BETA
SIMULATION SOLUTIONS

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EPILYSIS

The new FEA solver

EPILYSIS
SOLVER

“The most promising and dynamically developed solver for our contemporary needs”

EPILYSIS serves as a contemporary solution in the field of Finite Element Analysis, embodying the accumulated knowledge from 30 years of collaboration with the CAE community.

It covers numerous solution types and intends to bridge the gap between pre- and post-processing for disciplines such as Structural, NVH, Optimization, and more.

Benefits

- Benchmark accurate according to NAFEMS and other numerous tests
- Advanced tools for early detection of modeling errors
- Capability to run in batch mode
- Efficient solutions for large scaled models
- Faster simulations through parallel runs on multi-core processors
- Several solution types applicable in many industry sectors
- Reduced costs through less physical prototyping
- Bridges the gap between pre- and post- processing in an efficient and intuitive way
- Integrated in ANSA
- Numerous assistant tools

Engage with the solver that sets new benchmark standards in performance, accuracy and robustness.

EPILYSIS covers solution types such as Structural, NVH, Optimization and more.

Linear and Non Linear analysis

EPILYSIS is a general-purpose finite analysis program that will help you capture accurately and efficiently the linear and non-linear behavior of your design.

Structural Linear

EPILYSIS performs structural linear analysis on models subjected to static loads -while stress is proportional to strain- and real symmetric Eigenvalues analysis to evaluate the natural frequencies and the normal modes of structures. The Block-Lanczos and Automated Multi-Level Substructuring (AMLS) methods are supported.

Dynamics

You can execute frequency response analysis using the direct or the modal method to evaluate the behavior of structures in the frequency domain. Frequency response analyses can be performed through the Fluid-Structure interface. EPILYSIS will improve your modal frequency response analyses for large scale models, with a high number of normal modes, through an implemented Fast FRA algorithm. Direct or modal transient response analysis, will help you determine the response of structures in the time domain.

Structural non-linear

EPILYSIS runs quasi-static simulation between rigid and/or deformable structures that have small strains (linear materials) when non linear contacts are present.

Substructuring

Using the static condensation process, based on the Guyan method, you can reduce large scale models. For dynamic problems, dynamic substructuring is also supported based on the Component Mode Synthesis (CMS) method.

High Performance Computing

EPILYSIS is designed to solve analyses on large scale models with sophisticated in-and-out of core capabilities, and utilizes all the available system processors, reducing solution times with a shared memory parallel process technology.

Optimization

Reduce the production cost and increase the performance of your structures with the optimization tools of EPILYSIS.

Shape optimization

During shape optimization, the selected nodes are moved to make changes on a model's shape. Performed at later stages of product design, it improves a model's profile, making it more reliable and durable.
Choose among a variety of Morphing tools to easily create the shape basis vectors that characterize the allowable design changes, reducing, thus, the time and effort of their definition.
You can also run your analyses with the non-parametric approach of EPILYSIS that uses the Manual Grid Variation method to find the optimum solution from numerous designs.

Topology optimization

Topology optimization is performed at early stages of a product design to reduce the weight and increase the stiffness of a structure. An area of the product is selected as the design area and material is gradually removed resulting to a conceptual design proposal.
Impose design and manufacturing constraints to control the complexity of the model and obtain a feasible design.

Size optimization

Run a size optimization to fine-tune the parameters of a structure, such as its thickness, cross section dimensions, density, damping properties, among others and generate the optimum design.

Topometry optimization

Perform topometry optimization to find the optimum thicknesses on element level, rather than a size optimization on a property level. Each element of a component is a design variable. The result of the analysis helps to detect the critical design regions, configure the final sheet metal thickness of the component, and improve its structural behavior.

Manufacturing constraints

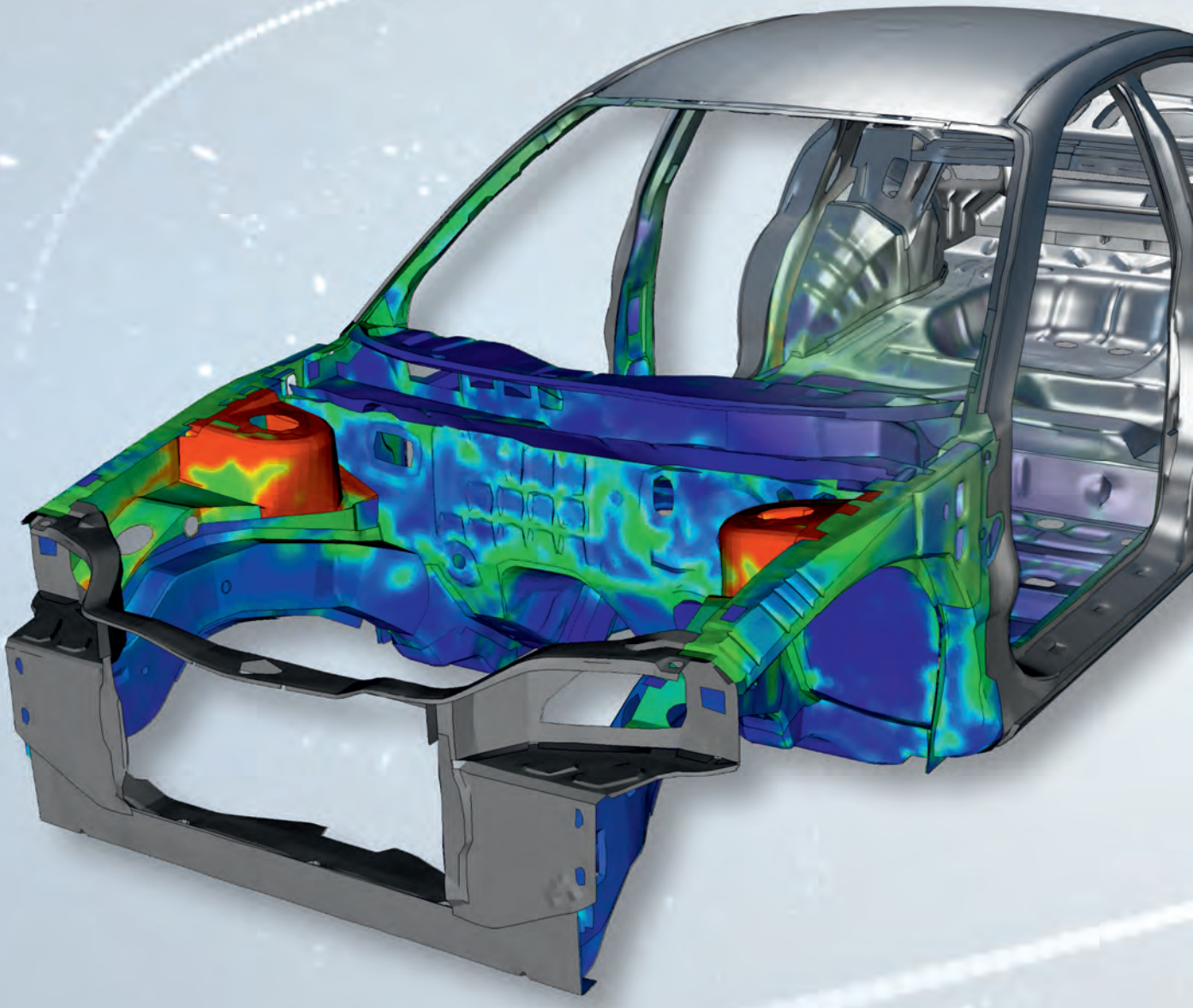
EPILYSIS optimization exploits the most important manufacturing constraints that lead to realistic designs. The symmetry constraint ensures symmetry behavior independently of the model's loading. The casting constraint acts as anti-cavity control. The extrusion constraint preserves a cross section along an extrusion path. The member size constraints control the maximum and minimum dimensions of the design area.

Composite optimization

Through EPILYSIS you will be able to exploit the benefits of size optimization for composite materials by setting up design variables for layer thickness and fibers orientation.

Predefined optimization workflow

A dedicated workflow, through the ANSA Task Manager, facilitates the definition of all the supported optimization solutions. The tool is an interface that allows users of minimum experience with solver keywords to easily define all the necessary entities for an optimization analysis, such as the design variables, the constraints, the responses and the objective function among others.



Applications

Simulate numerous engineering problems fast and efficiently. Utilize the assistant tools of ANSA for an effortless set up.

Structural analyses

A wide range of FEA problems that are often addressed by engineers require a structural analysis. EPILYSIS solver can cover several structural simulation scenarios effortlessly in combination with the several preprocessing tools of ANSA.

Safety analyses

In Safety analysis it is a common practice to depenetrate the dummy from the seat. Making use of a predefined scenario, the seat depenetration tool is based on the EPILYSIS solver to perform depenetration automatically.

NVH Console

The NVH Console in ANSA is a powerful tool to conduct the NVH analyses of multi-component assemblies. In collaboration with the EPILYSIS solver, it is able to calculate in the same environment the required modal reduced models (components) and beam stiffeners, and continue with a FRF based assembly analysis.

Optimization tasks

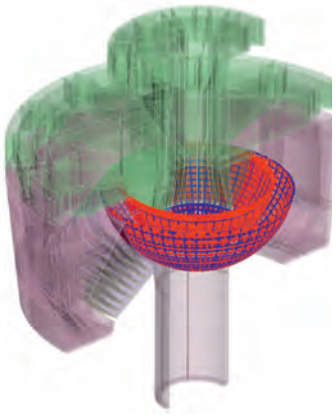
Several optimization tasks can be set within the Task manager of ANSA and invoke the use of the EPILYSIS solver. The solver provides the necessary results as input data for the optimizer according to which it will continue its optimization cycle.

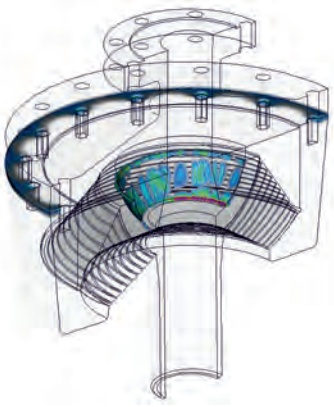
Composites modeling

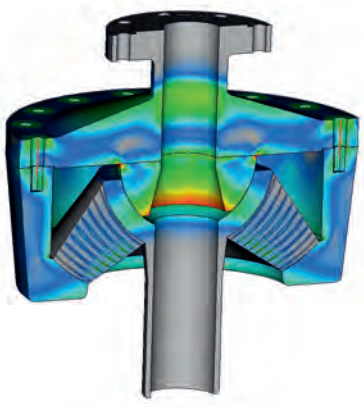
The ANSA and META products offer the perfect environment for composite modeling by introducing unique features that make the whole process more efficient. The EPILYSIS solver can drive this process one step further with the analysis of several loadcases in composite structures.

Results based mesh refinement

EPILYSIS can support a streamlined process from ANSA to META that is able to provide an optimized mesh based on the results.







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