

SECTOR:
HEAVY EQUIPMENT

OFFERINGS:
ENGINEERING SIMULATION
SERVICES

TECHNOLOGY:
STRUCTURES

STRUCTURAL ANALYSIS OF SUGAR DRYER ASSEMBLY

Our customer is design, engineering, and manufacturing company of critically customized industrial equipment. One of their leading products is sugar dryer that works on the principle of flow of hot air over sugar particles. Sugar particles are oscillated as they move on a vibrating perforated plate. Frequent failures were observed, mainly, shoring of bolts that hold leaf spring and flattening of bracket. The client resorted to finite element analysis to eliminate failures in the dryer.

Finite element analysis was carried out in ANSYS for the leaf spring, bottom plate and flange. Higher order 3D elements SOLID87 and SOLID186 were utilized. Load pertaining to eccentric displacement was applied to leaf spring. Similarly, self-weight and centrifugal load was applied to base plate. It was found that spring leaf is failing as stresses were higher than the endurance limit. Analytical calculations were also done to compare against FE results.

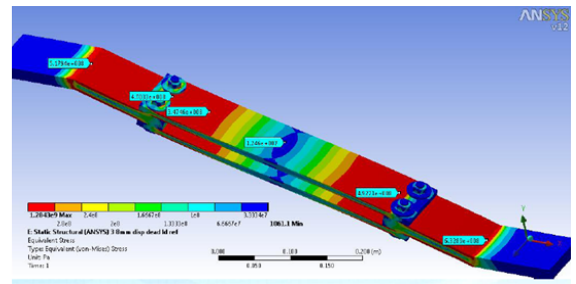


Figure 92: (a) Sugar dryer assembly (b) Stress distribution on leaf spring during breaking

Customer was given recommendation of increasing the width of leaf spring and introducing a fillet in bracket to reduce stress. Simulations to confirm the benefit of these modifications were also delivered. The study allowed the customer to identify the problematic areas in the design. These were incorporated to obtain robust operation of sugar dryer.