

HIPERFIRE Brings New Compensator to Market Faster with Help from Ansys Startup Program and Rand Simulation



The Organization

HIPERFIRE is transforming the firearms industry by designing, manufacturing, and selling accessory products that satisfy unmet needs of recreational shooters and professional operators. Established in 2011 to develop unique solutions to common problems, HIPERFIRE is best known for their upgraded AR-15 triggers; however, their product lines also include semi-automatic and fully-automatic fire controls, pistol grips, and muzzle compensators.



The Challenge

“A pursuit of perfection guides our development of high-performance products that meet standards no other company can match,” said Terry Bender, chief executive officer at HIPERFIRE. “When we started working on the second generation HIPERCOMP®, our recoil muzzle compensators, our goal was to make them smaller, less expensive, and with a recoil that met or exceeded the best reviewed after-market compensators we could find and test.”

To address these challenges and ensure a smooth product development process, Terry knew he’d need to incorporate engineering simulation software into the design process and partner with an expert for a smooth and rapid implementation.



The Solution

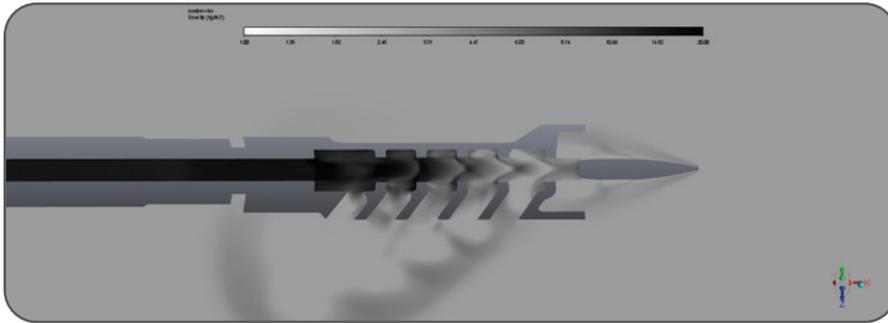
Terry was aware of the capabilities of Ansys Fluent, the industry-leading fluid simulation software.

“Instead of using the trial-and-error method to test our compensator designs, we wanted to use Ansys Fluent, which simulates real-world conditions and provides insight not obtainable from testing. With Fluent, not only were our design changes more informed, but each iteration took less time, required fewer resources and less financial investment,” said Terry. “This prediction of compensator performance empowered design adjustments needed for optimizing recoil and the unparalleled visuals made it easy to demonstrate our product’s superior capabilities.”

Terry reached out to Rand Simulation, an Elite North American reseller of Ansys engineering simulation software and services provider, given Rand Simulation’s expertise in ammunition product design and supersonic flows. HIPERFIRE was a prime candidate for the Ansys Startup Program which allowed Terry to access best-in-class Ansys technology to accelerate innovation without the capital of a larger, more established organization.

“I was impressed with everyone I spoke with at Rand Simulation,” said Terry. “They clearly knew Ansys, the Fluent software, Computational Fluid Dynamics theory/application, and they showed a sincere interest in helping me reach my goals.” Based on this positive experience during initial mutual-discovery, HIPERFIRE engaged Rand Simulation for:

1. **Ansys Fluent software** access through the Ansys Startup Program.
2. **Custom analysis template development** of a bullet moving through a sniper rifle so HIPERFIRE could quickly and confidently incorporate simulations into its design process with high-fidelity insight.
3. **Training on Fluent software** and application best practices over a few short web-based sessions, all recorded and centered around the custom template, to create direct access to the Rand Simulation experts as HIPERFIRE acclimated to Fluent.



The Results

“I went into this project knowing that I wanted to use Fluent software, and the Ansys Startup Program made that possible,” said Terry. “With access to the top simulation software at an affordable price, we had the tools needed to design two feasible options of the compensators before the physical prototype testing, which saved us a tremendous amount of time and money.”

Within just a few months, HIPERFIRE leveraged the software, templates, and training to design, analyze, and optimize two versions of the compensator. Based on their analysis of the data in Fluent, HIPERFIRE predicted a 10 percent improvement over the best recoil break that they could find, and prototype testing proved the analysis correct. With identical performance improvements in both versions of the compensator, HIPERFIRE selected the option that cost less to manufacture and passed the cost savings on to customers.

“I am confident that our analysis of the simulations led to the physical limits of what can be done with this compensator,” said Terry. “I am certain that no one can make a better compensator of the same size or smaller for less money.”

Terry continued, “Fluent was the best software package for us, and the Rand Simulation team was the right group to get us up to speed. We quickly produced an outstanding compensator that expands our product line and helps us stand out as a firearms technology company that designs and manufactures the best products on the market.”

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— Terry Bender
Chief Executive Officer, HIPERFIRE



About Rand Simulation

Rand Simulation is focused on helping organizations bring their product vision to reality through incorporating engineering simulation technology into the product development process. Rand Simulation caters to product development organizations looking to compress the design process, maximize innovation, strengthen competitive differentiation and grow bottom-line profitability. Rand Simulation serves as both a North American reseller of Ansys engineering simulation software and as a trusted design consultant offering insights gained on over 3,000 design projects using engineering analysis software to balance design performance with size, cost, DFM and aesthetics.