



GAMMA
TECHNOLOGIES

EXHAUST AFTERTREATMENT

Flexible Kinetics Solution for Aftertreatment Devices

Comprehensive Aftertreatment Solution:

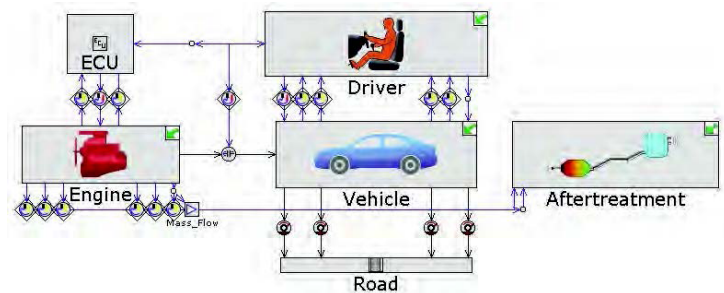
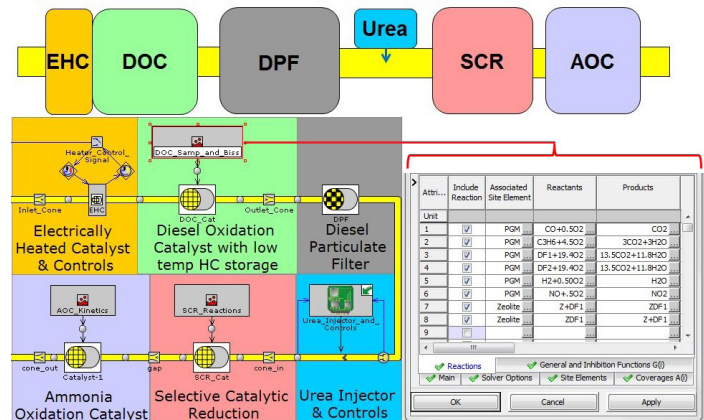
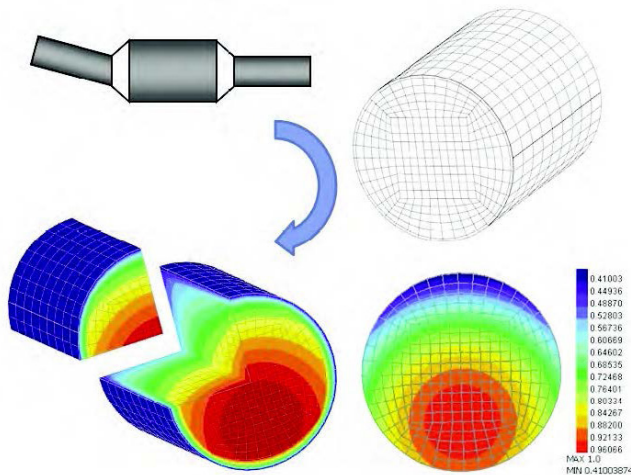
GT-xCHEM includes a complete chemical kinetics and aftertreatment (AT) device library that enables the user to model any AT device in isolation or within an integrated system, while providing the user the complete flexibility to modify and impose the participating kinetic mechanisms. Adding GT-xCHEM to GT-SUITE allows modeling of AT systems together with vehicle, engine, thermal management, and control systems, making this tool uniquely suitable for collaborative development.

Highlights Include:

- Highly intuitive and completely flexible input for specifying reaction mechanisms using GT-ISE graphical user interface
- Supports modeling of all catalysts and filters (TWC, DOC, LNT, DPF, Catalyzed-DPF, SCR-DPF, SCR, AOC, etc.) as well as future reactors being researched
- Advanced pore diffusion model in flow-through catalyst supporting dual washcoat layers
- Detailed fully-discretized wall-flow particulate filter model including diffusion in inlet channel, soot cake layer, substrate wall, and outlet channel
- Single integrated tool, no 3rd party tools required, no compiler required
- Built-in direct and DOE optimizer tools for kinetic parameter calibration
- Library of state-of-the-art mechanisms of each catalyst and DPF application provided to all users as starting models

Efficient Solvers Compatible with RT Simulation

- The fast and efficient Quasi-steady (QS) flow solver is compatible with RT model requirements for system simulation
- Using built-in tools, AT models can be transformed into neural network (NN) models to achieve 1-2 orders of magnitude higher computational speed for XiL applications
- Complex integrated model can be virtually sectioned into separate circuits in order to achieve RT performance without sacrificing accuracy and interactions between the sub-systems



Quasi 2-D/3-D flow/heat transfer modeling to simulate multi-D behavior of AT components.

Non-uniform distributions of flow rate, temperature, and all species can be supplied to the AT model.

Highlights:

- Built-in two-way coupling with 3D CFD (CONVERGE(TM))
- Highly flexible and intuitive user interface for any reaction mechanism
- Advanced Adaptive chemistry solver for stiff non-linear systems
- Fast and efficient Quasi-Steady solver compatible with real time solver
- Quasi 2-D/3-D flow/thermal modeling of DPFs and catalysts
- Built-in direct and DOE optimizers for kinetic parameter calibration

Advanced Features:

Capable of modeling:

- DOC/LNT/DPF/Catalyzed DPF
- SCR-DPF/SCR
- AMOX/TWC
- Any state-of-the-art catalyst under development
- Run as a standalone model or as a part of a integrated system comprising engine, vehicle and control sub-systems
- Virtual coupling with other sub-systems to achieve RT performance without sacrificing accuracy
- Designed for use with reagent control and regeneration strategies