PURDUE UNIVERSITY | Agricultural and Biological Engineering

CAPSTONE/SENIOR DESIGN EXPERIENCE 2020

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ICS-1 Seed Transfer System

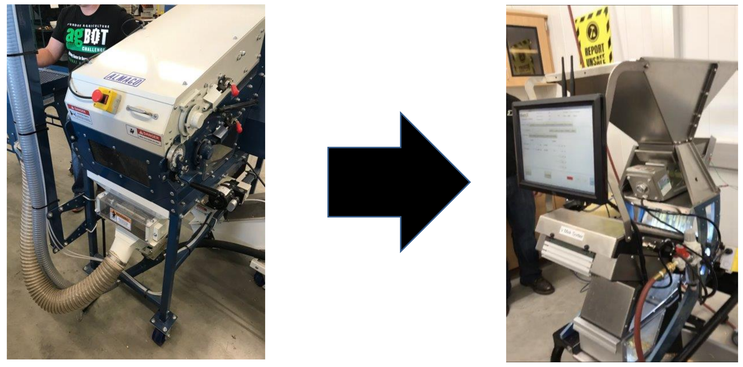
Objective:

The Indiana Corn and Soybean Innovation Center is a research facility in need of a seed transfer system.

Introduction

The Indiana Corn and Soybean Center is in need of a seed transfer system to go from their seed sheller to their seed counter.

This will improve the efficiency of their setup as they previously used buckets which was time consuming and tedious.



How-it-works:

- Clear transfer hose connects seed sheller with seed cyclone
- Cyclone is mounted on structure above seed counter
- Seed transfers from sheller, through cyclone, and drops into counter through air pressurization
- Dust and dirt are exhausted from cyclone into overhead ductwork routed outside

Project Impact

Our direct impact from this project is to increase efficiency and safety at the ICSC. On a larger scale our project will help researchers be more efficient. When efficiency is increased the quality of education is also increased.

Testing

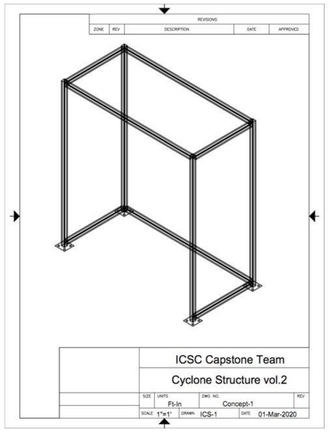
Our final design was tested out at the ICSC after it was installed. We checked for contamination throughout the transfer system, air leaks, ease of use, maneuverability, compatibility with other ICSC equipment and overall functionality. Once these requirements were met our sponsor was contacted and given a chance to operate the system.

Criteria

- ≤$4000
- Mobile system
- >60” tall and >41” wide
- Move all types of grain
- System hold 5-10 psi
- Operational by April 1st

Constraints

- Safe
- Matches current equipment
- Quick connections
- Low maintenance
- Monitor grain flow



Results

We completed a working design that ties into their current system and integrates the seed counter into their previously existing air system and adds a cyclone for improved grain handling. Our design also allows the ICSC flexibility to add another machine that fits under our cyclone.

Materials and Design Process

-1.5 inch x 8th inch thick square tubing
-24" 1.5 angle iron
-2"& 5" hose clamps
-banjo fittings
-4" hose
-2" hose
-zip ties

Conclusion

The final project was installed and seamlessly implemented at the ICSC on April 7th. The final product was approved and accepted by the ICSC Team.

Sponsor:
Jason Adams at the Indiana Corn and Soybean Innovation Center

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Dr. Tormoehlen

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