

INL Grinder Water Filtration System

Team Keep it Clean



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Project Goal

Redesign and build a water filtration system for a grinder and polisher within a Hot Cell at Idaho National Laboratories. Some Key improvements include; reducing the overall cost of the system, finding parts that were easy to replace, and making the parts ready to be operated in the hot cell environment.

System Requirements

- System must be less than 750lb
- System must fit in a 9" by 24" by 22.5" space
- System must be made completely of 304 Stainless Steel
- System must be compatible with Electro-mechanical manipulator
- System handle must be on center of gravity
- Flow rate must be at continuous rate of .2 gal/min
- Water level must be monitored to check for clogging

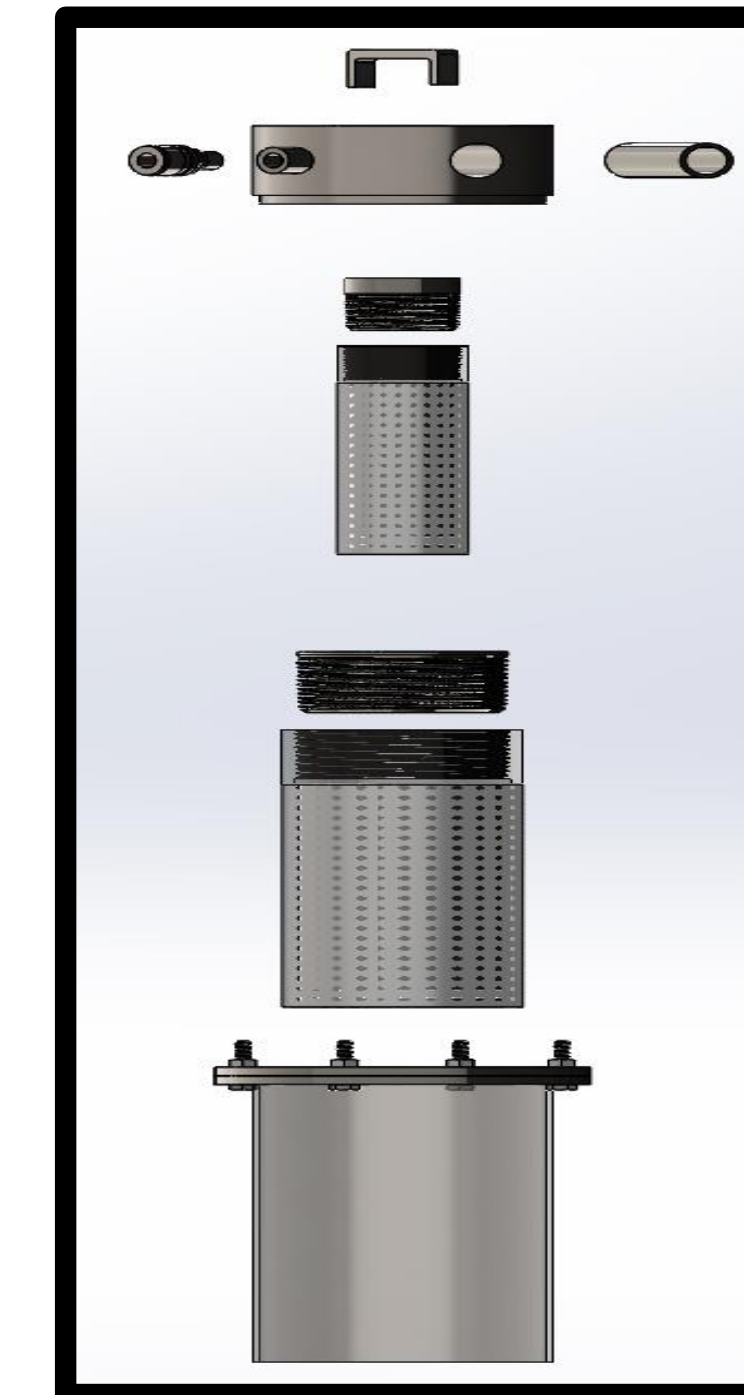
System Design Overview

The system is designed completely out of stainless steel to be able to handle the hot cell environment. Water flows off of the grinding disc into a two stage filter to remove particulate. The filter then drains into a slanted tank so that any remaining particulate gather in a centralized location for ease of cleaning. The clean water is then drawn from the tank by the pump and completes circulation by rinsing off the grinding disc once again.

System Built

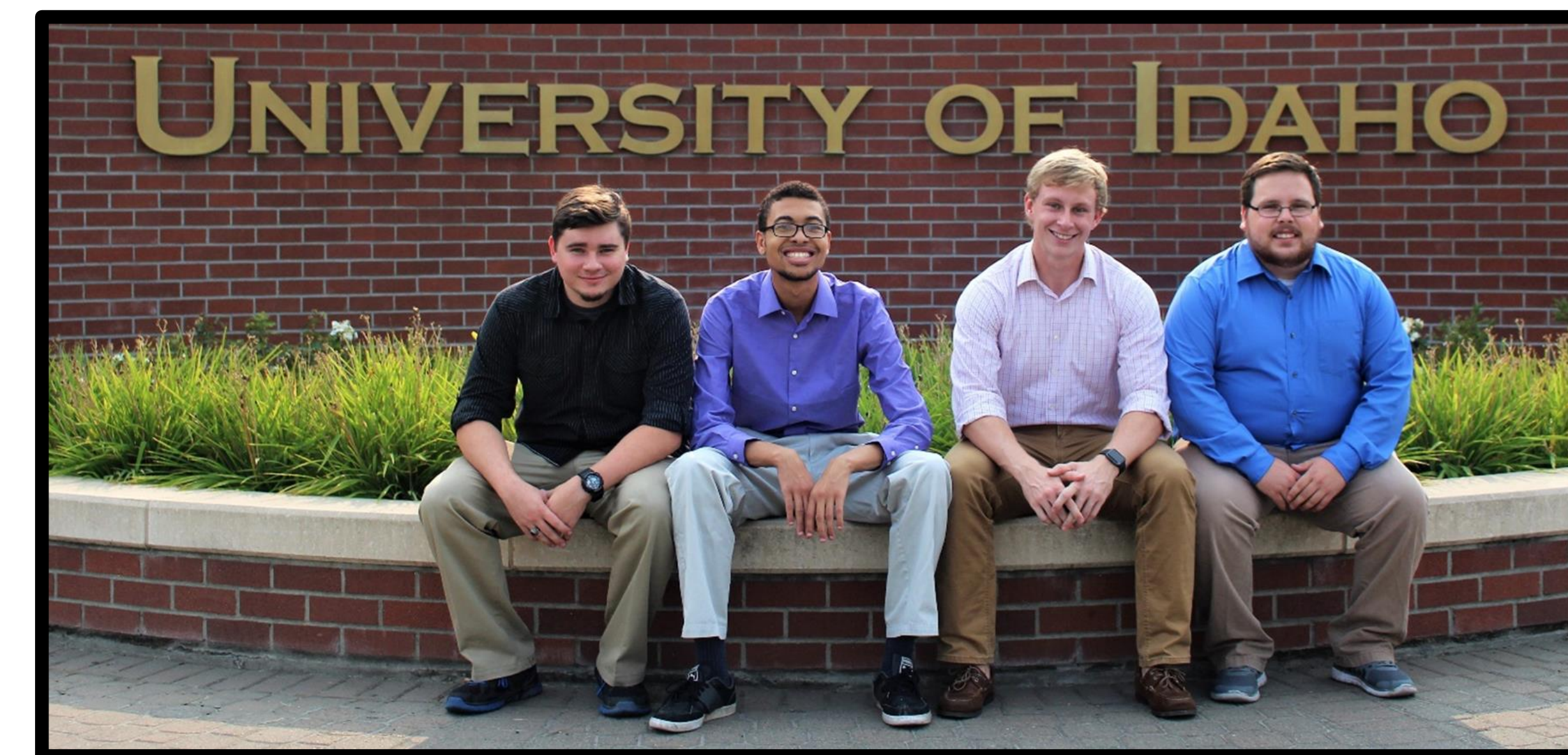
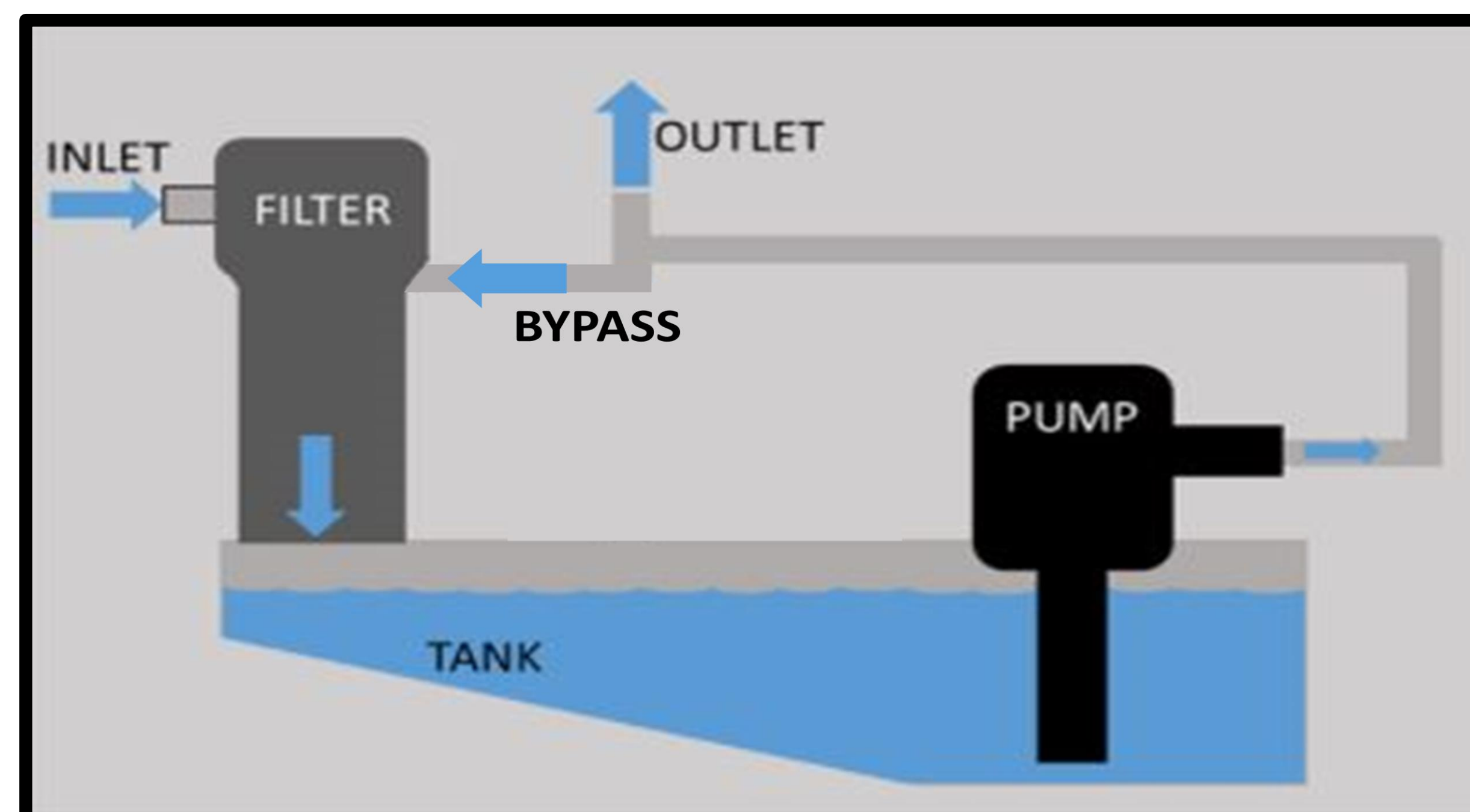


Filter Design



The Filtration system is important to our overall design of the system. The filter housing encloses two filters in series. The first small filter collects most of the big particles, and the next bigger filter collects the rest of the particles. This system is also easy and cost effective to replace, and operate in the hot cell environment.

System Flow Diagram



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