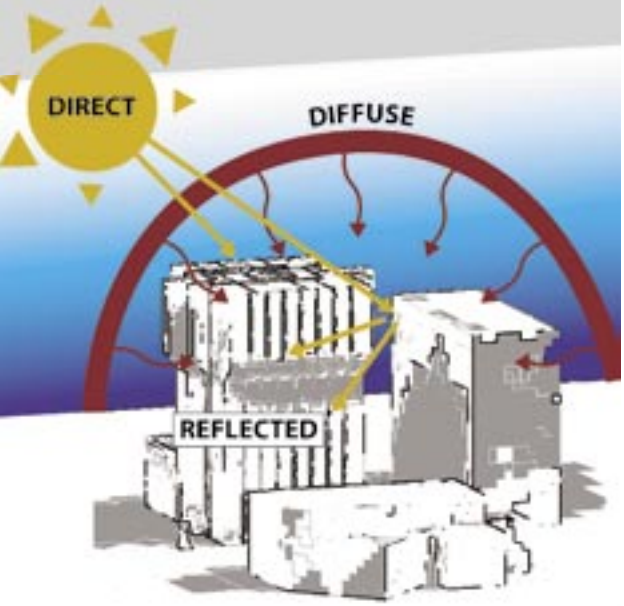
Software Solutions

Solar Modeling

All thermal analysis codes from ThermoAnalytics include our transient environmental modules: direct solar, diffuse solar, reflected solar, solar transmission through glass, sky radiation, and wind convection.



MuSES®

MuSES is the leading tool for infrared modeling of ground vehicles, ships, and aircraft. Providing both thermal simulation and IR signature results, MuSES lets your team generate high accuracy diffuse and BRDF IR signature predictions, including target-background interaction and sophisticated atmospheric effects for locations anywhere on the globe. Our separately-licensed modules for plumes and hyperspectral analysis render the most advanced IR signature predictions available.

The IR signature post-processor displays physical temperatures, in-band radiances, and apparent temperatures. MuSES displays the temperature and radiance data onto the geometry for rapid graphical analysis. MuSES can also be easily integrated into your scene simulation program to provide real-time, high resolution IR predictions.

RadTherm®

RadTherm heat transfer software is a professional thermal simulation tool for comprehensive CAE analysis. RadTherm computes transient conduction, convection, and both thermal and solar radiation very quickly. All functions are integrated into a single carefully-designed graphical user interface, allowing users to analyze designs rapidly and accurately. RadTherm can integrate the separately-licensed Human Comfort Module into complex, asymmetrical environments.

RadTherm is the industry benchmark for speed, accuracy, and flexibility. Faster setup and thermal analysis save you time and money, which translates into improved customer focus and time-to-market.

WinTherm®

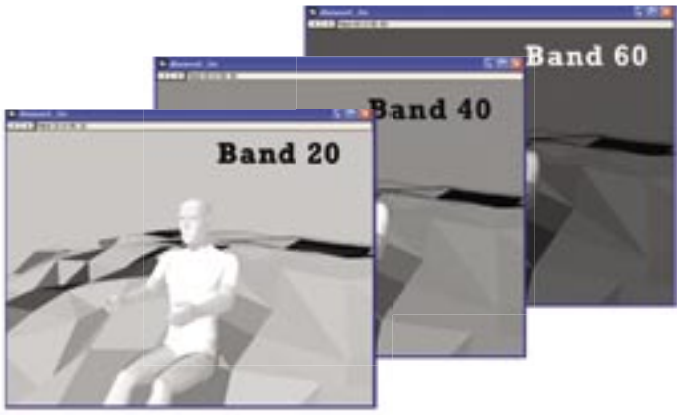
WinTherm brings powerful thermal analysis within reach of smaller firms. Based on our RadTherm technology, WinTherm allows engineers from any background to analyze their designs quickly and accurately.

With WinTherm, you can perform full parametric sweeps of component level design (e.g., exhaust components, circuit board) much faster than any other thermal management tool. All functions are integrated into a carefully designed graphical user interface, giving your team a streamlined workflow with cross-platform file sharing. WinTherm delivers complete transient or steady state thermal analysis and is licensed in several ways to balance cost with model resolution.

Advanced Technologies

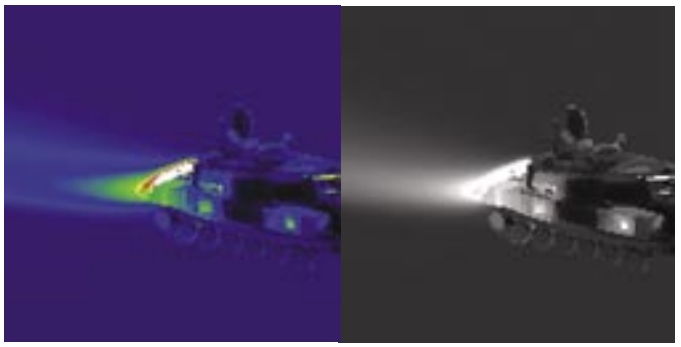
Hyperspectral IR Module

The Hyperspectral IR Rendering Module is a separately-licensed feature integrated in MuSES for rendering a hypercube of narrow-band BRDF renderings for MWIR and LWIR. These renderings represent the output of state-of-the-art hyperspectral thermal imagers currently available. The Hyperspectral Module extends the benefits of MuSES and enhances the analysis of detection and concealment technologies. Below: Selected bands from an LWIR Hypercube rendered at 1.0 cm^{-1}



Plume Analysis Module

Our Plume Analysis Module is a separately-licensed feature that allows for CFD-generated plume data to be imported to MuSES and integrated into the IR hardbody signatures against realistic backgrounds and sky. Path radiance off the plume is calculated for every pixel line of sight, including the effects of temperature, chemical species, and plume reflections off the hardbody.



Human Comfort Module

The Human Comfort Module operates with our thermal analysis software to provide a comprehensive simulation of human thermal comfort under transient and asymmetrical environmental conditions. The thermoregulatory response is fully supported, with blood flow, respiration and perspiration effects computed based on activity level. A clothing library is included and outputs include thermal sensation and dynamic thermal sensation based on the Fiala model seven-point scale.

ThermoReg

The ThermoReg software calculates human thermal response to exposure from electromagnetic (EM) irradiation. ThermoReg uses a highly detailed 3-D voxel-based anatomical model and calculates thermoregulation and bio-heat transfer effects for computing local tissue temperature. The level and location of heat loading is derived using the finite difference time domain (FDTD) method and applied to the model as a specific absorption rate. The ThermoReg software can calculate the effects of RF exposure from cell phones, external environmental influences, magnetic resonance imaging, or other medical applications.

RTcad

RTcad is ThermoAnalytics' ballistic vulnerability ray-tracing code for MUVES. This tool directly interrogates 3-D geometry models created by commercial CAD systems like Pro/E. This innovative system utilizes the Pro/E or STEP surface representation of solid geometry (BREP), and can be called from MUVES in place of the BRL-CAD ray-tracer. RTcad allows MUVES to directly interrogate Pro-E and STEP geometry thus avoiding the creation of BRL-CAD models and enabling users to save time, energy, and resources.

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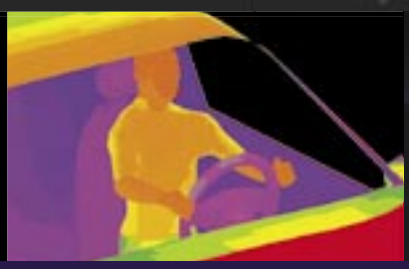
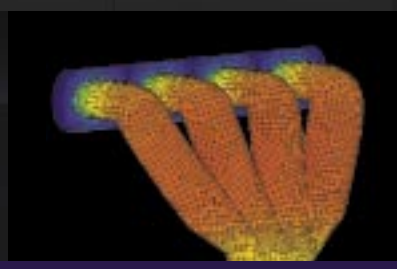




Total Thermal Solutions

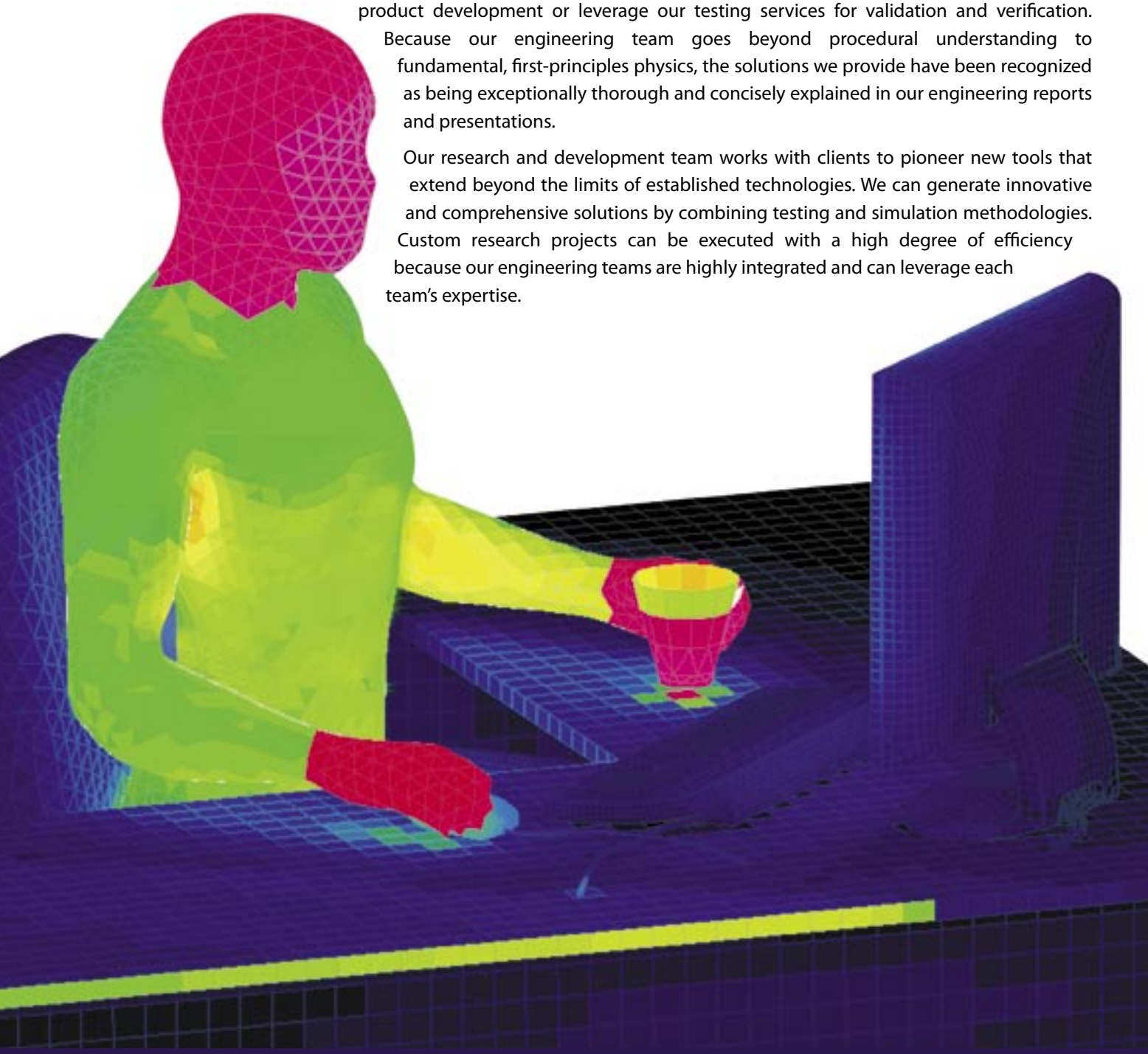
ThermoAnalytics®

Total Thermal Solutions

ThermoAnalytics is a team of industry-leading engineers and scientists with many advanced degrees and decades of experience in thermal analysis, infrared signature prediction, field testing and CAE software development. Our experienced research engineers deliver precision simulation and prototype thermal models to defense and commercial organizations throughout the globe.

Our customers rely on the accuracy of our engineering solutions to quickly proceed with product development or leverage our testing services for validation and verification. Because our engineering team goes beyond procedural understanding to fundamental, first-principles physics, the solutions we provide have been recognized as being exceptionally thorough and concisely explained in our engineering reports and presentations.

Our research and development team works with clients to pioneer new tools that extend beyond the limits of established technologies. We can generate innovative and comprehensive solutions by combining testing and simulation methodologies. Custom research projects can be executed with a high degree of efficiency because our engineering teams are highly integrated and can leverage each team's expertise.



Simulation & Testing Services

Advanced IR Signature & Plume Predictions

As the global leaders in radiation analysis, our team delivers not only heat management solutions, but also infrared signature predictions using our MuSES software. Defense agencies and contractors rely on ThermoAnalytics' comprehensive understanding of the physical phenomena that drive IR signatures. From low observables design to advanced heat management techniques, the ThermoAnalytics team provides valuable signature control recommendations and validated solutions for any global position and environment — land, sea or air.

Thermal & CFD Analysis

When faced with system-level thermal management problems, our seasoned engineers provide solutions using state-of-the-art CAE software. From early prototype design analysis to complex multi-mode heat transfer, each project is completed using the best available technologies and effective post-processing for maximum benefit and ROI.

Lab & Field Testing

Even the most advanced simulation requires ground-truth inputs and validation. Our laboratory testing services generate key parameters required to deliver top-accuracy in modeling projects and ensure the accuracy through comprehensive material testing, including physical properties and advanced surface properties. Our field testing services include comprehensive test planning, on-site thermal and infrared measurements, meteorological measurements, and statistical data analysis.

Research & Development

ThermoAnalytics has a long history of cost-effective innovation and commercialization of dual-use technologies. Our staff includes scientists and engineers holding doctorate degrees from leading universities. Their leadership and in-depth understanding of physics and numerical analysis provide the foundation for enhancing your innovations. Leverage this combined experimental and simulation expertise to improve your engineering and design processes. Our research team can work with you to optimize thermal and infrared performance of materials, surface treatments and system designs.