1. Check helium supply gauge. The ideal range is between 1.60 and 1.65 MPa on the compressor. If the pressure is lower than this, use the connected helium bottle to increase the pressure.
2. Fill out a log sheet (`https://documents.triumf.ca/docushare/dsweb/Get/Document-161977/iris_sht_log_sheets.pdf`).
3. Turn on the compressor ('Drive SW' on/off switch). Record the time.
4. Wait until PtCo1 reaches ≈ 4 K, and both PtCo1 and PtCo2 have stabilized. This should take 2-3 hours.

Pumping out gas volume and lines

5. While the cell is cooling down, turn on the roughing pump. Make sure $\mathbf{V}_{1-3}$ are closed, then open $\mathbf{V}_5$.
6. After a few minutes make sure that $\mathbf{V}_7$ is closed and open $\mathbf{V}_6$.
7. Again after a few minutes, close $\mathbf{V}_6$, then open ~~$\mathbf{V}_2$ and~~ $\mathbf{V}_3$.

purge gas line and volume for purity

8. When the foil and heat shield have reached their final temperature, close ~~$\mathbf{V}_2$ and~~ $\mathbf{V}_3$. Open $\mathbf{V}_7$ for a few seconds to fill the line up to $\mathbf{V}_6$. Purge the line by filling it a couple of times by opening $\mathbf{V}_7$, then pumping it out by opening $\mathbf{V}_6$.
9. Estimate the amount of hydrogen necessary for the planned target thickness. The volume between $\mathbf{V}_6$ to $\mathbf{V}_3$, including the pressure sensor and the hydrogen cylinder is 706 cc at 0.086 g/cc. For a target thickness of 100 μm, a pressure of 101 Torr is needed. Additionally ≈ 50 Torr will be needed to ensure a steady gas flow all the way through the formation.
10. Close $\mathbf{V}_5$. Fill the small hydrogen cylinder. A safe way to do so is to repeatedly fill the line up to $\mathbf{V}_6$ and then releasing it into the volume.
11. Close valves **SEBT2:IV3** and **SEBT2:IV4**.
12. Fill out a log sheet.
13. In Labview, change scan interval to 1 s and file-save interval to 1/1.
14. Open $\mathbf{V}_0$ two turns while holding the body of the valve lightly. → important to do this before moving up to target position residual gas in copper line is pumped into chamber.
15. Move the diffuser into the position marked by the upper right line.
16. ~~Open $\mathbf{V}_2$ slightly (about half a turn).~~
17. To form the target, open $\mathbf{V}_3$ slightly and monitor **MKS** and **VAC-PM**. $\mathbf{V}_3$ should be open enough so that **MKS** decreases at a rate of ≈ 1 Torr/s. Maintain **VAC-PM** at $1 - 4 \times 10^{-6}$ mbar. Close $\mathbf{V}_3$ when the pressure on **MKS** has decreased by the calculated amount.
18. Close V_0 and move the diffuser to the position marked by the lower red line.
19. Save screenshot of the Labview graphs. Change scan interval and file-save interval back.
20. In Labview, change scan interval to 10 s and file-save interval to 1/30.

4 Warming Process

1. Fill out a log sheet.
2. Close valves **SEBT2:IV3** and **SEBT2:IV4**.
3. Turn off **SEBT2:PNG4**.
4. In Labview, change scan interval to 1 s and file-save interval to 1/1.
5. Turn compressor off. Record time.
6. Wait 10-20 minutes for two peaks to show on the pressure graph. The first peak should occur immediately, and is a consequence of the evaporation of the hydrogen target. The area under the peak is proportional to the mass of the hydrogen target. The second peak corresponds to the contamination release from the heat shield.
7. Save screenshot of the Labview graphs. Change scan interval and file-save interval back.

wait for long time (>8hr) to open gate valves. Many contaminants released after long periods of time

8. Turn **SEBT2:PNG4** back on and open **SEBT2:IV3** and **SEBT2:IV4**.
9. Allow system to warm to at least 200 K.