

FRIENDSHIP SYSTEMS

Worldwide, FRIENDSHIP SYSTEMS is the sole provider of ready-to-use software for the integration of Computer Aided Design (CAD) and Computational Fluid Dynamics (CFD). The company develops software solutions for the simulation-driven design of functional surfaces which represent the most important components of turbo-machinery and vehicles of transport. Examples are pumps, generators, turbochargers, propellers, ship hulls and turbines. In simulation-driven design geometric modeling and flow simulation are tightly merged in order to facilitate the best possible optimization of key product properties like fuel consumption and flow rate.

Simulation-driven design is going to see the same success story as CAD in the past. In the next ten years it will become the principal technology in product development and engineering. Being the market leader in simulation-driven design in the marine industry, FRIENDSHIP SYSTEMS' solutions and expertise constitute the cutting-edge. Intelligent parametric models and the automated optimization of complex shapes are but a few aspects of the advanced techniques FRIENDSHIP SYSTEMS provides to the greatest possible use and benefit of the customer.

Key element of the product portfolio is the *FRIENDSHIP-Framework*. This Computer Aided Engineering (CAE) solution offers comprehensive modeling functionality and serves as *the* integration platform for external tools. It provides easy-to-handle mechanisms for tool integration and, hence, functions as a true *framework*, deployable in different domains.

The software offers unique parametric design techniques along with the management of variants and constraints. This enables the development of form and product families whose physical qualities can be compared in a time saving and systematic manner. Consequently, the best designs are easy to identify.

The *FRIENDSHIP-Framework* is the workbench for the designer.

The *FRIENDSHIP-Framework* was launched in summer 2007 after four years of intensive development. Major updates are released biannually. Users of the software are shipyards, manufacturers, model basins, consultants and universities. Among them are world-leaders in their field like the Korean shipyard Daewoo (DSME), the submarine manufacturer HDW Kiel, aero-engine developer Rolls-Royce Deutschland, the German propulsion specialist Voith Turbo, the Hamburg Ship Model Basin (HSVA) and the Shanghai Merchant Ship Design & Research Institute (SDARI) in China.

FRIENDSHIP SYSTEMS was founded in 2003 as a spin-off from the Technical University Berlin. In 2004 and 2005 a high-tech grant by the German Government set the company on sound footing. Following a period of continuous innovation and growth, FRIENDSHIP SYSTEMS became a member of the Germanischer Lloyd Group in January 2009. This strategic partnership ideally suits FRIENDSHIP SYSTEMS' mission: Providing high-quality solutions for energy efficient products. Customer benefits are higher cost-effectiveness and environmental sustainability.

Based on excellent products, a talented team, a thriving market position, a clear strategy and the strong backing of the Germanischer Lloyd Group, FRIENDSHIP SYSTEMS strives to establish the *FRIENDSHIP-Framework* as the industry standard in the simulation-driven design of functional surfaces.

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