Project Title: Billet Cutting Saw Automation

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Area: Mechanical Engineering

Sponsored by: Trelleborg Sealing Solutions

Trelleborg Sealing Solutions is looking to modify the current cutting system for extruded Polytetrafluoroethylene (PTFE) billets. The system starts by using a powdered PTFE compound which is loaded into a vertical PTFE extruder. The powder is then heated and compressed into a billet. The billet is then cut to the proper height by an automated chainsaw. The current issues with the cutting process include: the chainsaw requires significant modification to be mounted to the system; the chainsaw blade must be tensioned once a day; the blade must be replaced once every three months; and the chainsaw itself is replaced once a year because of motor failure. Trelleborg wants to improve the current system to make it more reliable/durable and more maintenance friendly.

The project task is to design a new automated cutting system that effectively cuts the PTFE billets from all extruders at an angle of 90° ± 3° under one minute. The designed cutting system must also surpass the maintenance and labor needs of the current system, requiring less modification to be installed and lasting a minimum of 3240 cutting cycles before failure.