

Filling the Liquid Nitrogen Tank

1. You should first take the appropriate on-line course via Learn@Northwestern.
 - a. Go to learn.northwestern.edu and login with your NetID
 - b. Search for the “Filling and Maintenance of Liquid Nitrogen Tanks Course” and enroll
 - c. Watch the online presentation and then take the corresponding quiz to complete your training
2. If you do not have access to the liquid nitrogen filling station, bring someone with you who does, borrow their ID card or sign-up for access on the FOM website (<http://www.fom.northwestern.edu>).
 - a. First register with your Net ID.
 - b. Next, register your WildCard with the head of the cryogenics facility. After you do this, he should give you access.
3. Before going down to the liquid nitrogen filling station (Tech EB42), make sure to bring:
 - your WildCard
 - the key for the lock from the Morimoto Lab (borrow from Sue’s top desk drawer)
 - a sticky note with the following information on it: your name, your lab, contact phone number and the date.
4. Use your WildCard (or the borrowed one) to enter the liquid nitrogen filling station (listen for the door to click before entering).
5. You will find up to three liquid nitrogen tanks all hooked together by a chain and a series of locks. These are generally to the right as you face the end of the room opposite the weigh station and are just past the filling station. (In this current picture, only two out of the three tanks are present).



6. Use the Morimoto key to unlock the Morimoto lock, remove one of the tanks, then re-thread the lock and shut it to complete the chain again.

7. Bring the tank to one of the three filling stations and position it such that the two hook-ups are facing the filling station. Note that there is only one way to position the tank such that both hook-ups are facing the wall with the filling stations.



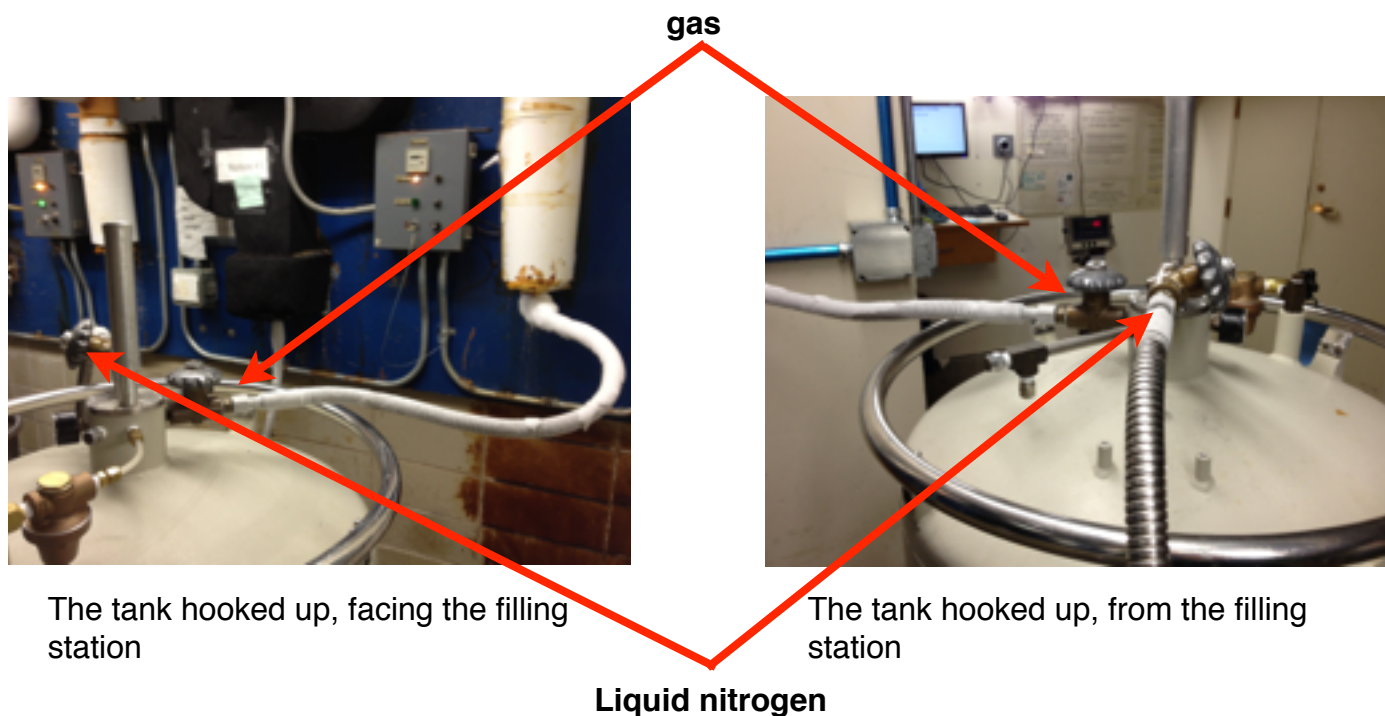
view from the side



view from the top

8. You will need to attach the liquid nitrogen line and the gas line to the appropriate hook-ups. If the tank is positioned properly, it will be clear which line goes to which hook-up. There are wrenches around to help tighten the connections.

- When tightening the connections, use the smaller wrench to hold the valves in place while tightening the nuts with the larger wrench



gas

The tank hooked up, facing the filling station

The tank hooked up, from the filling station

Liquid nitrogen

9. Open the gas valve first, and then open the liquid nitrogen valve. Also, make sure the pressure buildup valve is closed during filling. Do not change the pressure regulator valve (small valves, usually without knobs on them).

Pressure buildup valve

NOTE: the pressure buildup valve may look different on a different tank



DO NOT TOUCH:
Pressure regulator valve

10. Check if the system is on (orange light next to system on). If the light is off, flip the switch next to the “system on” light to turn the system on. Then, press the “solenoid on” button to start filling the tank. The green “solenoid on” light should turn on.

NOTE: If you need to stop filling the tank, you have to turn the whole system off by flipping the “system on” switch. The orange light and the green light should turn off



System on switch

Solenoid on button

11. Leave the sticky note on the tank to indicate that we are filling it up and will be back for it.
12. It takes about 45 minutes to fill up the tank and the filling station will shut-off automatically.
13. After 45 minutes, come back to the filling station to retrieve the tank. At least two people should go as the tank will be heavy.

14. Close the valves (liquid first, then gas) appropriately and unscrew the connections, using the wrenches as needed.
15. Roll the tank to the weigh station and record the full weight on a piece of paper (your used sticky note works well here!).
16. Bring the tank back to Cook 3117:
 - Take the basement elevator (right by the filling room) up to G
 - Walk across Tech until you reach another elevator. Take this elevator up to floor 1.
 - You should now be right by the Tech-Cook bridge. Bring the tank up the ramp to Cook and to the lab, using the freight elevator to bring it up to the 3rd floor.
17. Position tank near our liquid nitrogen tank. Borrow the “filler” from the Morimoto Lab - it is in their cell culture room Cook 3110 to your right as you enter the room. It is a long piece of copper tubing that can attach to the liquid nitrogen hook up and has a piece of hosing on the end that can go into our liquid nitrogen tank.
18. Attach the “filler” to the liquid nitrogen tank from the cryogenics facility (using a wrench to tighten if necessary — borrow from the Morimoto Lab). Depress the “reset” button on the alarm monitor on our liquid nitrogen tank and remove the lid of the tank. Put the lid down, and then place the hose-end of the “filler” into our tank.
19. Open the liquid nitrogen valve and allow liquid nitrogen to empty into our tank.
 - If the liquid nitrogen is coming out slowly from the tube, open the pressure buildup valve (rotate clockwise) to increase flow.
20. Continue to fill our tank until the liquid nitrogen is about 2 inches below the insulating neck of the tank. Check the progress regularly so that you do not overfill the tank.

NOTE: if you do overfill the tank, use the tool on the grey ledge above the tank (a conical attached to a pipette) to remove the excess from the tank. Pour excess liquid nitrogen into styrofoam containers or freezer buckets.



bottom of insulating neck. Fill to two inches below here.

hose of the “filler”

21. When our tank is filled, turn off the liquid nitrogen valve, remove the “filler”, put the lid back on our tank and press the “reset” button on the alarm monitor of our tank lid. Unscrew the “filler” from the large tank and return it to the Morimoto Lab.
 - The alarm monitor may go off. If this happens, press reset again.

22. Make sure to have a WildCard, your sticky note with the “full” weight, and the Morimoto key before rolling the tank back down to the cryogenics facility.
23. When you enter the cryogenics facility, the computer should register your ID card. If not, follow the instructions on screen to access our account.
24. Place the liquid nitrogen tank on the weigh station. Enter the “full” value you recorded before taking the tank upstairs and the “emptied” value now displayed into the computer to calculate our cost. Choose the appropriate chart-string to pay for the liquid nitrogen (as of December 2013, there is only the start-up chart string from which to choose).
25. Bring the tank back to the other chained tanks. Use the Morimoto key to unlock their lock, thread the chain back through the tank and relock the lock to secure the chain.
26. When you return to the lab, make sure there is not frost build-up on the underside of the lid where the lid-sensor is located. The presence of frost can result in the lid-sensor alarm going off even though the tank is full.