Maritime and Offshore design

Exceed the standards in engineering for the sea

Perform your Maritime simulation
in a single environment which offers all the tools you need

BETA CAE Systems software suite offers simulation solutions that cover the advanced needs of the Maritime industry. The advanced pre- and post- processing capabilities of our suite, will greatly contribute to costs reduction during your research and design processes, while the abundance of tools and practices will help you take your simulation analyses to new levels and grasp the behavior of your models in trials for the sea.

Model set up

- Integrated CAD tools for geometry creation, modification, cleanup and defeaturing.
- Middle skin extraction for complex parts with fully automatic functionality that produces high quality mesh and assigns nodal thickness.
- Powerful Batch Meshing that respects the user specified quality criteria and mesh parameters. Among others, ANSA offers automatic feature recognition and defeaturing, special treatment for fillets, flanges, tubes and holes, different meshing sessions for different areas of the model, local refinement and coarsening.
- Fully automatic curvature dependent surface meshing with user controlled growth rate, min & max element size and mesh feature angle.
- Fast and robust volume meshing for tetra, prism, pyramid, hexa and polyhedral elements.
- Generation of smooth boundary layers, advanced control for squeezing, collapsing or excluding to overcome quality and proximity issues.
- Automatic creation of beam elements with cross section selected from a user generated database. Replacement of meshed parts with beams of the same cross section.
- Distribution of non-structural mass for the proper total weight distribution.
- A variety of options for boundary conditions definition.
- Interoperable pre-processing decks for numerous solvers for FEA and CFD analyses.
- Automatic "Rigidize" feature for the replacement of a model part by rigid bodies that contain the mass and inertia of the substituted areas.
- Substructuring function to define an area of interest on the full body, while preserving loadcase attributes of the original loadcase setup.

- Parametric shaping of both FE model and geometry through the use of Morphing Tool, with model validation through the animation of model shaping, using the Simulate tool.
- Enhanced Design of Experiments, full factorial algorithm for easy definition of experiments.
- Direct coupling of ANSA and META with the most common parametric optimizers.
- Map pressure or temperature results from a CFD simulation to a FEA model.
- Easy creation of Smoothed-Particle Hydrodynamics (SPH) inside a volume of any shape.
- Creation, manipulation and calculation of cross sections using the Cross Section tool.
- Calculation of liquids level inside a tank of any shape, using the Tank tool.
- Calculation of ships & offshore platforms displacement and of corresponding waterline.
- Sinusoidal and Trochoidal waves with user specified parameters.
- Calculation of ships & offshore platforms static position, considered momentarily balanced upon a design wave.
- The Task Manager tool organizes a stepwise sequence procedure that manages all steps and actions necessary for the model build up.
- A C-like scripting programming language automates ANSA procedures. An easy way to perform repeated actions, to manipulate all entities and drive most of the core functionality.

Features

- Process automation
- Geometry clean up
- Shell and Volume meshing
- Boundary layer meshing
- Interoperable decks
- Solver-like entity cards
- Model assembly
- Model checks & fixes
- Welds modeling
- Mass trimming
- Substructuring
- Results mapping
- FE and geometry parametric morphing
- Coupling with optimizers
- Automated 3D & 2D post- processing
- Results calculation
- Automated reporting

Benefits

- Multidisciplinary processing in a single environment
- Cost and time-to-market minimization
- Decrease of human error factor
- Fast design modifications for re-analysis
- Easy handling of large and complex models
- Coupling with any optimizer
- Fast generation of comprehensive and ready-to-show reports
- Effortless realization and repetition of frequent tasks

Post-processing

- Hot spots identification through filtering capabilities incorporated in many tools of META.
- Overview of results achieved through statistics tables with spreadsheet functionality.
- Integrated calculator for linear combination of results deriving from other loadcases. New datasets can be created by applying any mathematical operation on existing data.
- Calculation of forces and moments on any user defined section and output in solver format to be used for sub-modeling.
- Integrated powerful graph tool for direct plotting of data deriving from the 3D model or from imported solver time history files.
- NVH post processing with a whole variety of 2D plots and integrated tools like modal model building, modal response calculator and FRF assembly.
- Post-processing for durability and fatigue analysis is greatly assisted by parameterized sessions and scripts.
- Coupling of META with external optimizers achieved through an integrated toolbar.
- Support of CFD results format such as ANSYS FLUENT and OpenFOAM. Streamlines as lines, ribbons or cylinders and colored by any available variable.
- Image matching and video synchronization for results validation.
- Reports creation in html, Postscript or pptx format using the Report Composer.
- Dragging and dropping images and copy to clipboard functionality for transferring data.
- Customized toolbars creation through the toolbar designer.

BETA
SIMULATION SOLUTIONS
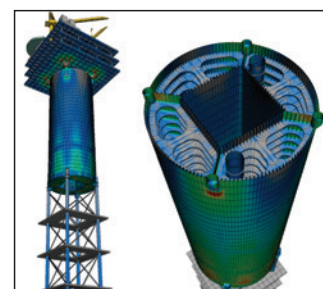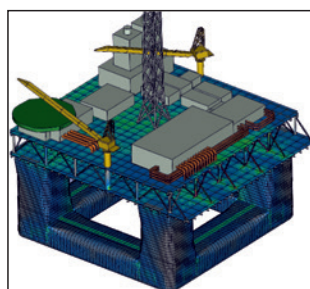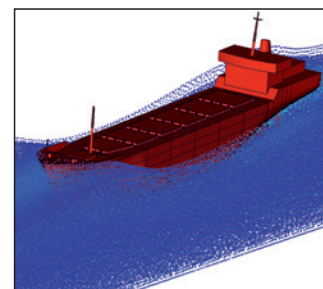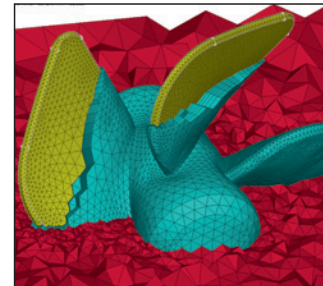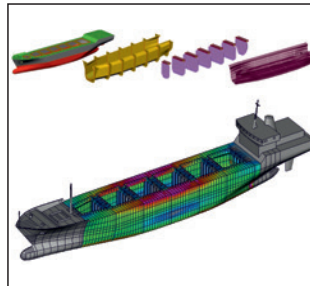
physics on screen

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