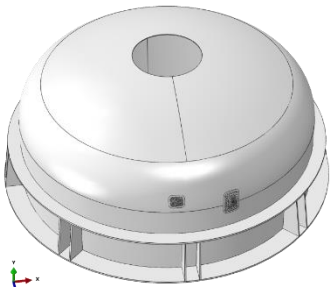
MATRIX | ENGINEERS OF INNOVATION

Pressure Vessel, Tank, Silo and Piping Fabricators

OUR SERVICE FOCUS

For pressure vessel engineers who require design verification of pressure containing equipment, Matrix has vast experience and knowledge in this area. As New Zealand's most experienced engineering analysis team, we offer a design by analysis service for when design by rule does not cover the equipment being designed. Matrix are familiar with the latest codes and non-linear finite element analysis (FEA) approach to verification. Matrix also have advanced computational fluid dynamics (CFD) and fluid structure interaction (FSI) capabilities for the development of fluid related loads.



SERVICE / SUMMARY

Detailed structural analysis of plant equipment using FEA, including static strength, buckling, vibration, fatigue assessment and fitness for service assessment (API 579-1/ASME FFS-1 and BS7910). Non-linear capability to account for complex effects such as contact and material plasticity. Advanced CFD including multiphase flows, heat transfer (conduction, convection and radiation), phase change (boiling, condensation and flashing), reacting flows (combustion), and fluid structure interaction.

- Specialists in FEA to the codes using design by analysis
- Can undertake design by rule for pressure vessels, tanks and piping
- Specialists in seismic loading to a collection of recognised NZ and international codes
- Expertise in soil load development
- Advanced analysis problems, e.g. parts in contact, bolted and welded connections, heat transfer, radiation and multiphase fluid dynamics
- Proven seamless collaboration with engineering teams over the years

PROBLEMS / SOLUTIONS

Matrix provides solutions for pressure vessel engineers needing to check code compliance.

Problem	Solution
How do show compliance if my vessel is not covered by design by rule?	Matrix can provide design by analysis code compliance checks for pressure vessels, tanks and silos.
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 do I design for fatigue and seismic?	Matrix has extensive experience in seismic analysis and in using the latest methodologies for fatigue analysis
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

- Used by NZ and international fabricators and designers
- Expansive knowledge of the relevant codes both local and international
- Reports to verification authorities of a high standard and high level of acceptability

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.