WINDOW RESIN RETROFITTERS
Bulletproofing your windows

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Project Goals

- Develop a nonintrusive method to fill existing dual pane windows with a bulletproof resin

- Create a mobile unit that can be brought into a building and used to inject resin into window cavities

Ballistic Testing

- We tested the resin panels using 9mm FMJ rounds
- Panels withstood 3 shots before failure
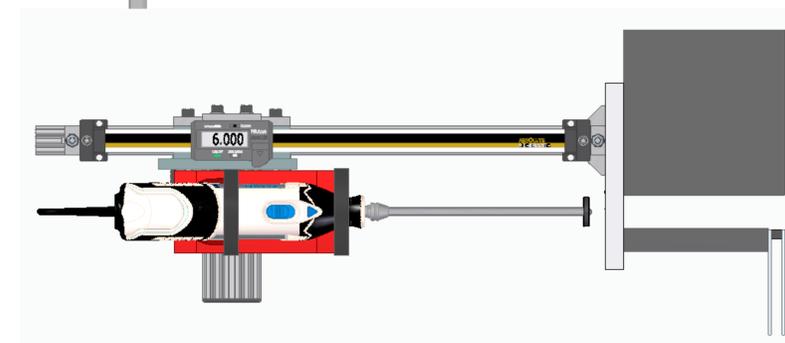
Three Subsystems

Transportation and Pump

- A 50-gallon-drum dolly was modified to transport resin and pump
- A peristaltic pump was selected to prevent resin from seizing up the pump

Window Access

- Designed drill jig with a Digimatic scale to drill precise hole in window frame
- Jig is fastened to window frame and hole is drilled just above the top of glass

- Dremel is placed in jig allowing accurate depth measurement to avoid damaging glass
- Dremel cuts downward to open access hole

System Testing
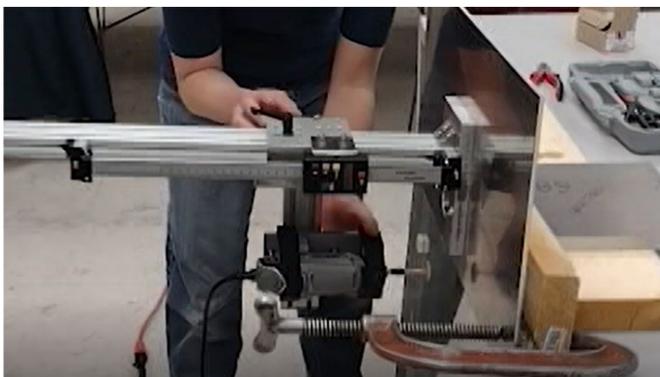
- Used aluminum plate to simulate window frame
- Used the jig system to successfully cut access hole in the window spacer

- Inserted a 1/8 " tube into the access hole
- Turned on pump and filled the window with water

Conclusions

Lessons Learned

- Used 1" diameter bits, but didn't account for odd shape of Dremel wheel
- Tube should be purged of air bubbles before going in window
- Tube curls up inside window and is difficult to aim

Moving forward

- Increase the bit diameters or use the expanding rotary cutter design shown below
- Place metal rings on the tube and use magnet to guide