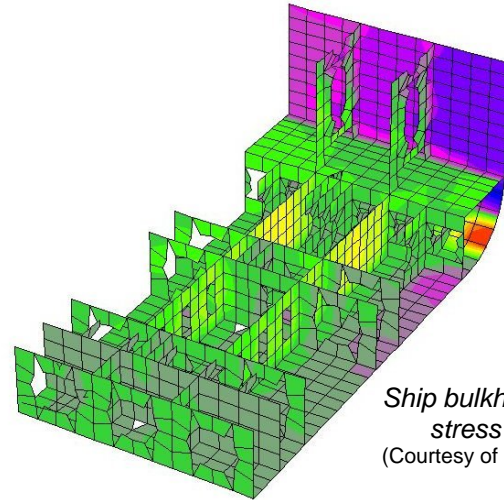


Trident FEA

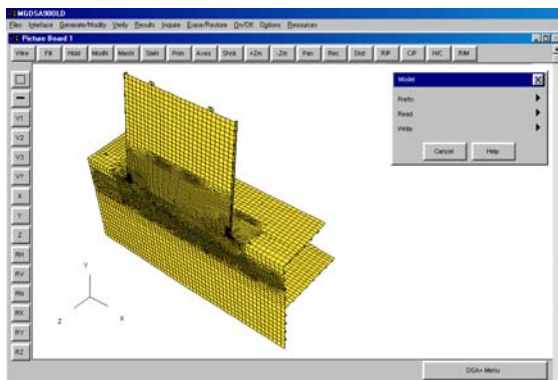
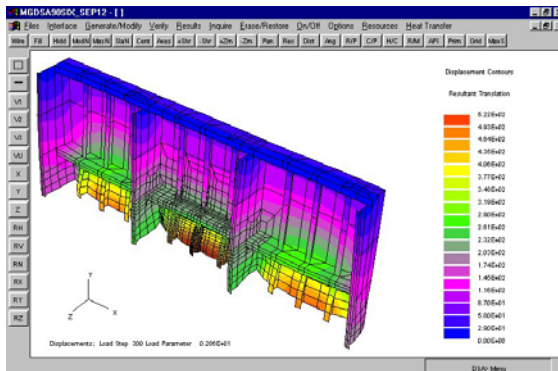
Advanced Finite Element Analysis for Ships

Trident FEA is an industry leading advanced finite element analysis software package for naval architecture and marine engineering applications.

Trident FEA provides the capabilities you expect in advanced finite element analysis (FEA) software including an integrated pre/post-processor and solver, powerful analysis capabilities, an extensive element library, and links to other industry-standard FEA systems.



Ship bulkhead detailed stress analysis
(Courtesy of Bureau Veritas)



Key Features

- Integrated pre/post-processor and solver
- Top-down analysis capability
- Extensive element library and mesh generation capabilities
- Powerful analysis capabilities including linear and non-linear, static and dynamic, natural frequency, buckling, thermal stress, heat transfer and fatigue
- Sparse matrix solver with fast computation times comparable to the best in the industry
- Comprehensive solution includes additional analysis modules and other Trident software including hydromechanics and specialized analysis tools
- Trident FEA operates stand-alone or integrates seamlessly with MAESTRO, part of Proteus Engineering's Flagship system
- Import and export complete or component models with other leading third-party FEA systems including CAD (IGES), ANSYS, NASTRAN, HyperMesh, and USA.

*For more information,
please contact Martec.*

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Trident FEA Basic Package

The Trident FEA Basic package offers standard FEA capabilities, which can then be enhanced with additional analysis modules, data translators and other Trident software.

The Trident FEA Basic package includes:

- *Pre/post-processor* - Allows for detailed structural modeling, automatic mesh generation and refinement using an extensive library of elements. Comprehensive post-processing capabilities allow for in-depth visualization of the most complex analysis.
- *Linear static analysis* - State-of-the-art linear static analysis capabilities. The program produces displacements, strains, stresses, forces, and error estimates as results of the analysis under a variety of loading conditions.
- *Top-down capability* - Conduct coarse mesh global analysis and then refine the mesh for more accurate results in high stress areas.
- *Sparse matrix solver* - Trident FEA includes Martec's new sparse matrix solver, which dramatically reduces computation time.
- *MAESTRO seamless integration option* - For users of the Maestro ship building system, Trident FEA works seamlessly under a single user interface.

Additional Analysis Modules

Trident FEA Basic can be customized with any of the following analysis modules:

- *Natural Frequency* - Provides several eigenvalue analysis techniques to evaluate natural frequencies and their corresponding mode shapes.
- *Buckling* - Predicts the loads at which the onset of structural instability will occur.
- *Dynamic* - Performs dynamic response analysis due to time history loading, response spectra input, steady state harmonic input, and random vibration excitations.
- *Nonlinear* - Performs nonlinear static and dynamic analysis, including large displacements, plasticity, hyperelasticity, and post buckling.
- *Thermal Stress* - Predicts thermal-induced stress and linear elastic deformations.
- *Heat Transfer* - Solves for steady state and transient temperature and heat flux distributions, including phase changes, due to convection, conduction and heat generation.
- *Fatigue I* - Basic fatigue analysis capability using Miners Sums and Fatigue Diagrams methods.
- *Fatigue II* - Advanced fatigue analysis allows simulation of crack initiation and propagation under deterministic and spectral loads.

Translators

A number of translators are available to allow the import and export of data files with other FEA and CAD systems including:

- *CAD* - Import and export data files in standard IGES format
- *Nastran* - Import and export data files with MSC.Nastran
- *ANSYS* - Import and export data files with ANSYS
- *HyperMesh* - Import and export files with HyperMesh
- *USA* - Import and export data files in USA format
- *Patran* - Import and export data files with MSC.Patran

Additional Trident software

Martec's Trident suite provides a comprehensive solution for the shipbuilding, offshore and marine industries. Stand-alone or as an extension of Trident FEA, these powerful tools provide additional analysis capabilities.

- **Ship Modeller:** Rapidly build new Trident FEA models from standard structural components including panels, strakes, girders, mounts and brackets.
- **WaveLoad:** Hydrodynamic analysis tool used to accurately predict motion, hull pressure distributions and sea loads for ships moving in waves.
- **UNDEX:** Modeling and analysis of underwater explosions
- **UltSAS:** Ultimate Strength modeling capability, which includes the ULTMAT and VAST codes.
- **AVAST:** Boundary element software for the prediction of radiated noise from submerged elastic structures.

Trident software is developed in partnership with:



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