

## **Objective**

The objective of our project is to mitigate the debris on the Mylar sheet during the justification process.

## **Purpose**

During the creation process of the Diesel Particulate Filter (DPF), justification is required to line the filter up with a cement pump which fills the DPF with cement batch which filters out the diesel particulates. The problem arises during the justification process, after the upper grippers release the DPF, ceramic debris falls onto the Mylar sheet beneath the filter. This debris causes issues as it prevents a proper seal with the lower grippers and Mylar. This improper seal causes the cement batch to leak onto the sides of the DPF which requires a secondary process to remove and fix the filter, using Corning's time and resources.

## **Current State of Selected Design**

The group has selected the design and have begun prototyping. This model, named Spring Ramp, is the highest scoring design from our design selection process. Now, the group has chosen the materials and created the bill of materials to make a final model. Meanwhile, part of our group was devising a way to increase the space between the upper gripper and lower tooling. This will be worked on during the winter break to ensure completion of the design and proper fitment within the tooling. The group has also completed a rapid prototyping design using simple materials. This prototype show the basic functionality of the final design as well as the small area that we are working with on the robot tooling.

## **Problem Areas**

There are several problem areas with our project that our group has identified moving forward. One problem can be increasing the space between the upper grippers and lower tooling. This will be problematic due to how they are attached to the machine. We have not been provided with the full CAD

model of the machine the upper grippers and lower tooling are attached to. This will be addressed over the winter break with the Corning team. Secondly, the exact shape for our Spring Ramp design will be difficult to model. We believe this will take multiple tries with 3D printed models to understand the exact shape needed to ensure no gaps remain for debris to fall onto the mylar sheet. The last area of concern for our design is dealing with the motion of the design. This motion may cause the DPF to flake off more debris when contacting it. We will have to test how much force the outer skin can withstand before breaking off to ensure the design is viable.

#### **Extra Notes**

Our group has been tasked with mitigating debris on the mylar adhesive sheet during the justification process. The justification process is used to center the DPF (diesel particulate filter) onto the mylar adhesive sheet for the plugging process.