Filename: LN2TankChange_Protocol_20180604HJAM

How to Change the Liquid Nitrogen Tank

(Modified: 2018-06-04 Hannah Appiah-Madson)

When the liquid nitrogen vapor freezer is connected to a liquid nitrogen tank that is empty or extremely low, you must exchange the old tank for a new (full) tank.
Note: You must be trained to work with liquid nitrogen! Be sure that you have completed the EHS course and received instructions from OGL staff.

Supplies List:

- New (full) tank of liquid nitrogen
- Wrench
- Insulated gloves (if any of the equipment is cold)

Step #1

Disconnecting the old tank:

1. Turn off the "Liquid" valve on the old tank (the tank that is connected to the freezer).
   Note: The "Liquid" valve may have a knob (turn it completely in the "close/shut" direction) or a lever (push it completely in the "close/shut" direction).
2. Use the wrench to gently turn the hexagonal fitting counterclockwise, unscrewing and loosening the hose from the old tank.
   Note: Avoid unscrewing the hose when it is cold. The hexagonal fitting should be the only piece that rotates. If other pieces of the tank or hose begin to twist, STOP and try again when the metal has warmed up.
3. Use the wrench and/or your fingers to keep unscrewing the hexagonal fitting (turning it counterclockwise) until the hose is completely disconnected from the old tank. Let the hose dangle temporarily.

Step #2

Moving the tanks:

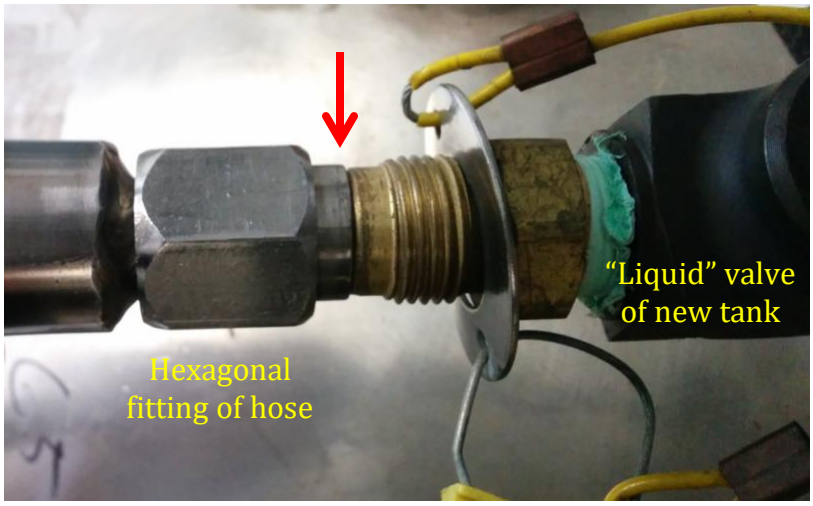
1. Roll the old tank away from the freezer, toward the door of the room.
2. Roll the new tank next to the freezer.
3. Rotate the new tank so that the "Liquid" valve is facing the freezer.
4. Position the old tank so that it does not block the door of the room.

Step #3

Connecting the new tank:

1. If there is a hose connected to the new tank, disconnect it using the instructions in Step #1. Place this hose off to the side.
2. Pick up the free end of the hose that is connected to the freezer.
3. Push the hexagonal fitting away from the free end of the hose, so that the rigid opening of the hose is exposed.
4. Locate the "Liquid" valve of the new tank.
5. Position the rigid opening of the hose directly against the "Liquid" valve of the new

tank. Make sure that the openings are flush against each other in a straight line.



6. Use your fingers to turn the hexagonal fitting clockwise, screwing it onto the "Liquid" valve.
7. Continue turning the hexagonal fitting with your fingers until it stops. If the hose does not screw on easily, unscrew it, adjust the fitting so it is completely in line with the valve, and try again.
8. Use the wrench to gently turn the hexagonal fitting (clockwise) a small additional amount until it stops.
   Note: Do not be forceful with the wrench!
9. Turn on the "Liquid" valve on the new tank.
   Note: If the "Liquid" valve has a lever, push the lever completely in the "open" direction. If the "Liquid" valve has a knob, turn the knob completely in the "open" direction, and then turn it about a half-turn in the "close/shut" direction.

Step #4 (recommended but optional)

Testing the new tank:

1. Press the "Start Fill" button on the freezer control panel.
2. Watch to ensure that the freezer is filling properly:
   a. Is any liquid nitrogen leaking from the "Liquid" valve? (Condensation and frost are normal, but you should not see drops squirting from the valve.) If you see leaking drops, the connection between the hose and the valve is probably crooked.
      i. Press the "Stop Fill" button on the freezer control panel.
      ii. Wait for the metal to warm up.
      iii. Repeat Step #3 and make sure that the connection is completely flush.
   b. Is the liquid level rising on the freezer display?
      i. The level should rise gradually. If the level does not rise after several minutes, check that the "Liquid" valve is open and that the new tank is not empty.
3. The freezer should stop filling automatically once the liquid level reaches the set point. If you wish to stop filling early, press the "Stop Fill" button.

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How to Dispense Liquid Nitrogen

(Modified: 2016-07-25 Hannah Appiah-Madson)

If you need to dispense liquid nitrogen into a dewar, you must follow this protocol. Please use the tank attached to our LN2 freezer, and not the unattached tank.
Note: You must be trained to work with liquid nitrogen! Be sure that you have completed the EHS course and received instructions from OGL staff.

Supplies List:

- Unattached hose
- Wrench
- Insulated gloves (if any of the equipment is cold)

Step #1

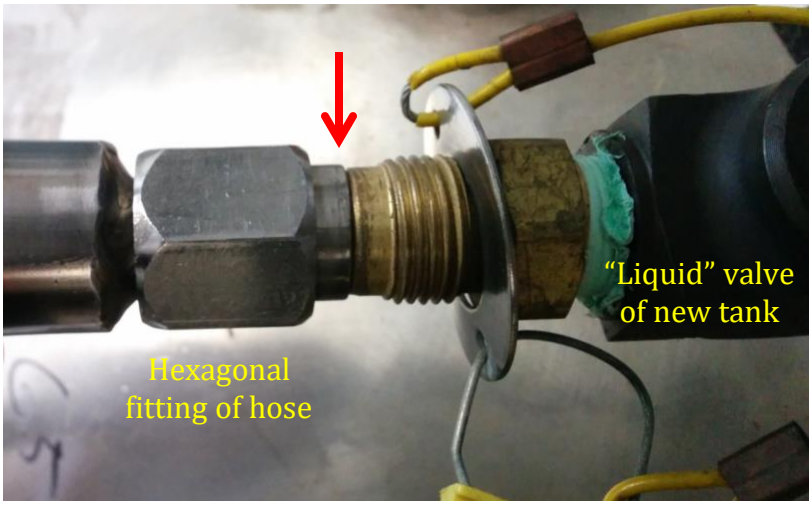
Disconnecting the tank from the LN2 freezer:

1. Turn off the "Liquid" valve on the tank that is connected to the freezer.
   Note: The "Liquid" valve may have a knob (turn it completely in the "close/shut" direction) or a lever (push it completely in the "close/shut" direction).
2. Use the wrench to gently turn the hexagonal fitting counterclockwise, unscrewing and loosening the hose from the tank, not the freezer.
   Note: Avoid unscrewing the hose when it is cold. The hexagonal fitting should be the only piece that rotates. If other pieces of the tank or hose begin to twist, STOP and try again when the metal has warmed up.
3. Use the wrench and/or your fingers to keep unscrewing the hexagonal fitting (turning it counterclockwise) until the hose is completely disconnected from the old tank. Let the hose dangle temporarily.

Step #3

Connect a new hose:

4. Pick up a free end of the unattached hose.
5. Push the hexagonal fitting away from the free end of the hose, so that the rigid opening of the hose is exposed.
6. Locate the "Liquid" valve of the new tank.
7. Position the rigid opening of the hose directly against the "Liquid" valve of the new tank. Make sure that the openings are flush against each other in a straight line.
8. Use your fingers to turn the hexagonal fitting clockwise, screwing it onto the "Liquid" valve.
9. Continue turning the hexagonal fitting with your fingers until it stops. If the hose does not screw on easily, unscrew it, adjust the fitting so it is completely in line with the valve, and try again.
10. Use the wrench to gently turn the hexagonal fitting (clockwise) a small additional amount until it stops.
    Note: Do not be forceful with the wrench!



Step #4

Dispense liquid nitrogen:

11. Place the end of the hose into your dewar.
12. Turn on the "Liquid" valve on the new tank
    Note: If the "Liquid" valve has a lever, push the lever completely in the "open" direction. If the "Liquid" valve has a knob, turn the knob completely in the "open" direction, and then turn it about a half-turn in the "close/shut" direction.
13. When you have dispensed enough LN2, close the valve.
    Note: The "Liquid" valve may have a knob (turn it completely in the "close/shut" direction) or a lever (push it completely in the "close/shut" direction).

Step #5

Remove the hose:

14. Wait for the hose to warm up. You will likely need to come back later.
15. Use the wrench to gently turn the hexagonal fitting counterclockwise, unscrewing and loosening the hose from the LN2 tank.
    Note: Avoid unscrewing the hose when it is cold. The hexagonal fitting should be the only piece that rotates. If other pieces of the tank or hose begin to twist, STOP and try again when the metal has warmed up.
16. Use the wrench and/or your fingers to keep unscrewing the hexagonal fitting (turning it counterclockwise) until the hose is completely disconnected from the tank.

Step #6

Reattach the hose from the LN2 freezer:

17. Pick up the free end of the hose attached to the LN2 freezer.
18. Push the hexagonal fitting away from the free end of the hose, so that the rigid opening of the hose is exposed.
19. Locate the "Liquid" valve of the new tank.

20. Position the rigid opening of the hose directly against the “Liquid” valve of the new tank. Make sure that the openings are flush against each other in a straight line.
21. Use your fingers to turn the hexagonal fitting clockwise, screwing it onto the “Liquid” valve.
22. Continue turning the hexagonal fitting with your fingers until it stops. If the hose does not screw on easily, unscrew it, adjust the fitting so it is completely in line with the valve, and try again.
23. Use the wrench to gently turn the hexagonal fitting (clockwise) a small additional amount until it stops.
    Note: Do not be forceful with the wrench!
24. Turn on the “Liquid” valve on the new tank.
    Note: If the “Liquid” valve has a lever, push the lever completely in the “open” direction. If the “Liquid” valve has a knob, turn the knob completely in the “open” direction, and then turn it about a half-turn in the “close/shut” direction.