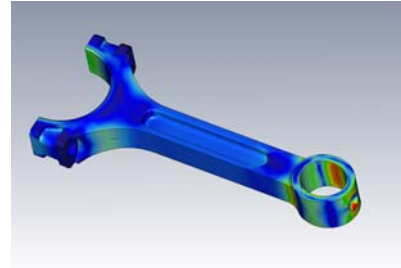


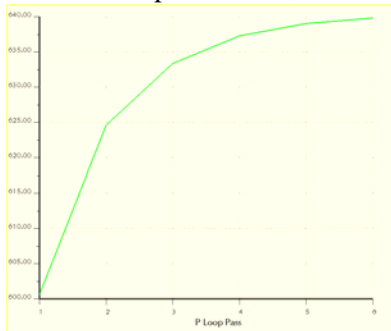
Engineering Analysis using Pro/MECHANICA®

About Pro/MECHANICA

Pro/MECHANICA has been around since 1989, but is still probably one of the most advanced finite element analysis programs available. Pro/MECHANICA Structure uses adaptive p-element technology whereas conventional finite element codes use non-adaptive h-element technology. With h-elements a linear or quadratic equation is usually used to describe the element deformation. This means that these elements cannot follow accurately curved geometry and in areas of high stress gradient it is difficult for such elements to give an accurate result. Large numbers of small elements are required and the analyst has to run manual convergence studies by re-meshing with smaller elements to obtain a converged result. This process is difficult and time consuming, and is by no means guaranteed to produce an accurate result.



With Pro/MECHANICA, the use of higher order polynomial equations overcomes these problems. The underlying geometry can be followed more precisely. The elements use a polynomial equation to describe the stress shape function, which can vary from 3rd to 9th order. This means that fewer elements are required and they can follow high stress gradients very closely. It also means that an automatic convergence strategy can be employed, whereby the polynomial order of the elements is increased rather than having to re-mesh with smaller elements.



Furthermore Pro/MECHANICA has built-in optimisation capabilities, so that designs can be optimised efficiently and automatically.

We have been using PTC's Pro/MECHANICA suite to undertake engineering analysis since its early days, and as such we are probably one of the most experienced companies in the world. We rated it then for its ease of use, convergence control, optimisation and integration between modules and Pro/ENGINEER (that's why we bought it), and we still do. Standard and Advanced modules of Pro/MECHANICA combined Structure and Thermal are available.

Training, Consultancy, and Support for Pro/MECHANICA

We run all our Pro/Mechanica training courses at customer sites. We have a standard 3-day basic course for new users and we have also written Advanced Pro/MECHANICA courses that are only available from Elite Consulting. These cover aspects such as contact, analysing assemblies, vibration and thermal in more depth. We can also customise courses especially for you. We have provided training in Finite Element Techniques to Rolls Royce, Thales, Alstom, Serck Aviation, Triumph Motorcycles, Dowty Aerospace, Cosworth and PTC amongst others.

Our consultants can also visit you to help your staff improve their Pro/MECHANICA skills and to show them the best techniques for designing and analysing your own products. For instance we helped one company determine some simple design rules as a result of studying the results of a number of analyses.

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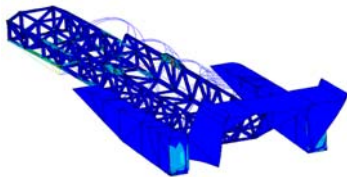
Design and Analysis

Elite Consulting staff have a wealth of experience analysing and solving engineering problems. Rod Giles, our Technical Director, has a background in the medical device and automotive industries and is a NAFEMS advanced registered analyst.

We have undertaken structural, thermal, vibration and dynamics analyses in a number of industries, such as aerospace, automotive, defence, offshore, industrial, electronics, rail transport and consumer goods, all using Pro/MECHANICA as our primary analysis tool.

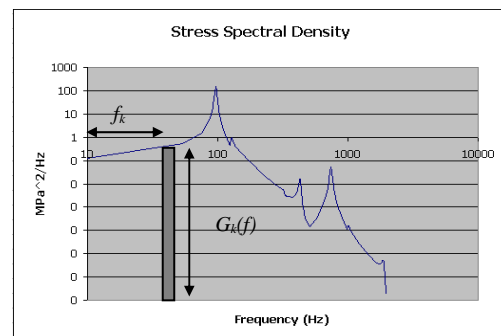
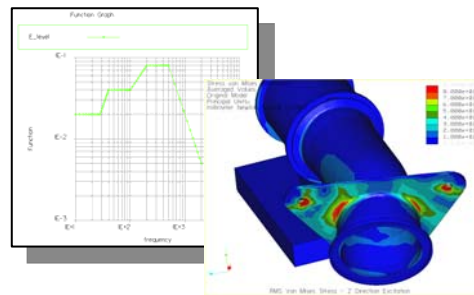
Past customers who use our engineering consultancy services include Rolls-Royce (Industrial and Gas Turbines), Alstom, Thales, Perry Slingsby, FenderCare, Serck Aviation, Hotpoint, Euroseas and many others.

Stress Analysis of Quicksilver Frame



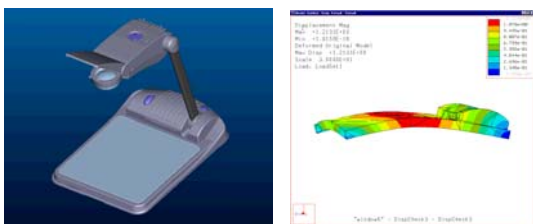
Quicksilver WSR is a world water speed craft that is currently in construction, and we have conducted the stress analysis of the frame for integrity against operating loads.

Vibration & Fatigue Analysis of an Aerospace Valve



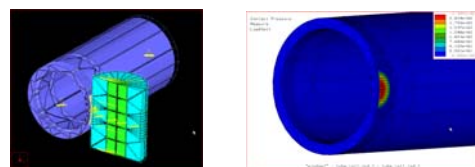
Analysis of valve mounting subject to random vibration. Then post processing of results to determine fatigue life.

Thermal Distortion of an OHP



Company X had redesigned an OHP to be made from ABS instead of aluminium, only to find that it suffered from thermal distortion. They had tried some 'fixes', but none worked, so we were called in to see if we could find a solution. We analysed the model in Pro/MECHANICA Thermal and Structure, obtained correlation and then optimised the design to obtain two possible solutions; a long term one that would require a tooling change, and a short term one that didn't.

Contact Analysis Study



Optimisation of methodology for contact analysis of a roller on a tube.