

Senior Design Project Description

Company Name	<i>Dixon Quick Coupling</i>	Date Submitted	<i>6/8/2020</i>
Project Title	<i>Burst and Static Pressure Testing System (DIXON PRESS)</i>	Planned Starting Semester	Fall 2020

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	4	Electrical	2
Computer		Systems	
Other ()			

Company and Project Overview:



Dixon Quick Coupling is a leading manufacturer of hydraulic and pneumatic quick disconnect couplings and related products. Quick disconnect couplings are designed to make a quick, leak-free connection for many different fluid power and fluid transfer applications. Our products are used in a wide variety of industries including transportation, oil and gas, construction, underground utility, agricultural, industrial and more.

Dixon is famous for its variety of couplings that allow fast, hand actuated connections that provide a leak proof seal. An example is shown below:



UNC CHARLOTTE

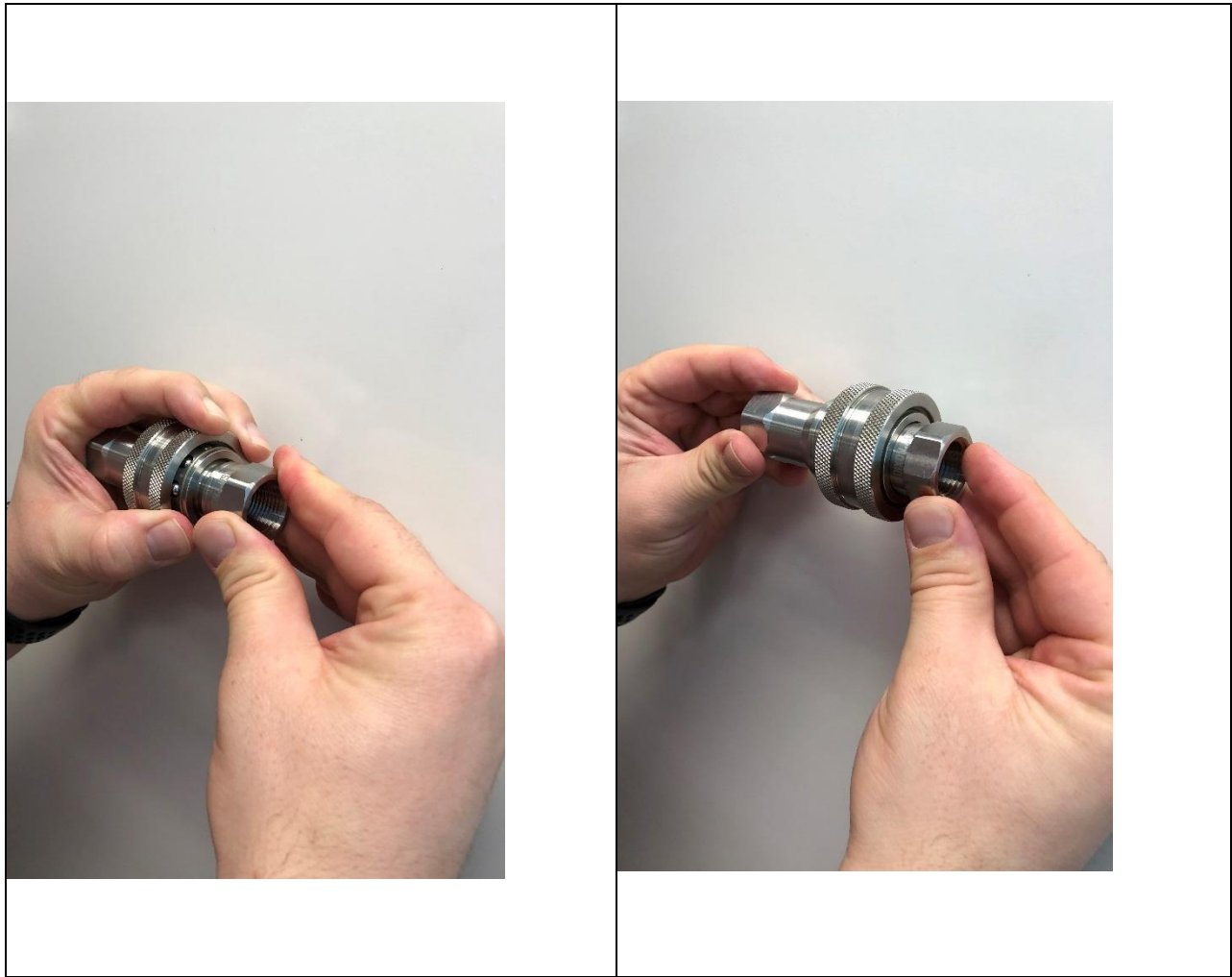
The WILLIAM STATES LEE COLLEGE of ENGINEERING





UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING



In this example, the locking collar is retracted, which allows full insertion of the part on the right side. Once seated, the collar is released which locks and seals the coupling in place.

There are many tests required to qualify and test the quality of couplings. Dixon has a need for a burst and static pressure testing system with improved capabilities over our current system.

Project Requirements:

The team will design and build a machine that can perform burst and static pressure testing of quick couplings. The machine will need to meet the following requirements:

- 50,000 psi minimum pressure rating
- Set and hold at any pressure between 100 and 50,000 psi
- Test couplings ranging in size from 1/8" to 2" nominal diameter
- Controlled ramp rate of 14,500 psi/min maximum
- Programmed using LabVIEW with data-logging and reporting capability
- Enclosure with interlocked door to prevent access while under pressure
- Integrating lighting in test chamber



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

- Camera capable of high speed and high resolution for video recording of tests
- Test media: fresh water, must include supply connection and drain
- Power requirements: 110 VAC
- Air requirements: 110 psi air available

It is expected that the budget for this project will exceed that of a standard project. The costs should be established as part of the design process and a plan discussed and approved by Dixon.

Expected Deliverables/Results:

- 3D Cad models for all components and assemblies
- 2D drawings of all machined components
- Copy of LabVIEW program
- Functional test system

Disposition of Deliverables at the End of the Project:

All hardware, models, and drawings developed by the UNC Charlotte senior design team is the property of Dixon Quick Coupling. The hardware will be given to Dixon at the conclusion of the design expo unless otherwise noted.

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

- 3D CAD Modeling – Solidworks preferred
- Basic machining and fabrication
- Control system setup and wiring
- LabVIEW programming