

TEN TECH LLC

A Mechanical Engineering Consulting Company that Provides Design, Test and Analysis Services

TEN TECH LLC is an ITAR (International Traffic in Arms Regulations) registered mechanical engineering consulting company headquartered in Los Angeles, CA with operations in Billerica, MA, providing Mechanical Design, Analysis and Test services with emphasis on Aerospace & Defense, Hi-Tech Electronics and Renewable Energy applications. TEN TECH's Mechanical Design Division specializes in Consumer-grade and Ruggedized Electro-Mechanical Packaging, Electromagnetic Interference Hardening and Plastic Parts Design. Its Mechanical Analysis Division provides expertise in Structural Dynamics, CFD (Computational Fluid Dynamics), Thermal Analysis, Vibro-acoustics and Aeroelasticity while the Physical Testing Division offers Shock & Vibration, Thermal, Acoustics, Salt/Fog, Humidity and Airflow testing services. TEN TECH has been one of Software Cradle's power users since 2011.



TEN TECH LLC

<https://www.tentechllc.com>

Founded	2011
Business	Mechanical Engineering Consulting
President	Connie Yokogawa
Location	Los Angeles, CA (USA)
Size	10 - 50 employees



Picture 1: William Villers
Co-founder
& Director of
Engineering at TEN
TECH LLC

Mr. William Villers is a 25-year veteran of the aerospace and defense industry, with an ABD (All but dissertation) Doctorate in Mechanical Engineering from the Mediterranean Institute of Technology in Marseille, France. His expertise is in structural dynamics, shock, vibration, fluid dynamics and thermal analysis of mechanical systems, with a specialty in avionics systems and chassis. Working for major corporations including Eurocopter, Aerospatiale and EDS both in Europe and the United States, Mr. Villers has enjoyed a continuously growing and successful career in engineering and engineering management. Over the course of his career he has been part of and directed engineering activities for high-profile aerospace and defense programs including NH90, Ariane 5, JPL MER & MSL, and JSF to name a few. As a Managing Partner of TEN TECH LLC, his engineering knowledge and professional experiences are often called upon for Subject Matter Expert representation.

scSTREAM Met and Exceeded Expectations from Day 1

Meshing strategies can often be a key component that influences one's decision on software. At least this was the case for TEN TECH as they were searching for Cartesian-grid coupled CFD/thermal software. There of course were more criteria in his mind: good geometry translators; geometry simplification capabilities; fast, accurate and sophisticated solver and post-processing; and yet competitive price. "scSTREAM met and exceeded all our expectations from day 1. It is extremely easy to use, very fast and very accurate at the same time." Model handling and time constraint are a notorious issue when it comes to CFD analysis, but the modeling capability of the preprocessor and the solver speed of scSTREAM surprised him. "We are able to create accurate thermal models of complex systems in record time. We have used and evaluated several competitive products, one of which being the apparent de-facto standard, FloTHERM®. Not only was scSTREAM easier to use, had a better looking UI (user interface) and better performance, but the price was so much in favor of scSTREAM that our decision was very easy: scSTREAM has been our main CFD/thermal tool for the last 5 years for electronics cooling applications, and we have not regretted it."

Just the Right Tool for Electronics Applications

Mr. Villers further discussed his company's success with scSTREAM for the last five years. "scSTREAM has been performing flawlessly for all of our electronics cooling applications: it is easy and fast to create a model, its solver is fast and accurate, and

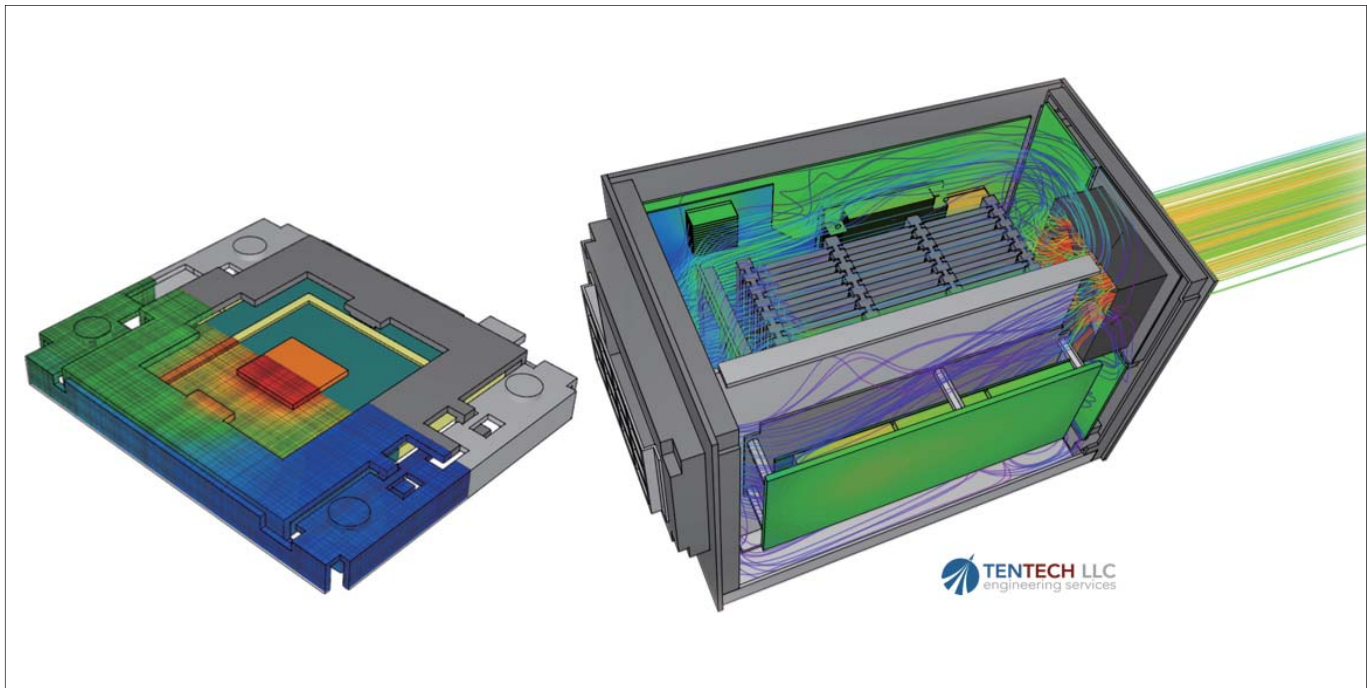


Figure 2: A detailed thermal model (left) and Ruggedized Data Recorder System model (right)

with would be very impractical and costly to replicate in a test facility,” he explained. On the other hand, he also addressed the difficulties of conducting CFD in general. Of the most common issues discussed within this industry, including price-to-performance value, complexity of use, and quality of results interrogation and documentation, Mr. Villers explained how scSTREAM can alleviate most concerns. “scSTREAM addresses both price and performance points very well, and is constantly improving the user experience with the aesthetic appeal of the UI.” He said that the GUI (graphical user interface) is very important for “casual” users. He added that scSTREAM’s ability to interrogate the model and visualize results in a clear and “pretty” manner is also on par with the best CFD software on the market.

Future Usage of scSTREAM

Mr. Villers’ current work ranges widely from component-level to system

level thermal analysis. The analysis with CFD greatly helps in the thermal management, design and qualification of defense electronics systems. Thanks to scSTREAM’s versatility, TEN TECH sees an increased opportunity for CFD applications. “Future uses of scSTREAM will include building aerodynamics and air conditioning applications as well as Fluid Structure Interaction and CFD-FEA (Computational Fluid Dynamics-Finite Element Analysis) coupling, and/or co-simulation with Dassault Systèmes’ Abaqus.” FLDUTIL, a supplementary tool of scSTREAM, enables the CFD results such as pressure information to be mapped into structural analysis

tools like Abaqus. Figure 3 describes the connection between scSTREAM’s postprocessing file (FLD file) and structural analysis system. scSTREAM will continue to serve as a fast, simple, and reliable analysis tool for TEN TECH LLC.

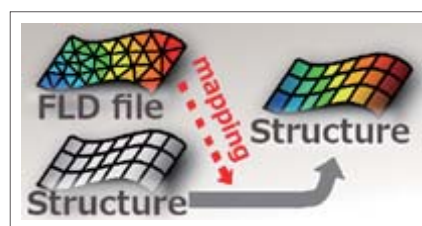


Figure 3: Data Mapping with scSTREAM FLDUTIL



scSTREAM

scSTREAM uses a structured mesh to model general purpose thermal/fluid applications where tiny details and curved surfaces are not critical for an accurate simulation. scSTREAM can both create the mesh and calculate the solution quickly and efficiently using the finite volume method. A ten million element model only consumes 5.5GB of RAM. In addition to highly capable models for simulating complex physics, scSTREAM also includes a set of Visual Basic interfaces and table/function inputs that make it customizable.

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