

Design and Design Verification Finite Element Analysis

Atkins, Rotherham's design engineers use various tools to extend its insight into a wide variety of engineering disciplines and industries. One of the most widely used of these tools is Finite Element Analysis, a computational technique that allows designers to test concepts by means of computer generated models. The models allow our engineers to explore stress levels, thermal gradients or fluid flow regimes under a wide variety of load conditions and analysis types. In turn the model results enable detailed evaluation and reporting regarding the structural integrity of structures or mechanisms.

FEA techniques are equally applicable for concept design, parametric design evaluation, design verification or failure investigation. Irrespective of the technique adopted or stated applications, our engineers are vastly experienced in using analysis results to provide engineering solutions.

In recent years both the hardware and software has become more sophisticated and running speeds have increased to unimaginable rates compared to only a short time ago. This has resulted in the ability to produce fine mesh models of an intricate nature at a more cost effective and faster rate which has opened the technology to a much wider client base than previously possible. Additionally software development has reached the stage where complex non-linear analysis is now possible using affordable computational equipment. Large scale deflection, material non-linearity, contact, fatigue, fracture mechanics and fully coupled analysis techniques mean that we can offer clients a wide variety of solution techniques to suit individual requirements.

While access to such design tools is becoming more widespread the skill and experience to use them correctly is not and the old adage "rubbish in - rubbish out" is still a valid maxim.

Our Computational Analysis department has developed these skills and experience over a considerable period of time and by continually keeping abreast of the latest hardware and software technology has maintained its position amongst the world leaders in this increasingly important area of expertise.

Some illustrations of the wide variety and nature of the work undertaken by us are shown here.

