

# CREATIVE PROTOTYPING

## A Strategic Engineering Lever, Not Just a Development Step

### OBJECTIVES & BACKGROUND

A customer approached Able Coil seeking a redesigned bobbin-wound coil after failed efforts with a previous supplier. The existing design was costly and failed to meet performance and manufacturability requirements for their end use application.

**A technical review of the incumbent design revealed several critical challenges:**

- **Over-engineered bobbin geometry**- which introduced unnecessary complexity
- **High production cost**- driven by precision machining requirements and extended setup time.
- **Limited manufacturability**- as the bobbin configuration restricted winding access and required hand winding to maintain dimensional accuracy.

The overall effect was elevated unit cost, extended production time, and inconsistent winding repeatability.

### ABLE COIL'S SOLUTION

Able Coil collaborated directly with the customer's technical team to conduct a structured design and manufacturability review. Through a thorough prototype analysis, our engineering team identified multiple design elements that could be optimized without altering the coil's functional requirements.

**Key Improvements Implemented:**

- **Redesigned bobbin geometry** to eliminate unnecessary machined features while maintaining structural integrity and dimensional stability.
- Transitioned from a machined component to a **high-precision 3D printed bobbin**, significantly reducing tooling complexity and lead time.
- Optimized the bobbin design to support **automated winding**, improving repeatability and eliminating the need for hand winding.

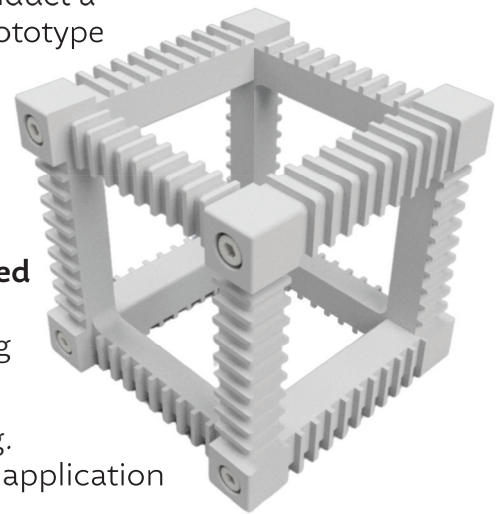
A functional prototype was produced and delivered for validation testing. Performance results confirmed that the 3D printed bobbin not only met application requirements but could also serve as the production intent solution.

### VALUE DELIVERED

Able Coil delivered a **fully integrated, turn-key solution** encompassing prototyping, production intent design, and a full-scale manufacturing provider. The result was a design optimized for manufacturability, reduced overall cost, and complete technical compliance with the customer's performance and application requirements.

- Eliminated complex machining operations and associated tooling costs
- Reduced overall component cost through additive manufacturing
- Improved winding consistency by enabling machine winding
- Minimized risk of operator induced variability
- Shortened production lead time

By leveraging prototyping as a strategic engineering tool rather than simply a validation step, Able Coil transformed a cost intensive and labor dependent design into a scalable, production ready solution.



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