



Company Information

Company Name	<i>Cefla North America</i>	Date Submitted	<i>5/1/2023</i>
Project Title	<i>Design of a Vacuum Coater Cleaning System (CEFLA_CLEAN)</i>	Planned Starting Semester	<i>Fall 2023</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	1	Systems	

Company and Project Overview:

Cefla Finishing, which belongs to the Cefla Group which is 90 years old and started in Italy, provides technologies and solutions for painting, decoration and digital printing of countless materials and substrates. Cefla Finishing designs and manufactures tailored and "turnkey" systems for the wood market and today is in the forefront also in the field of glass, plastic, fiber cement, composite materials, and metal. Customers range from big names in the building and furniture sector, including the aerospace and automotive industries. The entire Cefla group consists of leading companies and brands which have made innovation their strong point.

One of the machines designed and manufactured by Cefla North America in Charlotte, NC is the CVR Vacuum Coating system (see below).



INDUSTRIAL SOLUTIONS LABORATORY



Vacuum coating, as with many coating processes, can require a significant amount of time to clean, whether to change the coating color, or to keep the machine in good operating condition. The clean-up process basically requires the draining and flushing of any paint in the system, and then the breakdown of the system to individually clean many of the parts. Cleaning takes a number of different trays and pans, as well as a cart of cleaners and rags, both clean and dirty (see below), and often a lot of PPE.





Project Requirements:

The goal for this project will be to design a system to help clean a Cefla Vacuum coating system quicker, safer, and more efficiently to reduce the workers exposure to paints and solvents, use less cleaners/chemicals, and to reduce the amount of waste.

Expected Deliverables/Results:

- First, we would like to document the time and materials that are currently required to effectively clean a Vacuum Cleaning system
- Create a design (3D CAD model, Solidworks Preferred) for a cart based cleaning system that addresses the main points that currently need improvement.
 - Draining the system of as much of the good coating as possible in a fast and clean way as possible
 - Flushing the system as quickly and thoroughly as possible



- Creating containers on the cart that are safe and efficient while working at the machine, and transporting supplies to and from holding or disposal areas
- Writing a report of the expected time and cost savings, as well as any other improvements that include safety and more ECO Friendly
- Build of a complete prototype.

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):

- 3D CAD modeling design, including sheetmetal and weldments
- Basic to Intermediate machine design with tanks, pumps, piping, fittings, pneumatics
- Researching and sourcing commercial components to use in design
- Travel to Cefla site in Charlotte