



Company Information

Company Name	<i>Mohawk Wood & Laminate</i>	Date Submitted	<i>11/27/2023</i>
Project Title	<i>Design a Modification to an Industrial Filtration System (MOHAWK_FILTER)</i>	Planned Starting Semester	<i>Spring 2024</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	5	Electrical	0-1
Computer		Systems	

Company and Project Overview:

Mohawk is the world’s largest flooring company and so much more. With leading market positions on four continents, Mohawk offers a comprehensive array of fashionable, high performance and sustainable flooring options for residential and commercial spaces as well as a growing selection of products for surfaces beyond the floor. Our industry-leading innovation has yielded products and technologies that differentiate our brands in the marketplace and satisfy all remodeling and new construction requirements. Our brands are among the most recognized in the industry and include Mohawk, American Olean, Daltile, Durkan, Eliane, Feltex, Godfrey Hirst, IVC, Karastan, Marazzi, Pergo, Quick-Step and Unilin. During the past decade, Mohawk has transformed its business from an American carpet manufacturer into the world’s largest flooring company with operations in Australia, Brazil, Canada, Europe, India, Malaysia, Mexico, New Zealand, Russia and the United States.

Our Thomasville, NC location is home to a 1.6 million square foot state-of-the-art manufacturing facility for laminate flooring. The Thomasville, NC team has developed and produces waterproof wood. The product is a result of two main features – a click & lock tongue-and-groove installation

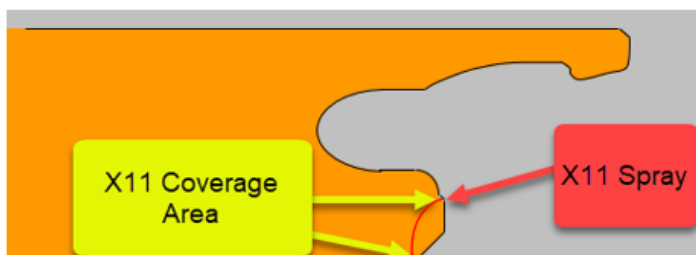
with beveled edges and a water-repellant HydroSeal coating developed by Mohawk. The tightly locking planks block moisture from entering through the sides, and the coating blocks it from the surface.

Product is shown below:



Project Requirements:

Process Explanation: Following the cutting and milling of the plank, a high-pressure waterproofing agent is sprayed into the board's profile.



This high pressure is essential for adequate board penetration, maximizing waterproofing effectiveness. The impregnated board undergoes vacuum removal of excess spray, captured by a cyclone filter system. See phot below:



Clean air is subsequently circulated back to the roof via a blower fan.

Problem Description: The waterproofing agent transforms into fine particulates during spraying, posing challenges for the cyclone filter in completely removing it from the air before returning to the exhaust blower. Over time, the hard lines leading to the blower and the blower itself sustain damage due to the accumulation of dried waterproofing agent. The existing filter design proves unsuitable for this application.



Expected Deliverables/Results:

Develop and integrate a waterproofing agent waste separation device on an existing production line.

Solution Requirements:

- The filter should maintain effectiveness for a 2-week duration before requiring cleaning or replacement.
- The cleaning process must prioritize safety and ergonomic friendliness.
- Cleaning should be efficiently completed within a 15-minute timeframe.
- The filter should not compromise the vacuum efficiency.
- Incorporate a manual vacuum adjustment feature on the filter.
- Simplicity in design is preferred.
- Utilizing readily available spare parts is advantageous.
- Provide personnel training on proper waste handling to ensure compliance with protocols.
- Implement efficient waste segregation, and compliant disposal methods for byproducts from the spraying application.

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):

- Ability to travel to Company's Thomasville, NC facility as required, mileage will be reimbursed per course policy.
- Interest in Machine design