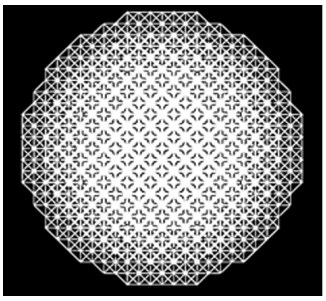
RF APPLICATIONS

FORTIFY

PUSHING THE BOUNDARIES OF 3D PRINTED RF DEVICES



Printed dielectric lens (top) with 3D-graded dielectric properties using topology optimization via nTopology.

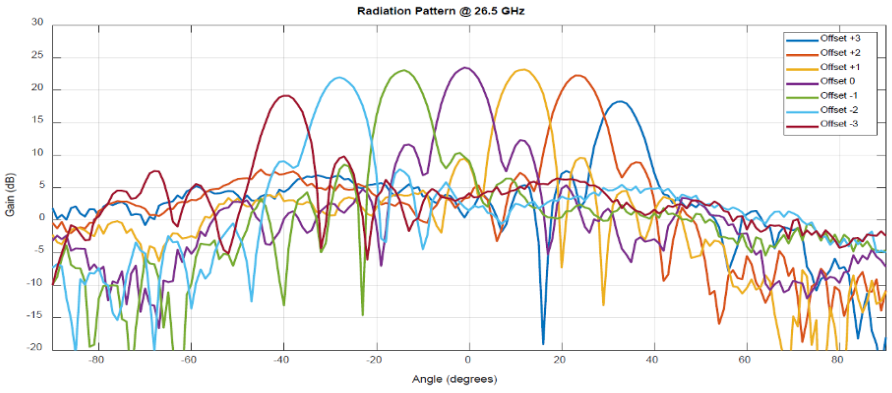
Fortify is developing a palette of dielectric materials for printing components used in high-bandwidth, high frequency communication systems. Specifically tailored for wide-band mm-wave applications, the Fortify platform grants users the capability to manufacture low roughness, high-resolution features necessary for high frequency applications.

FORTIFY DIGITAL COMPOSITE MANUFACTURING

Fortify's patented DCM (Digital Composite Manufacturing) platform enables repeatable and reliable printing of particle filled photopolymers. For RF applications, a unique low-loss polymer is blended with specialty dielectric ceramic additives to create dielectric materials.

Leveraging lattice-based design, the Fortify platform can print functionally graded architectures - generating monolithic components with smooth gradients of effective permittivity perfect for GRIN (Gradient Index) applications. Fortify's RF materials are an excellent choice for printing **lenses, wave-guides, and connectors**.

*	Low Loss 2.6	Low Loss 4.9
Dielectric Constant (SPDR @ 10GHz)	2.6	4.9
Dielectric Loss Tangent (SPDR @ 10GHz)	0.0049	0.0039
CTE (TMA, xy-dir and z-dir, -50 to 50C)	83ppm/C	<80ppm/C
Water Absorption (wt% gain; 24hr @ 50C)	<0.1%	<0.1%
Decomposition Temperature (TGA 1% wt loss)	>280 °C	>280 °C
Outgassing (ASTM E595, vacuum; TML < 1.0% CVCM <0.10%)	Pass	Pass



Radiation pattern for a 1.7dk-1.3dk 3D printed Luneburg-style lens at 26.5 GHz. A waveguide feed source was translated on the backside of the lens to demonstrate the beamforming and beam steering capabilities of the lens.

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