

## Gas Cylinder Handling Procedures for FRNY Building

This document is to clarify the handling procedures for gas cylinders and liquid nitrogen tanks and the use of the gas cylinder storage area located outside of FRNY.

The compressed gas cylinders are segregated as following:

- Area 1: Return gas cylinders (by PHYS)
  - Flammable gases and non-flammable gases are segregated by distance
- Area 2: New deliveries and storage (NW side of FRNY)
  - Flammable gases and non-flammable gases are stored in separate cages labeled above their doors and are also numbered.



Figure 1. (a) Area 1 - Return cages by PHYS. (b) Area 2 - New arrivals by FRNY.

### ***Receiving procedures:***

1. The individual who ordered the cylinder will be notified by email when the cylinder arrives.
2. Each research group will be issued one key. This key should be used to gain access to both Areas 1 and 2, and should be kept in a secure place accessible to all the group members.
3. Cylinder carts are available for use outside the shipping/receiving hallway.
4. Make sure you have the appropriate PPE – safety glasses, sturdy closed toed shoes, long pants.
5. For correct use of gas cylinder carts follow the instructions clearly posted on the cart and at the bottom of this document.

6. Use the ramp on the NE side of FRNY to take the cart to Area 2 for new arrivals.
7. As soon as you unlock any cylinder cage, place 4 orange safety cones on the bike track from both sides of the cylinder storage area, to warn bikers of obstructions. Safety cones are available inside one of the cages. Retrieve the cylinders from the corresponding cage(s).
8. Before leaving, make sure that the cage is locked and the paddling lock is closed in place.
9. When transporting the cylinder to your lab, **DO NOT CROSS** any bridges between the old and new wings of FRNY with gas cylinders! Use the ground floor (through the atrium if needed) to access the elevator on your side of the building.
10. After securing the cylinder in your lab, return the cart to its original location.

### ***Returning empty cylinders procedures:***

1. Make sure you have the appropriate PPE – safety glasses, closed toed shoes and long pants
2. Retrieve the cart from outside the shipping/receiving hallway. For correct use of gas cylinder carts, follow the instructions clearly posted on the cart.
3. Use the elevator on your side of the building to get to the ground floor - **DO NOT CROSS** any bridges between the old and new wings of FRNY with gas cylinders!
4. Take the empty gas cylinders to Area 1 using the ramp on the NE side of FRNY and place them in the corresponding storage area (based on flammability). If the gas is marked as being an oxidizer, place them on the far end of the non-flammable section, away from the flammable gases.
5. Before leaving, make sure that the cage is locked and the paddling lock is closed in place.
6. Return the cart to its original location.

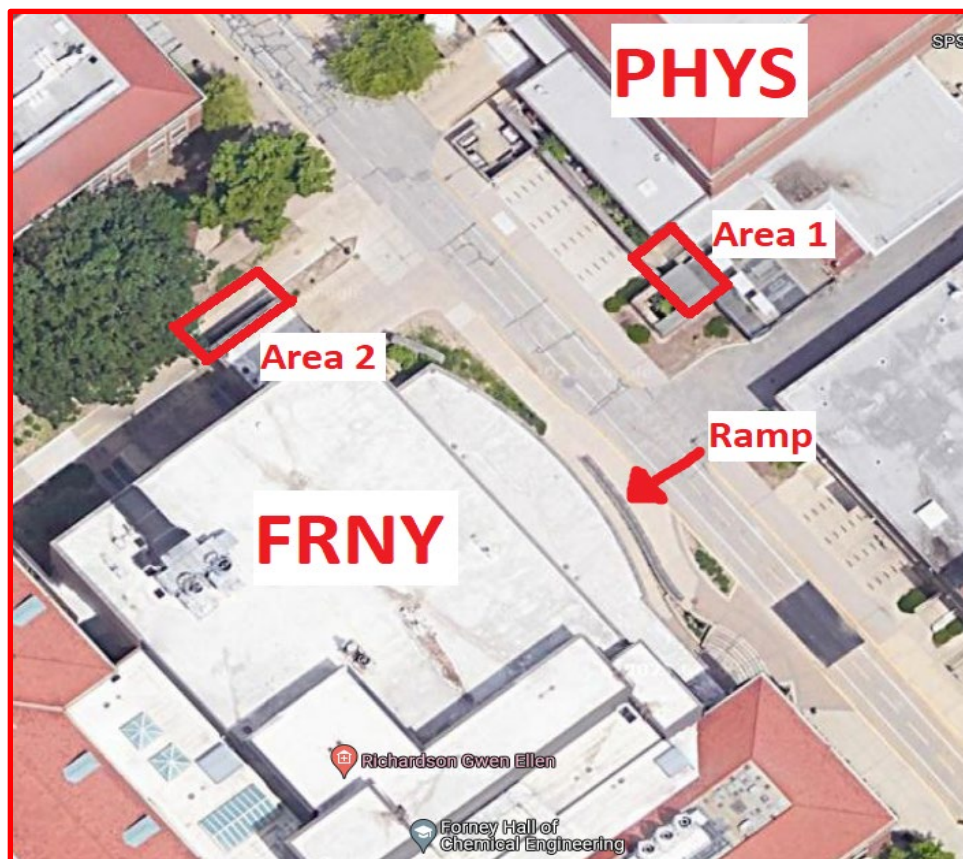


Figure 2. Satellite image of FRNY and locations of the gas cylinder cages.

## **General notes:**

- ❖ A cylinder should be picked up or moved from the incoming cage **within 2 days of notification**.
- ❖ Use two hands to **PUSH** the gas cylinder cart. **DO NOT PULL** gas cylinder carts.
- ❖ **DO NOT** handle two gas cylinder carts simultaneously! **Only one cart** should be handled by one person at a time.
- ❖ Oxidizing gases are considered non-flammable. **DO NOT** store oxidizing gases next to flammable gases - rather, separate them by distance in the return cages in Area 1.
- ❖ If your cylinder is obstructed by other cylinders, gain access to it by moving these cylinders and securing them with chains available in each cage. **DO NOT** leave any cylinders unsecured at any time.
- ❖ Be aware of inclement weather conditions that could affect the easy movement of gas cylinders. E.g.: do not attempt to move cylinders when there is a snow storm or when the walkways are not cleared. If the cage locks are frozen, use the deicer available in FRNY G134 during normal working hours. If necessary, use the lifting platform at the receiving area to bring your full gas cylinder into the building (during normal working hours).
- ❖ Before attempting to move/transport any gas cylinders or liquid nitrogen tanks, visually inspect the cart for mechanical integrity, and make sure the cylinder is safely secured to the cart. **DO NOT** use defective carts!
- ❖ **ALWAYS CHECK** the pressure and release excess pressure when moving liquid nitrogen tanks or Dewars, empty or full. Carry cryogenic gloves with you to be able to release the excess pressure safely.
- ❖ Use the lifting platform at the receiving area to bring full liquid nitrogen tanks into the building. Due to the heavy weight of a full liquid nitrogen tank, it is not safe to bring it inside the building via the ramp on the NE of FRNY.
- ❖ Liquid nitrogen tanks should always be handled by two people during transportation.
- ❖ If you don't feel comfortable handling the gas cylinder cart, or the liquid nitrogen cart, **STOP** and ask your supervisor or colleagues for assistance.
- ❖ **When using the elevator** to transport liquid nitrogen tanks or gas cylinders (full or empty) follow this procedure:
  1. Send the tank/gas cylinder cart unaccompanied to the upper/lower floors.
  2. One person is loading the tank/gas cylinder cart in the elevator, while the second person is waiting for it at the destination floor.
  3. The big elevator in the new wing and the elevator in the old wing are fitted with magnetic belt barriers, to prevent people from boarding the elevator (should it stop at intermediate floors). The person loading the tank/gas cylinder cart in the elevator secures the belt barrier in place, exits the elevator and sends the load to its destination floor.
  4. Make sure that no one is using the elevators while gas cylinders and Dewars are being transported in them, for both full and empty cylinders.
  5. Upon arrival, the person waiting on the destination floor releases the belt barrier and removes the tank/gas cylinder cart from the elevator.
- ❖ **Make sure** the liquid nitrogen tank and gas cylinders come to room temperature before using them. Very cold/hot weather outside will cause pressure changes in the cylinder.