

## PATENTED METAMATERIAL DIELECTRIC FILMS FOR HIGH-DENSITY ENERGY STORAGE.

NanoPlex HDC-based films can create energy and power storage solutions, offering up to 4x more energy storage capacity in half the footprint with significantly improved thermal stability and an extended device lifetime. We enable capacitor customers to build smaller, lighter, and more robust energy storage solutions with up to 4x energy storage, resulting in smaller, lighter devices with enhanced thermal operational limits across a wider variety of applications.



NANOPLEX™  
HDC

### AT A GLANCE

- Up to **4x More Energy Storage**
- More Power in the Same Footprint**
- Up to **2x Smaller Capacitor Footprint**
- 100% U.S. Engineering**
- Over **20 Global Patents**



AIRCRAFT EMALS



POWER GRIDS



LASER FUSION MACHINES



EVS

### PEAK NANOPLEX METAMATERIAL MANUFACTURING LEADERSHIP

NanoPlex films require not only new product science but also new manufacturing science. Peak is a global leader in the science of rheology, a branch of physics that deals with the formation and flow of matter, especially the non-Newtonian flow of liquids and the plastic flow of solids. Our advanced capabilities in this area allow us to deliver up to 4,096 layers in our metamaterial.

PROPERTY	METHOD	UNITS	4125	3125
Dielectric Constant	ASTM D150	1 kHz, 25°C	4.7	3.7
Dissipation Factor	ASTM D150	in % at 1 kHz, 25°C	1.0	0.5
Breakdown Strength @ 25°C (oil submersion)	ASTM D149	V/micron	790	820
Shrinkage MD/TD	JIS K7133	% at 130°C	<0.1/<0.1	<0.1/<0.1
Shrinkage MD/TD	JIS K7133	% at 150°C	0.75/0.60	1.9/0.65
Tensile Strength, MD/TD	ASTM D638	MPa	63/57	90/75
Young's Modulus MD/TD	ASTM D638	MPa	2300/2500	2300/2500
Elongation at Break MD/TD	ASTM D638	%	65/60	95/100
Coefficient of Friction (Static)	JIS K7125	roll face to air face	0.45	0.45
Coefficient of Friction (Dynamic)	JIS K7125	roll face to air face	0.35	0.35
Surface Roughness (Ra)	JIS B0601	microns	0.03	0.03
Density	ASTM D792	g/cc	1.5	1.36
Maximum Temperature	n/a	°C	105	105
Thickness*	n/a	micron	8, 12	8, 12
Roll Width	n/a	mm	620	620
Film Length	n/a	m	500-5000	500-5000

\*Based on 8 micron film