Overview
The Dresser-Rand business, part of Siemens Power & Gas, is a leading producer in custom high performance centrifugal compressors which are used extensively in the oil and gas industry. In order for these compressors to run as efficiently as possible, impeller eye seals must prohibit the back flow of gas and air. In order or these seals to accomplish this, they must maintain structural and compositional integrity.

Objectives
The team’s objective was to find a polymeric seal that could withstand as many chemicals as possible that would be seen in the compressor. The team also focused on a polymer that would perform at high temperatures. It was also very important that the seal would withstand any impacts from the compressor itself due to vibrations.

Approach
- Conducted internal research on Dresser-Rand to get an understanding of current state of the art
- Visited Dresser-Rand’s Olean, NY site to get a hands on idea of the seals and compressors
- Began external research on high performance polymers
- Narrowed search down to three specific polymers
- From chosen three, selected the polymer with best suited properties, Perfluoroalkoxy (PFA)
- Constructed potential test parameters and metrics to perform on potential test samples
- Ordered test samples of our selected polymer (PFA) and Dresser-Rand’s current technology
- Performed basic machining and surface tests in The Learning Factory and the FAME Lab

Outcomes
- PFA is a viable option to use in replace of Dresser-Rand’s current state of the art
- Has a higher initial cost, however being more durable, an in depth cost analysis will still need to be done