BLUESHIFT

PhaseBlue®

Series Circuit Materials

Lighter, Smarter, Design Ready.

PhaseBlue Series Circuit Materials

Core polyimide aerogel layer:

- 85% air / 15% polyimide
- Dielectric thickness ranges:
  - 0.0065 - 0.030” (165 - 750 µm)
- Environmental alternative for PTFE based materials, REACH-compliant

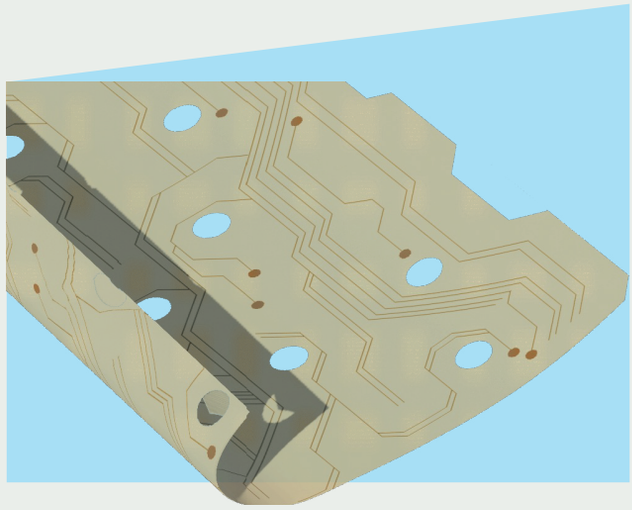
Applications

Designed for phased arrays, patch and conformal antennas, and radomes in aerospace applications

Performance

- Ultra-low Dk and Df
- Flexible, formable structure (ideal for 3D shapes)
- Robust dimensional and thermal stability
- Compatibility with FR-4 PCB processes (DES, etchback, drilling)

Relative Permittivity (ε_r)	1.37 - 1.53 @ 1 GHz
Dissipation Factor	<0.001 @ 1 GHz
Density	0.27 - 0.39 g/cm^3



State-of-the-Industry

High Frequency Signal Loss

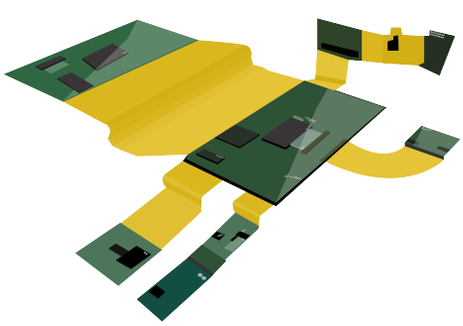
As data rates increase, traditional laminates exhibit signal attenuation and dielectric losses. Designers need materials with ultra-low dielectric constant (Dk) and dissipation factor (Df) to maintain signal integrity in 5G, mmWave, and high-speed digital applications.

High Temperature Limitations

With denser, multi-layer board designs and high-power components, conventional CCLs often lack the thermal stability needed to withstand prolonged exposure to elevated temperatures. This can result in reliability concerns, delamination, or performance degradation over time in harsh environments. Our material delivers superior high-temperature stability, outperforming PTFE, ensuring long-term durability and reliability under extreme conditions.

Rigid and Bulky Substrates Limiting Design Flexibility

Traditional rigid substrates add unnecessary weight and constrain design freedom, especially in compact or high-density applications. Our material combines lightweight construction with exceptional flexibility, enabling tighter bend radii, thinner form factors, and more creative design possibilities, without sacrificing reliability or thermal stability.



Excellent Formability

Working With PhaseBlue

Handling & Storage

- Temperature: 70 ± 5 °F (21 ± 3 °C)
- Relative Humidity: below 50%
- Keep in original packaging with sulfur-free paper
- Handle using rigid frames to avoid tears and deformation

Processing Essentials

- Avoid plasma etchback—use gentler cleaning
- Monitor drill and plating quality
- Limit lamination pressures and temperatures
- Limit heat exposure during soldering (passes IPC solder float)

Performance Highlights

100%

Sustainably Compliant

PFAS-Free and Halogen-Free

80%

Weight Savings

Up to 80% lighter than commercially available laminates

Additional Benefits

- Stable Dk across wide frequency range
- High-temp survivability: reliable well beyond PTFE operating limits
- Easy flex and rigid-flex PCB integration
- IPC 4202/15 compliant
- Made in the USA

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