



**Company Information**

<b>Company Name</b>	The Polymers Center of Excellence, Inc	<b>Date Submitted</b>	05/04/2021
<b>Project Title</b>	<i>Injection Mold Exchange Cart Motorization (PCE_MOLD2)</i>	<b>Planned Starting Semester</b>	Fall 2021

**Senior Design Project Description**

**Personnel**

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills:

<b>Discipline</b>	<b>Number</b>	<b>Discipline</b>	<b>Number</b>
Mechanical	2	Electrical	3
Computer		Systems	
Other ( )			

**Company and Project Overview:**

The Polymer Center was founded in 1972 when the State of North Carolina funded plastics specialists in the Industrial Extension Service program at UNCC. The center, located at that time on the UNCC campus, expanded in 1994 when a joint venture was entered into with NCSU to form PEP (Polymers Extension Program). By 1999, PEP moved off of the UNCC campus (to the close by University Research Park) and became today's Polymers Center of Excellence (PCE). In 2012, Polymers Technology Center (PTC) was added for small scale production for plastic injection molding and compounding plastics. Since then, the Polymers Center has continued to impact economic development through education, research and development, and trial production.

This project will be focused on improving tooling handling in the injection molding lab. The lab contains three injection molding machines from three different manufacturers, various sizes of molds and a mold exchange cart that was designed by the 2020/2021 PCE\_MOLD senior design team. The lab is unusual in that it has carpeted floors and low ceilings, making mold exchanges challenging.



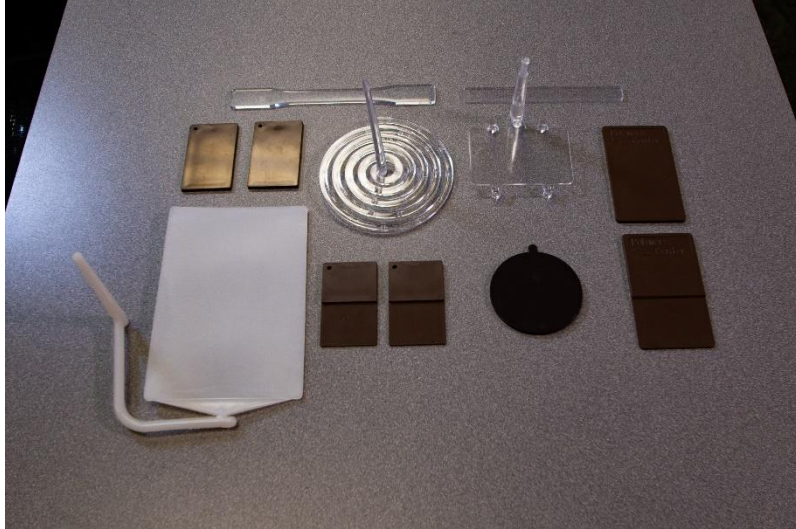
UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING  
Industrial Solutions Laboratory

Photos of the lab are below:



Examples of injection molded parts made at PCE:



The 2020/2021 PCE\_MOLD Design Team's cart:







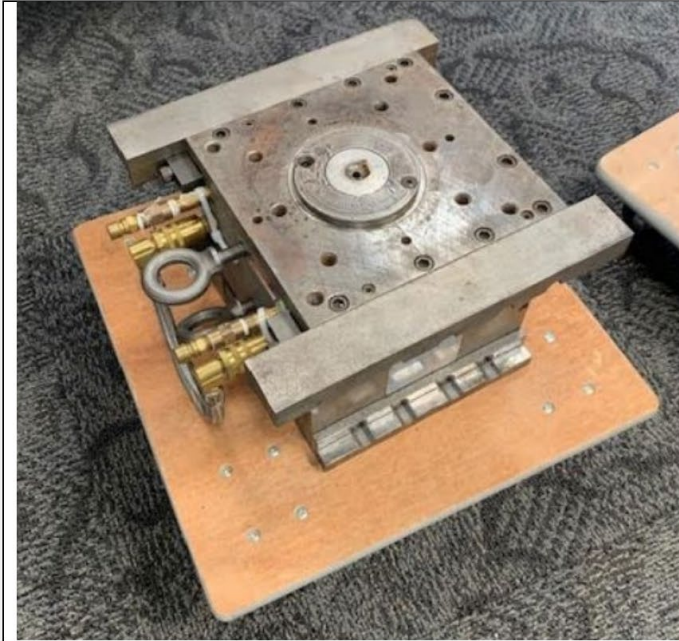
UNC CHARLOTTE

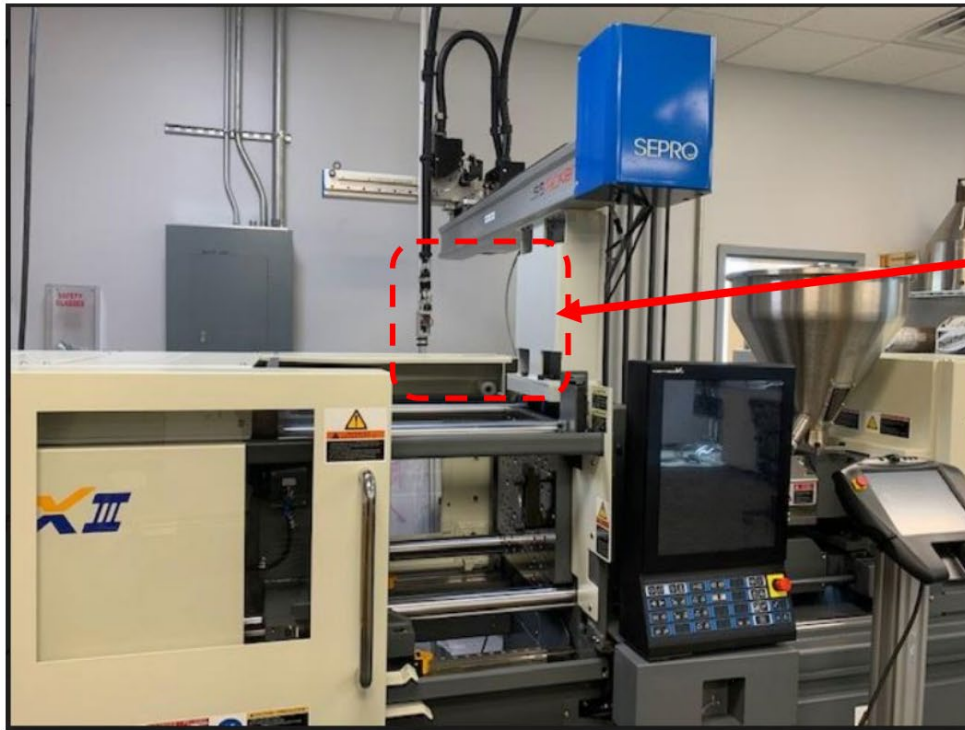
The WILLIAM STATES LEE COLLEGE of ENGINEERING  
Industrial Solutions Laboratory

### Project Requirements:

The goal of this project is to motorize the existing cart so it is easy for one person to maneuver. The cart lifts molds weighing up to 500 lbs from storage, transports them to the injection molding machines, and lowers them between the tie bars so they can be clamped in place.

These are two different injection molds.





Mold lifted into this area and then lowered into place

This cart will be kept inside the injection molding lab and used solely for mold exchanges. With the motorization, the cart must meet the following specifications:

- Safe to be operated and easy to push/pull by one person
- Lift and maneuver 500 lbs
- Battery operated and move the device from mold storage to the machine (<100ft) and back without requiring recharging
- Not damage the industrial carpet
- Must be able to control speed

**Expected Deliverables/Results:**

- Design and build a system that achieves the specifications listed above
- Drawing package and Bill of Material for the design
- Tested and verified in the Polymers Center Injection Molding Lab
- Operation and Maintenance manual
- Training video for operator

**Disposition of Deliverables at the End of the Project:**

The Polymers Center would use this device on a weekly basis and it would become part of the state-of-the-art molding center. Team to deliver the cart to the Injection Molding Lab after the conclusion of the Expo.



UNC CHARLOTTE

*The* WILLIAM STATES LEE COLLEGE *of* ENGINEERING  
Industrial Solutions Laboratory

**List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):**

- None