

APA for Marine

Altair HyperWorks and the Altair Partner Alliance (APA) software has numerous available simulation and analysis options that apply to the marine and shipbuilding industry. The APA grants customers access to partner applications using their existing HyperWorks Units with little or no incremental cost, under one simple licensing model.

Learn more about the APA and the products mentioned below at www.altairhyperworks.com/apa.

Manufacturing Simulation

NovaFlow&Solid CV, Virfac®

APA users can simulate the casting process to improve essential parts, such as blade propellers, clutch housings, boat pumps, etc. to improve efficiency in the process of producing quality parts. Roughly 30% of parts for the marine industry are produced in a foundry, which means there is plenty of opportunity for cost and time savings. Welding is a common method of assembling marine structures. Weld design, the simulation of the welding process, predicting distortion and residual stresses can be performed with the capabilities available through the APA.

Durability, Fatigue & Reliability Analysis

CAEfatigue VIBRATION, FEMFAT, nCode DesignLife, RAMDO

Fatigue and reliability analysis are essential in understanding how long a ship will last. With such a huge investment required, shipbuilders want to ensure that the customer will be satisfied with the longevity of the product.

APA software can help reduce costs initially by eliminating some physical testing required, minimize weight with the opportunity to evaluate multiple design options, correlate software results with physical test data and by helping manufacturers avoid warranty claims by reducing part failure.

Noise, Vibration and Harshness Analysis

AVL EXCITE™ Acoustics, Coustyx, EFEA, SEAM

NVH simulation and analysis is important when considering the effect a ship will have on its surroundings. Too much noise emitted underwater can greatly affect ocean wildlife, not to mention make for an uncomfortable ride for passengers and crew members.

APA users can simulate the underwater and structural acoustics and noise emissions of submarine hulls and ship engine housings as well as analyze the directivity of sonars, identify main paths of power transfer for radiated noise and meet interior noise level requirements.

Hydraulics and Systems Modeling

CosiMate, DSHplus, Maple, MapleSim, ModelCenter®, XLDyn

Hydraulic systems and individual parts, such as propellers, are fundamental in maintaining and refining the performance and reliability of marine vessels. The APA offering includes mathematical software to quickly help marine engineers optimize parts with complex design calculations, as well as systems modeling tools for hydraulic systems and components development. Those, coupled with MBD, controls and CFD codes, provide a full system simulation. APA software can also be used to perform co-simulations, and validate performance on the system level.

Composites Modeling and Analysis

CoDA, KTex Family, LAP, MultiMech

Lightweight design is a promising trend among many industries, and composites are playing an important role in that space, offering tailored properties, desirable material properties and flexibility in manufacturing.

In addition to optimizing composite materials, APA software provides micromechanical modeling, structural analysis, detailed failure and stress analysis, crush analysis and fiber orientation of reinforced plastics and mold-filled parts.

Electromagnetic Analysis

SENSE, Optenni Lab, VSim

Electromagnetic analysis is staple technology in the marine world, providing crucial technology for powering and protecting large ships. Complementing Altair's electromagnetic simulation tools (FEKO, WinProp and Flux), APA enabled-customers can use Optenni Lab to quickly and easily design matching circuits for antenna systems, VSim for applications dealing with electromagnetics and plasma related to multipacting, travelling wave tubes, and satellite charging and SENSE for touch screen design.

Computational Fluid Dynamics (CFD) Analysis

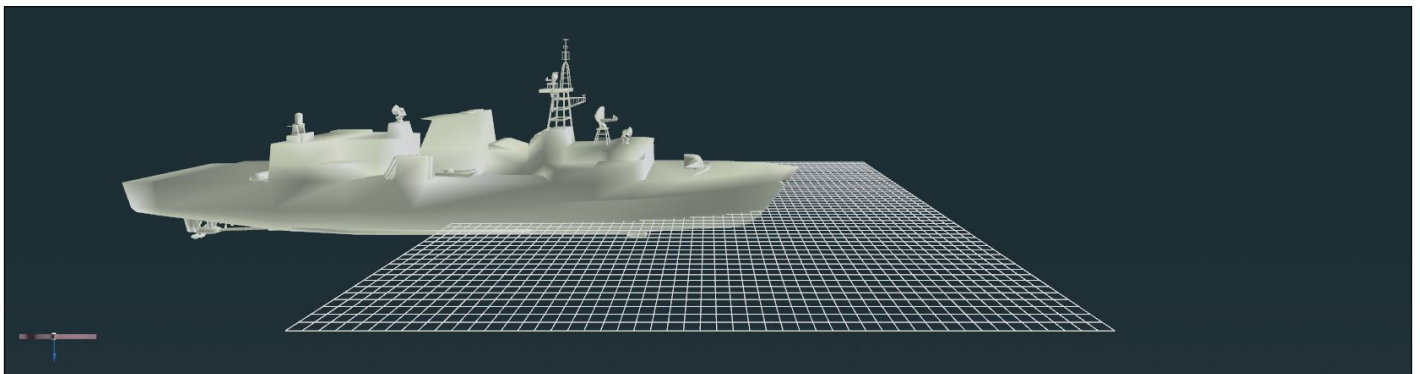
AVL FIRE™ M, Flow Simulator, ProteusDS, ShipMo3D, scSTREAM, SC/Tetra

CFD solutions are essential in preserving ship efficiency and performance, taking into account the interaction between the wind, waves, and current and the ship itself, as well as its parts, such as the propellers. Altair and the APA Partners provide a number of solutions to test these factors to help designers develop the best possible product for the job.

Material Information

CES Selector, Matereality Workgroup Database Pro, Total Materia

Use APA software to access a comprehensive materials database and quickly pre-screen materials to identify the most promising solution before investing significant time in a design. Making the correct material choice at the start of the process minimizes costs of both materials and development. Build and maintain a fully scalable material database, and empower team members with data ownership while still achieving consolidation. Data is always globally available precisely when you need it.



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