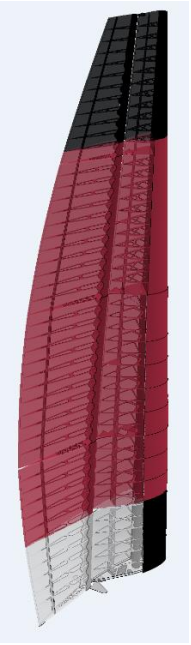
MATRIX | ENGINEERS OF INNOVATION

Marine Engineering

OUR SERVICE FOCUS

For Yacht Designers and Naval Architects needing detailed engineering analysis, Matrix are expert providers of Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) services. As New Zealand's most experienced engineering analysis team, Matrix offers an efficient and robust solution to validate and improve your designs with a proven track record in collaborating with sailing teams and marine designers.



SERVICE / SUMMARY

Detailed structural analysis of composite and alloy vessels using FEA, including static strength, buckling, vibration (e.g. shaft whirling) and fatigue assessment. Non-linear capability to account for complex effects such as stay modelling and flexible structures where load redistribution is important. Advanced CFD including free surface flows, turbomachinery (e.g. jet boat units), cavitation onset and fluid/structure interaction.

- Specialists in Finite Element Analysis (FEA) and Comp. Fluid Dynamics (CFD)
- Experience in composite and metallic structures
- Fatigue assessment of metallic components
- Analysis and optimisation of flow in marine propulsion systems
- Whirling and vibration analysis of powered vessel drive systems
- Hull performance flow simulation including dynamic sinkage and trim
- Jet boat pump design and simulation
- Advanced analysis problems, e.g. parts in contact, bolted and bonded connection, preloaded rigging
- Proven seamless collaboration with many sailing teams and marine designers over the years

PROBLEMS / SOLUTIONS

Matrix provides solutions for yacht designers and naval architects needing detailed engineering analysis.

Problem	Solution
How do I demonstrate that my design is code compliant and that my customer is confident it will perform well in service?	Detailed structural analysis using best-in-class software
How do I avoid paying for costly analysis software, staff training and retainment?	Matrix prides itself on offering value for money and its ability to partner with our customers to achieve results.
How to optimise material placement to minimise weight and maximise performance?	Virtual prototyping using numerical analysis can quickly lead to optimised designs
If a failure occurs in service, how do I identify the root cause and avoid further problems?	Significant expertise in fracture mechanics, fitness for service assessments (analysis of damaged parts) and fatigue assessment

CUSTOMERS / EXPERIENCE

- Racing yacht teams including ETNZ and Team Gitana
- Whirling analysis of vessel drivelines
- CFD of jetboat intakes, impellers and hull performance of catamarans

OUR TEAM

Meet our highly qualified and experienced engineering analysts.

Don Campbell, BSc, BE(Hons), PhD, CMEngNZ, CPEng (Mech), IntPE, NAFEMS Adv Reg Analyst, 45 yrs exp
James Hamilton, BE(Hons), PhD, CMEngNZ, CPEng (Mech), IntPE, composites & non-linear FEA, 20 yrs exp
Kava Crosson-Elturan, BE(Hons), (Mech, Purdue), numerical simulation FEA/CFD, physics-driven design, 18 yrs exp
Guido Quesada, MSME, ASME, FEA, advanced Abaqus instructor, pipe joints, product development, 23 yrs exp
James Cheng, BE(Mech), ME(Mech), fracture mech, press vessel design, plastic injection moulding, 18 yrs exp

ABOUT MATRIX

Matrix provides solutions for engineering design and information management. New Zealand's first and largest team dedicated to engineering computing, supporting the process of innovation for over 35 years. Visit www.matrix.co.nz.