3M Spot Cleaning Device

From left to right: Lucas Shriver (M.E.), Tyler Johnson (Cp.E.), Eclas Hiro Ssebattta (E.E.), Tom Bureau (M.E), Fred Lee (M.E.)

3M Science. Applied to Life.™

TEAM 9

INDUSTRY REPRESENTATIVE

Jesscia DeYoung

Christopher Shaffer

FACULTY ADVISOR

David Forliti

PROJECT SUMMARY

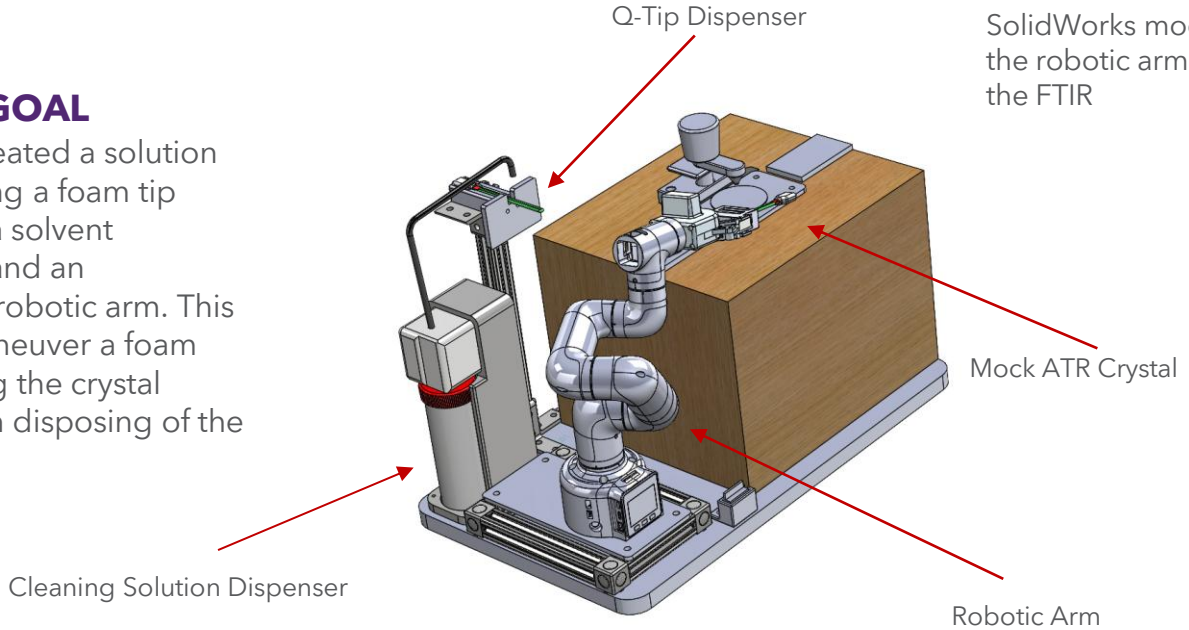
3M uses Fourier Transform Infrared spectroscopy (FTIR) to measure material change and chemical composition broadly throughout the company. Of these analysis, a technique using an attenuated total reflectance crystal (ATR) is most often used. This requires a sample to be in contact with a diamond crystal for analysis. To automate this analysis, we will need an automated cleaning method that will prepare surface after every analysis.

DESIGN CONSTRAINTS

- Components must be UL certified
- Fully enclosed electronic circuitry
- Safely interact with optical microscope surface
- Effectively clean the testing surface
- Repeatable system

DESIGN GOAL

We have created a solution incorporating a foam tip dispenser, a solvent dispenser, and an automated robotic arm. This arm will maneuver a foam swab wiping the crystal surface then disposing of the swab.



SolidWorks model of the robotic arm and the FTIR