



Company Information

Company Name	<i>HUBER Technology, Inc.</i>	Date Submitted	<i>04/14/2022</i>
Project Title	<i>Design of a Recirculating Hydraulic Testing Channel for Mechanical Water Treatment Equipment (HUBER_WATER)</i>	Planned Starting Semester	<i>Fall 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.

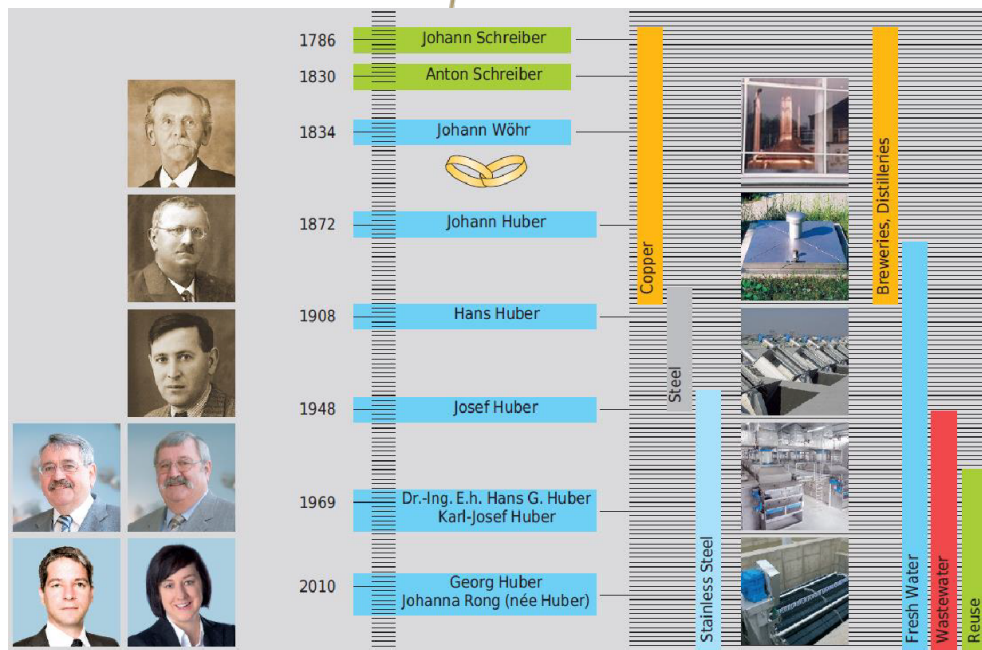
Discipline	Number	Discipline	Number
Mechanical	3	Electrical	2
Computer		Systems	

Company and Project Overview:

HUBER Technology, Inc. is a leader in the municipal and industrial wastewater equipment markets, with over 50,000 pieces of wastewater treatment equipment installed worldwide, and an order intake of over 150 Million Euro in 2021. HUBER was officially founded in 1786, with the company rebranding under the HUBER name in 1872 through the continued growth and direction of Johann Huber. Celebrating our 150th anniversary this year, the Huber Company is still a family-owned business headquartered in Berching, Germany, manufacturing stainless steel equipment for water treatment facilities around the world. Huber Germany is based in a 400,000 sq. ft. manufacturing facility that produces only the highest quality stainless steel, with state of the art cutting, bending, and surface treatment equipment. Huber US was founded in 1999 due to significant company growth in the US market, and now stands as the largest fully owned subsidiary in the Huber Group Worldwide, with yearly order intake exceeding \$50 million. In early 2020, Huber US finalized a 70,000 sq. ft. manufacturing facility in Denver, NC, and plans to expand to 195,000 sq. ft. by the end of 2023. By this point, Huber US will produce their entire product portfolio in their Denver, NC factory. Huber’s goal has always been to transform waste into resources, and takes pride in their role in treating water for beneficial reuse.



INDUSTRIAL SOLUTIONS LABORATORY



A family owned company in the HUBER name for 150 years


Huber US currently employs around 80 full-time staff members in their Denver, NC factory, including engineering, sales, aftermarket, manufacturing, and service personnel. Thanks to continued growth, Huber expects this number to increase significantly over the coming years, as Huber looks to expand their reach into new and evolving market segments within the broader water treatment industry. Some product examples:





US based Research

and Development (R&D) is becoming more of a factor as the US market is vastly different than the rest of the world. As Huber US continues to innovate for the US specific market, the demand for US based testing will no longer be an option, but a requirement. This project aims to develop testing equipment that will assist Huber in their growth as a company, and as a North Carolina based manufacturer.

	<p>This project is partially supported by a grant from the NC Manufacturing Extension partnership, an organization the helps to support business and job growth for NC companies. To learn more about the NC MEP, click on this link: https://www.ncmep.org/.</p>
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Project Requirements:

Design a versatile, closed circuit circulating water channel used for experiments in fluid dynamics and debris loading on water and wastewater mechanical screens. This project will allow the testing of multiple types of water and wastewater screens in a controlled environment to both improve upon designs and demonstrate performance to potential customers. The stainless steel channel should include a singular recirculation system that produces a high enough flow to circulate the stream with a maximum flow rate of 4,800 to 7,000gpm. Design shall also incorporate diffusers to create a laminar flow prior to a viewing test section (39-42" wide x 42" deep x 90" long with plastic viewing panels) to minimize turbulence for testing. Channel shall be mounted to a movable skid and be able to withstand dynamic loading and static loading of a minimum of 3,500lbs in the testing section. This will provide a sturdy base to mount the water/wastewater screens. Recirculation system shall include a control panel with variable output adjustment, flow meter / measuring device and radar level sensors located both upstream and downstream of the testing section. Design will be for a full-scale design and build/test/verify will be a scale model.



Expected Deliverables/Results:

- Channel design with CAD/3D models
- Detailed components list and manufacturing drawings
- Flow analysis to show laminar flow in testing section
- Control panel drawing (Up to 20AMP, 460VAC, 220VAC or 110VAC)
- Variable propulsion system design
- O&M manual – anticipated design conditions, pump care, lifting instructions, etc.
- Scaled model of final conception
- Cost estimate
- Design alternatives with cost estimates for evaluation

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):

- Fluid mechanics
- Mechanical design
- CREO/Solidworks
- CAD