



## Combustion Technology

Combustion systems are challenging to design. Whether it's for a high-pressure jet engine or a high-speed airbreathing propulsion application, a combination of modeling tools and experimental validation is needed to develop robust combustion systems. GE Aerospace, Research has been studying combustion systems for over 50 years and has solved some of the most difficult problems in low-emission and fuel flexible designs. GE was first to market with world-leading low emissions technologies including dry low NOx burners for power generation and TAPS premixed liquid fuel injectors for Aviation. We have developed state-of-the-art modeling tools, diagnostics, and high-pressure test facilities. If you have combustion technology needs that would benefit from the experience and capabilities of our engineering team, we're ready to help!

### GE Aerospace, Research Portfolio

The GE Aerospace, Research Combustion Laboratory has more than 30 researchers focused on solving the challenges of combustion systems using industry leading experimental and computational resources. Our engineers have expertise in pollutant emissions, combustion dynamics, durability, efficiency, and fuel flexibility design. The team combines its strengths with on-site test facilities and a deep network of academic, industry, and government partners to innovate quickly. Combustion models can be developed and validated experimentally in house. Custom 1D and 3D modeling tools along with data analytics are used to analyze results and develop digital twins of your system, leading to robust design.

### High Pressure Experimental Facilities

The GE Aerospace, Research state-of-the-art combustion test facilities enable efficient performance evaluation reaching full-power conditions for aviation and land-based turbines. The test facility can handle both conventional and unconventional gaseous and liquid fuels. The fuel feed systems enable online mixing of different gaseous fuels to target specific blends of interest. Our test cells are equipped to gage performance of complex architectures and enable efficient and accurate test execution. Advanced combustion diagnostics using lasers, IR imaging, tunable acoustic chambers, and custom-built instrumentation probes enable thorough validation of new designs and can identify the root cause of field failures.



### Combustion Modeling and High-Performance Computing (HPC)

Engine operational experience feeds back to our modeling expertise and tool application. GE scientists are world-class experts in developing simulations of combustion on HPC systems enabling prediction of performance metrics related to operability, durability, emissions, and fuel flexibility. The validated tools and processes developed by the team guide engineering analysis and design selection for current and next generation combustors. They include unsteady flow simulation methodologies like LES and thermo-acoustic network models. We've run hundreds of millions of CPU hours analyzing complex combustor architectures for key design metrics with fast turn-around.

### What's Next

Whether you want us to develop a combustion system design, solve an existing issue, or give you access to our computational and experimental facilities for your own development efforts, we're ready to put in the work. Take advantage of tools and experience that would take decades to develop on your own. We see collaboration as the path forward, and we're ready to work with you.

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