

STRUCTURAL MECHANICS

Thermal Analysis



THERMAL FE FOR INTERNAL COMBUSTION ENGINES

With the focus shifting to electric vehicles, many manufacturers are experiencing reduced resources for ICE development in terms of both workforce and financial backing. Yet IC engines are still viable options for the future, particularly for alternative fuels (e.g hydrogen) or as smaller units in hybrid vehicles. These developments require R&D to improve overall efficiency, while reducing engine emissions, friction, oil consumption and Noise, Vibration, Harshness.

Manufacturers need to do more with less.

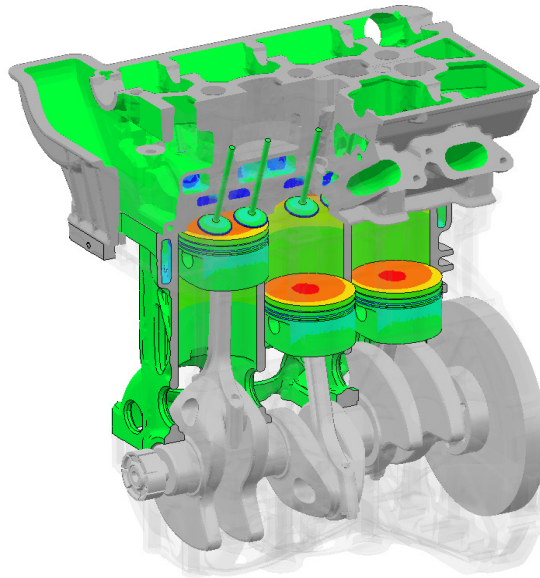
MEETING THE NEW CHALLENGES IN THE DESIGN AND DEVELOPMENT OF INTERNAL COMBUSTION ENGINES

The heat generated by an IC Engine has a significant effect on both the performance of system and its structural integrity. Accurate prediction of temperatures throughout a powertrain structure is vital for the successful design of the engine components and of the system. Component failure due to thermal loading at the prototype stage is not only costly but could impact on the time scales for delivering the engine. Key focus areas for thermal analysis include warm-up from cold to optimum conditions, powertrain integrity, piston performance and durability.

FIND OUT HOW WE CAN HELP YOUR PRODUCT DEVELOPMENT

CONTACT@REALIS-SIMULATION.COM | REALIS-SIMULATION.COM

REALIS SIMULATION, FORMERLY RICARDO SOFTWARE



Many OEMs already have methods in place for conducting thermal analysis, but they are often time consuming, costly, and less efficient for today's modern engines. Predictive methods are essential to successfully understand the thermal behaviour early in the design phase and throughout the development process, as physical testing alone cannot be relied upon to guide the design. But how can this be achieved in practice ?

Realis have developed a new reliable, accurate and predictive tool that can be used easily with limited data, and in timescales appropriate for real engineering development. Its called **FEARCE-Vulcan**, Thermal Finite Element analysis for ICE.

FEARCE-Vulcan uses a unique iterative solution that considers all the heat paths in detail to deliver a reliable and accurate predictive tool for conclusive structural investigations.

KEY BENEFITS

Optimised Cylinder Design

Delivers a robust process for optimising cylinder components quickly with minimal inputs

Lower Engine Emissions

Accurate thermal predictions for vehicle thermal management and combustion performance

Improved Structural Integrity

Unique iterative solution that considers all heat paths giving detailed component analysis

Reduced Development Costs

Fast model set up and reduced simulation times for durability analysis and thermal load modelling

FEARCE-Vulcan Predictive thermal analysis



Interested in learning more? Our experts are ready to discuss your current challenges and work with you to find the optimal solution.

CONTACT@REALIS-SIMULATION.COM | REALIS-SIMULATION.COM

REALIS SIMULATION, FORMERLY RICARDO SOFTWARE