CeTech Co., Ltd.

No. 48, Xuetian Rd., Wuri District, Taichung City 41456, Taiwan

Tel: +886-4-2337-3348
Fax: +886-4-2337-3990
Website: www.ce-tech.com.tw

Renewable Energy Technology

Carbon Paper

Gas Diffusion Layer and Electrode for fuel cells

CeTech®
CeTech Co., Ltd

Product Features

1. Offer many types of GDLs for different operating conditions
2. GDL can be customized for specific operating conditions

A. with Micro Porous Layer

Substrate with MPL & PTFE			Carbon Paper			
Measurement	Units	Method	N1S1007	GDL240	GDL260	GDL340
Thickness	mm	TECLOCK SM-114	0.21	0.24	0.26	0.34
Basic Weight	g/m^2	ASTM D-646	85	90	100	125
Air Permeability	sec	Gurley	<225	<85	<200	<200
Through-Plane Resistance	$m\Omega cm^2$	Base on ASTM C-611	<15	<15	<10	<10
Tensile Strength (MD)	N/cm	ASTM D-828	35	30	37	45
Tensile Strength (XD)	N/cm		17	18	33	36
Flexural Modulus (MD)	MPa	ASTM D-790	3100	4000	7000	4600
Flexural Modulus (XD)	MPa		1300	1500	2600	2400

B. without Micro Porous Layer and PTFE

Substrate without MPL & PTFE			Carbon Paper			
Measurement	Units	Method	N0S1005	GDS210	GDS230	GDS310
Thickness	mm	TECLOCK SM-114	0.18	0.21	0.23	0.31
Basic Weight	g/m^2	ASTM D-646	50	50	65	80
Air Permeability	sec	Gurley	<10	<10	<10	<10
Through-Plane Resistance	$m\Omega cm^2$	Base on ASTM C-611	<7	<6	<6	<5
Tensile Strength (MD)	N/cm	ASTM D-828	25	24	24	20
Tensile Strength (XD)	N/cm		18	20	22	10
Flexural Modulus (MD)	MPa	ASTM D-790	3300	4700	9200	3500
Flexural Modulus (XD)	MPa		1500	1600	5300	2000
Porosity	%	Mercury Intrusion Porosimeter	77	77	77	77

Carbon Paper

Gas Diffusion Layer and Electrode for fuel cells

科学材料站
SCI Materials Hub

CeTech®
CeTech Co., Ltd

New Product

Product Features

1. Offer many types of GDLs for different operating conditions
2. GDL can be customized for specific operating conditions

		Carbon Paper	
Measurement	Units	GDS090 (without MPL & PTFE)	GDL120 (with MPL & PTFE)
Thickness	mm	0.09	0.12
Basic Weight	g/m^2	50	80
Air Permeability (Gurley)	sec	<50	<100
Tensile Strength (MD)	N/cm	15	20
Tensile Strength (XD)	N/cm	10	15
Voltage Loss※1	mV	<7	<10
Through-Plane Resistance※2	$m\Omega cm^2$	<6	<15
Porosity	%	68	N/A

※1. Voltage loss at 500mA/cm^2 and 20 N/cm^2

※2. Through-Plane Resistance($m\Omega cm^2$) Four Point measurement, copper plate contact under 200psi, testing area 19.6cm^2

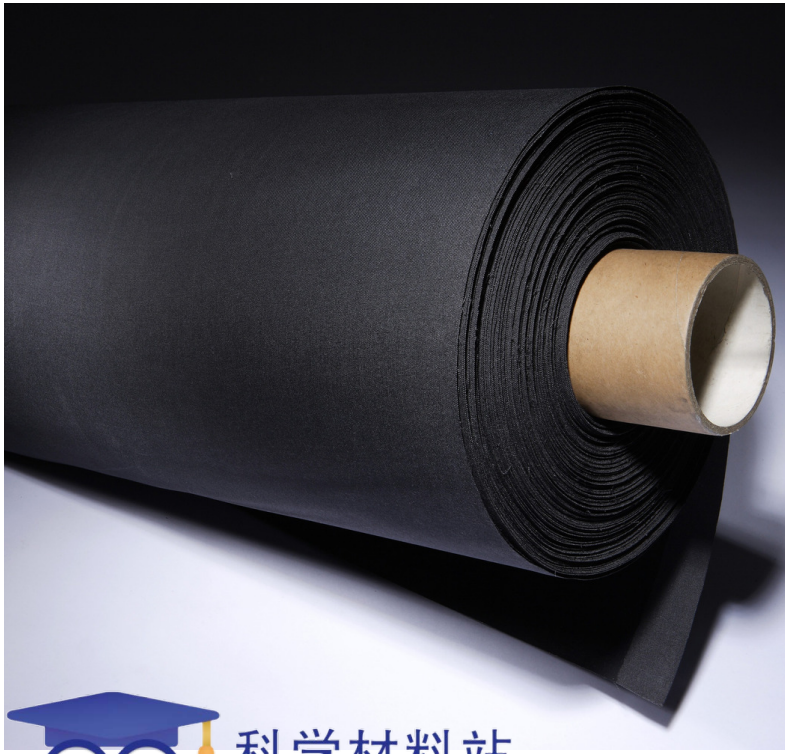
Carbon Cloth

Gas Diffusion Layer and Electrode for fuel cells

CeTech®
CeTech Co., Ltd

Product Features

1. Offer many types of GDLs for different operating conditions
2. GDL can be customized for specific operating conditions



A. with Micro Porous Layer

Substrate with MPL & PTFE			Carbon Cloth
Measurement	Units	Method	W1S1009
Thickness	mm	TECLOCK SM-114	0.41
Basic Weight	g/m^2	ASTM D-646	180
Air Permeability	sec	Gurley	<55
Through-Plane Resistance	$m\Omega cm^2$	Base on ASTM C-611	<13
Tensile Strength (MD)	N/cm	ASTM D-828	10
Tensile Strength (XD)	N/cm		5

B. without Micro Porous Layer and PTFE

Substrate without MPL & PTFE			Carbon Cloth
Measurement	Units	Method	W0S1009
Thickness	mm	TECLOCK SM-114	0.33
Basic Weight	g/m^2	ASTM D-646	120
Air Permeability	sec	Gurley	<10
Through-Plane Resistance	$m\Omega cm^2$	Base on ASTM C-611	<5
Tensile Strength (MD)	N/cm	ASTM D-828	10
Tensile Strength (XD)	N/cm		5

Carbon Plate

Gas Diffusion Layer and Electrode for fuel cells

科学材料站
SCI Materials Hub

CeTech®
CeTech Co., Ltd

New Product

Product Features

1. Offer many types of GDLs for different operating conditions
2. GDL can be customized for specific operating conditions

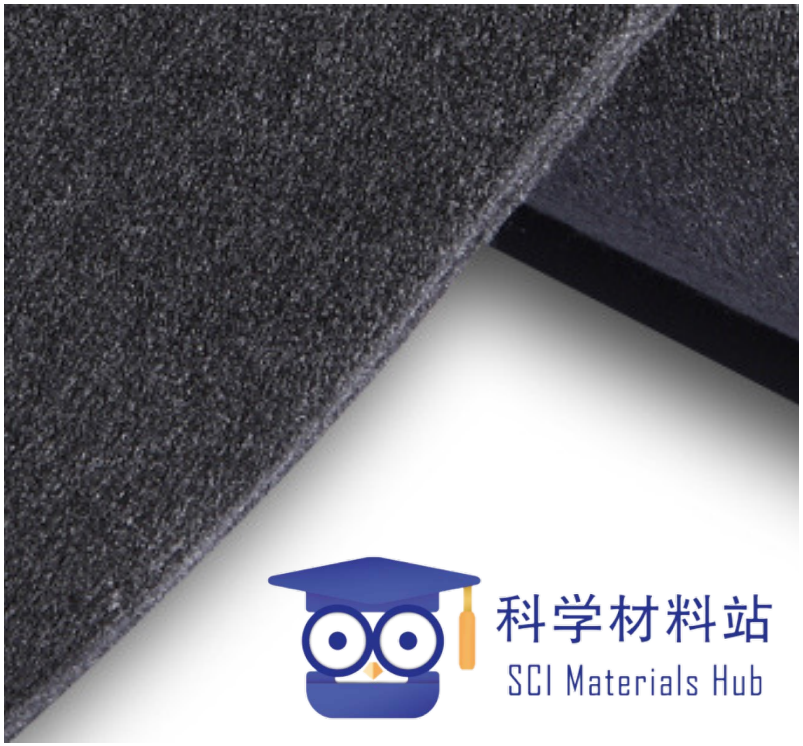
		Carbon Plate			
Measurement	Units	GPP035 (without MPL & PTFE)	GPP043 (without MPL & PTFE)	GPP050M (with MPL & PTFE)	GPP070M (with MPL & PTFE)
Thickness	mm	0.35	0.43	0.5	0.7
Basic Weight	g/m^2	200	240	300	450
Air Permeability (Gurley)	sec	N/A	N/A	<150	<150
Density	g/cm^3	0.49	0.56	N/A	N/A
Voltage loss※1	mV	<9	<9	<20	<20
Through-Plane Resistance※2	$m\Omega cm^2$	<9	<9	<15	<15
Tensile Strength (MD)	N/cm	N/A	N/A	90	200
Tensile Strength (XD)	N/cm	N/A	N/A	40	160

※1. Voltage loss at 500mA/cm^2 and 20 N/cm^2

※2. Through-Plane Resistance($m\Omega cm^2$) Four Point measurement, copper plate contact under 200psi, testing area 19.6cm^2

Graphite Felt

Electrode for Vanadium Redox Flow Batteries (VRBs)



Product Features

1. Excellent chemical stability
2. Good electrical conductivity
3. Even thickness
4. Long life cycle

CeTech®
CeTech Co., Ltd

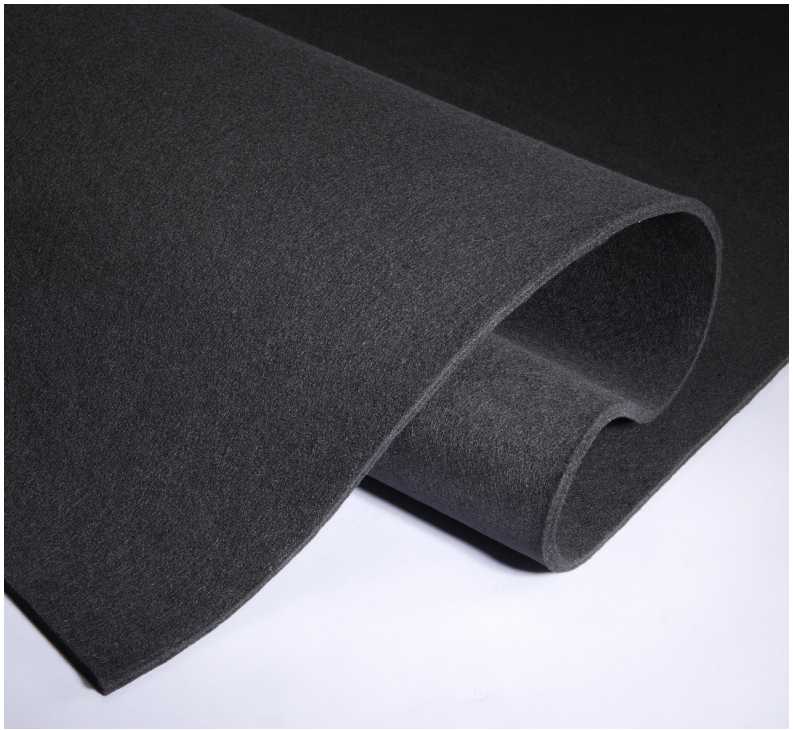
		Graphite Felt
Measurement	Units	GF065
Thickness	mm	6.5
Roll Width	mm	1030
Roll Length	Meter	25-35
Basic Weight	g/m^2	590
Carbon Content	%	98.5
Ash Content	%	<0.09
Thermal Conductivity at 1500°C	W/mK	0.1
Tensile Strength	MPa	0.12

New Product

			Graphite Felt	
Measurement	Units	Method	GF020	GF030
Thickness	mm	ISO5084	2±0.5	3±0.5
Voltage loss	mV	Voltage loss at 500mA/cm^2 and 20 N/cm^2	35	35

Insulation Felt

High-temp protection for vacuums and inert gas furnaces



Product Features

1. Low thermal conductivity
2. Dimensionally stable at elevated temperature
3. High strength-to-weight ratio
4. Puncture and abrasion resistance
5. Acid and alkali resistance
6. Welding sparks and spatter resistance
7. Excellent flexibility

CeTech®
CeTech Co., Ltd

		Carbon Felt	Graphite Felt
Measurement	Units	CF120	GF100
Thickness	mm	12	10
Roll Width	mm	1200	>1000
Roll Length	Meter	25-35	17-18
Basic Weight	g/m^2	800	500~800
Carbon Content	%	>50	>50
Ash Content	%	<0.2	<0.2
Thermal Conductivity at 1500°C	W/mK	0.15	0.10
Tensile Strength	MPa	0.18	0.20

Insulation Felt

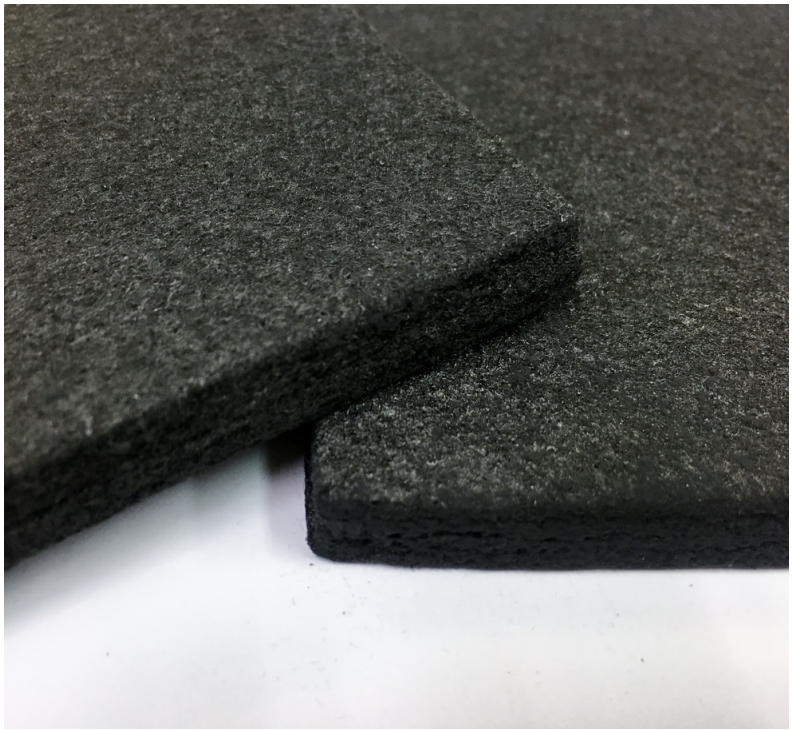
High-temp protection for vacuums and inert gas furnaces

Product Features

1. Low thermal conductivity
2. Dimensionally stable at elevated temperature
3. High strength-to-weight ratio
4. Puncture and abrasion resistance
5. Acid and alkali resistance
6. Welding sparks and spatter resistance

CeTech®
CeTech Co., Ltd

New Product



Measurement	Units	Graphite Rigid Felt
Thickness	mm	10
Density	g/cm^3	0.2
Ash Content	%	<0.1
Sheet Size	mm	400*1000

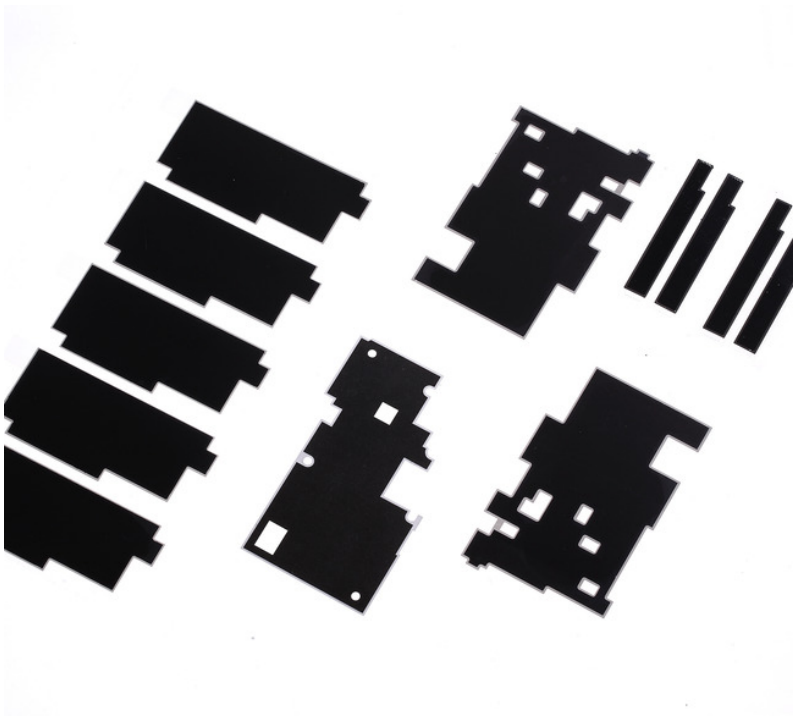
iGS Graphite Sheet

iGS (Intelligent Graphite Sheet) for smart phone, tablet PC, ultrabook, digital camera and camcorder

Product Features

1. Excellent thermal conductivity enables higher heat flow and higher computing speed
2. Light weighted: Only 1/4 of copper and 1/2 of aluminum
3. Flexible as paper and can be bended in three dimension design
4. With low thermal conductivity in z-direction, iGS is able to keep hot spots on one side and maintain its x-y-direction conductivity at the same time
5. Can survive in extreme environment

CeTech®
CeTech Co., Ltd



			iGS Graphite Sheet	
Measurement	Units	Test Method	iGS025	iGS040
Thickness	mm	Micrometer	0.025	0.04
Thermal Conductivity (x,y)	W/mk	Angstrom Method	1500	1250
Thermal Conductivity (z)	W/mk	Laser Flash	10	10
Thermal Diffusivity	cm^2/s	Angstrom Method	7.5	7.5
Density	g/cm^3	Archimedes Law	2.1	1.8
Specific Heat	J/g K	DSC	0.94	0.94
Extensional Strength (x,y)	MPa	ASTM D882	30	15
Bending Test	Frequency	MIT (R5/180°)	>10000	>10000
Electric Conductivity	S/cm	JIS K7194	>13000	>13000
Temperature Condition	°C	Thermometer	-40 ~ 400	-40 ~ 400

*These data are measured at our lab and not guaranteed values.