



FEBRUARY 8, 2024

FACTOR OF SAFETY CALCULATION

COMBUSTION CHAMBER SUB-TEAM

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RIT LIQUID PROPULSION



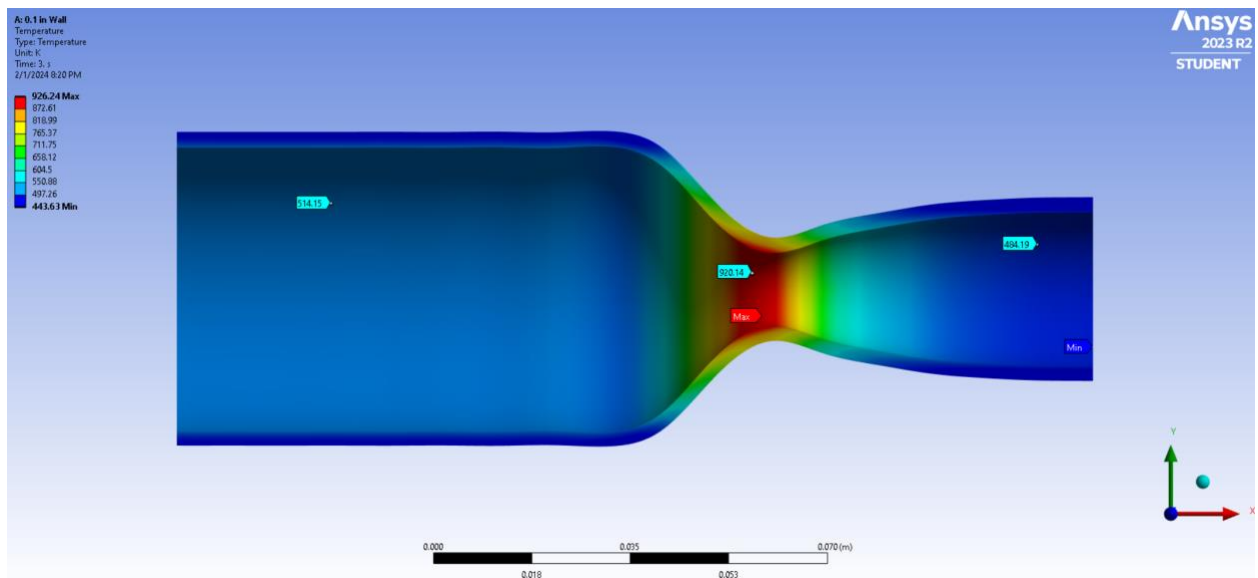


Figure #1: 0.1[in] Wall, 3[s] Burn

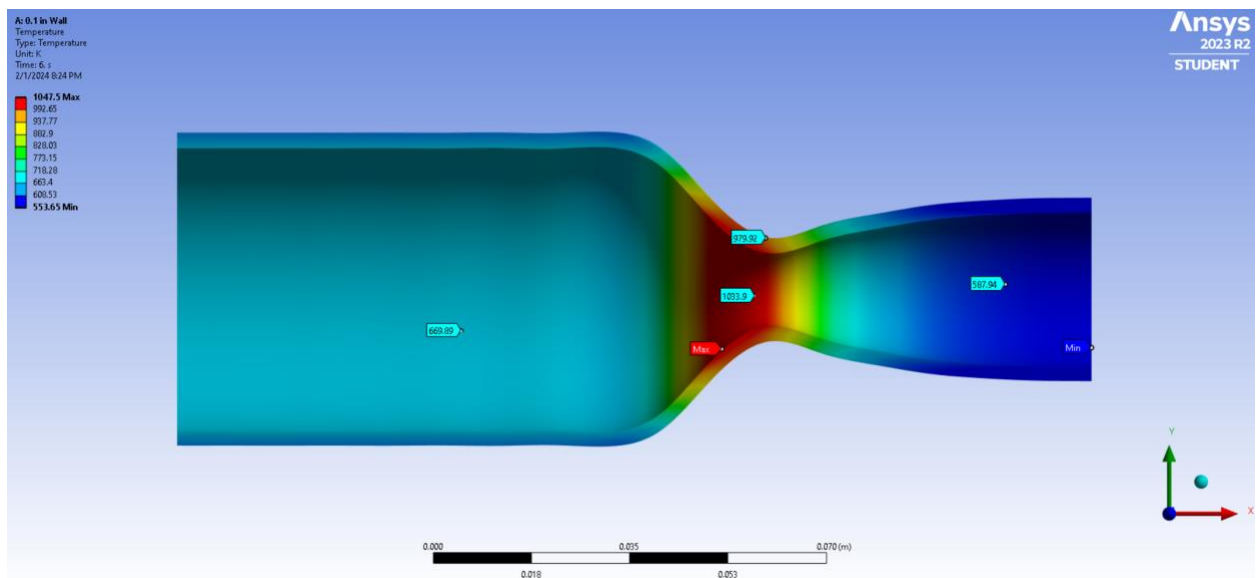


Figure #2: 0.1[in] Wall, 6[s] Burn

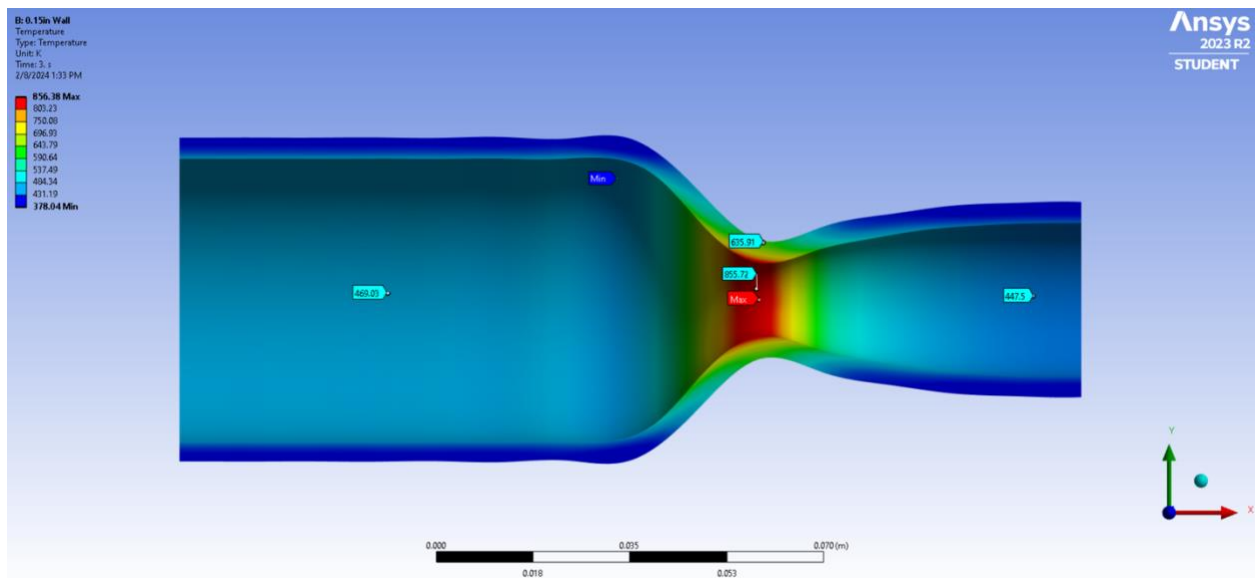


Figure #3: 0.15[in] Wall, 3[s] Burn

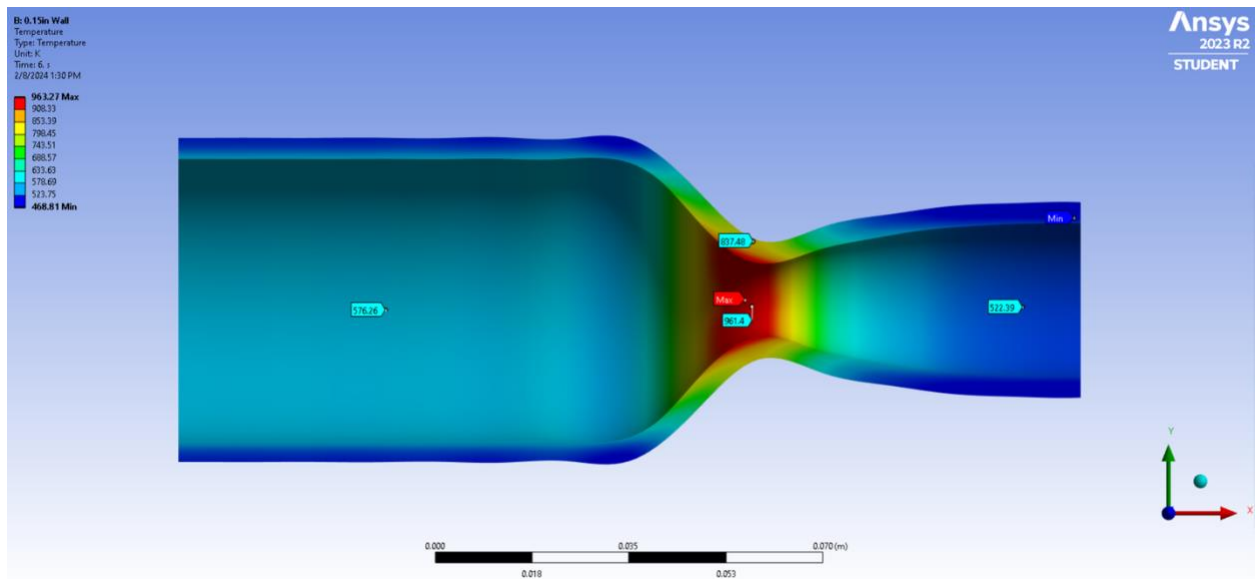


Figure #4: 0.15[in] Wall, 6[s] Burn

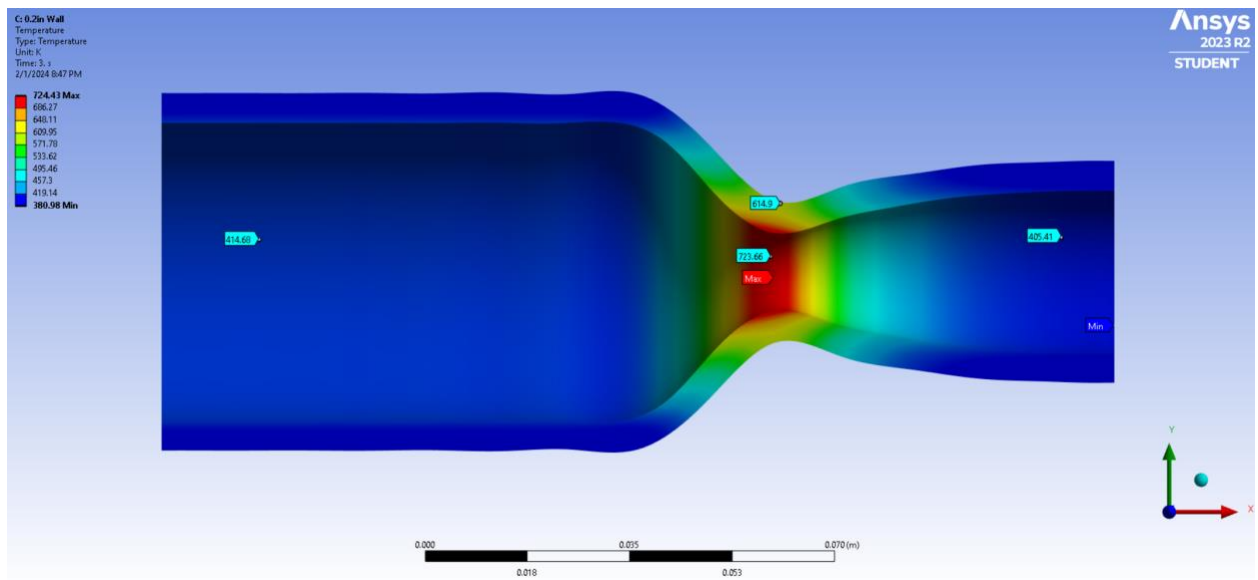


Figure #5: 0.2[in] Wall, 3[s] Burn

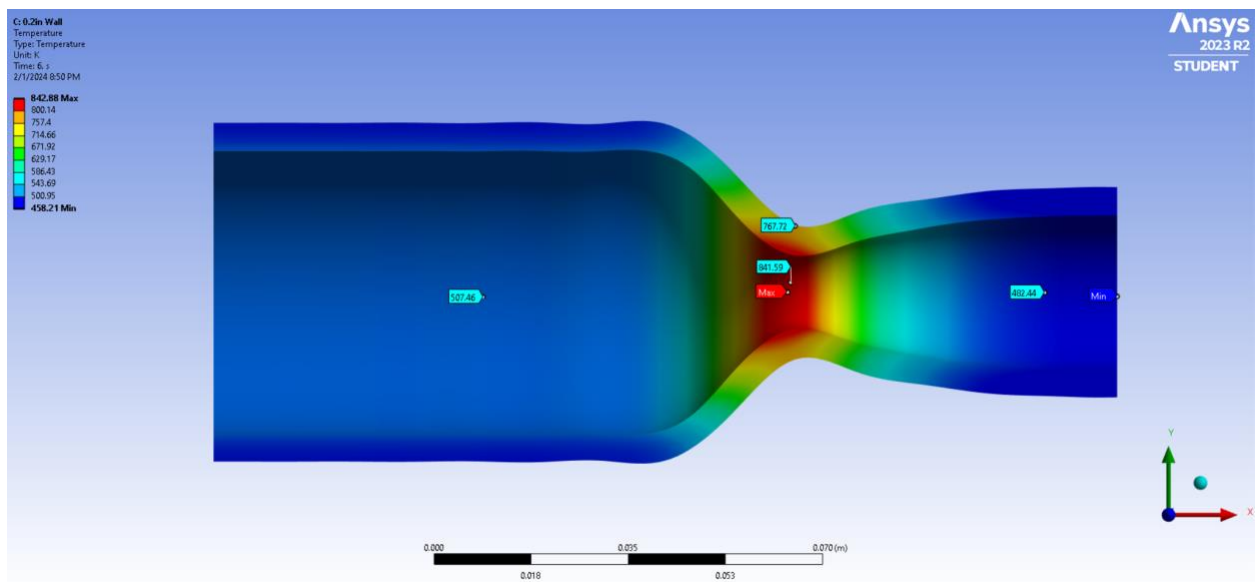


Figure #6: 0.2[in] Wall, 6[s] Burn

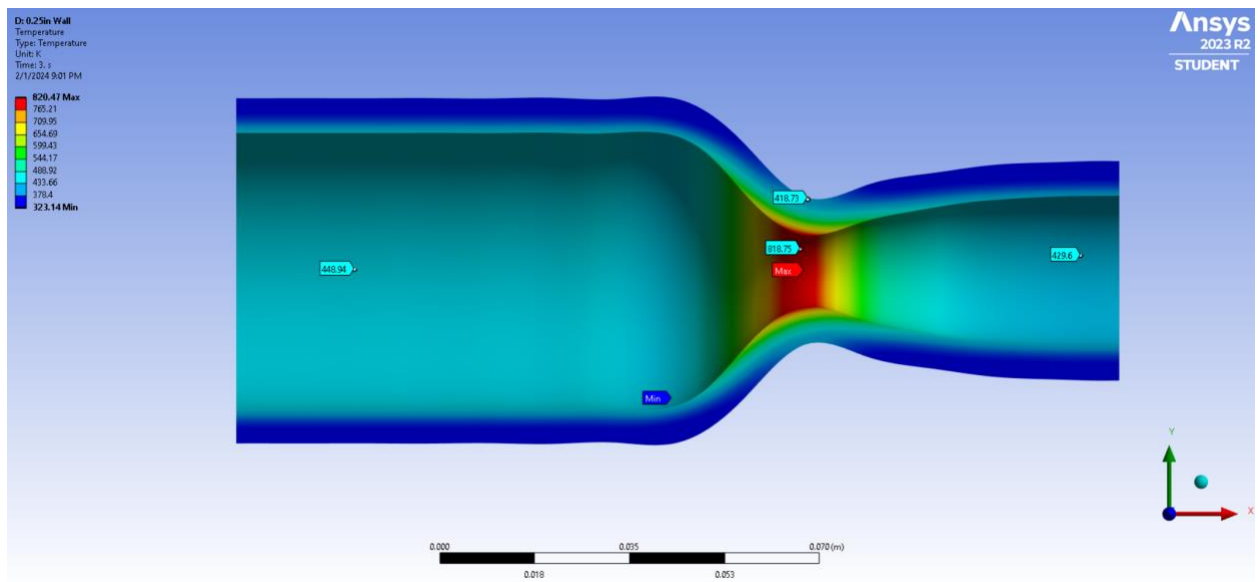


Figure #7: 0.25[in] Wall, 3[s] Burn

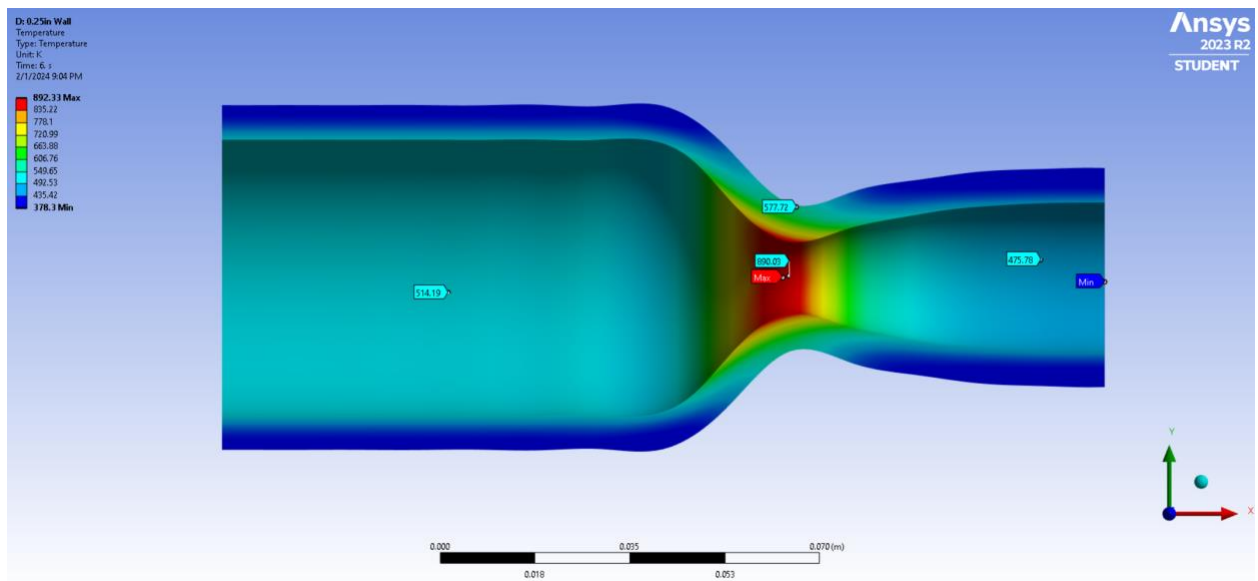


Figure #8: 0.25[in] Wall, 6[s] Burn

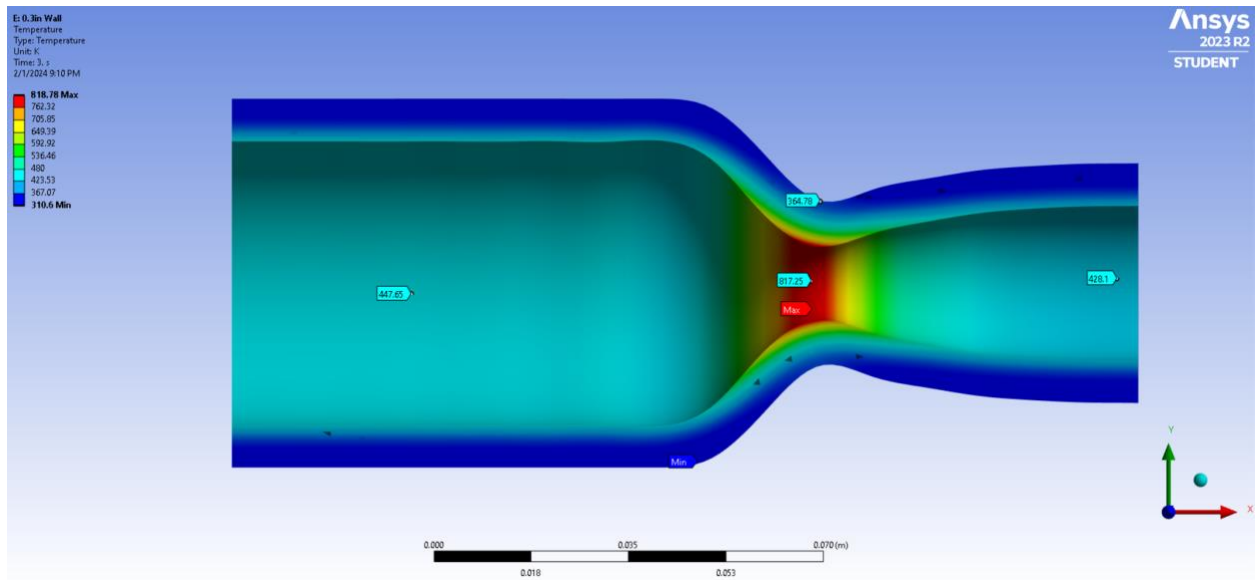


Figure #9: 0.3[in] Wall, 3[s] Burn

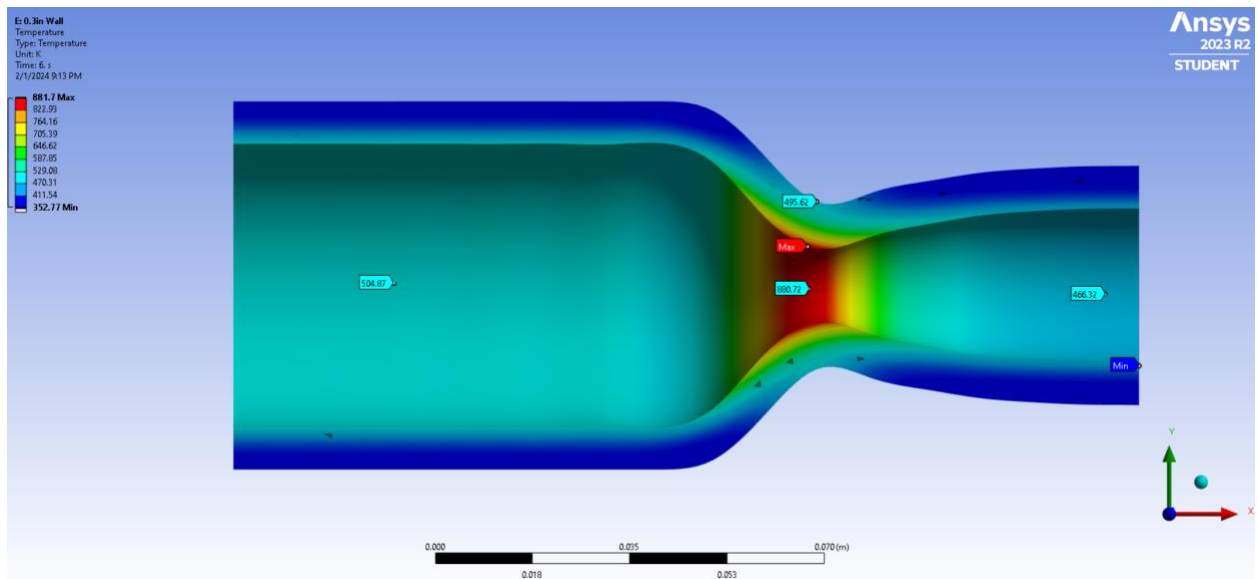


Figure #10: 0.3[in] Wall, 6[s] Burn

Table #1: FOS for Given Wall Thickness & Burn Time

		Wall Thickness				
Burn Time		0.10 [in]	0.15 [in]	0.20 [in]	0.25 [in]	0.30 [in]
	3 [s]	Chamber – 4.9 Throat – 36.7	Chamber – 8.1 Throat – 61.6	Chamber – 11.4 Throat – 84.0	Chamber – 15.0 Throat – 112.9	Chamber – 18.3 Throat – 154.0
	6 [s]	Chamber – 4.4 Throat – 30.9	Chamber – 6.9 Throat – 57.3	Chamber – 9.6 Throat – 82.2	Chamber – 13.1 Throat – 99.8	Chamber – 16.5 Throat – 131.1

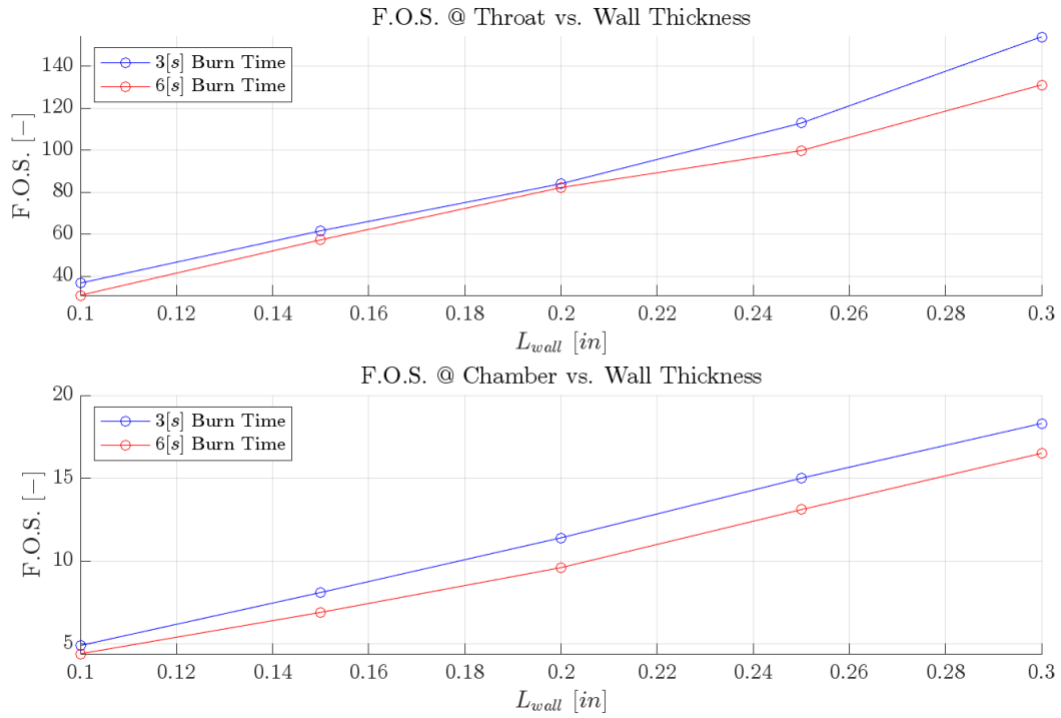
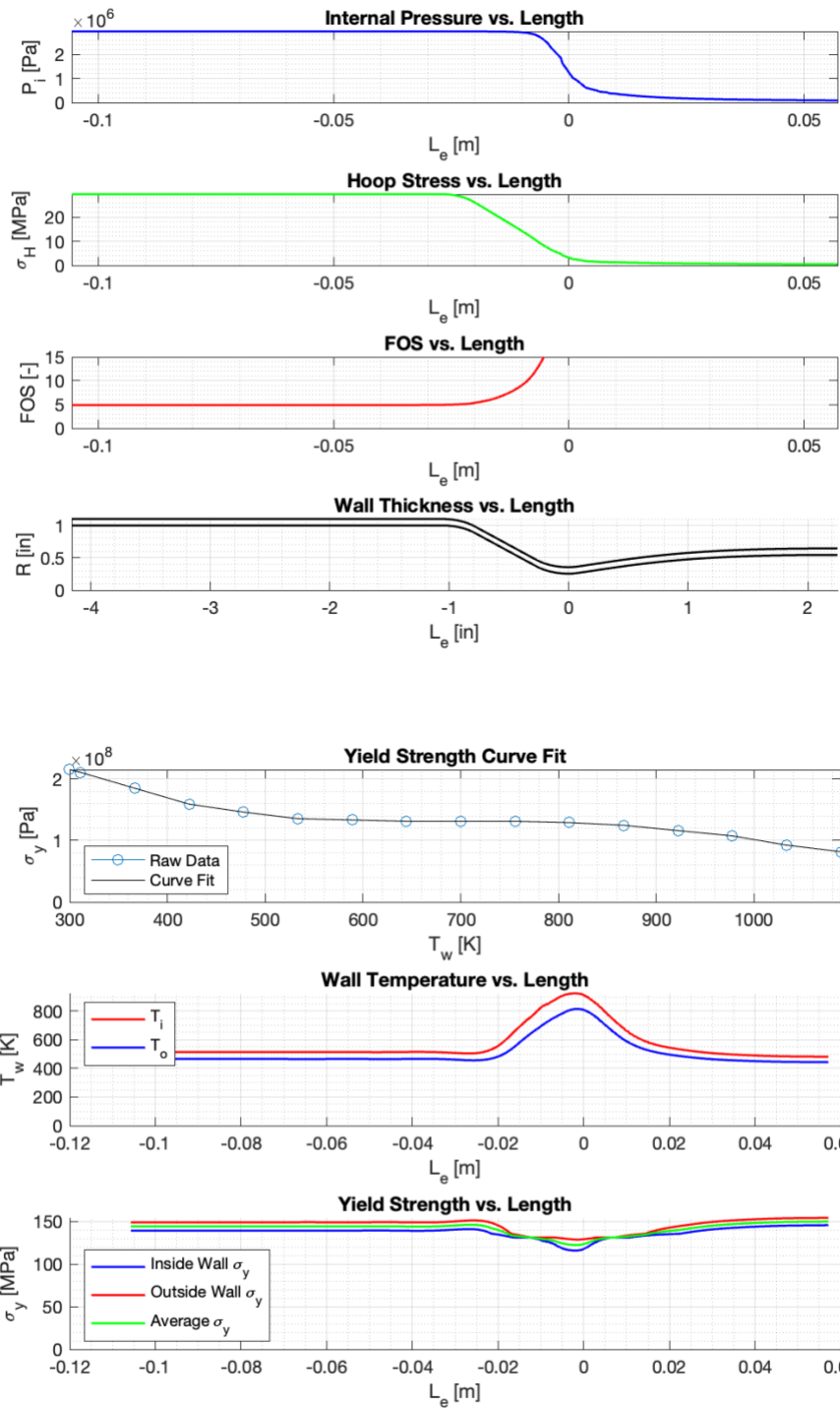
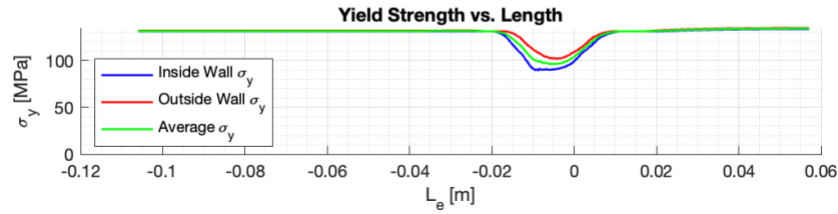
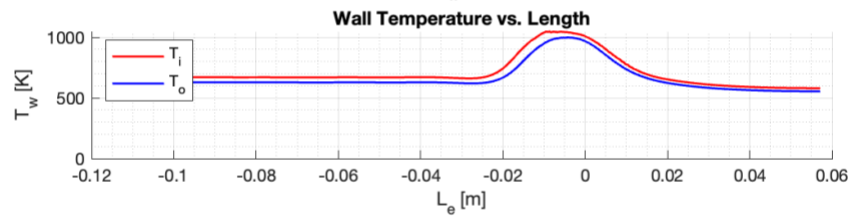
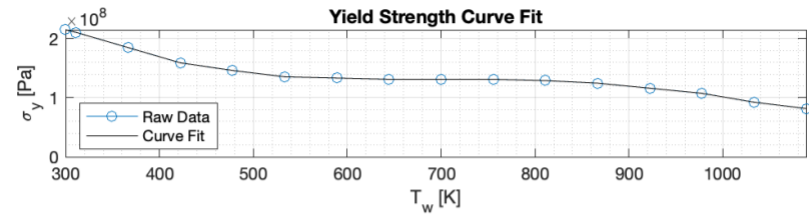
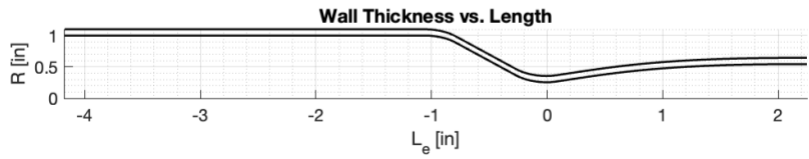
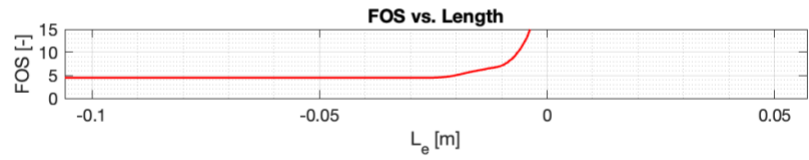
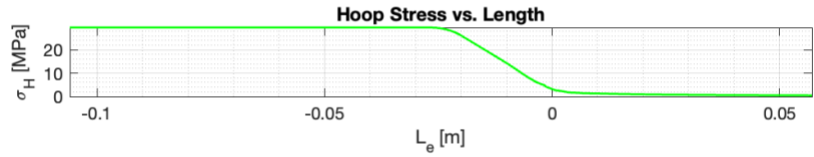
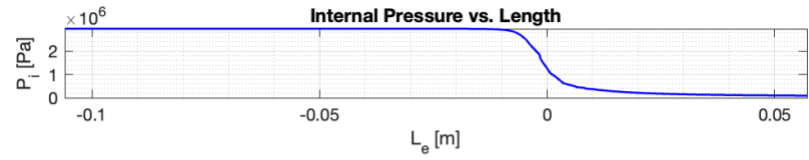


Figure #11: FOS vs. Wall Thickness for Burn Time

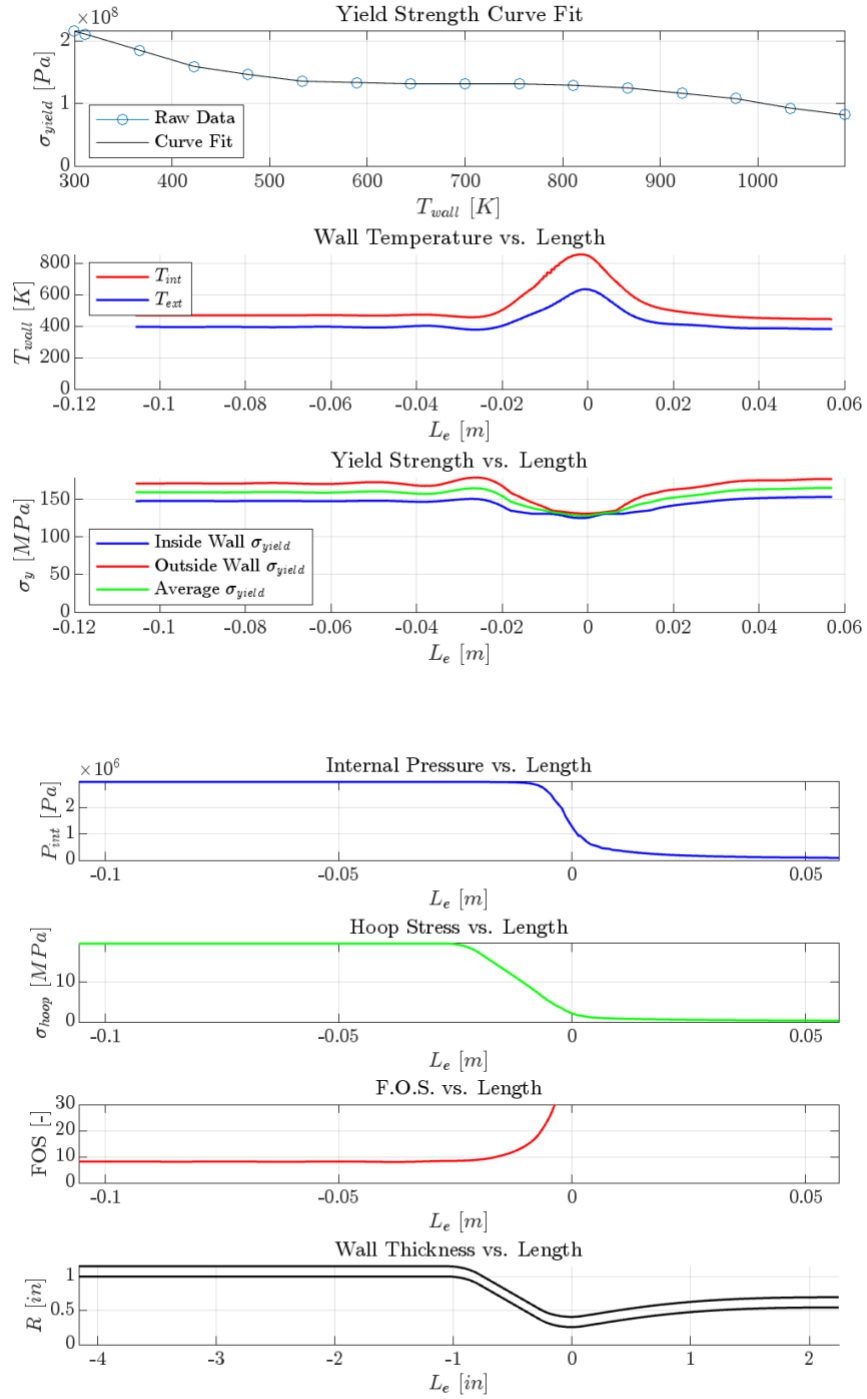
0.1[in] Thickness, 3[s] Burn Time



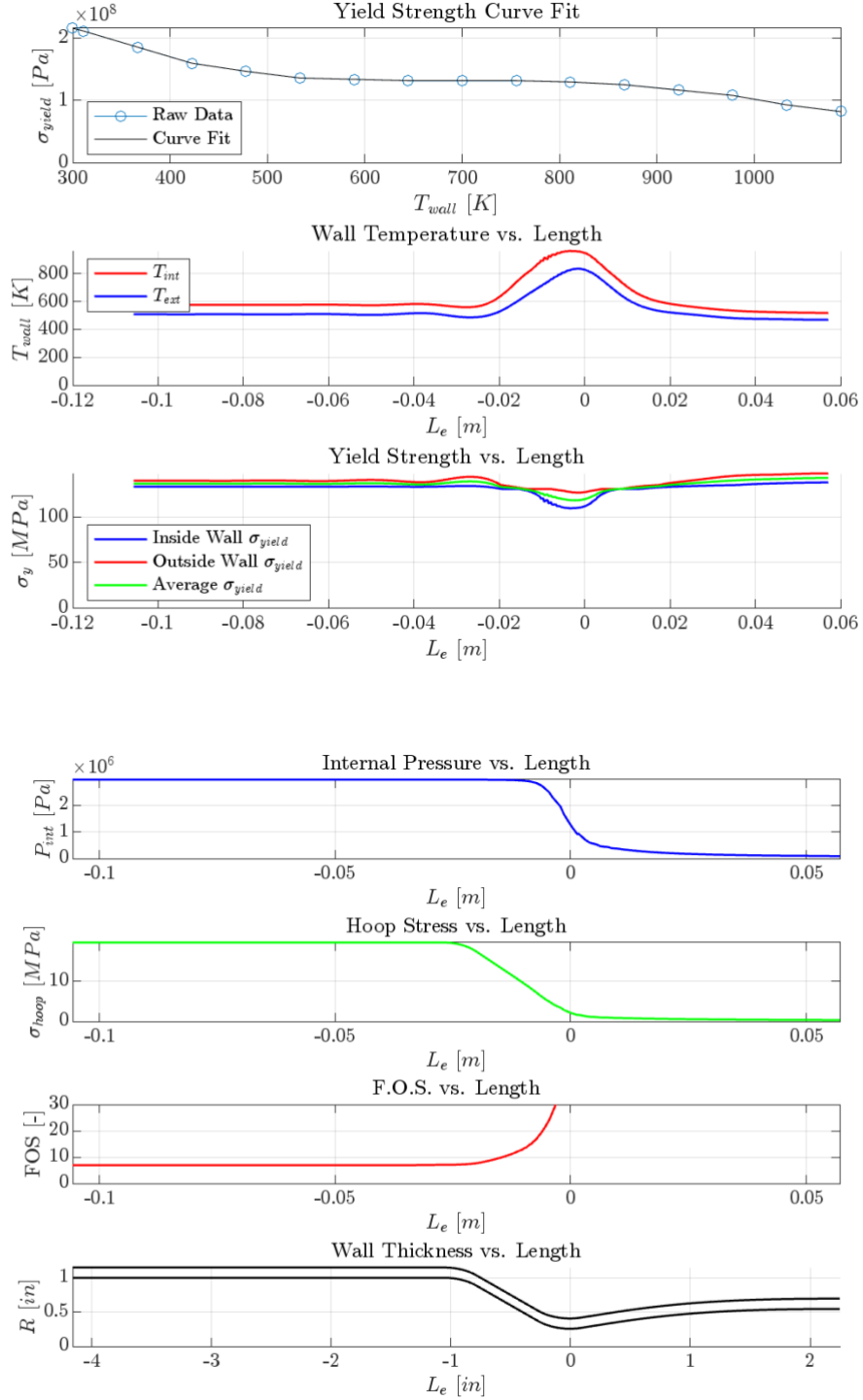
0.1[in] Thickness, 6[s] Burn Time



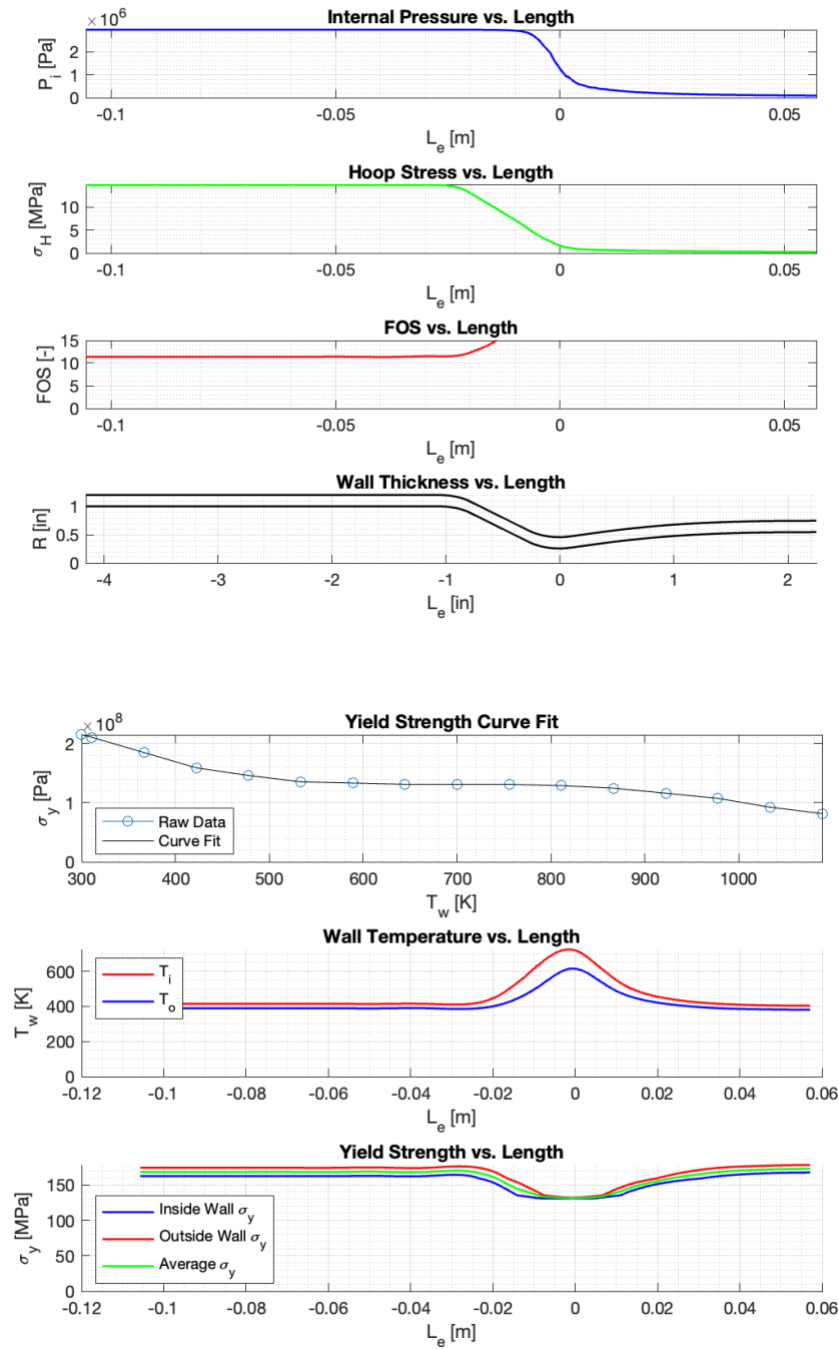
0.15[in] Thickness, 3[s] Burn Time



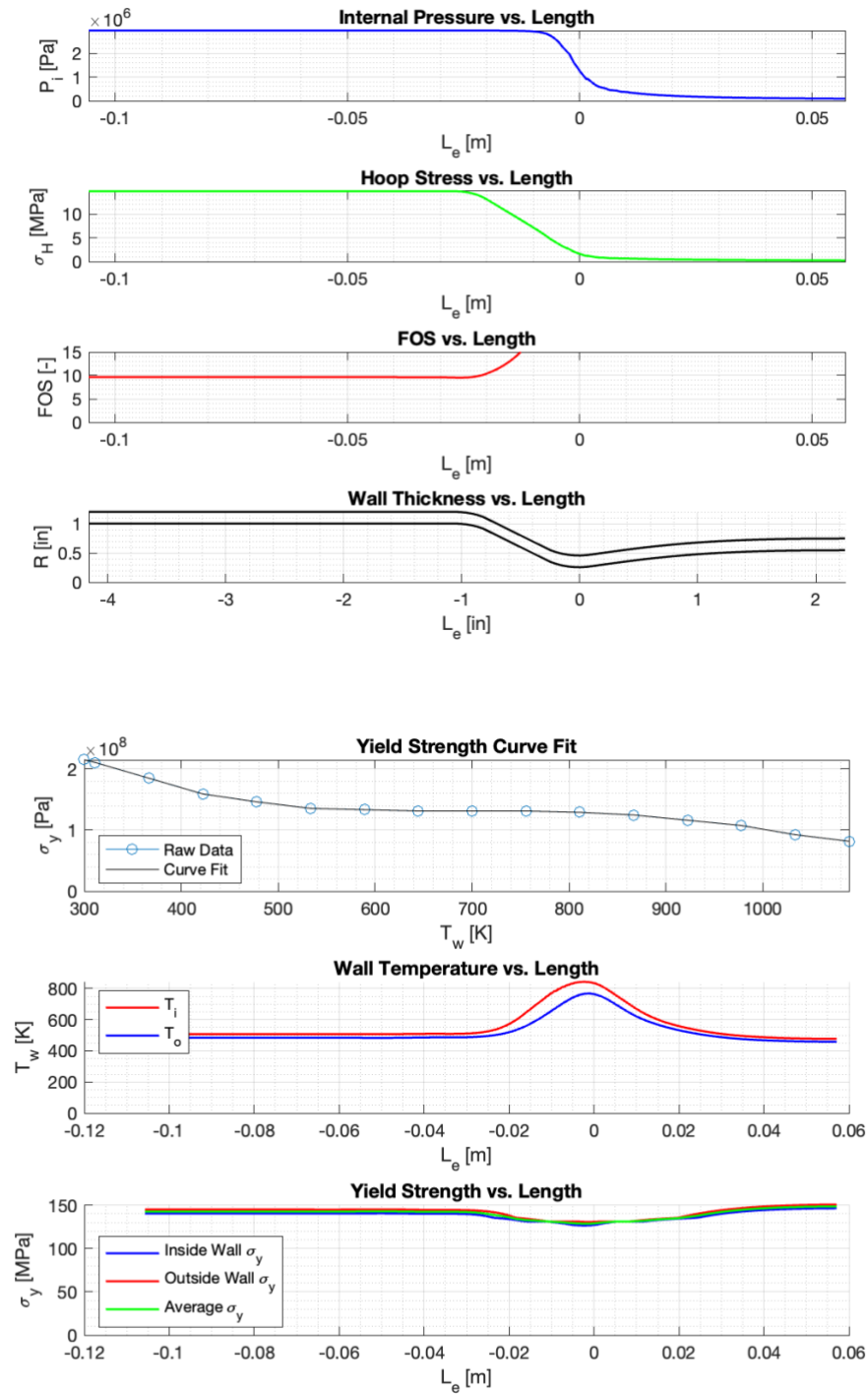
0.15[in] Thickness, 6[s] Burn Time



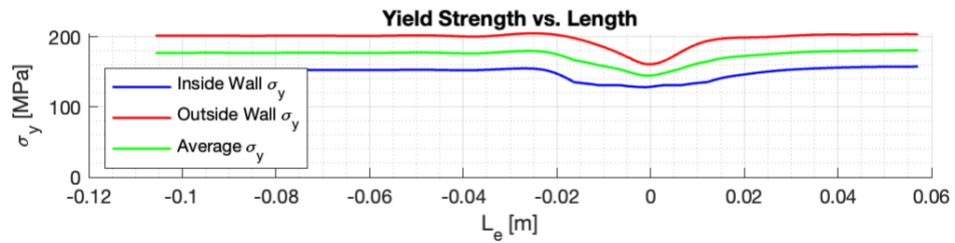
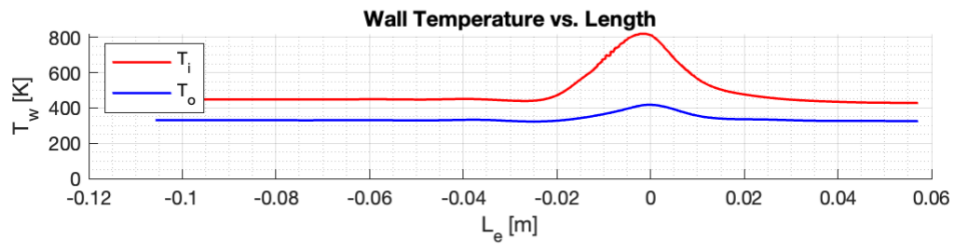
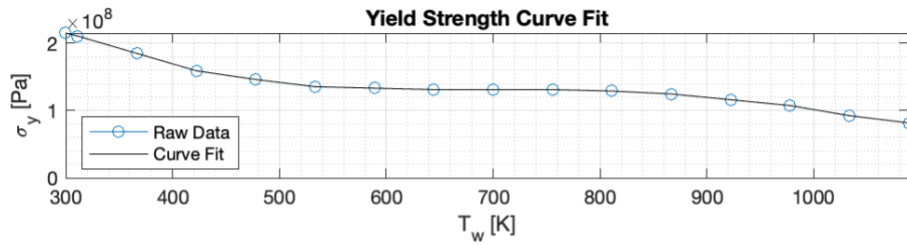
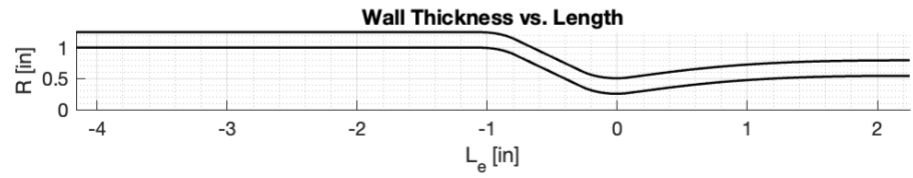
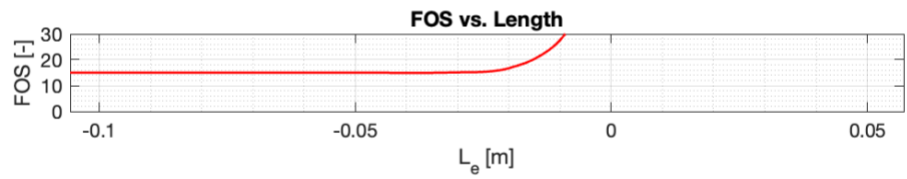
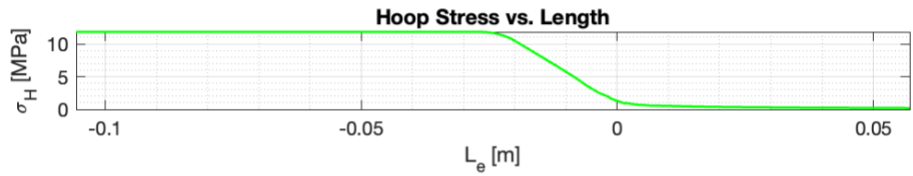
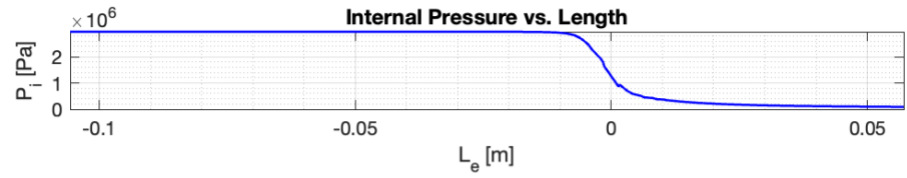
0.2[in] Thickness, 3[s] Burn Time



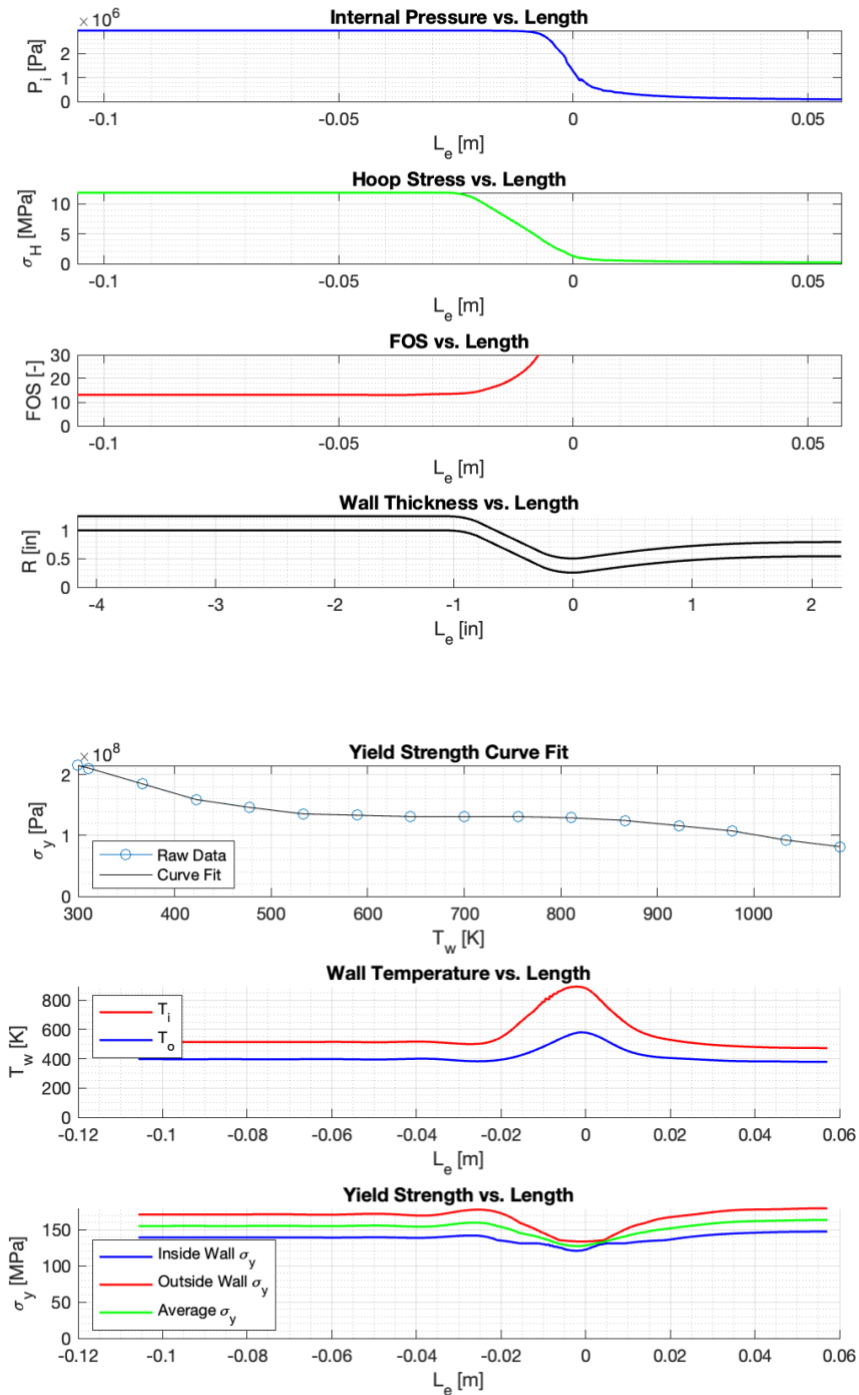
0.2[in] Thickness, 6[s] Burn Time



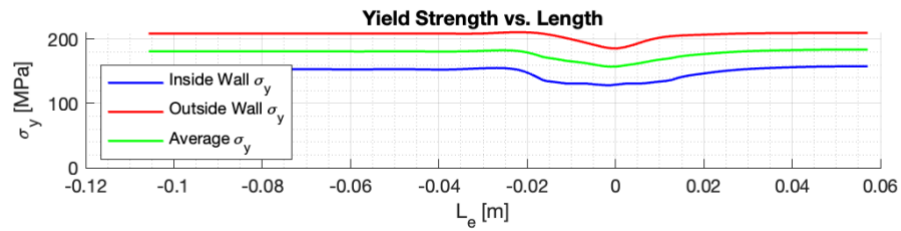
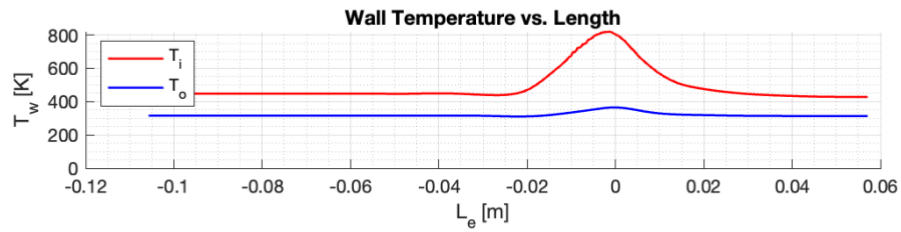
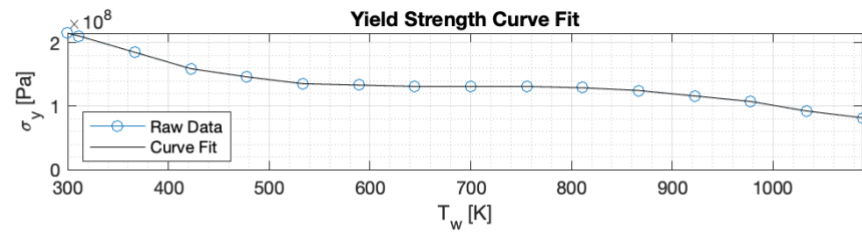
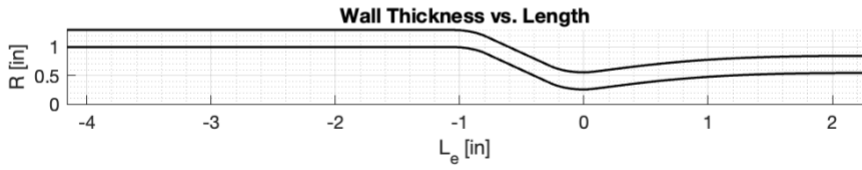
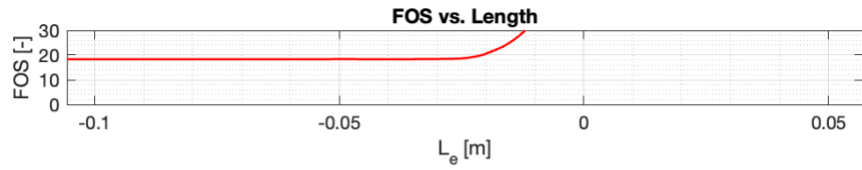
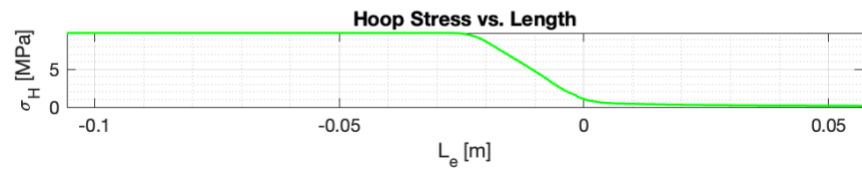
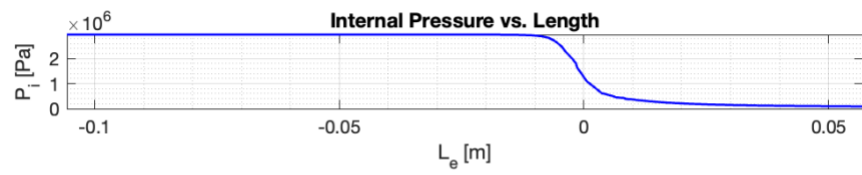
0.25[in] Thickness, 3[s] Burn Time



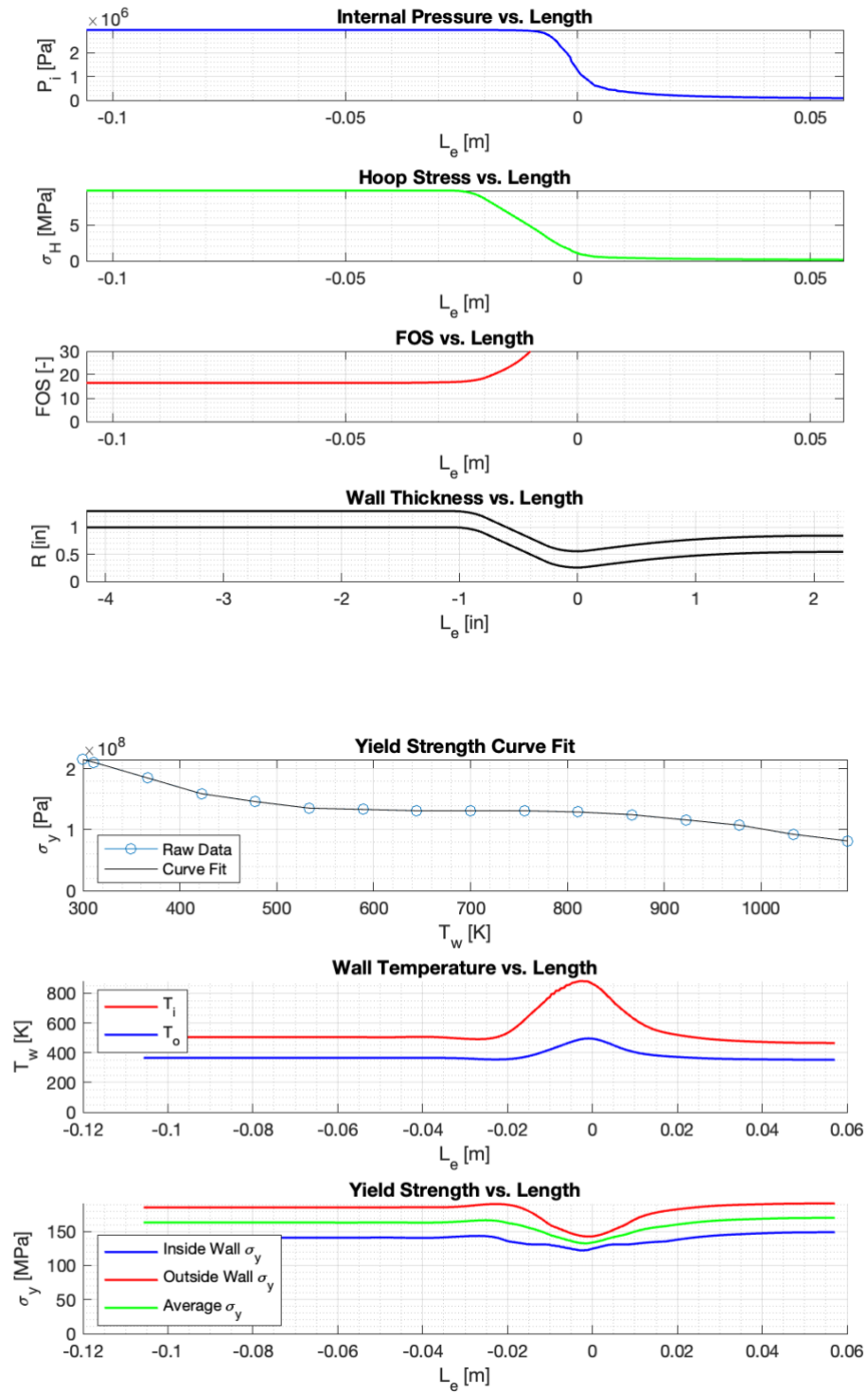
0.25[in] Thickness, 6[s] Burn Time



0.3[in] Thickness, 3[s] Burn Time



0.3[in] Thickness, 6[s] Burn Time



**All raw data can be found on the Launch Initiative GitHub under the calc-factor-of-safety repository*