INDUSTRIAL SOLUTIONS LABORATORY

Company Information

Company Name	*Robert Bosch Tool*	**Date Submitted**	*11/13/2023*
Project Title	*Design of a Grinder Trolley Cart Washing Station (BOSCH_WASH)*	**Planned Starting Semester**	*Spring 2024*

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	1	Systems	

Company and Project Overview:

The Power Tools Division of the Bosch Group is the world market leader for power tools and power tool accessories. Bosch Tool Corporation's plant in Lincolnton, NC focusses primarily on the manufacturing of power tool blades such as circular saw blades, reciprocating saw blades, and other accessories such as sander belts, Dremel bits and other rotary tools. This project is related to the production of large diameter (10in and 12in.) circular saw blades.

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Project Requirements:

The problem to be addressed is the automatic cleaning of our technical low trolleys. These trolleys are used to transport the blades through different stages in the machining and production process. As they proceed though the manufacturing cycle, the trolleys build up dust and debris within our process. This consists of some light oils mixed with some remnants of our coating process and general dust. Over time this turns into a sort of thick and sticky grime on our technical pallet system which gets transferred around to multiple machines. As of right now these are cleaned by hand very seldomly and we would like to have these more presentable and represent less of a risk of contamination of other machines in the process.

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	Picture of a dirty trolley

The objective of the project will be to design an automated trolley wash station that would be a fully enclosed solution. The operator would place the trolley into the station and the apparatus would use heated high-pressure water to remove this grime. Following the wash cycle, the full assembly would also need to be dried. The dirty wash solution will need to be pumped into a standard IBC for containment.

	Example of an Intermediate Bulk Tank to be used for water capture

Expected Deliverables/Results:

- Sealed enclosure to avoid any mist escaping during the washing process
- Automatic cycle, single button press to start
- Must be interruptible, a stop button that will end the cycle
- Auto/manual pump out options for the waste
- Easy to clean basin inside of the washdown section for buildup removal
- Designed to pump out to a standard IBC
- Footprint not exceeding 4 ft x 10 ft
- Must operate off of standard water supply
- 120v or 480v (120v preferred)
- Below 80dB during operation
- Drawings, operation and maintenance manual, video instruction for operator

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):

- Mechatronics
- Automation
- Machine Design
- CAD
- May require travel to the Company's location