Electrifi™ Functional Prototype Validation Program (EFPVP)

Advancing Functional Additive Manufacturing Through Collaborative Performance Validation

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Program Overview

The Electrifi™ Functional Prototype Validation Program (EFPVP) is a collaborative initiative designed to accelerate the validation and adoption of 3D printed functional components fabricated using Electrifi™ high-conductivity copper composite filament.

EFPVP enables research laboratories, engineering teams, and advanced prototyping groups to evaluate, characterize, and benchmark additively manufactured conductive structures under real-world laboratory conditions.

The program transforms conductive material innovation into validated functional systems.

Program Objectives

- Expand performance characterization of Electrifi™-based functional components
- Generate real-world measurement data across application domains
- Support rapid prototyping and feasibility validation
- Establish a community-driven performance database
- Accelerate adoption of conductive additive manufacturing

Application Domains

EFPVP supports validation across multiple functional categories:

RF & Microwave

- Horn antennas
- Waveguides
- Transmission line structures
- RF fixtures
- EMI enclosures

Thermal & Power

- Printed resistive heaters
- Current-carrying conductors

- Embedded heating channels
- Power distribution structures

Sensing & Mechatronics

- Strain sensors
- Piezoresistive elements
- Flex sensors
- Conductive traces for embedded systems

Custom Functional Designs

Participants may submit CAD models for fabrication and collaborative validation.

Available Reference Geometries (Phase 1)

The following prototypes are available as engineering sample units:

- WR75 Horn Antenna – 10–15 GHz
- WR-Compatible Waveguide Section
- Baseline Electrifi™ Strain Sensor Geometry

These serve as validated starting points for performance benchmarking and further refinement.

How the Program Works

Step 1 — Prototype Acquisition

Participants may:

- Purchase a reference geometry, OR
- Submit custom CAD files for fabrication

Step 2 — Laboratory Testing

Participants conduct structured testing using appropriate laboratory instrumentation, such as:

- Vector Network Analyzer (VNA)
- Anechoic chamber
- Strain testing apparatus
- Thermal imaging systems
- Power measurement equipment

Step 3 — Data Submission

Participants submit structured measurement data including:

- Test setup description
- Instrument model and calibration method
- Measured plots or datasets
- Observations and conclusions

Step 4 — Validation Credit Issuance

Based on the completeness and technical rigor of submitted data, participants receive store credit toward:

- Electrifi™ filament purchases
- Future prototype fabrication

Validation Credit Structure

Credit is proportional to data quality and characterization depth:

- Basic electrical validation — up to 20%
- Functional characterization — up to 30%
- Advanced RF validation — up to 50%

Credit applies to future purchases and is valid for 12 months.

Engineering Sample Disclosure

Prototypes supplied under EFPVP are designated:

Engineering Sample – Performance Under Continued Validation

These components are intended for:

- Experimental research
- Feasibility evaluation
- Comparative benchmarking
- Additive manufacturing studies

Participant Benefits

- Accelerate functional prototyping
- Reduce machining and fabrication costs
- Access high-conductivity additively manufactured components
- Influence next-generation design development
- Collaborate directly with materials innovators
- Gain optional technical visibility through case studies

Data & Intellectual Property Policy

- Participants retain ownership of all submitted measurement data
- Multi3D may reference anonymized results unless attribution permission is granted
- Custom CAD files remain the property of the submitting party
- NDA agreements are available upon request

Program Vision

EFPVP aims to establish Electrifi™ as a validated platform for functional additive manufacturing across RF, sensing, and power applications.

Through structured collaboration and real-world measurement, conductive 3D printing evolves from material capability to system-level performance validation.

Become a Validation Partner

Multi3D invites qualified laboratories and engineering teams to participate in Phase 1 of the Electrifi™ Functional Prototype Validation Program.

To apply, please provide:

- Institution or company name
- Available test equipment
- Application domain of interest
- Prototype request

Contact: info@multi3dmaterials.com