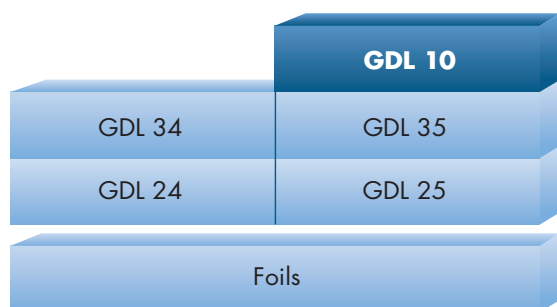


SIGRACET®

GDL 10 Series Gas Diffusion Layer



SIGRACET Gas Diffusion Layers (GDLs) are “graphitized” carbon fiber-based nonwovens, either papers or felts, specifically designed to transport reactant gases into and excess liquid product water out of the electrocatalyst layers of Proton Exchange Membrane (PEM) fuel cells.

The GDL 10 series is our first-generation baseline material, which is produced using a novel technique unique to SGL Group. This material has an open pore structure, good mechanical strength and high

electrical conductivity, and is targeted for use in moderate-to-high humidity and higher current density operating environments. GDL 10 types can also be used with both low or high stack temperatures and in both ambient or pressurized gas conditions. GDL 10 is well suited to stationary and portable power systems. The GDL 10 product line has also been demonstrated successfully as either a cathode GDL or anode Liquid Diffusion Layer (LDL) in Direct Methanol Fuel Cell (DMFC) applications.

GDL 10 substrates are produced in-house by SGL Group and are ready for “post-processing”. Our continuous value-added processing steps to the substrate consist of a bulk impregnation of the fiber matrix with PTFE and our standard carbon/PTFE-blended Microporous Layer (MPL) applied to one side. The end result is a “finished GDL” ready to be inserted directly into PEM stacks or to be bonded to Catalyst-Coated Membranes (CCMs) for producing Membrane Electrode Assemblies (MEAs).

Properties of SIGRACET® GDL 10

Property	Unit	GDL 10 BA	GDL 10 BB	GDL 10 BC
Thickness ▲	mil	15.7	16.3	16.3
	µm	400	420	420
Areal Weight	oz/ft ²	0.28	0.41	0.44
	g/m ²	85	125	135
Porosity	%	88	84	82
Air Permeability ■	cm ³ /(cm ² · s)	85	3	1.45
Electrical Resistance (through plane) ●	mΩcm ²	< 12	< 15	< 16


- ▲ Under 0.45 N/cm² (5 psi), sample diameter 30 mm
- Gurley model 4118, 300 cc, 0.1 sq.in orifice, 304 Pa, sample diameter 30 mm
- 2-point measurement, circular (25 mm diam.) gold-plated contacts 100 N/cm²

Broad Base. Best Solutions.



Grades

We supply SIGRACET Gas Diffusion Layers in roll form in lengths of 75 +/- 25 m. Our standard roll width is 45 cm, but we can split parent rolls into multiples thereof, i. e. 2 x 22.5 cm wide rolls, 3 x 15 cm wide rolls, etc. Sheets stamped to a specified geometry are also available if so desired. Substrate PTFE loadings are available from 0 to 30 wt%, but 5 wt% is standard.

	AA		YA			YC
						
	Y	A	B	C	D	E
% PTFE		0	5	10	20	30



By courtesy of SFC

GDL "AA" is our plain substrate with no value-added post-processing.

GDL "BA" is our hydrophobized substrate with a 5 wt% PTFE loading.

GDL "BB" or "BC" is our hydrophobized substrate (5 wt% PTFE) and with our standard Microporous Layer (MPL) on one side.



Unique Characteristics

Our GDL 10 nonwovens are truly 3-dimensional in fiber orientation. They are more compressible and resilient when compared with typical 2-dimensional papers. On request, we will advise you on maximum compression loads for use in bonding to Catalyst-Coated Membranes (CCMs) or assembling stacks. Gasket design also needs to take the compression behavior of GDL into account.

The resilience of our GDL 10 is useful in maintaining uniform electrical contact by compensating for the dimensional changes of other components such as membranes that swell during stack operation.

As with other continuously manufactured webs, properties in the machine and transverse directions are different; the anisotropy factor is typically 4 to 6.

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