

Engineering Specialist Services – Assessment of plant **Finite element stress analysis of structures**



Many loaded structures, such as pressure systems, have complex shapes making it difficult to determine stresses and strains to any reasonable degree of accuracy using conventional formulae and calculation methods. Finite element analysis (FEA) can be applied to almost any structure to give an accurate prediction of its behaviour under load.

What does the service include?

Using state of the art software we are able to undertake FEA and provide you with a detailed report, including recommendations. This enables you to make an informed decision regarding the suitability of the design or the suitability of the equipment for further service.

Who does it affect and why?

The discovery of an irreparable crack or other defect in a structure or item of equipment could result in it being scrapped. The cost implications for a replacement could be significant. However by applying FEA and fracture mechanics assessment it is possible to determine the critical defect size, allowing equipment with a non critical defect to remain in service (subject to monitoring).

FEA can also be invaluable when proving the adequacy of the design of new pressure equipment or similar structures. It helps with refinement of the design process, ensuring points of high stress in the equipment are reduced or eliminated. This can often lead to a reduction in the thickness of the materials used.

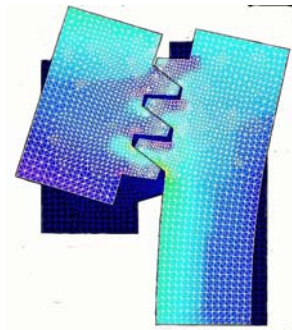


Image 1: Thread on an autoclave door closure under load

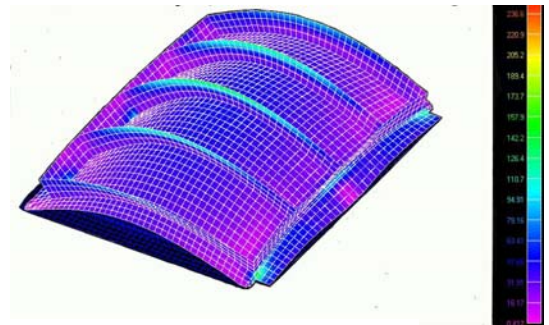


Image 2: Autoclave door under load

Our approach

We have knowledge and understanding of a wide range of plant and equipment which enables us to provide sound advice on its design and condition.

First we need to gather data on the equipment concerned, including dimensional details and materials data. This can often be obtained from manufacturer's drawings. Preliminary modelling and analysis of the structure would be undertaken by one of our Senior Engineers. Our findings are then discussed with you and where appropriate changes made to the model before finalising the analysis.

Linked services include notified body assessment of pressure equipment

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