Improving the gypsum manufacturing process at 
CertainTeed Gypsum

Overview
The Company wants to improve their process by model the fluid flow inside their gypsum mixer. The team’s biggest problem was the unfamiliarity with the fluid modeling software. Also the initial scope was too large and had to be reduced during the course of the semester.

Objectives
- Create a 3D CAD model using Solidworks
- Create a computational fluid dynamics model Fluent
- The team created the Solidworks models and modeled one and two rows of rotor pins

Approach
- First the team created a Solidworks model of the entire mixer
- The team visited the sponsor site to gain a better understanding of the process
- The model was then broken up into simpler ones
- Gambit was used to create 3D meshes of the models
- The team used Fluent to create the CFD models

Outcomes
- An accurate 3D model of the mixer
- A groundwork for continued work on CFD modeling
- CFD models showed some mixing cause by the pins
- Guides for meshing in Fluent and Gambit

Figure 1. Unsteady state CFD model for second simplified mixer