



### **Company Information**

<b>Company Name</b>	<i>Ketchie, Inc.</i>	<b>Date Submitted</b>	<i>03/27/2024</i>
<b>Project Title</b>	<i>Design of a Mist Collection Solution for Blanchard Grinder (KETCHIE_FUME)</i>	<b>Planned Starting Semester</b>	<i>Fall 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.

<b>Discipline</b>	<b>Number</b>	<b>Discipline</b>	<b>Number</b>
Mechanical	3	Electrical	2
Computer		Systems	

#### **Company and Project Overview:**

Ketchie inc., a Concord, North Carolina full-service precision CNC machine shop, has continuously grown since its formation in 1947 from a textile job shop serving the local mills to a woman-owned, third-generation, ISO-certified corporation operating CNC equipment.

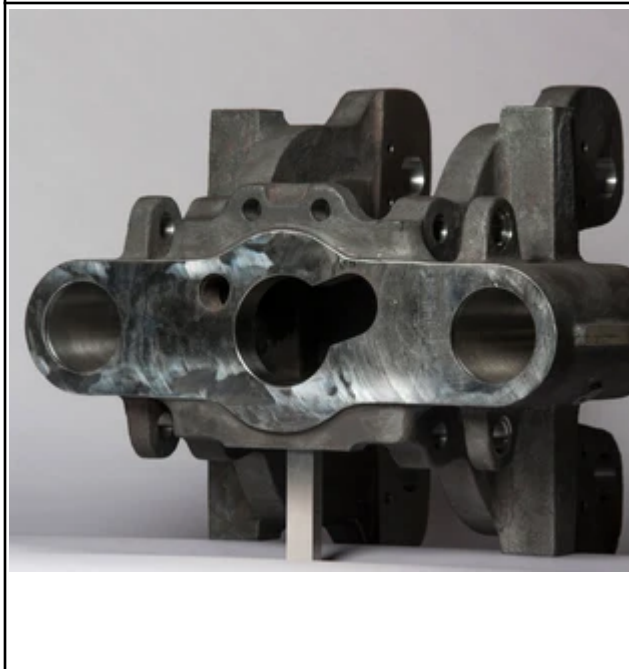
The company offers supply solutions to government and commercial customers in various industries, including Rail, Agriculture, Textile, Heavy Machinery, Industrial Equipment, and many specialized OEMs.

Ketchie makes it easy for American manufacturers to focus on what they do best and have confidence in their supply chain by investing in machining technology, people, and processes. Manufacturing low to mid-range volumes of machined parts, from a golf ball to a large suitcase in size, is what they are equipped to machine competitively.

The company provides a variety of precision machine products including many varieties of gears and bearings. See the photos below for examples of Ketchie products.



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See more at [www.ketchieinc.com](http://www.ketchieinc.com)



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This project is partially supported by a grant from the NC Manufacturing Extension partnership, an organization that 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/>.

### **Project Requirements:**

Ketchie has a large variety of modern sophisticated CNC machines and capabilities utilizing the latest equipment from Mazak, Kellenberger, Okamoto and Cincinnati. Being in business for 75 years, Ketchie also has some older equipment that does not have the features of more modern equipment. One of their older machines is a Blanchard Surface Grinder:





The volume for this operation is sporadic, so it has not been financially justifiable to replace this machine with a new model. The machine meets the requirements for the business, but Ketchie seeks to add a capability to the machine that it currently does not have. This project team will design and manufacture a system to collect coolant mist that comes off the Blanchard surface grinder. As an older piece of equipment, there is not a standard air filtering system off the shelf that would provide the needed mist collection capability. Ketchie has examined portable fume extractors, but due to the size of the machine and the manner in which the mist is produced, they are not sufficient.

The student team will design and implement a custom mist collection system specifically fitting this machine and how the mist is produced. The design can be a combination of custom designed parts and off-the shelf components.

#### **Expected Deliverables/Results:**

- Collection system for the mist produced
- System must not interfere with the operation of the machine
- System must work using locally available power
- Collection should consider ducting to capture or ventilation ducting
- Condensed mist should be returned to the coolant pan
- Operation instructional video produced
- Maintenance manual
- All drawings for the system
- Operation must be tested and verified on the actual machine

#### **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):**

- Interest in Machine Design
- Interest in fabrication and machining
- Ability to travel to Concord, NC facility for design data development and verification testing