UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Senior Design Project Description

Company Name	Stabilus	**Date Submitted**	4/18/2018
Project Title	Gas Spring Pressure Testing Device for DOT Requirements (STAB_TEST)	**Planned Starting Semester**	Fall 2018

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project. 250 hours are expected per person. Complete the following table if this information is known, otherwise the Senior Design Committee will develop based on the project scope:

Discipline	Number	Discipline	Number
Mechanical	5	Electrical	2
Computer	0	Systems	
Other ( )			

Company and Project Overview:

As one of the world's leading providers of gas springs, damping solutions and electromechanical POWERISE drives, Stabilus has demonstrated its expertise for eight decades in the automotive industry and a variety of other sectors. Gas springs, dampers and electromechanical drives from Stabilus optimize opening, closing, lifting, lowering as well as adjusting actions and protect against vibration. Employing more than 6,200 people worldwide, the company has its operational headquarters in Koblenz. Stabilus has reported sales revenues of €910.0m in the 2017 business year. Stabilus operates production plants in nine countries and distributes its products in over 50 countries in Europe, North, Central and South America as well as Asia Pacific via its regional offices and sales partners. Stabilus produces products for the automotive industry from its plant in Gastonia NC.

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Stabilus is required to pressure test closed steel tubes to meet DOT requirements for shipping a pressure vessel. A tester is required to secure pressure tubes of various diameters and pressurize the tube to up to 400 Bar. The tubes are closed on one end and will come in various lengths and diameters. This test should be fast, less than 2 mins, and should visually indicate whether the tube passed the test. It should be repeatable as the test may be conducted up to 50+ times per day.

Project Requirements:

Functional Display
Power source: Electric (110V or 220V), pneumatic, hydraulic lines are available
Media: will use a fluid (Titan SAF 1720 B) to reach pressure, and it should be recoverable
Pressure Requirements:
Max Pressure: **400 Bar Max. (Adjustable)**
Standard operating pressure between 350 – 400 Bar.
Controlled: Can set variable pressures depending on tube size
Tubes:
Tube lengths: 60mm - 1000 mm
Tube OD Diameters: 15mm, 18mm,19mm, 22mm 28mm (example of each tube drawings will be provided)
Footprint: Maximum, 4x4 feet
Safety:
Due to the high pressure must be enclosed to prevent injury in event of failure
E-Stop / reset
Tube used for testing must not be damaged during testing on O.D. or I.D. as it will be a sellable tube

Upon reaching desired pressure set point, pressure to be held for 15 seconds. After 15 seconds, a pass or fail indicator tells operator status, pressure is released and media is recovered (if using a fluid).

Expected Deliverables/Results:

Completely functional tester shall be provided. If cost of the tester exceeds the available project budget, then discussions with the Supporter will need to determine additional funding, provision of parts from supporter to allow completion of tester within budget or reduction in the build scope to fit the budget.

Disposition of Deliverables at the End of the Project:

Provide to Stabilus at the conclusion of the Expo

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

- None
- Strong focus on safety