

# Product Design and Simulation

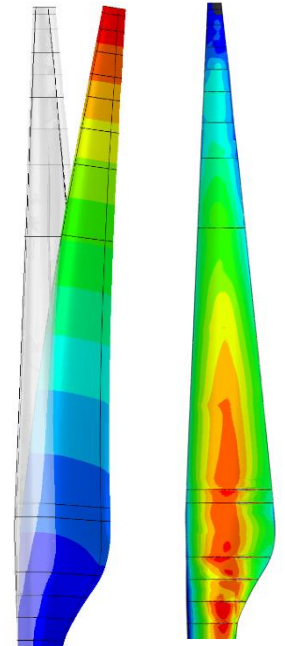
**OUR SERVICE FOCUS**

For product designers who require specialist analysis services Matrix has over 35 years niche experience and knowledge in this area. As New Zealand's most experienced engineering analysis team, we offer an efficient and robust solution to model difficult physics ranging from highly non-linear FEA, rigid and flexible body dynamics, computational fluid dynamics (CFD), fluid structure interaction (FSI) and design optimisation.

**SERVICE / SUMMARY**

Detailed structural analysis of products using FEA, including static strength, buckling, vibration and fatigue assessment. Non-linear capability to account for complex interactions such as bolted connections and flexible structures. Advanced material modelling for rubbers and composites. Explicit dynamics simulation for impact and other short-duration events. Advanced CFD including heat transfer, multiphase flows, turbomachinery, combustion and fluid/structure interaction.

- Specialists in Finite Element Analysis (FEA) and Comp. Fluid Dynamics (CFD)
- Experience in rubber, composite and metallic structures
- Fatigue assessment of metallic components
- Advanced analysis problems, e.g. parts in contact, bolted and bonded connections, heat transfer, radiation and multiphase fluid dynamics
- Experience in pump intake design
- Expertise in leveraging simulation to optimise design performance and overcome technical difficulties
- Proven seamless collaboration with many product designers over the years



**PROBLEMS / SOLUTIONS**

Matrix provides solutions for product designers needing detailed engineering analysis and design advice.

Problem	Solution
How do I demonstrate that my design will perform well in service?	Matrix has vast experience in understanding solid and fluid behaviour and can provide valuable design advice and simulation expertise to improve your products reliability and performance.
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 and fatigue assessment

**CUSTOMERS / EXPERIENCE**

- Matrix has collaborated in hundreds of product design projects over the past 30 years
- Design experience has resulted in the filing of design patents for both Matrix and our customers
- International recognition which has led to collaboration in projects all over the world

**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
- Paul Bosauder**, BE(Hons), NAFEMS Adv Reg Analyst, Advanced CFD, composites & non-linear FEA, 20 yrs exp
- James Hamilton**, BE(Hons), PhD, CMEngNZ, CPEng (Mech), IntPE, composites & non-linear FEA, 20 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](http://www.matrix.co.nz).