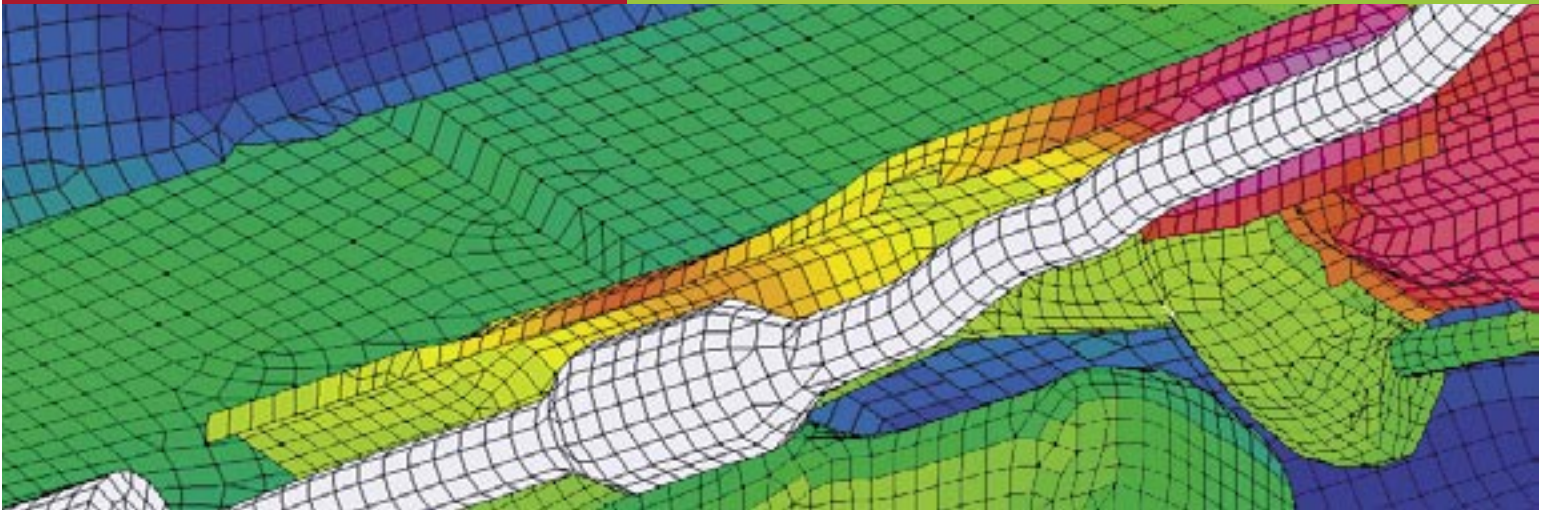


Exhaust Thermal Analysis

Improve Design with Thermal Modeling



Principal Benefits

Reduced Development Time

Fastest, Most Accurate Shield Analysis Software
Industry Standard for Heat Transfer Analysis
Predict Shield Thermal Performance
Parametrically Study Shielding Systems
Full Radiation, Convection, Conduction
Transient or Steady State Analysis
Multi-Layer Shield Design with Planar Mesh
Test Layering and Thickness for Optimal Weight

Components or Full Systems

Analyze Components or Full Vehicle Systems
Reduce Vehicle Testing to Final Design Phase
Faster, More Accurate Product Development
Weight Reduction and Shield Optimization

Applications

Underhood and Underbody Shielding
Exhaust and Catalytic Converters
Diesel Particulate Filters
Fire Protection Analysis
Industrial Processing Equipment
Ovens and Drying Systems
Material Performance Analysis
Turbocharger Packaging
Manifold Shields
Brakes and Fully Vehicle Thermal Management

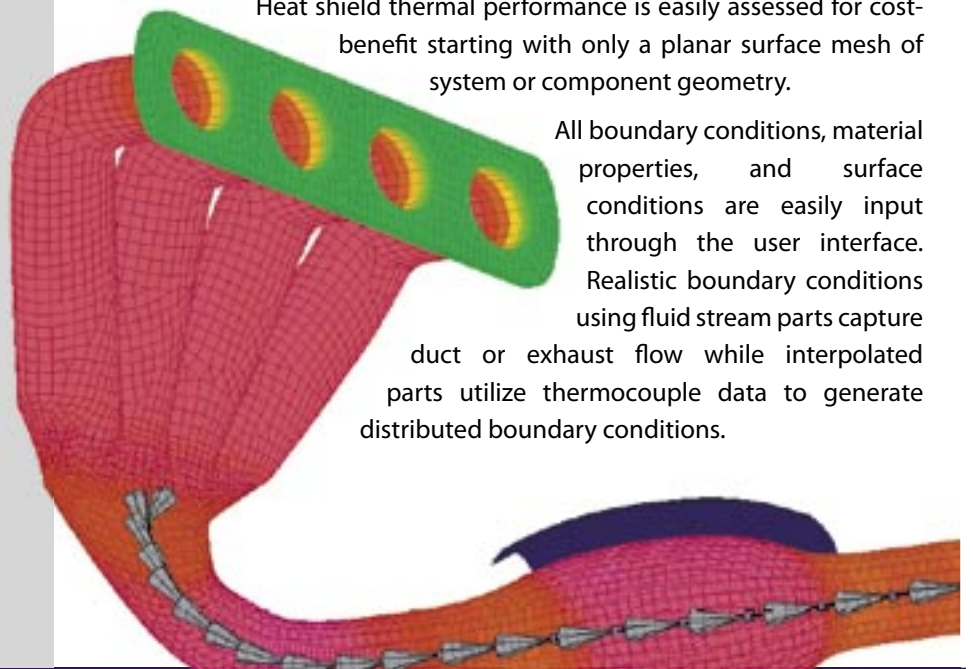
Advanced Exhaust Analysis

RadTherm® Software from ThermoAnalytics is the industry benchmark for exhaust thermal analysis. Providing both steady state and transient analysis, RadTherm employs a highly intuitive graphical user interface to guide the engineer through model setup, analysis and post-processing. Full thermal results, including flux rates for each mode of heat transfer, are delivered quickly and allow the user to perform trade studies on layering, surface treatments, material choice, and material thickness.

Heat shield thermal performance is easily assessed for cost-benefit starting with only a planar surface mesh of system or component geometry.

All boundary conditions, material properties, and surface conditions are easily input through the user interface. Realistic boundary conditions using fluid stream parts capture

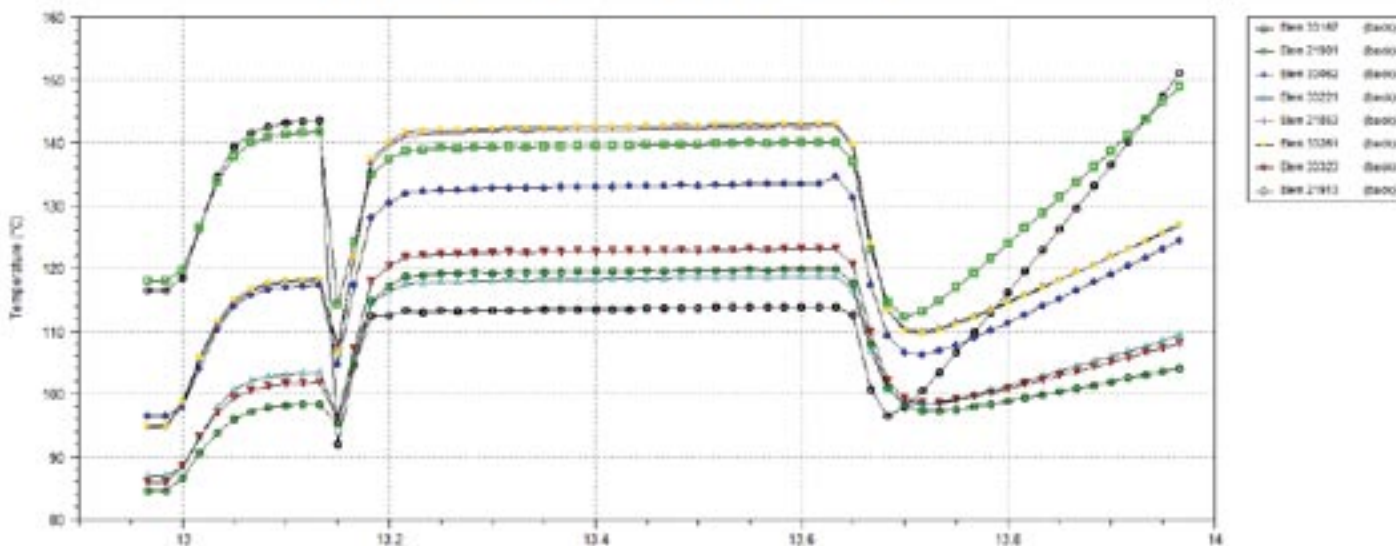
duct or exhaust flow while interpolated parts utilize thermocouple data to generate distributed boundary conditions.



Heat Shield Analysis

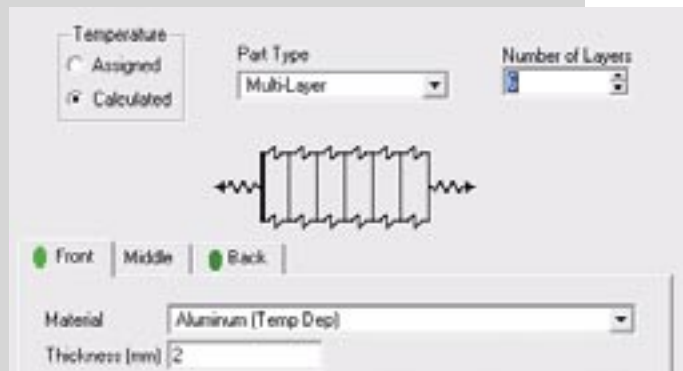
Improve Design with Thermal Modeling

Heat Shield Surface Temperature During Arizona Drive Cycle



Layered Solutions

Parametrically study multi-layer shields without resorting to CAD: up to 20 layers of solids, air gaps, vacuum, or porous media can be represented with a single planar mesh. RadTherm and WinTherm structure the thermal solution to include lateral and vertical conduction through each layer. Anisotropic materials are also fully supported, along with temperature dependent material properties.



Custom Analysis

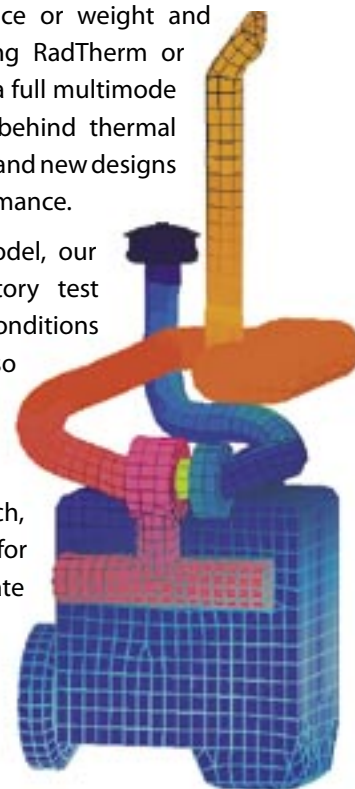
Our research engineers can support your team with model setup, custom user routines, measurement of physical properties, or deliver a complete analysis package with concise engineering reports and recommendations. Contact us for an engineering review of your project requirements.

Total Thermal Solutions

Improvements to heat shield performance or weight and cost reduction are quickly explored using RadTherm or WinTherm. Because our software predicts a full multimode heat transfer solution, the mechanisms behind thermal performance are made visible to your team and new designs can be quickly analyzed for optimal performance.

Should your team wish to validate a model, our engineers can provide field or laboratory test support. Measurement of boundary conditions

and physical properties can also be provided to ensure the accuracy of your model and all relevant inputs. Because of our Total Thermal Solutions approach, we integrate the best practices for simulation with realistic, accurate input measurements and a complete understanding of the heat transfer mechanisms.



Get Started

Our sales and application engineers can help your team get started with heat shield analysis: we have a library of sample models, training sessions for use of our software, and we regularly offer web seminars on exhaust thermal analysis. Contact us today to discuss engineering services and software solutions.