170-200
Tensile Strength	Mpa	120-150
Thermal Conductivity	W/m·k	5-10
C.T.E(-1000°C)	Ω·cm	1 x 10 ⁻⁶
Impurity	PPM	50

C/SiC and SiC/SiC composite materials through combination of ICVD, ICVI, TGCVI, IPGCVI, TPGCVI, PIP, LSI processes.

It is possible to manufacture products that meet the needs of customers such as plates, tubes, and blocks with simple shapes.

▪ Manufacturing process

- Preforms: 2D lay-up, 2.5D needle punching, Filament winding preforms
- Interphase coatings: CVD pyrocarbon, hBN, SiC
- Densification processes: single or combination of ICVI, TGCVI, IPGCVI, TPGCVI, PIP, LSI processes
(Isothermal, thermal gradient, pressure gradient CVI, polymer impregnation & pyrolysis, liquid silicon impregnation & carbidization)



Control Panel



TPG chamber

Gas cabinet & bubbler

Control Panel

DC power supply

▪ Main application

- High temperature, oxidation resistant, light weight applications.
- Gas turbine components for power generation
- Aerospace engine components

▪ Available dimensions

Type	Dimension(mm)
Plate, Block	Max. W300*H300*20t
Cylinder	Φ300*L300*10t

• Plate



• Cylinder



▪ Typical properties

Parameter	Unit	Value
Bulk Density	g/m ³	1.5-2.4
PLS (Proportional strength)	Mpa	100-200
KIC (Fracture toughness)	Mpa*m ^{0.5}	10-20

www.korcarb.com



We provide Ceramic Matrix Composite solution

KORCARB Co., Ltd.

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