

# PCBA Rework Station



Olin College  
of Engineering

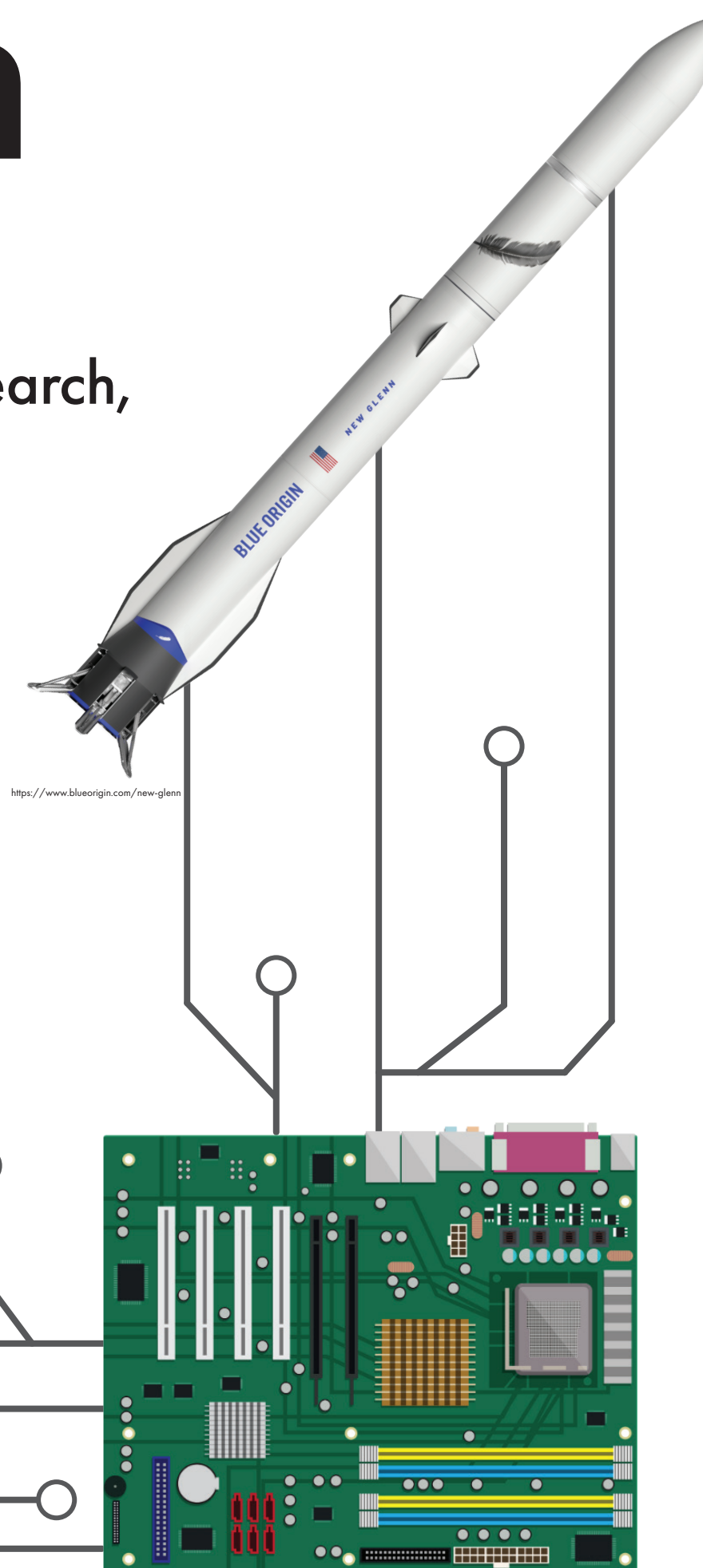


## Mission Statement

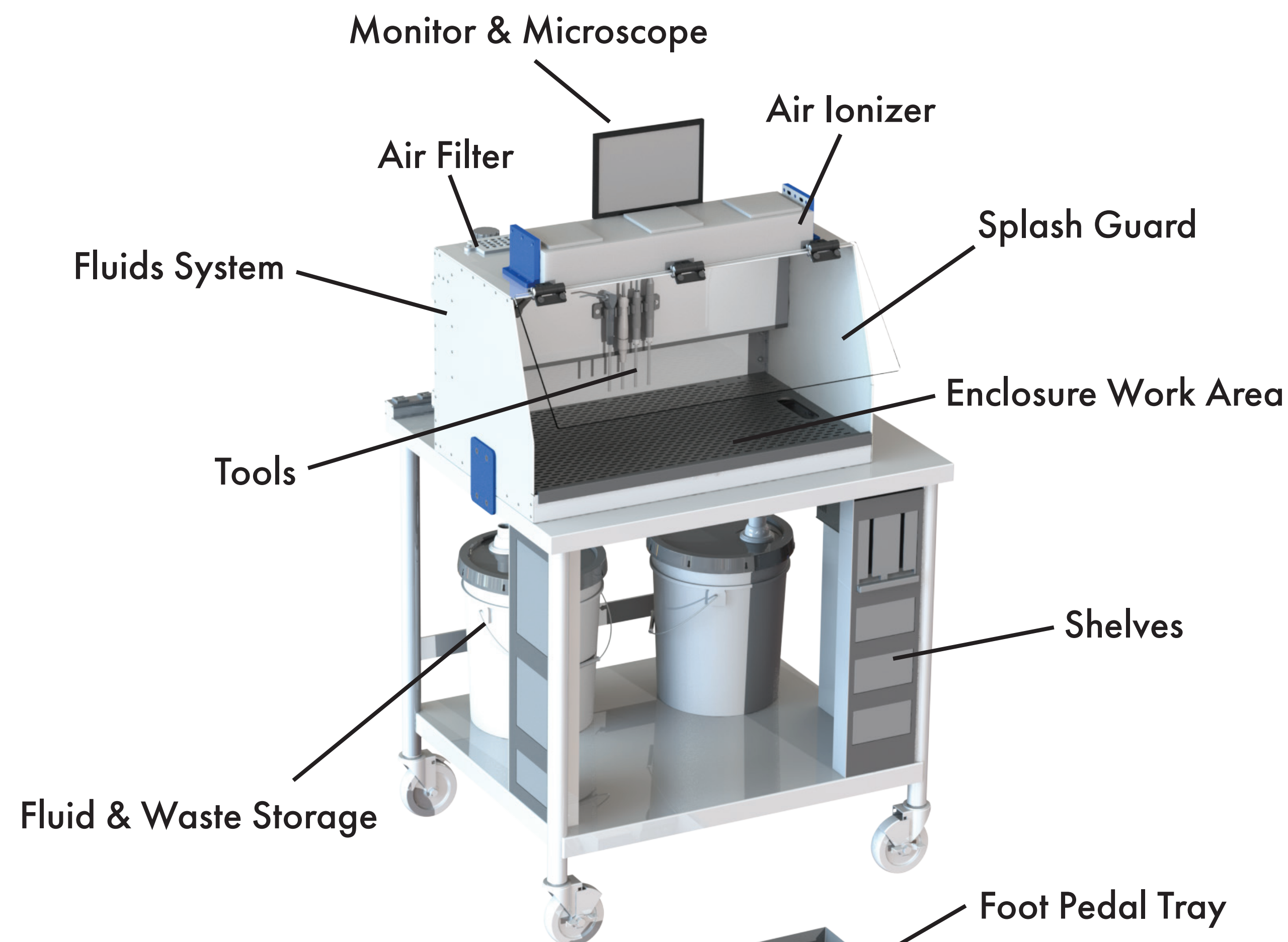
Blue Origin is focused on developing reusable rocket technology for space tourism, scientific research, and potentially missions to the Moon and beyond. Their spacecraft includes New Shepard for suborbital trips and New Glenn for orbital launches.

## Challenge

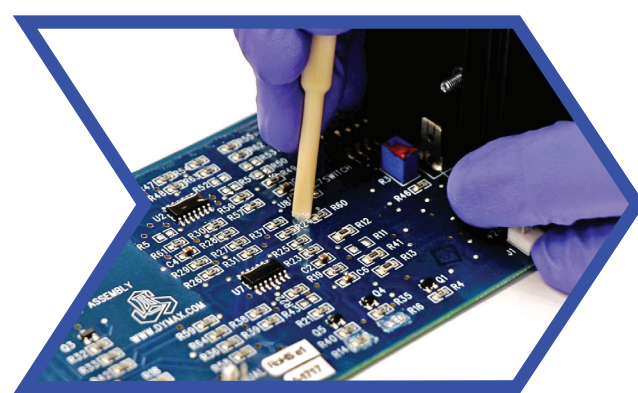
In the R&D lab, when a component on a PCBA is broken or obsolete, it is far faster to remove and replace that single component rather than making an entirely new PCBA. However, it is still a long and tedious process, taking up to 3 weeks. It involves 4 main steps: Coating Removal, Component Replacement, PCBA Cleaning, and Coating Recoat. With our workstation, this process can be reduced to 1 day by aiding in coating removal and PCBA cleaning.



**What is a PCBA?**  
A printed circuit board assembly (PCBA) is the backbone of all electronic devices and hold together all the important electrical components. PCBAs are used in almost everything, ranging from simple tasks like heating up your food in the microwave to powering incredibly complex networks of computers such as Blue Origin rocket ships.



### Coating Removal



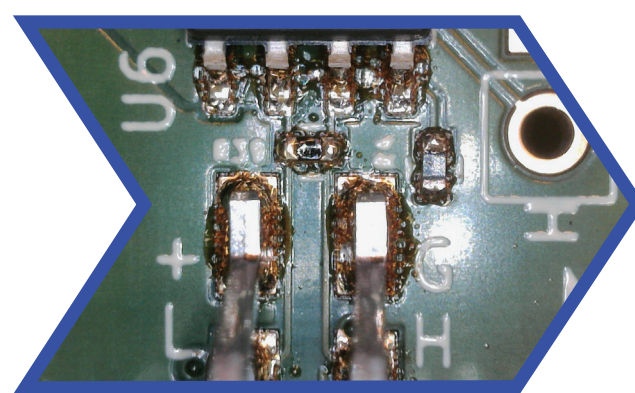
First, a thin layer of conformal coating, which protects the board from the harmful environment of space, needs to be removed to access the component.

### Component Replacement



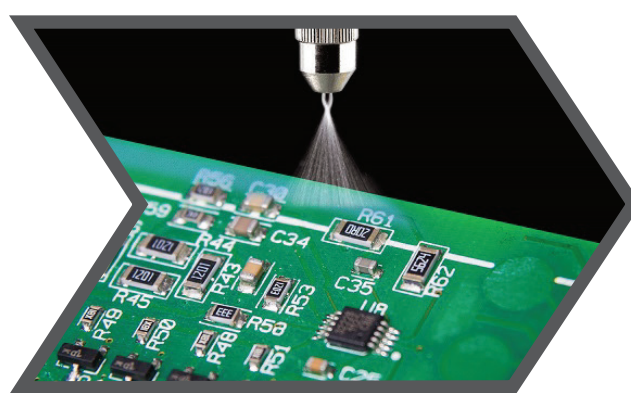
Second, the old component needs to be desoldered by melting the metal filler connecting it to the board and a new one is soldered in its place.

### PCBA Cleaning



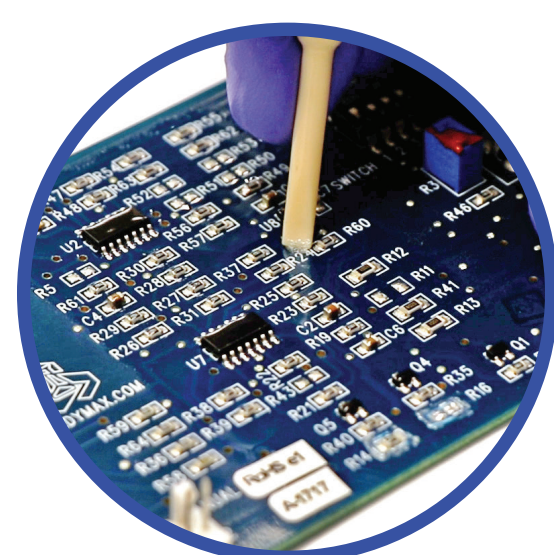
Third, any flux residues left over from soldering is cleaned because contaminants can lead to corrosion and failure of the board.

### Coating Recoat



And finally, the board is re-coated with a new layer of conformal coating.

## Previous Method



Removing the coating with wooden picks takes hours.



Cleaning with isopropyl alcohol does not meet standards

## New Method



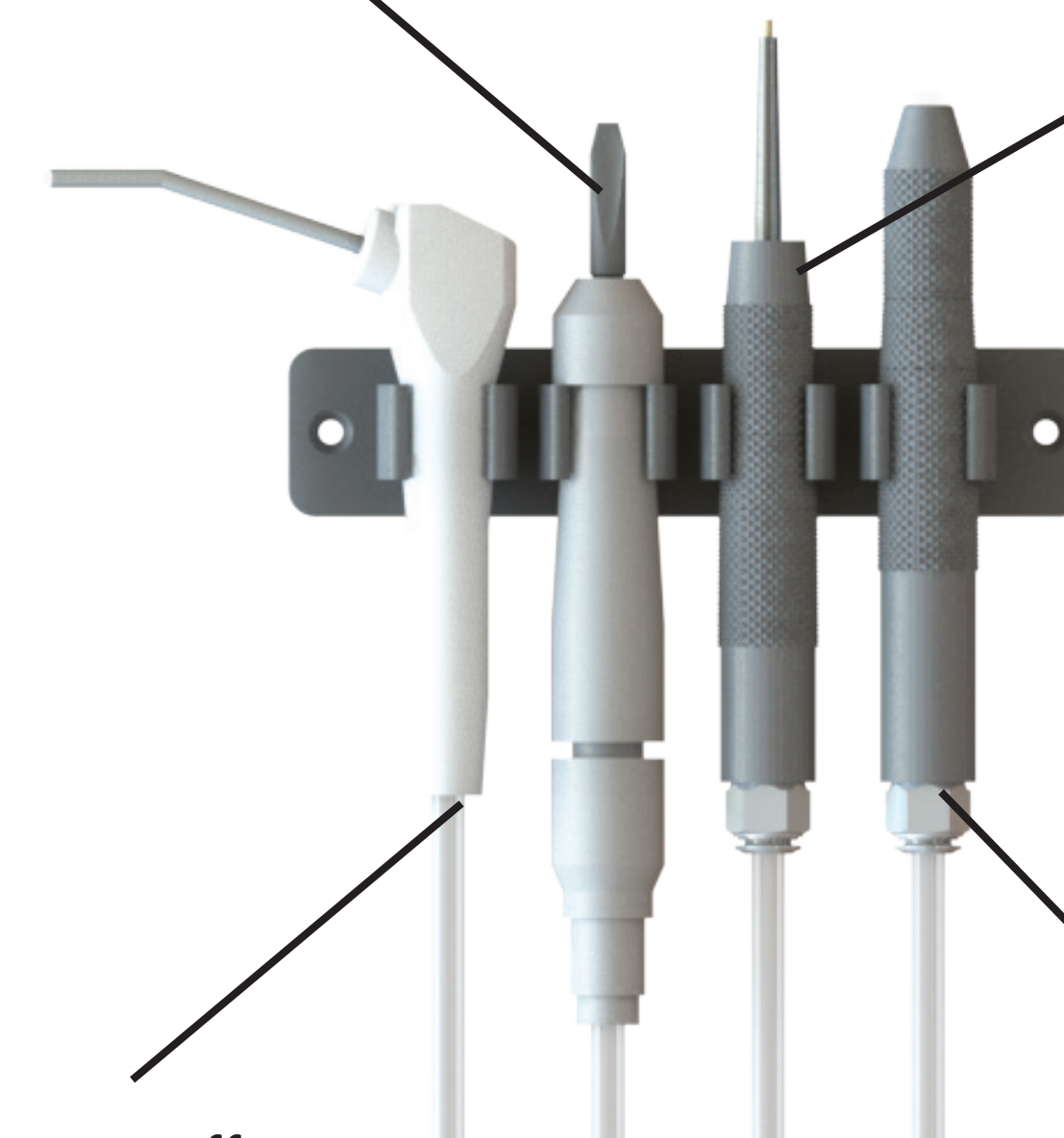
Removing the coating with custom chisel takes minutes.



Cleaning with solution and custom brush meets standards

**Pneumatic Chisel**  
Uses custom chisel tips to remove conformal coating in a few minutes.

**Cleaning Brush**  
Dispenses a specialized cleaning solution to remove flux residues.



**DI Water/Air Tool**  
allows technicians to quickly rinse off any remaining debris and cleaning solution.

**Vacuum Tool**  
helps keep the work area clean and removes pooling fluids.



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