

CASE STUDY

FLUID CODES

 SOFTWARE  SUPPORT  TRAINING  CUSTOMIZATION

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FEA FOR LIFTING OF TOP PORTION OF SPHERE FOR ERECTIONS

CHALLENGES

The first part of the project was focused in to calculate the best pad eye locations, for which several FEM simulations were performed in the semi-sphere. In order to perform this scenario, shell elements were used for the semi-sphere model.

Shell elements are used to model structural elements in which two dimensions are much greater than the third. The advantage of the use of shell elements results mainly from time-saving due to reduced number of finite elements (and consequently the equations to solve). It means that more eye pad locations can be simulated in the same amount of time so the best location will be identified in a more effective way.

Once the eye pad locations were fixed, the eye pad design was performed. For this purpose, the submodeling technique was used. Submodeling is an important technique in finite element analyses that allows us to get a more accurate answer in a local region of a larger model. Often computational and time limitations prevent us from using a fine mesh, which is required to adequately assess the results in all local regions of a large complex model.

ENGINEERING SOLUTION

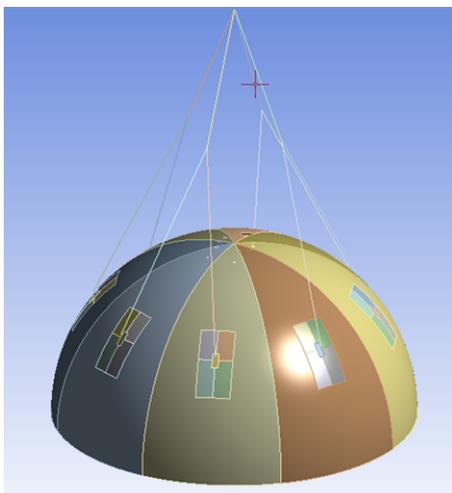


Figure 1. Geometry to be simulated

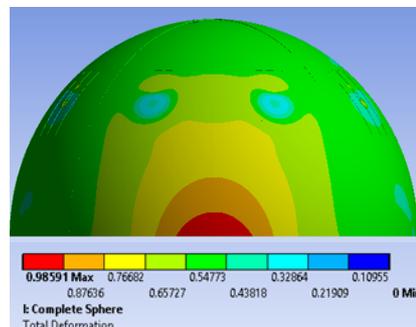


Figure 2. Total deformation in mm

L: Submodel (Reinforcement 3)
Equivalent Stress
Type: Equivalent (von-Mises) Stress
Unit: MPa
Time: 1

Red	146.93
Orange	130.61
Yellow	114.29
Light Green	97.956
Green	81.631
Cyan	65.307
Blue-Cyan	48.982
Blue	32.657
Dark Blue	16.333
Black	0.0079253 Min

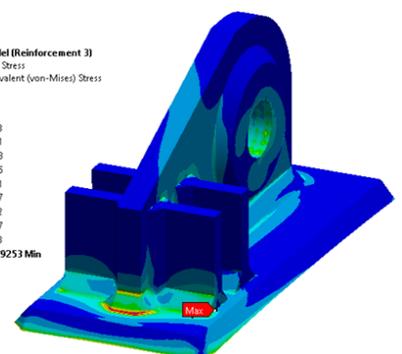


Figure 3. Von Mises Stress for the Eye Pad