

UNC Charlotte – Lee College of Engineering Senior Design Program

Senior Design Project Description

Company Name	<i>Lowe's Companies</i>	Date Submitted	<i>06/26/2019</i>
Project Title	<i>Lowe's Burst Pressure Test Apparatus</i> LOWES_TEST	Planned Starting Semester	Fall 2019

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	2	Electrical	1
Computer	1	Systems	
Other ()			

Company and Project Overview:

Lowe's Companies, Inc. (NYSE: LOW) is a FORTUNE® 50 home improvement company serving more than 18 million customers a week in the United States and Canada. With fiscal year 2018 sales of \$71.3 billion, Lowe's and its related businesses operate or service more than 2,200 home improvement and hardware stores and employ approximately 300,000 associates.

This project is being requested by the Quality Assurance department of Lowe's. QA is responsible for several things including product compliance, performance, and safety, ethical sourcing, reducing product return rates, and customer satisfaction.

This project will design and build a test apparatus to test the burst pressure of various products using water pressure.

Project Requirements:

As part of product design, testing and evaluation, Lowes Engineering and Quality Assurance labs need to test a variety of devices that are sold in Lowes stores. One performance characteristic that is tested is pressure rating. This testing apparatus will be designed to accommodate all of the products that Lowes sells that contain pressure. The chamber will be designed to do pressure tests using water pressure. Specific dimensions will be based on discussions with Lowes. The test chamber must safely contain the water under all test conditions and not subject an operator to any



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potential burst sprays. The max pressure for testing will be 2000 psi. The pressure input must be variable between 200 and 2000 psi. Flow rate capacities to be defined in discussions with Lowes. When the test is in progress, the pressure level should be displayed. There should be an easy to use control/display panel to initiate operation, start water flow, control pressure levels, hold pressure at defined time limits, capture max pressure at failure, show current status, record results and end test and drain the testing chamber. The unit under test must be clearly visible and well lit at all times during the test, but contained so that any burst will not injure the operators. Unit must be water tight and be easy to fill and drain without loss of control of water in test area. Fittings to accommodate the variety of products under test.

Expected Deliverables/Results:

- A burst pressure testing apparatus per the requirements defined above
- Verification Testing using provided product samples
- Operations manual with text and photos that train an operator how to use the test apparatus
- Maintenance instructions
- Bill of material defining sourcing instructions for all parts

Disposition of Deliverables at the End of the Project:

Equipment built as part of this project will be demonstrated at Expo, then returned to Lowe's at the conclusion.

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

- none