

Supercritical CO₂ Corrosion and Stress Corrosion Cracking

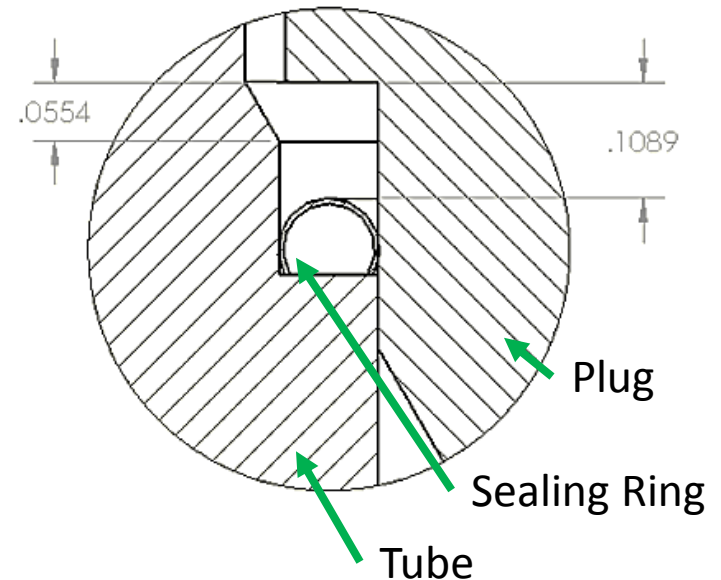
Oregon State University
Project 16-050

Project Description

The project involves the characterization of corrosion in supercritical CO₂ and the development of stress corrosion cracking capability in in supercritical CO₂.

Progress Since August

- System sealing issue fixed
 - The original space for the sealing ring was too large for the system to pressurize. A solution has been developed and tests have begun.



- Unstressed stainless steel samples have begun exposure
- In the process of duplicating electrical components for the stress corrosion cracking measurements.

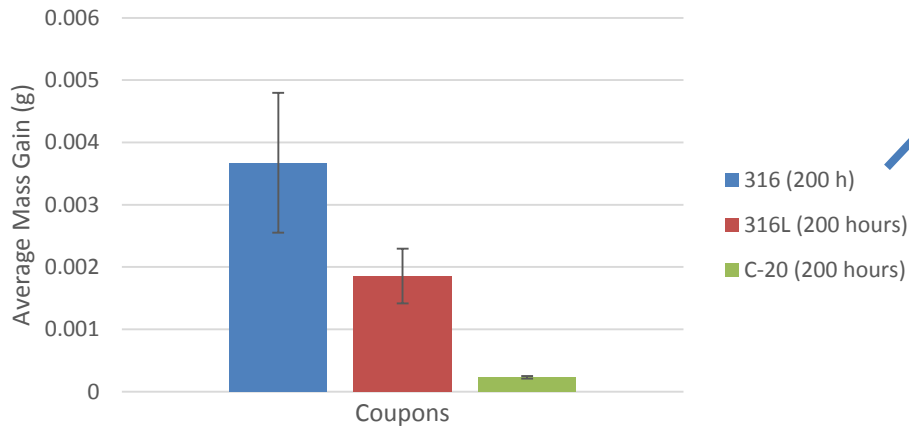
Corrosion data generated this fiscal year

Up to 1000 hours of testing scheduled

- 200 hour increments
- 550 °C
- 20 MPa

First 200 Hour Corrosion Exposure

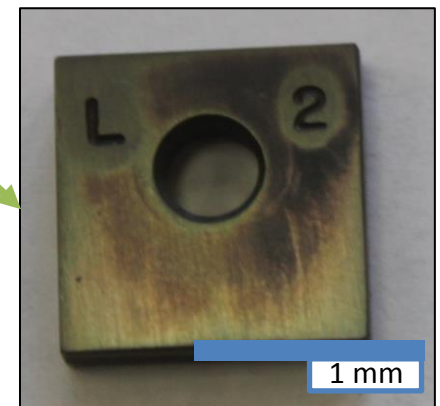
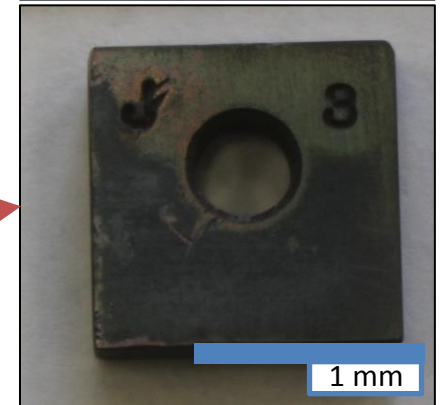
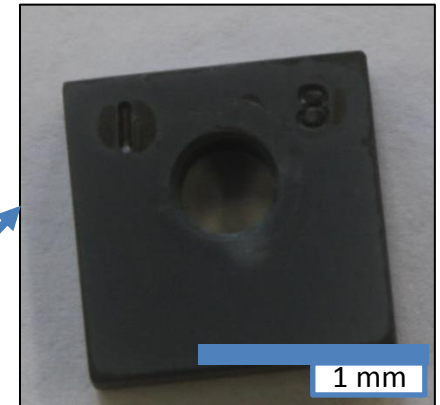
Mass Gain of Coupons Exposed to sCO₂ at 20 MPa for 200 hours



347H and P91 have been added to the second iterative testing cycle.

The second exposure will have:

- 400 total hours
 - 316, 316L, and C-20
- 200 total hours
 - 347H and P91



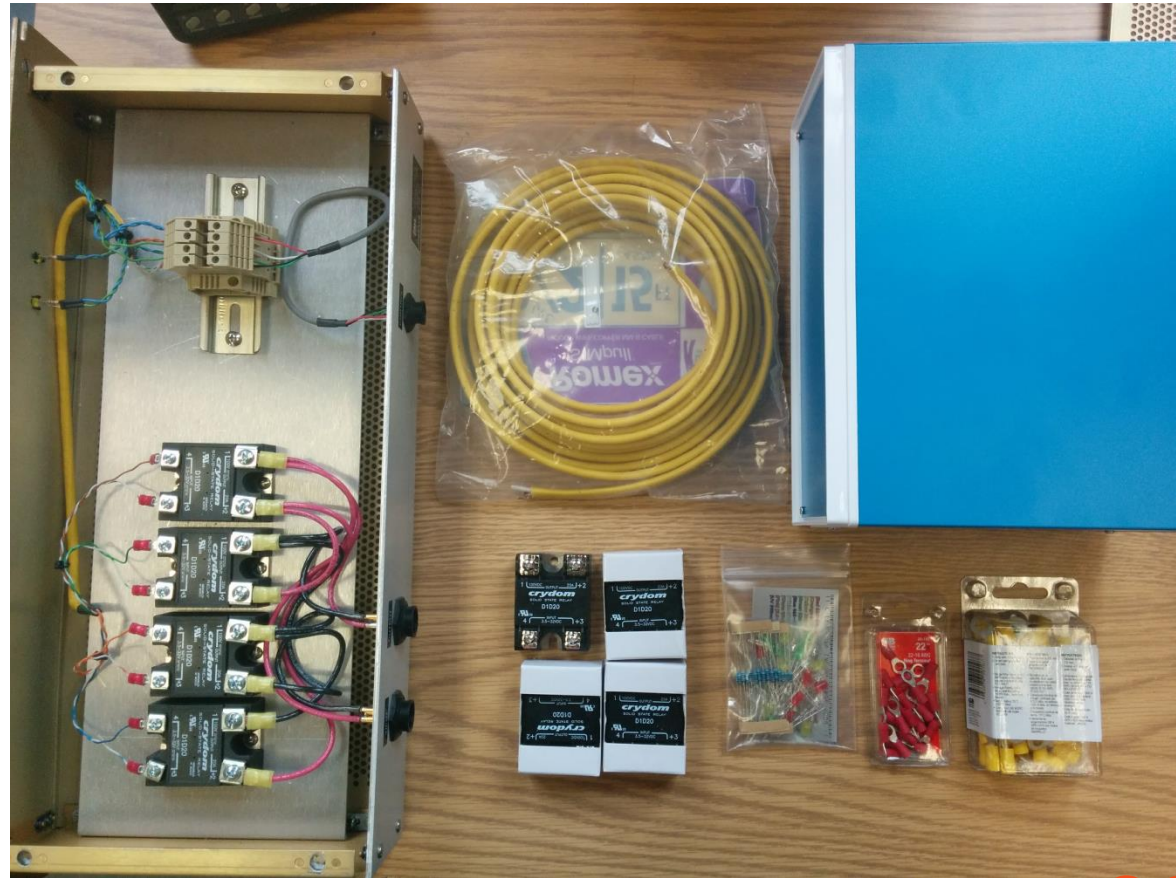
Finalizing the construction of the electronic components needed for in-situ stress-corrosion-cracking propagation rate measurements

Plans and original Polarity Switch provided by Idaho National Lab.

Most parts have arrived , assembly to begin soon.

New assembly by Lucas Teeter and Thomas Wood.

Special thanks to Jason Swick, Electrical Engineer



New parts adjacent to the original