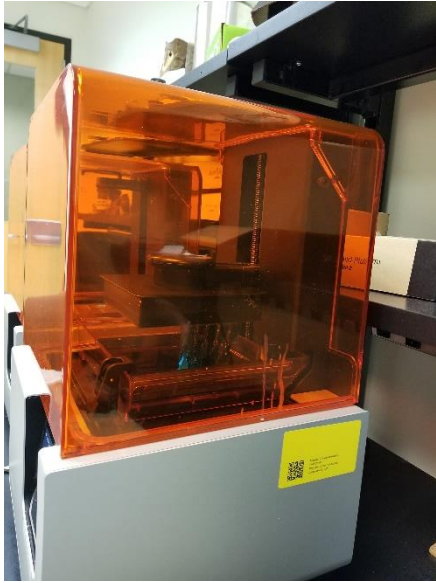


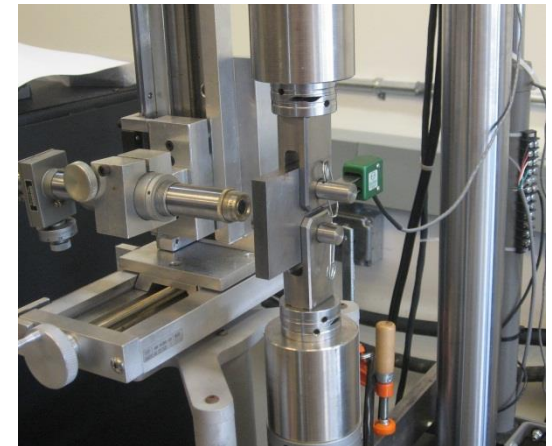
3D Printing of Polymers

Riddell, Stanzione (need 3-4 students – work will be mostly in tech park)



3D printing is a new technology that is revolutionizing manufacturing. There are opportunities to apply 3D printing to the repair of composites, which is particularly exciting. The printing process can lead to different failure behaviors than observed in traditional bulk material. We are currently using a Formlabs printer, which uses an optical technique to cure resin, but are moving toward using a thermal spray technique.

Our current efforts are aimed at establishing effective methods to perform fracture mechanics tests on 3D printed polymeric materials. While these methods are well-established for alloys, certain aspects of polymeric behavior and 3D printing make this a more difficult problem for our application. We need to learn some things so that data for 3D printed polymers are more robust.



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WHAT YOU WILL LEARN –

- Use the Formlabs equipment to 3D print tensile and fracture mechanics specimens.
- Pre-cracking techniques for fracture coupons.
- Imaging techniques using both optical and scanning electron microscopes.
- Use of an Instron load frame for mechanical and fracture mechanics testing.

WHAT YOU WILL BE DOING –

- Use the Formlabs equipment to 3D print tensile and fracture mechanics specimens.
- Pre-crack fracture specimen using various strategies.
- Perform fracture and tensile testing using an Instron load frame.
- Assist graduate student on assessing the effect of different test techniques on the quality of data, based upon scatter and convergence or results from different methods.

If you have questions about this project, please contact Dr. Riddell riddell@rowan.edu

