

The Problem

Maintaining optimal mushroom growth environments requires a level of time and effort not available to all. With automation, the Spora Pod removes this barrier to entry.

Mushroom Preferences

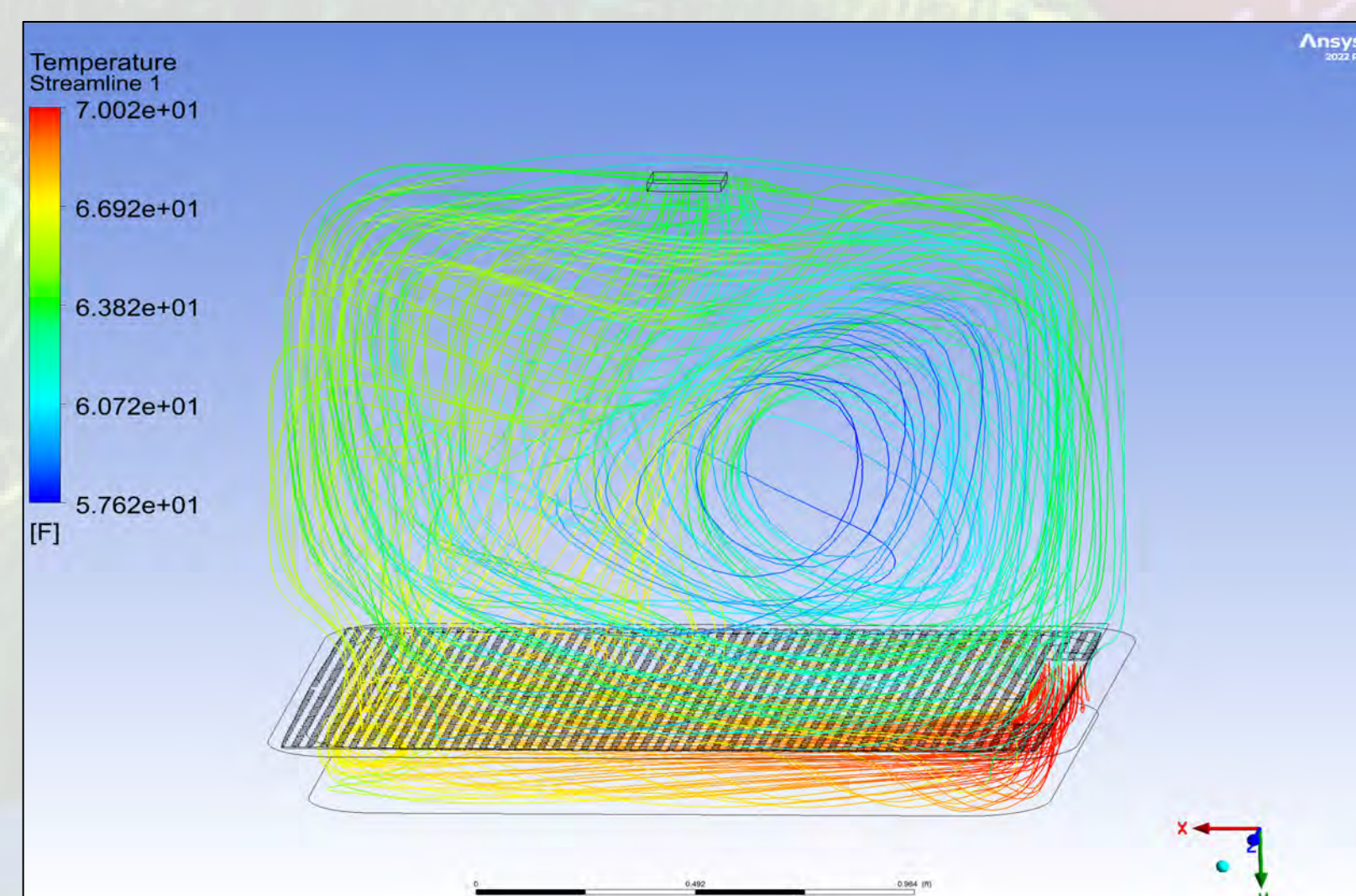
Mushrooms	temp [F]	humidity	air exchange
Cremini	62-65	95-100%	<1000ppm
Shiitake	59-68	95%	2-4 per hour
Oyster	55-60	95%	4 per hour
Enoki	50-55	85%	<1000ppm
Agaricus Biquorcis	75-77	95%	<2000ppm

Design Metrics Table

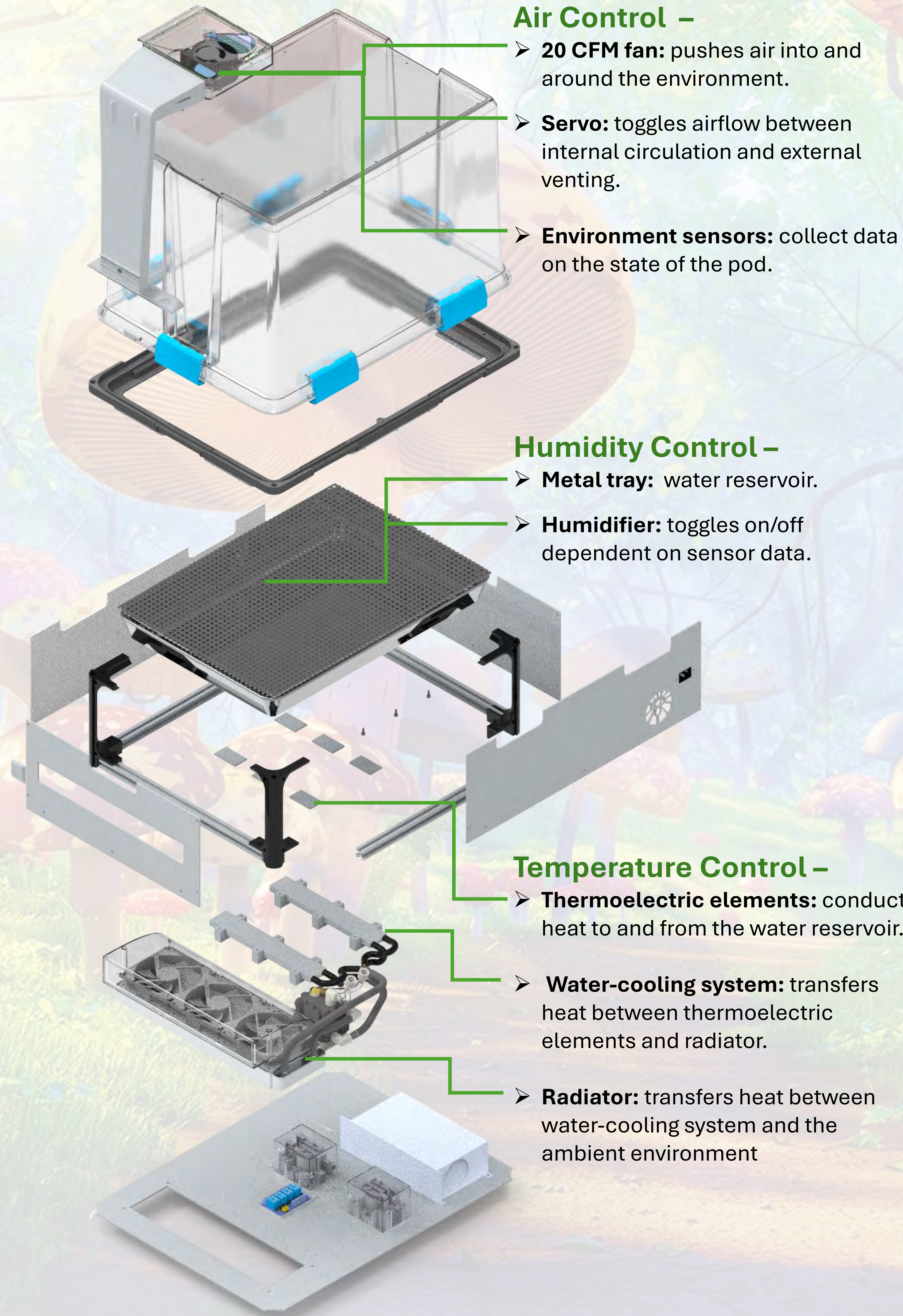
Requirement	Status
Shall weigh less than 40lb	25lb
Should fit at least 2 inoculated blocks	3 blocks
Should reach temperatures in range 55F-75F	55F-90F
Shall control temperature within 2 degrees	±0.6F
Shall control humidity up to 100%	30-100%
Shall control CO2 ppm down to ambient	<600 ppm
Should use GUI to set target parameters	Yes
Shall maintain target environment for two weeks without human intervention	Yes

Analysis

ThermoFluid – Our team developed a CFD model of the internal fluid flow. This approach enabled us to validate heat transfer within the environment. Providing valuable insights that guided our sensor placement.

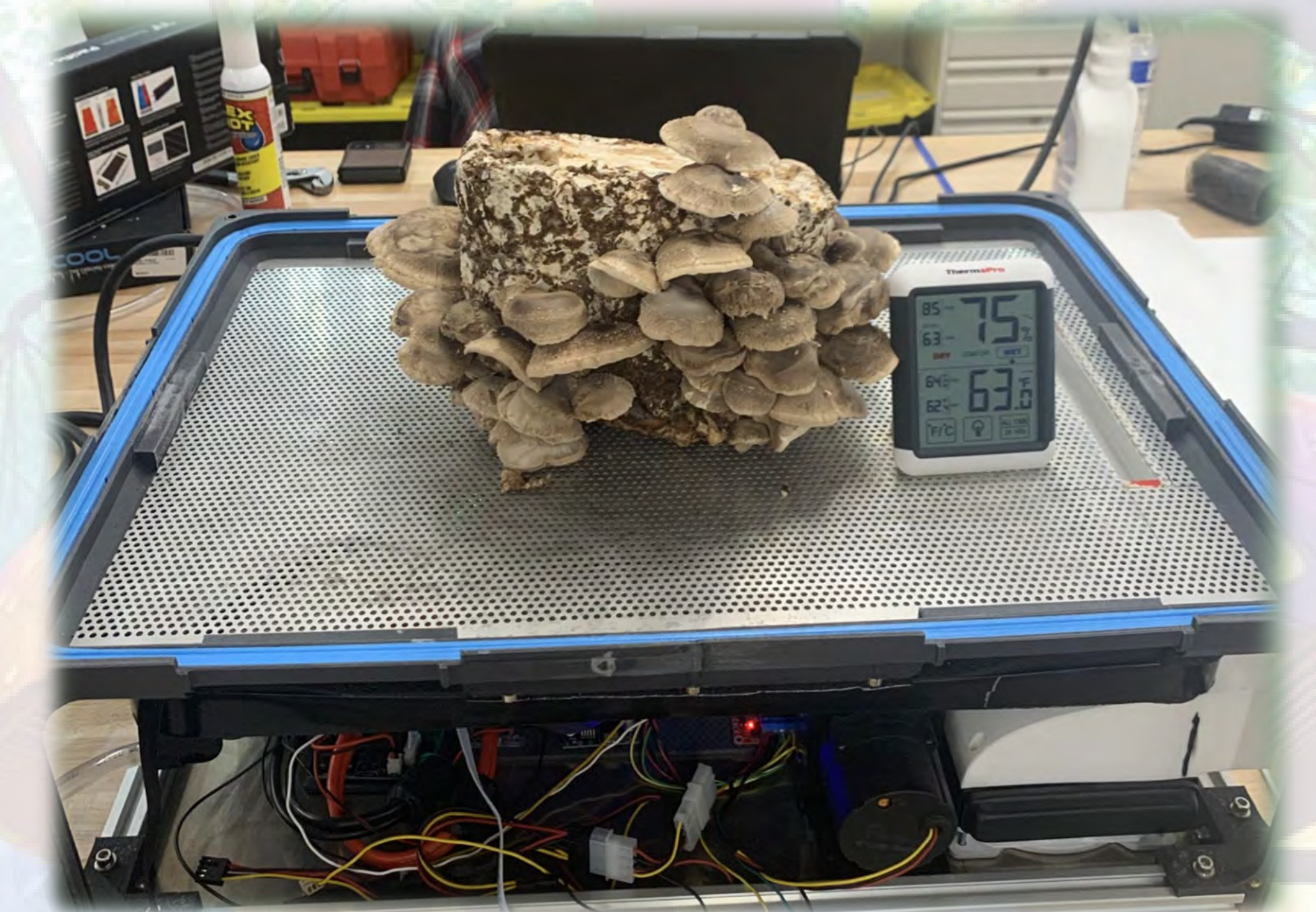


Mechanical Design



Test Results

Our team has conducted several tests to grow pre-inoculated blocks of shiitake mushrooms. Each test has been with increasing control functionality, which has nearly doubled mushroom yield between tests.



Conclusion

The Spora Pod successfully autonomously grows mushrooms in the post-inoculation phase of their growth cycle. This pod removes the barrier to entry for mushroom home growers.

What's Next?

- Unify electrical design with permanent circuitry.
- Optimize parameter setpoints for preset profiles.
- Adjust design to increase ease of cleaning.
- Improve the aesthetics and manufacturability.
- Develop brand and connect with local mushroom growing communities.

Stay In Touch!

