Traditional washing machines are not designed to work in microgravity environments or accommodate for the scarcity of resources on a spaceship. Because of this, there is currently no way of washing clothing in space. Because of this, having a supply of clean clothing for astronauts requires exhaustive and infeasible alternatives to washing clothing such as taking exorbitant amounts of clothing into space, or receiving clothing resupplies from earth. As the distance from earth and increasing need for self sufficiency for astronauts increases, so does the need for astronauts to be able to clean their own clothing.

The typical wash process involves multiple phases of treating clothing items including hydration, agitation, removal of dirty water, and disinfection. While carrying out the phases of the wash process is very important, finding the most simple and automatable mechanical process to carry out or enable the addition of these phases. ~~Many solutions to this problem that have been explored in the past include agitating clothing in a bag or using rollers, but all have a great deal of complexity and unsolved issues that accompany them, likely disqualifying their usefulness for this application.~~ Carrying out the wash process using a sealed piston head and wash chamber is one process that may be able to do this.

Compressing a clothing water mixture generates a flow through the clothing that can agitate the clothing. The displacement caused by the piston compressing the clothing creates a flow which can be directed to perform phases of the wash process such as hydrating and drying the clothing as well as other auxiliary or additional processes such as spraying the clothing with high velocity water when it is decompressed. In this way, the press for the washing machine both acts as the mode that the clothing is washed by, but also as a circulating pump that enables all functions surrounding the wash process. Using a piston design has inherent advantages such as being able to keep fluids such as air and water separate, being able to accommodate multiple clothing types and sizes, and bypass key issues of other designs such as surface tension and being able to work independent of gravity. Due to the simplicity of this design and flexibility of the wash plan, the microgravity press washing machine proves to be a promising solution to this problem.