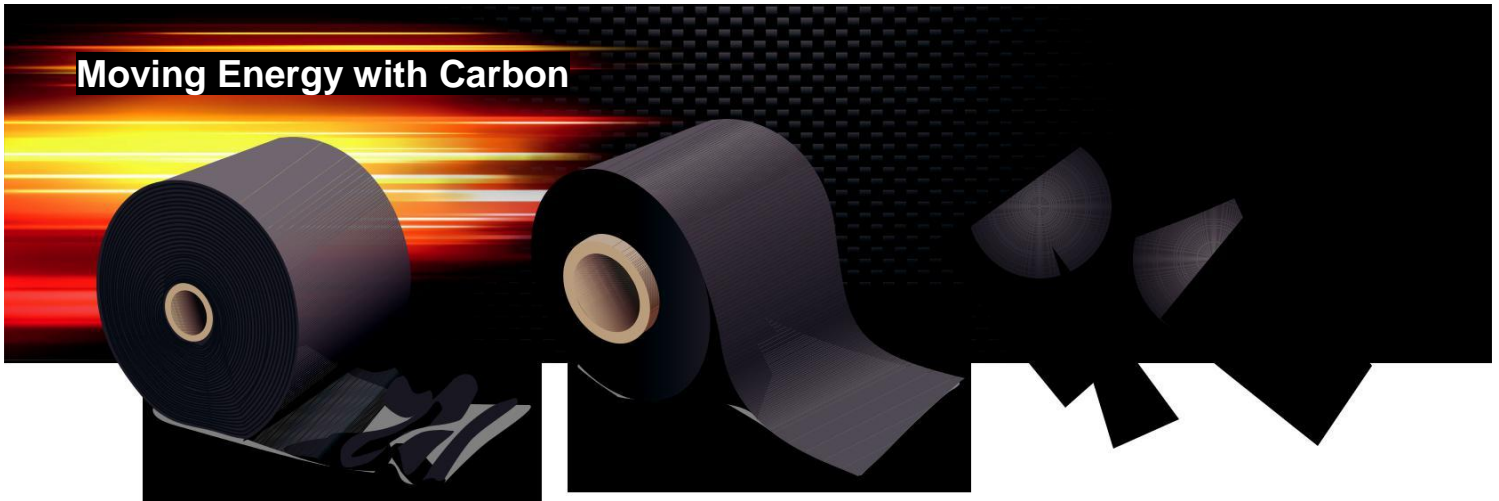




AvCarb® Gas Diffusion Substrates



Moving Energy with Carbon

AvCarb Gas Diffusion Substrates

Substrates are critical components of fuel cell membrane electrode assemblies (MEAs). AvCarb Gas Diffusion substrates are unparalleled in their ability to meet the rigorous demands of the fuel cell, including platinum catalyst and functional layer support, effective transport of gases and liquids, and conduction of heat and electricity. Moreover, AvCarb substrates are highly durable, both chemically and mechanically.

AvCarb Carbon Fabrics

- ▶ Flexible
- ▶ Open structure

AvCarb Carbon Fiber Papers

- ▶ Rollable
- ▶ Scalable, cost-effective

AvCarb Molded Graphite Laminates

- ▶ High rigidity
- ▶ Highly graphitized

PTFE Treatments

- ▶ AvCarb material Solutions offers carbon fiber papers with standard PTFE treatments for water repellency
- ▶ Custom PTFE treatments are available for all AvCarb Gas Diffusion Substrates at levels 5%–35% PTFE by weight
- ▶ Custom MPLs are also available, please contact us for details

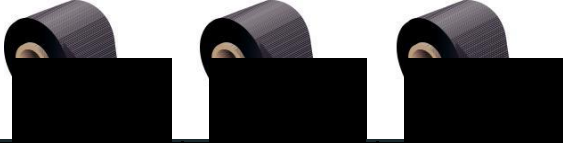




AvCarb® Gas Diffusion Substrates

AvCarb® Carbon Fiber Papers are used as gas diffusion substrates or electrode backings for fuel cell applications.

The table below lists nominal properties of commercially available AvCarb carbon papers for fuel cells. Please contact us for assistance in selecting the right product for your application or for more information.



Substrate Grade	Units	AvCarb EP40	AvCarb P50	AvCarb P75
Nominal Thickness				
(@ 1 psi / 0.7 N/cm ²)	microns	200	170	245
(@ 7.3 psi / 5.1 N/cm ²)	microns	190	150	205
Nominal Basis Weight				
	g/m ²	36	50	75
Break Strength				
Machine direction	MPa	5.0	5.0	6.5
Cross machine direction	MPa	3.5	3.0	3.9
Stiffness				
Machine direction	Taber	9.5	7.5	20.0
Cross machine direction	Taber	3.5	3.0	3.5
Bulk Density				
(@ 0.69 N/cm ² /1psi)	g/cm ³	.20	.31	.29
Air Permeability (Gurley)				
Through-pane permeability	sec/100cc	4.5	35	15
In-plane permeability	sec/100cc	50.9	295	83
Compressibility				
(22N - 113N)/22 x 100%	%	14.0	11.5	10.7
Through-Plane Resistivity				
	mOhm*cm ²	8.0	6.7	7.8
Typical Roll Width	mm	400/800	400/800	400/800