



Company Information

Company Name	<i>Sealed Air Corporation (SEE)</i>	Date Submitted	<i>11/13/2023</i>
Project Title	<i>Design of a Sanitary Compression Tester for Liquid-Filled Pouches (SEALED AIR_POUCH)</i>	Planned Starting Semester	<i>Spring 2024</i>

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.

Discipline	Number	Discipline	Number
Mechanical	3	Electrical	1
Computer	1	Systems	

Company and Project Overview:

At Sealed Air, we partner with our customers to solve their most pressing resource challenges by delivering new solutions derived from our unmatched industry knowledge and expertise. These solutions create a more efficient, secure, and less wasteful global food supply chain and enhance commerce through fulfillment and packaging solutions to protect the worldwide movement of goods.

Headquartered in Charlotte, NC, Sealed Air employs over 16,000 employees globally across 97 manufacturing centers. Sealed Air generates over \$5 Billion in yearly revenue and serves 120 countries/territories.

The following brands are part of the Sealed Air company:



INDUSTRIAL SOLUTIONS LABORATORY



Some product examples from SEE®



Biopharma Films





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One of Sealed Air's product offerings to the Quick Service Restaurant industry is a sealed pouch that can contain a variety of fluids, condiments, or sauces. After the pouches are filled with the liquid in a customer's production facility, the sealed pouches are periodically tested to ensure that the opening force required falls within a predetermined force range.

This load testing is currently performed using a [Mark-10 Compression Tester](#). However, this equipment is not washdown-rated, is not simple and intuitive for the operators to use and has more functionality than needed for our in-plant testing.

The goal for this project is to provide a working prototype of a compression testing machine for our sealed pouches that is washdown-rated (preferably IP69k), simple to use for the plant operators, and contains grippers and fixtures for the 2 types of pouches that will be tested.



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Project Requirements:

The UNC Charlotte senior design team is requested to develop, test, and build a working prototype of a compression testing machine to test the burst force of sealed, fluid-filled pouches for the food industry.

The testing equipment is necessary to ensure that the frangible seals on the pouches will open at the correct force to allow the user to begin dispensing the product.

Expected Deliverables/Results:

- Working prototype of sanitary compression testing machine.
 - All components of the prototype should be able to survive a high-pressure washdown in a food production facility.
 - The testing machine will need 2 sets of product fixtures for the sealed pouches.
 - 1 fixture for squeezing the pouches between two oversized parallel plates
 - 1 fixture for squeezing the pouch with a plunger inside of a tube
 - Utilize a washdown-rated force sensor
 - Incorporate a visual display to alert operator of go/no-go burst force. Options can include light bars, digital readouts, gauges, etc.
 - Student design team will determine the best force application method (machine screw, pneumatic cylinder, hand crank, etc.)
 - The operation of the test machine should be simple and intuitive.
 - The machine should employ safety features to prevent overloading the force sensor and



to prevent injury to the operator.

- Operations and maintenance manual
- Video instructions for the operation of the device

Disposition of Deliverables at the End of the Project:

Students are graded based on their display and presentation of their team's work product. It is mandatory that they exhibit at the Expo, so if the work product was tested at the supporter's location, it must be returned to campus for the Expo. After the expo, the team and supporter should arrange the handover of the work product to the industry supporter. This handover must be concluded within 7 days of the Expo.

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

- Team must be able to travel to the Sealed Air headquarters in Charlotte, NC as required to view and understand the current equipment, pouches, and testing set-up and to receive sample test pouches.
- Interest in CAD, Machine Design and Mechatronics
- May require travel to the Company's location