

DuPont™ Kapton® GS

Polyimide Film

Description

DuPont™ Kapton® GS film has been specifically designed and manufactured to expand the processing window and improve yields during artificial graphite sheet production. This particular film has high tensile strength and uniform properties that permit controlled shrinkage during the carbonization process. The film's molecular structure permits uniform graphite formation during the graphitization process.

The above described properties of Kapton® GS films enable excellent “in plane” thermal conductivity when converted into artificial graphite sheet.

Applications

Artificial Graphite Sheets

- Used as a thermal dissipative “in plane” material in a variety of commercial & industrial applications to consumer electronics such as cell phones and tablet computers.
- Enables excellent downstream process latitude for lamination of coverfilms, adhesive application, and punching or forming of the graphite sheets to the desired shape.

Product Specifications

Kapton® GS conforms to the pad roll specification, width tolerances, and packaging material requirements as outlined in the Kapton® general specification bulletin H-38479 (6/18).

Certification

Kapton® GS meets ASTM D-5213 (type 1, item A) requirements. Written confirmation is available with each delivery upon request.

Table 1 – Typical Values of Physical Properties of DuPont™ Kapton® GS at 23°C (73°F)

Property	Unit	1 mil 25µm	1.5 mil 37.5µm	2 mil 50µm	2.4 mil 61 µm	2.7 mil 68.6 µm	3 mil 75µm	5 mil 125µm	Test Method
Ultimate Tensile Strength	psi (Mpa)	33,500 (231)	33,500 (231)	33,500 (231)	33,500 (231)	33,500 (231)	33,500 (231)	33,500 (231)	ASTM D-882, Method A
Elongation	%	72	72	72	72	72	78	82	ASTM D-882, Method A
Density	g/cc	1.42	1.42	1.42	1.42	1.42	1.42	1.42	ASTM D-1505
Coefficient of Friction (Kinetic) film to film		0.48	0.48	0.48	0.48	0.48	0.48	0.48	ASTM D-1894
Coefficient of Friction (Static) film to film		0.63	0.63	0.63	0.63	0.63	0.63	0.63	ASTM D-1894
Refractive index (Sodium D line)		1.7	1.7	1.7	1.7	1.7	1.7	1.7	ASTM D-542
Poisson's Ratio		0.34	0.34	0.34	0.34	0.34	0.34	0.34	Avg 3 samples elongated at 5, 7, and 10%

Table 2 – Thermal Properties of DuPont™ Kapton® GS Film

Thermal Property	Typical Value	Test Method
Melting Point	None	ASTM E-794-85 (1989)
Specific Heat, J/g·K (cal/g·°C)	1.09 (0.261)	Differential calorimetry
Heat Sealability	not heat sealable	
Smoke Generation (performed in NBS Smoke Chamber)	$D_m = <1$	NFPA-258
Shrinkage, % 30 min at 150°C 120 min at 400°C	0.17 1.25	IPC-TM-650 Method 2.2.4A; ASTM D-5214
Limiting Oxygen Index, %	34	ASTM D-2863-87
Glass Transition Temperature (T _g)	A second order transition occurs in Kapton® between 360°C(680°F) and 410°C(770°F) and is assumed to be the glass transition temperature. Different measurement techniques produce different results within the above temperature range.	

Table 3 – Thermal Coefficient of Expansion DuPont™ Kapton® GS Film, 25 μm (1 mil)

Temperature Range, °C, (°F)	ppm/°C
30–100 (86–212)	17
100–200 (212–392)	32
200–300 (392–572)	40
300–400 (572–752)	44
30–400 (86–752)	34



For more information on DuPont™ Kapton® or other DuPont products, please visit our website.

kapton.com

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