

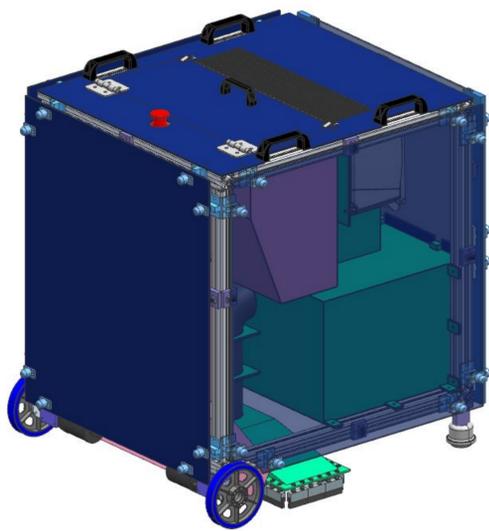
AD Robotics - Radiation Cleaning Robot

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Taking Clean Work Space to the Next Level

Here at Fermi, work is centered around particle accelerators. With the functionality of these accelerators comes a small amount of radioactive dust. For the sake of all employees in this environment, a yearly deep clean is necessary. The aim of this robot is to save time by running an automated cleaning robot 24/7.

The Solution to Our Pressing Issue



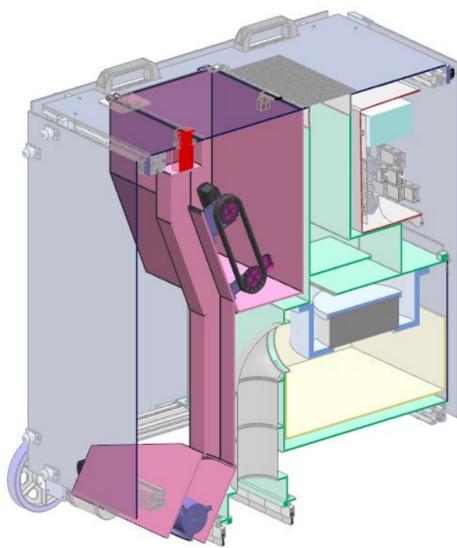
Here, we have an isometric view of the entire assembly with one panel transparent.

Our solution stands less than 3 feet tall with quite the punch behind it. Featuring a cleaning powder distributor and a strong vacuum, the robot distributes a special “Tough Guy” powder to attract all neighboring, including radioactive dust.

From there we are able to use a high powered fan to suck up the powder and dust into a removable reservoir.

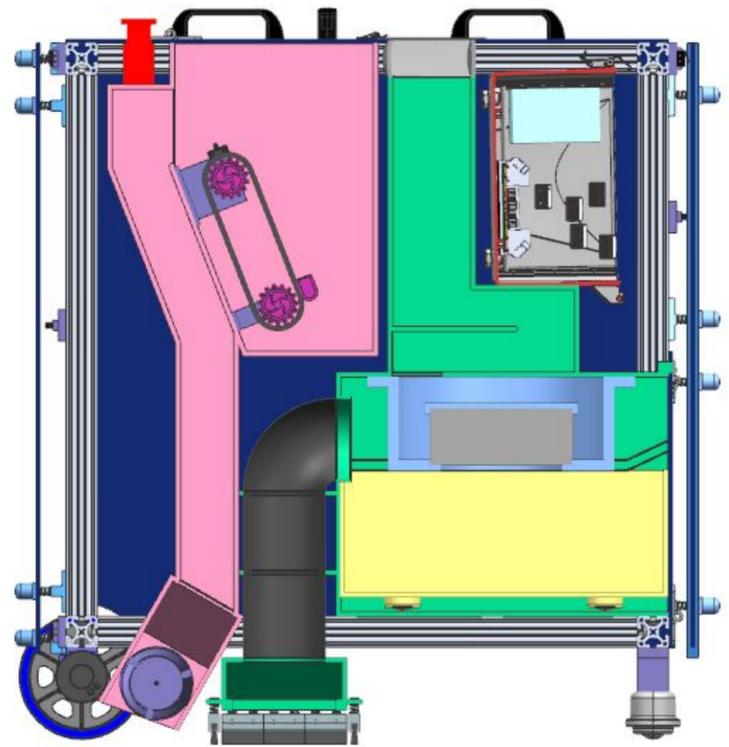
Along with the main systems, we have pressure plates surrounding the entire robot. We can use these pressure plates to detect when the robot comes into contact with any of its surroundings.

Because of the size of this robot, we also have accommodations for carrying the various components. Handles on the top allow for multiple people to lift the robot, while a ramp system allows for easy removal of the wheeled dust reservoir.



This gray system is the “Tough Guy” powder distributor.

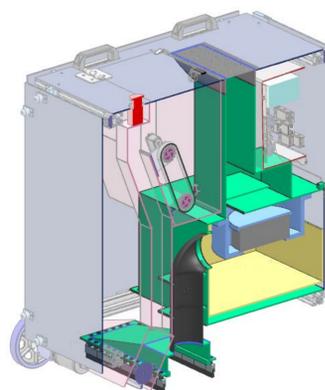
Why Choose This Solution?



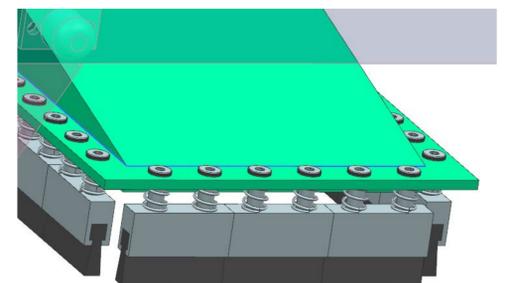
By using a sectioned side view, we can get a better understanding of the project as a whole.

Normally, vacuums actually kick up a significant amount of dust. However, this robot avoids that by the addition of a baffle chamber. This labyrinth prevents dust from immediately leaving the robot, allowing for it to settle within it instead.

In addition to this, many automated robots don't take into account dips and grooves in the ground. However, this machine utilizes spring loaded, flexible brushes. By remaining in contact with the floor below it, we can ensure dust will be agitated and brought up into the air only to be sucked up soon after.



This image focuses on the vacuum system of the robot.



The close up in this photo focuses on a subsystem of moving brushes.