Temperature Measurement
Problem

The temperature rise was smaller and slower than we expected.
Diagnosis

We checked our expectation for temperature rise by performing some analytical temperature predictions. These predicted a quick temperature rise (less than 1 sec) and 10's of degrees of rise.

We checked the thermocouple by immersing it in hot water and cold water and collecting the temperature measurements. These simple trials showed us that the thermocouple was working properly and that it could respond quickly.

Then we suspected that the thermocouple wasn’t making good contact with the workpiece. We measured the length of the thermocouple and how much of it sticks out of the workpiece when screwed into its mounting hole. Then we removed the thermocouple and measured the depth of the hole. It turns out that the thermocouple tip was not touching the bottom of the hole as intended.
Measurement Results
After Correcting Setup