

GT-POWER

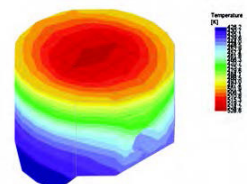
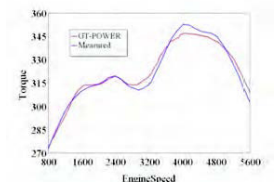
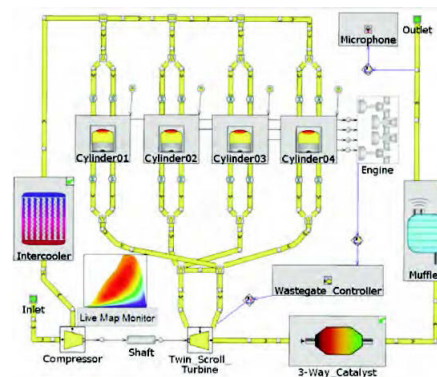
Engine Performance Analysis Modeling

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GT-POWER is the market leading engine simulation software, used by every major engine manufacturer for the design and development of their engines. It is applicable to all sizes and types of engines, and its installed base includes a highly diverse group of car, truck, motorcycle, motor sport, marine, locomotive, power generation, mining and construction, agricultural, and lawn and garden equipment manufacturers.

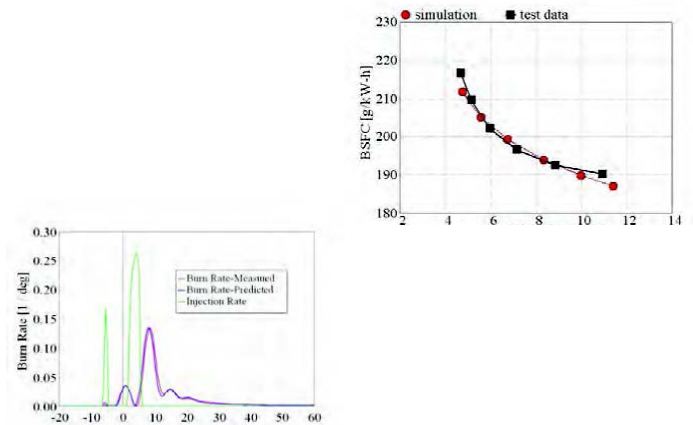
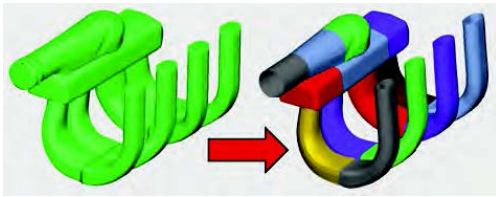
GT-POWER contains the industry's most comprehensive and advanced set of models for engine performance analysis, providing the breadth of features required to allow the engineer to analyze a large number of engine configurations and performance characteristics, including:

- Torque and power curves, airflow, vol. efficiency, fuel consumption, emissions
- Steady state or full transient analysis, under any driving scenario
- Turbocharged, supercharged, turbocompound, e-boost, pneumatic assisted boosting
- SI, DI, HCCI and multi-mode combustion, multi-fuel, and multi-pulse injection
- Infinitely variable valve timing and lift (VVT and VVL)
- Acoustic analysis of intake and exhaust systems
- Manifold and cylinder component thermal analysis, with included FE solver
- Controls system modeling, via built-in controls library or Simulink coupling



Unmatched Model Accuracy

GT-POWER has long been recognized for its high degree of accuracy in predicting the behavior of complex engine related phenomena. At its core, the GT-POWER solver is based on the 1D solution of the fully unsteady, nonlinear Navier-Stokes equations. Beyond this core lie state of the art thermodynamic and phenomenological model solvers to capture the effects of combustion, heat transfer, evaporation, in-cylinder motion and turbulence, and engine and tailpipe out emissions, to name just a few. This combination of solvers provides for unmatched model accuracy for both macro level quantities such as torque, BSFC, airflow, etc., as well as detailed micro level quantities such as crankangle resolved cylinder pressure resulting from multi-pulse injection strategies, as well as emission specie concentrations anywhere in the system.

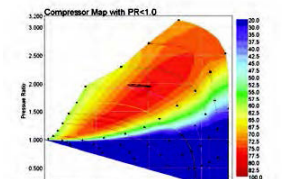
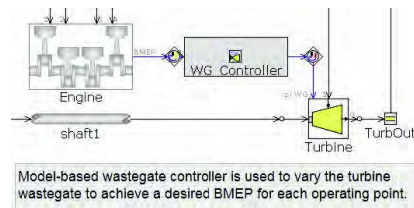


Rapid Building of Models from CAD

The 3D pre-processors GEM-3D enables rapid building of models from a wide variety of CAD file formats, including importing, cleaning, discretizing and exporting to GT-ISE. In addition, ideas can be designed and simulated in GEM-3D without making CAD files.

Beyond Basic Cycle Simulation

GT-POWER is licensed as an all-inclusive package containing many advanced modeling features not found in other engine simulations. A full FE solver for in-cylinder temperature and heat flux distribution, as well as a complete, fully flexible, detailed chemical kinetics and aftertreatment library are just two of the many advanced modeling capabilities included with GT-POWER at no extra cost.



Highlights:

- Industry standard engine simulation, used by every major engine maker
- Wave dynamics captured via robust solution of the Navier-Stokes equations
- Applicable to engine of any size, from smallest utility engine to largest marine application
- Fully flexible to allow studies of advanced and unconventional concepts
- State of the art combustion models
- Complete controls library for dynamic system controls studies, including calibration-free throttle, load, wastegate and VGT controllers
- Includes CAD based pre-processors for accurate yet quick and easy model building
- Integrates with other GT-SUITE libraries for thermal warmup studies, drive cycle analysis, and more

Advanced Features and Applications:

- Highly accurate, multi-pulse diesel combustion model
- Tumble sensitive, turbulent SI combustion model
- Combustion of non-carbon fuels, e.g., H₂ and NH₃
- Includes FE solution of in-cylinder temperatures
- Vehicle model for integrated engine/vehicle simulations
- Directly coupled with Simulink, Star-CCM+, CONVERGE, Fluent and other codes
- Acoustics of intake and exhaust systems
- Input variables may be defined by map or math function
- Flexibility to study any valving concept, infinitely variable VVT and VVL, as well as cylinder deactivation concepts
- Acoustics of intake and exhaust systems (see brochure on Acoustics)
- Complete chemical kinetics library for aftertreatment (see brochure on GT-xCHEM)
- Capable of Real-Time execution (see brochure on real-time modeling with GT-POWER-xRT)