

# From Risk to Robot

## How Grain Weevil Is Revolutionizing Farm Safety

Every harvest season, one of the early steps of treating grain is storing it in a grain bin. That stored grain requires periodic aeration to cool and maintain uniform temperatures and moisture, which reduces the chances of mold and insect development. Farmers and their children have traditionally carried out the chore of aeration and breaking up clumps of grain by stepping into a grain bin with a rake or shovel; this is dangerous business. Some workers develop farmer's lung which can lead to lifelong respiratory problems and dozens of deaths occur each year due to suffocation or heart attacks. Dedicated to making grain management safer, the company Grain Weevil developed an Unmanned Autonomous Vehicle (UAV) that moves through grain with a pair of motorized augers. This revolutionary robot manages grain work without the need for significant human intervention.



**Safety**



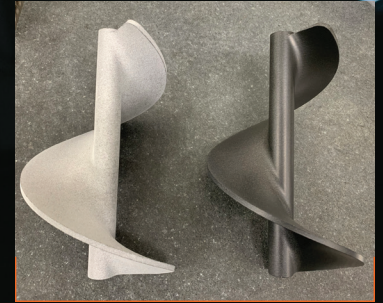
**Operates  
Autonomously**



**Efficiency**



**Cost-Effective**



### Solution Found in Additive Manufacturing

- Auger designs yield a longer run time
- Decreased wear and tear on the robot
- Reduced cost compared to traditional manufacturing
- Operated by remote control without the need to enter the grain bin

### Final Product: Grain Weevil Robot with Two Sets of Augers

- 30% increase in speed and efficiency
- Significant improvement in mobility in different granular materials
- MJF printed augers represent 4 of the 25 unique parts of the robot and its supporting components
- The robot is managed via remote control as the system is able to navigate and perform its tasks autonomously using onboard sensors

➤ **Reflecting on the speed and efficiency of the robot, Grain Weevil's Senior Product Design Engineer, Travis Vanderheyden, said,**

*"The geometry of this part massively affects how this robot performs. The parts we are printing with ADDMAN are performing better than we ever imagined. In addition, the flexibility and speed have been monumental."*

### The Future of the Ground-breaking Grain Weevil UAV

Customers are eager to use these robots because aerating is heavy and hard work. A robot can do more work than a person.

Grain bins are hazardous environments where combustible dust may be in the air. The Grain Weevil robot is going through the safety certification process with Underwriters Laboratories (UL) to become one of the first robots in the world to be considered explosion-proof.

**Find out how ADDMAN can take your product from prototype to production.**

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