

Biax Experiment (revised. 16 Aug 2022)

For Current Calibrations: ~gpfs/group/cjm38/default/Calibrations/

$$\sigma' = \sigma_n + (0.53 P_c) - P_p$$

17.06 9.4
 7.94

Exp. Name: P5791
 Operators: Affinito, Elisink, Marone
 Temperature (°C): 22.1
 Relative Humidity (%): 41.2

Date/Time: Oct 4th 2022
 Hydraulics start: 5609.0
 Hydraulics end: 5624.0
 Data Logger Used/Control File: FORGE

Purpose/Description: FORGE Vessel, DDS Experiment with new jacket and at higher temperatures (100°C)

Sample Block Used and Thickness with no Sample:

Steel 5x5 cm, _____ mm SDS Vessel 5x5cm, _____ mm
 Steel 10x10 cm, _____ mm AC-DDS Vessel 5x5cm, _____ mm
 Acoustic Blocks _____ Non-AC DDS Vessel 5x5 cm, ~167.5 mm

Sample Gouge/Material Preparation:

Material: FORGE - Granitoid
 Particle Size, Distribution: <125 um
 Benchtop Sample Thickness [mm]: _____
 Pre-Compaction Sample Thickness [mm]: _____
 Post-Compaction Sample Thickness [mm]: _____

	Block 1	Block 2
Empty Block Weight [g]	-	-
Weight of Material Used [g]	-	-
Sample Block Weight [g]	-	-
Weight of Gouge [g]	16.6	16.6

Load cells:

Contact Area [m]: 0.00318m²

Load cell name	Calibrations (mV/kN)	Target stress (MPa)	Init. Voltage	Volt. @ load
<u>44 mm H</u> <i>Horizontal load cell 2: HCF</i>	LG: 12.894 HG: <u>129.955</u> HG: 119.751	H2, Panel 2 Hor: 20.0, 3 Calibration: (V/MPa) <u>0.413</u> 0.3808		8.2572 (20) 5.872 <u>7.036(70) = 1.169</u>
<u>44 mm V</u>	LG: 13.074 HG: <u>120.365</u>	Vert: Calibration: (V/MPa)		

Vessel Pressure:

Pore Fluid: DI. Water

Calibrations (V/MPa)	Pressures (MPa)	Initial Voltage	Voltage @ Load
<u>LG: 0.145</u>	HG: 1.51 PpA: 5.1	-0.0605	0.739
<u>LG: 0.143</u>	HG: 1.46 PpB: 4.9	-0.014	0.6867
<u>Gain : 0.1456</u>	Pc: <u>15</u> <u>17</u>	0.034	2.218
LG: NA	HG: NA Pdiff:		

Displacement Transducers

Horz. DCDT	Long Rod	Short Rod	Vert. DCDT	Long Rod
Low Gain	1.556mm/V	1.352mm/V	Low Gain	2.820mm/V
<u>High Gain</u>	<u>0.756mm/V</u>	0.658mm/V	<u>High Gain</u>	<u>0.568mm/V</u>

Horz On-Board DCDT	Biax	Vessel	Vert. On-Board DCDT	Biax	Vessel
Low Gain	1.165mm/V	0.837mm/V	Low Gain	1.263mm/V	0.963mm/V
High Gain	0.578mm/V	0.416mm/V	High Gain	0.633mm/V	0.488mm/V

Horizontal Servo Settings:

P: _____ Datten: _____
 I: _____ Feedback: _____
 D: _____ E-gain: _____

Chilled water at HPS

1. Temp In (°F): _____
 2. Pres. In (psi): _____
 3. Temp Out (°F): _____
 4. Pres. Out (psi): _____
 5. Flow (lpm): _____

Chiller Unit

6. Panel Temp (°F): _____
 7. Panel Pres. (psi): _____
 8. Near Pres. In (psi): _____
 9. Near Pres. Out (psi): _____

Process water at Chiller

10. Temp In (°F): _____
 11. Pres. In (psi): _____
 12. Temp Out (°F): _____
 13. Pres. Out (psi): _____

Vertical Servo Settings:

P: _____ Datten: _____
 I: _____ Feedback: _____
 D: _____ E-gain: _____

Hyd. Power Supply (HPS)

14. Tank Temp (°C): _____ 15. Temp. Out (°C): _____ 16. Pres. Out (psi): _____

after override: 45.6

38.6

45

* Had to unload/drain twice

* Temp had issues

* Temp was residual $\sim 1\text{mV}/^\circ\text{C}$

110000 Temp \uparrow

207000 Perm Test #1 @ 77°C

22700 manual offset on vertical load

22900 shear started

226000 v. offset

337160 Perm Test #2 @ 80°C at 8mm displacement

We drained pc and had a slight over pressure and drop.

\rightarrow we followed up with new hold for when we increase temp.

31300 temperature sensor changed from inside to touching P_c outflow line

35000 start 2nd v. step sequence

36336 shear to find τ_{max} $43\text{kN} \rightarrow 90\% = 38.7$

379300 shear load $\sim 38\text{kN} \rightarrow$ Locked!