



HOW TO FILL LHe ON 7T PHARMAScan AT VIVARIUM

1. **General**

- a. Everyone that is participating at the filling session has to be familiar with safety rules regarding MRI and cryogenics and has to have worked with cryogenics before.
- b. During filling, one should avoid transfer of He gas into the magnet (only liquid He should be transferred). Transferring gas would increase pressure in the magnet and could cause a quench.

2. **Preparation**

- a. Remove the back pipe on the top back of the magnet and connect the exhaust pipe with a clamp. Make sure the arrow on the transfer pipe points upwards. This is the direction of the exhaust.
- b. Remove the small screw from the top of the magnet and slide it onto the shorter end of the He transfer pipe. In addition, slide one or two appropriately sized gaskets onto the transfer pipe.
- c. Close the opening on top of the magnet with the plug.
- d. Have a He gas tank ready. Connect the rubber transfer tube from the He tank to the pressure-building valve on the LHe dewar.

3. **To begin filling**

- a. Open all the valves on the LHe tank.
- b. Slowly start inserting the transfer pipe into the tank. Make sure the pressure release valve is open during this procedure. If you hear a strong sound, slow down and wait for the temperature to stabilize.
- c. When you reach the bottom of the tank, lift the pipe back up and check that it is possible to insert the other end of the transfer line into the magnet. Close the safety release valve. You might also need to very slightly close the main valve on the top. This helps to keep the transfer line fixed in position.
- d. Open the He gas tank (the main valve at the top) and then open the flow with the brass valve on the side, next to the flow meter.
- e. Adjust the flow of He gas to a little less than 3 units.
- f. The pressure in the tank will build up and slowly start to push the LHe out of the tank in the form of a "flame" at the other end of the transfer pipe.
- g. When the flame is 6 cm big, one can start inserting the tube into the magnet, and the other side of the tube deeper into the LHe tank.
- h. Insert the tube slowly and listen to the sound. If sound is too loud, slow down.
- i. When the tube hits the bottom, lift it up app. 2 cm and screw down the screw on both sides of the transfer tube.
- j. Also screw tightly the big screw on the top of the magnet.
- k. Now both sides of the transfer tube should be inserted (one side into the magnet and one side into the tank).

4. **During filling**

- a. Change the sampling rate on the cryogen monitor to fill (from normal).
- b. Wait that the system stabilizes. One should see a slight flame on the top of the magnet reaching the ceiling.
- c. **The reading on the monitor should start rising 2-3 units for each reading** (it is important that the filling speed is not faster than that!).
- d. If the reading is not rising up by 2 units, then you can gradually increase the pressure in the He gas tank up to max 4 units.
- e. A full LHe tank can increase the reading on the monitor by 200 units.
- f. When the reading rises by approximately 160 units, start following the sound of the system.
- g. When the sound changes from slow to fast, the tank is empty.

5. **Finishing up**

- a. Disconnect the He gas tube from the LHe tank to stop the pressure from building up.
- b. Open all the valves on the LHe tank. Make sure you enable the safety release valve.
- c. Take out the transfer pipe from the magnet as well as from the LHe tank.
- d. Take the screw and the gasket off from the transfer pipe and screw it back onto the opening on the top of the magnet.
- e. Remove the exhaust pipe in the back of the magnet and screw on the original back pipe.
- f. Close again all the valves on the LHe tank except for the green safety valve, which should be enabled.
- g. **IMPORTANT:** Switch the sampling rate on the cryogen monitor back to normal (from fill).
- h. Write a log of He fill into the logbook.