NAVCAD™

"The scope of NavCad is enormous, and should be a required acquisition of all design offices..." The Naval Architect

What is NavCad?

NavCad is a software tool for the prediction and analysis of vessel speed and power performance. It also provides for the selection of suitable propulsion system components – engines, gears and propellers. *NavCad*'s capabilities can be summarized as:

- Bare-hull resistance
- Steady-state propulsion analysis
- Added resistances
- Propeller selection
- Hull-propulsor interaction
- Vessel acceleration
- Supplemental analyses

Who should use NavCad?

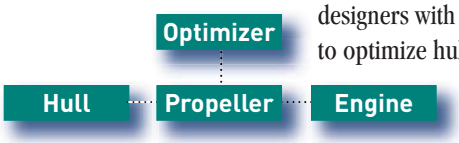
Naval architects, marine engineers, hydrodynamicists and researchers in shipyards, design consultancies, equipment manufacturers, navies and research institutions all rely on *NavCad*.

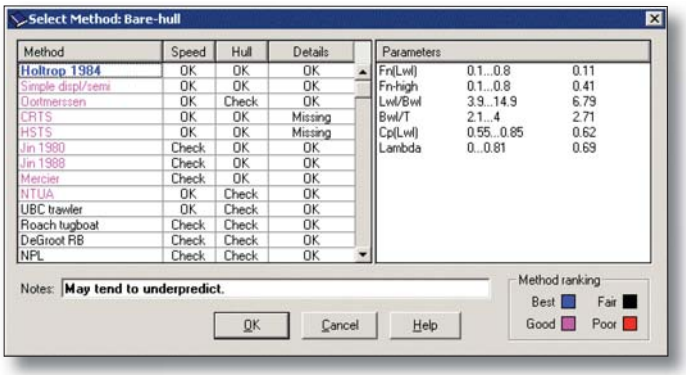
What vessels can I evaluate with NavCad?

NavCad can be used for virtually every type of displacement, semi-displacement and planing craft, sailboat or catamaran. Towing and free-running analyses are supported, as are open and ducted propellers, waterjets and advanced propulsors.

What makes NavCad different?

NavCad is unlike any other resistance and propulsion software. Not limited to a few routines for the prediction of one or two aspects of performance, *NavCad* provides a complete platform for the steady-state equilibrium analysis of performance from hull to engine. Features such as the Minimum Hull Drag analysis provide designers with powerful tools to optimize hull forms.

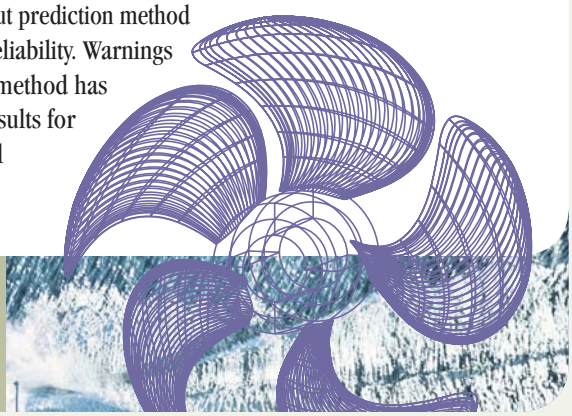




How accurate is NavCad?

Prediction accuracy is insured by offering **A**] the largest available suite of prediction methods (over three dozen for bare-hull resistance alone), **B**] compatible components between methods, **C**] calculations built from contemporary state-of-the-art methodologies, **D**] a complete analysis environment where critical components (like shallow water resistance, for example) cannot be forgotten and **E**] dedicated evaluation, testing and internal R&D [see MacPherson, D.M., "The Ten Commandments of Reliable Performance Prediction", International Symposium on Power, Performance and Operability of Small Craft, Royal Institution of Naval Architects, 1997].

In addition, *NavCad* contains HydroComp's Method Expert prediction method ranking system. This feature takes your vessel data and ranks all monohull prediction methods based on speed regime, ranges of hull parameters and the availability of hull details (i.e., if bulb or immersed transom data, for example, has been entered and is used in the method). It also takes into account HydroComp's extensive knowledge about prediction method behavior and reliability. Warnings are raised if a method has shown poor results for the given vessel information.



Marine Propulsion Software Since 1984

HYDROCOMP inc.

NAVCAD™

Technical Specifications

Vessel Types
Monohulls and catamarans • Displacement • Semi-displacement • Planing

Applications
Ocean-going merchant and naval vessels • Small ships and work boats • Motor and sailing yachts • High-performance vehicles • River barge trains • AUV/ROV propulsion

Calculation Protocols
C-based ITTC-78 and user-defined • Equilibrium-trim planing analysis • Resistance prediction • Propulsion analysis • Propeller sizing

Resistance Prediction
Over three-dozen bare-hull methods • Alignment-to-resistance model tests and sea trials • Added drag for appendages, wind, seas, shallow water • Roughness effects

Propulsion Analysis
Prediction of hull-propulsor coefficients • Analysis by free-run, towing, bollard, or acceleration • Determination of thrust, power, efficiency, fuel rate • Extensive cavitation review

Propulsor Options
Open, ducted, surface-piercing, and cycloidal propellers • Waterjets • Shaft angle effects • Cupping • Controllable-pitch • Cavitation breakdown • Alignment to propeller model tests • Roughness effects

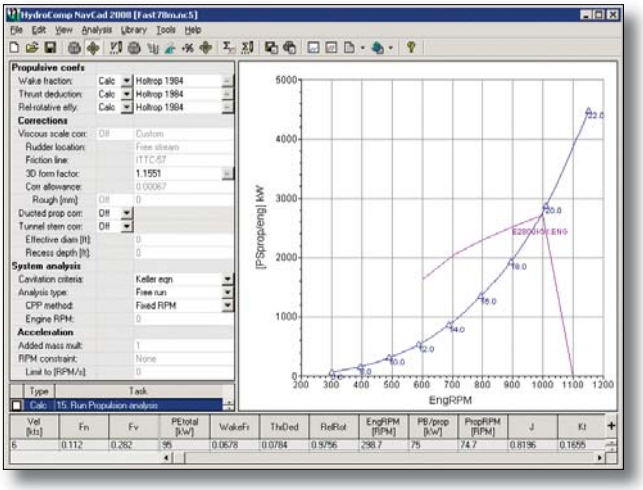
Propeller Sizing
Diameter • Pitch • Blade area ratio • Reduction gear ratio

Integrated Calculation Spreadsheet
Evaluate arbitrary conditions • Analyze sea trials • Validate model tests

Supplemental Analyses
Hydroacoustics • Sinkage and trim • Synchronous pitching • Barge train resistance

Design Guidance
Minimum drag analysis • Optimum trim

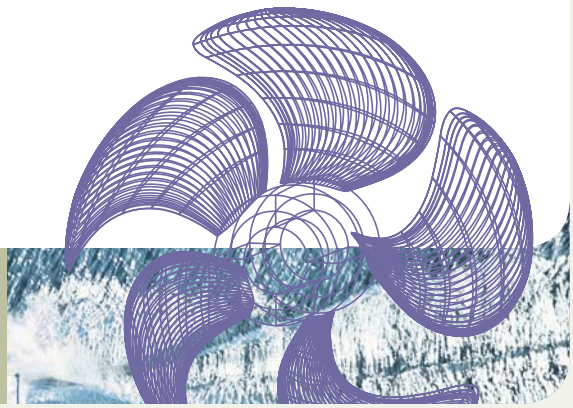
NavCad: The industry's most effective software for ship performance and propulsion



NavCad includes:

- *Largest collection of methods*
- *Extensive algorithm validation*
- *True equilibrium planing analysis*
- *Advanced propulsors such as waterjets*
- *Parametric optimization utilities*
- *Correlation to model-test results*
- *Comprehensive propeller analysis*
- *Prediction of shallow water effects*

To order, please contact HydroComp, Inc. or this authorized representative:



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