



**Product
Realization
Group®**

Success Story

Securing Reliability in Ventiva's Next-Generation Electronic Product

What we did:

Conducted a comprehensive reliability and product verification assessment for Ventiva's new cutting-edge thermal management product. The project aimed to identify potential design and manufacturing risks and develop strategies to mitigate them, ensuring that Ventiva's product met the stringent demands of the market.

Results:

The collaboration between Ventiva and PRG led to significant advancements in the reliability foundation and overall quality of Ventiva's products.

Company: Ventiva

Headquarters: Silicon Valley, California, USA

What they do: Ventiva has pioneered a groundbreaking thermal management technology that is set to revolutionize the electronics industry. Their innovative solution, Ventiva ICE, is an active, hybrid cooling system with no moving parts or noise, making it perfect for a wide range of devices including ultra-thin TVs, wireless chargers, automotives, IoT devices, laptops, and more. Ventiva ICE operates on the principle of ionization, seamlessly bridging the gap between active and passive thermal management in a compact, solid-state form factor.

Challenge

Ventiva's product faced several critical challenges that could impact its reliability and performance.

Resource constraints. Limited availability of key personnel delayed the completion of crucial documentation and analysis.

Design vulnerabilities. Initial assessments revealed sensitivities in the ICE component to environmental factors such as air turbulence and volatile organic compounds (VOCs).

Lack of documented processes. Ventiva's design process lacked formal documentation and standardized tools, making it difficult to ensure consistent product quality.

Manufacturing uncertainties. The absence of defined manufacturing process controls posed risks to the reliability of the products being produced.

PRG's solution

PRG's team worked closely with Ventiva to address these challenges through a series of targeted interventions.

1. Product requirements development. PRG initiated the development of a comprehensive Product Requirements Document (PRD) that integrated customer feedback and updated engineering specifications. This document served as the foundation for all subsequent reliability testing and design improvements.

2. Design failure mode & effects analysis (DFMEA). PRG provided DFMEA training and facilitated initial DFMEA sessions focused on Ventiva's ICE and Power Supply subsystems. This analysis helped to identify and prioritize design risks and guided the team in making critical design improvements.

3. Reliability testing strategy. PRG developed detailed reliability testing plans for both system-level and board-level components, incorporating industry standards and customer requirements. PRG also identified and coordinated with external testing labs to ensure that all necessary tests were conducted.

Key benefits of engagement with PRG

- **Enhanced product design.** The DFMEA process identified key areas for design improvements, guiding the way to more robust and reliable products.
- **Improved testing protocols.** The reliability testing strategy ensured that Ventiva's products would meet both industry and customer requirements, reducing the risk of field failures.
- **Stronger manufacturing controls.** The implementation of process controls and documentation provided Ventiva with a more reliable manufacturing process, reducing variability and increasing product consistency.

"Partnering with PRG was pivotal for Ventiva. Their expertise in reliability engineering and product validation helped us to address potential design and manufacturing risks and ensured that our breakthrough cooling technology meets the highest industry standards. With PRG's support, we are confident that Ventiva ICE will set a new benchmark in thermal management, delivering unparalleled quality and performance for our customers as well as the ability to rapidly scale our business."

— Gary Oliverio
Vice President of Research and Development

4. Process improvements. PRG provided guidance on documenting the design process, defining special characteristics critical to quality (CTQ) and function (CTF), and implementing manufacturing process controls. These steps were essential in ensuring that the products being tested were representative of those to be mass-produced.

The right systems, processes, and relationships

PRG's expertise in reliability engineering and product development played a critical role in helping Ventiva overcome significant challenges and achieve their reliability goals. The success of this project underscores the importance of a structured approach to reliability and the value of collaboration in bringing innovative products to market.