



Company Information

Company Name	<i>Dixon Quick Coupling</i>	Date Submitted	<i>11/15/2021</i>
Project Title	<i>Automated CNC Chip Removal System (DIXON_CHIP)</i>	Planned Starting Semester	<i>Spring 2022</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	1-2
Computer		Systems	
Other ()			

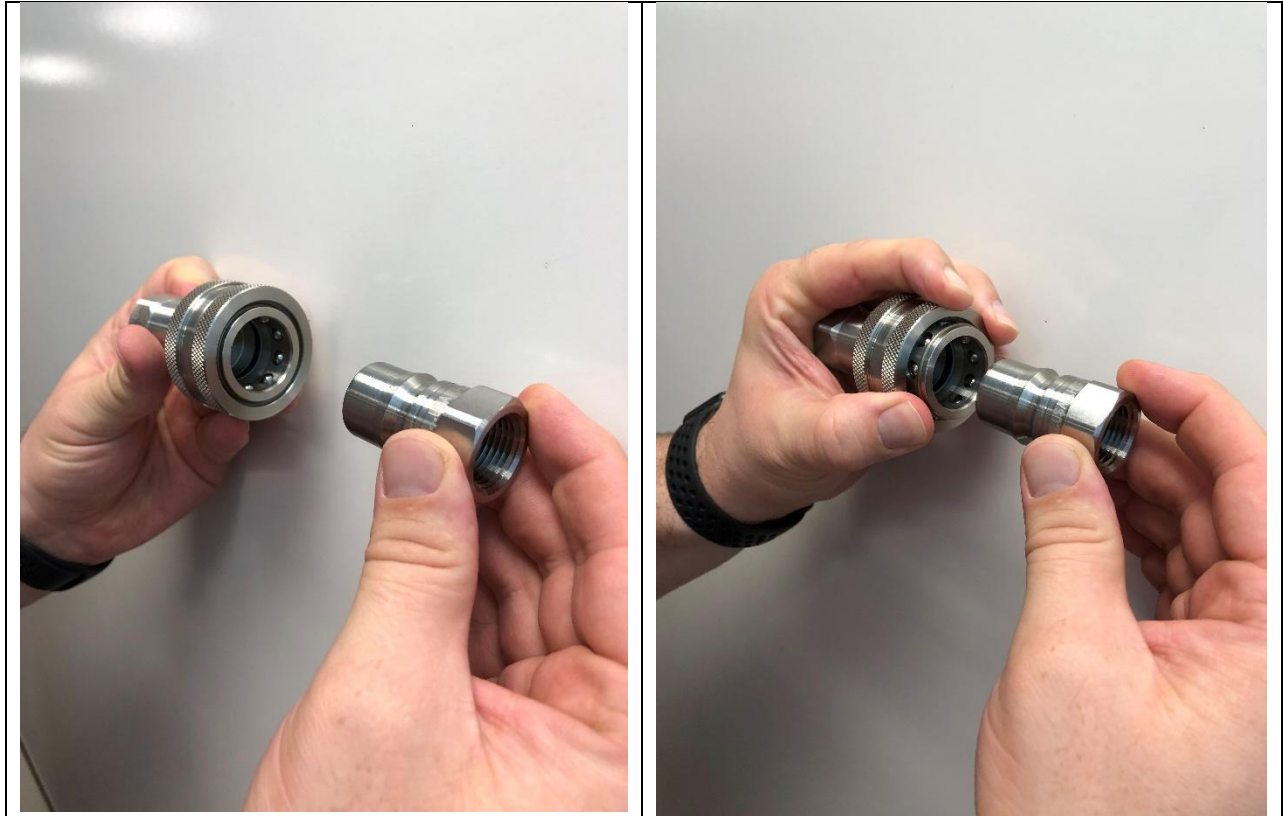
Company and Project Overview:

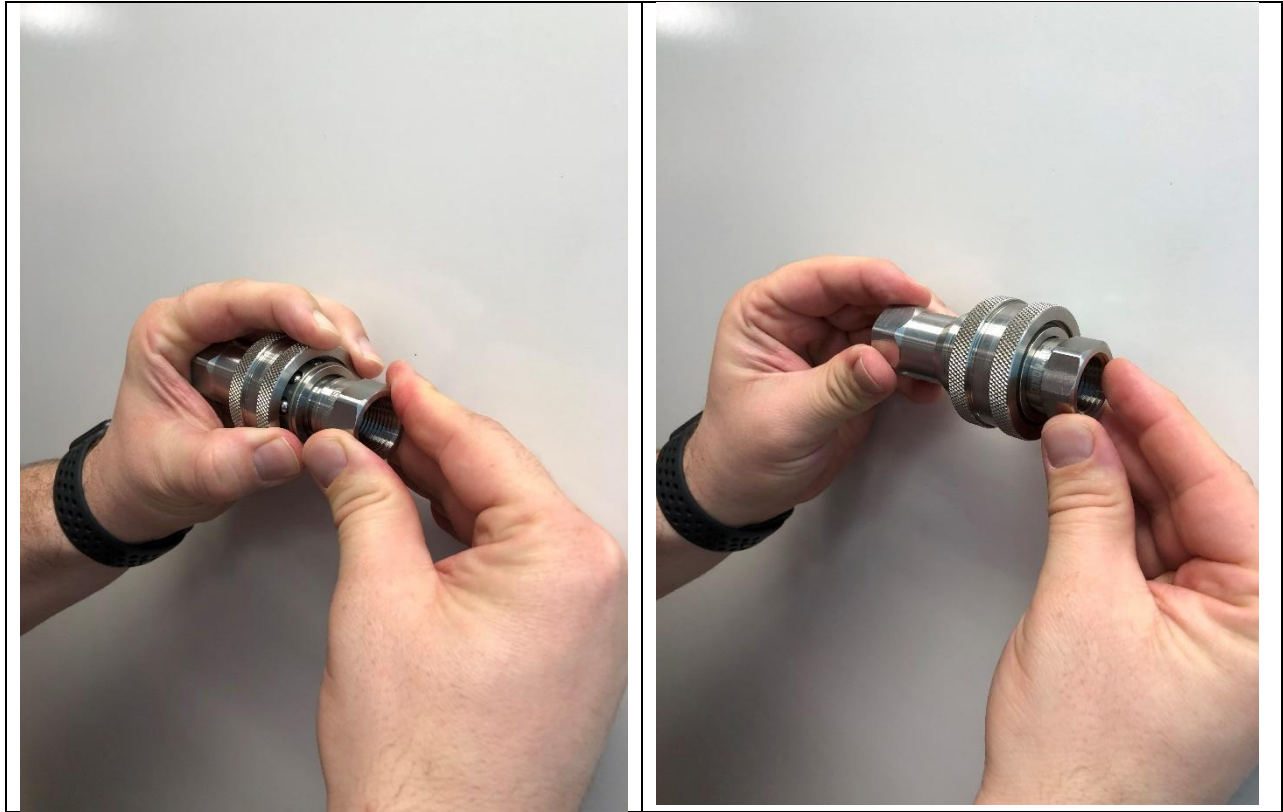


Dixon Quick Coupling is a leading manufacturer of hydraulic and pneumatic quick disconnect couplings and related products. Quick disconnect couplings are designed to make a quick, leak-free connection for many different fluid power and fluid transfer applications. Our products are used in a wide variety 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:





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.

Many of the coupling components are machined using CNC lathes. The chips generated during the machining process (as shown in the pictures below) need to be removed from the component. Currently this is performed manually by an operator using compressed air. The goal of this project is to design and build a prototype machine that is capable of automatically removing the chips using either compressed air, water or another fluid.



Project Requirements:

The team will design and build a prototype machine that will remove all chips from a variety of machined components. The components vary in size and geometry, so the machine should be configurable to work with different components. The machine will need to meet the following requirements:

- Components range from 1/2" to 2-1/2" outside diameter
- Component maximum length is 6"
- Cleaning fluid: compressed air, water or other fluid such as CNC coolant (Note: if coolant is used then system should include a filter prior to the pump)
- Power requirements: 110 VAC
- Air requirements: 110 psi air available

Expected Deliverables/Results:

- 3D Cad models for all components and assemblies
- 2D drawings of all components
- Functional prototype 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.

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):

- 3D CAD Modeling – Solidworks preferred
- Basic machining and fabrication
- Control system setup and wiring
- Travel to Dixon to understand current processes and products, and testing.