

**Company Information**

<b>Company Name</b>	<i>Husqvarna Professional Products Inc.</i>	<b>Date Submitted</b>	<i>11/12/2021</i>
<b>Project Title</b>	<i>Quiet Leaf Blower (HUSQ_QUIET)</i>	<b>Planned Starting Semester</b>	<i>Spring 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.

<b>Discipline</b>	<b>Number</b>	<b>Discipline</b>	<b>Number</b>
Mechanical	4	Electrical	
Computer		Systems	
Other ( )			

**Company and Project Overview:**

 **Husqvarna Group**





Husqvarna Group is a leading global producer of outdoor power products for forest, park and garden care. Our strong technical expertise and passion for innovation and quality create performance, pride and improved results for customers.

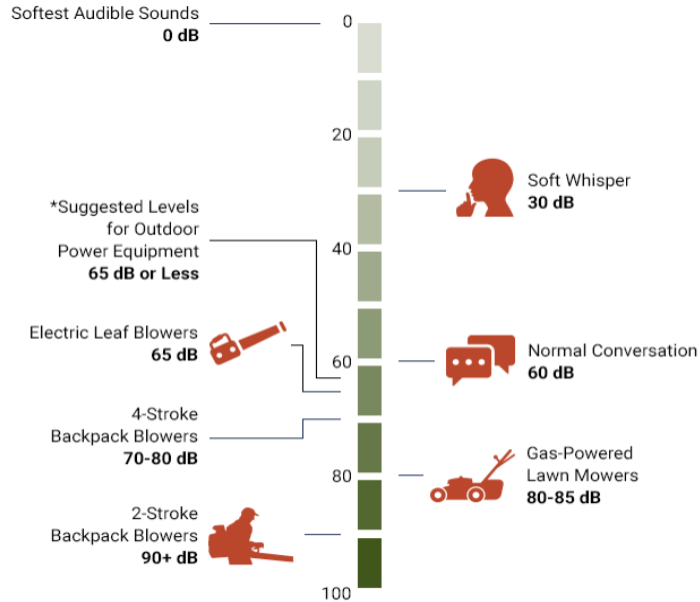
The Group is also the European leader in garden watering products and a global leader in cutting equipment and diamond tools for the construction and stone industries. The Group's products and solutions are sold under brands including Husqvarna, Gardena, Redmax, Flymo, Zenoah and Diamant Boart via dealers and retailers to consumers and professionals in more than 100 countries. Net sales in 2020 amounted to SEK 42 billion and the Group has around 12,000 employees in 40 countries.

The North American Division of the Husqvarna Group has its headquarters located in Charlotte, NC. The NA Division aims to be the leading forest and garden supplier for the broad mass consumer segments.

Products are sold mainly through retailers such as Lowe's and TSC in the US and Castorama and B&Q in Europe. The retail landscape is highly consolidated in North America and competition in the mass consumer segment is fierce with a strong emphasis on price. The estimated addressable market amounts to SEK 70bn, of which more than 60 percent is in North America and slightly less than 30 percent is in Europe.

Cities, municipalities, and towns across the North American market are instituting strict regulations and, in some cases, banning leaf blowers entirely.

In order to remain competitive, Husqvarna needs to provide the market with a battery operated leaf blower solution that satisfies the 65 dB(A) requirement at the operator's ear from 50 feet per ANSI B175.2-2012 without sacrificing performance.



\*Limits suggested by municipalities such as Burlingame, CA

### **Project Requirements:**

Husqvarna will provide the UNC Charlotte Senior Design Team with a prototype 350iB 36V Leaf Blower along with the 3D CAD data in .stp format. The design team will be responsible for analyzing the leaf blower to determine the source of prominent noise features (e.g. electric motor, fan blade pass, housing resonance, air flow, etc.) and providing a design solution or solutions that meet the target goal of 65 dB(A) at 50 ft per ANSI B175.2-20. Along with meeting the 65dB(A) sound requirement, the leaf blower must also provide the end user with  $\geq 20\text{N}$  of peak blow force and  $\geq 600\text{ CFM}$ .





**Expected Deliverables/Results:**

- Fully functioning 350iB 36V leaf blower with the following characteristics:
  - $\leq 65$  dB(A) @ 50ft.
  - $\geq 20$ N
  - $\geq 600$  CFM
- Acoustic benchmarking measurements
- Blow Force measurement data
- CFM calculations
- Identify design features and/or sound characteristics that lead to high noise level

**Disposition of Deliverables at the End of the Project:**

- Any hardware or software developed by the UNC Charlotte senior design team is the property of Husqvarna. The hardware and software will be handed over to Husqvarna at the conclusion of the final Design Expo unless otherwise noted.

**List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):**

- 3D CAD Modeling
- Computational Fluid Dynamics
- Basic knowledge of plastic design
- DC Motors & Controllers