How to load a PAC can for a HB-2C WAND^2 experiment at your home institution:

Loading a PAC can

Introduction, Notes

1. Vanadium PAC cans are available in nominal diameters of 6, 8 and 10 mm. Can height is ~5.64 cm. The WAND^2 mail in program uses a Al lid with a threaded 1/4-28 stud, and an optional Cu gasket (Figure 1).

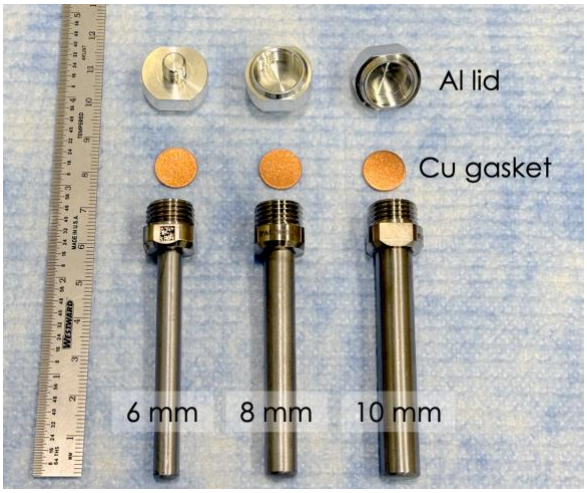

Figure 1. HB-2C WAND^2 mail in program uses a Al lid, Cu gasket, and V can.

2. For low temperature 2-100K measurements:
    a. For air- or humidity- sensitive samples, **cans must be filled with Helium** to prevent the formation of ice. If you are unable to load the cans under helium, please note this in the sample loading sheet and notify instrument scientists. The cans will be backfilled with helium once they arrive at HFIR.
    b. For air-stable samples, if the user doesn't have access to a He environment, the sample can be loaded without the Cu gasket. Instead, use quartz wool to prevent the powders from moving.
3. Cans should be received emepty and clean. However, we recommend users cleaning cans with alcohol/ethanol. Please handle V cans carefully. They are costly and prone to bending or other types of damage.

Sample loading steps

1. Weigh and record the weight of the empty can with the Al lid, with or without the Cu gasket, depending on the sample requirements (as detailed above).
2. Support the can upright. Note: Upside-down funnels, sockets, and tube racks can work well as holders.
3. Pour sample powder into can.
4. Measure Sample Height (in mm, Figure 2) from the bottom of the can and log it on the loading sheet.
5. On the loading sheet, record the container ID (PACXX####, Figure 2) and Sample Height (mm).

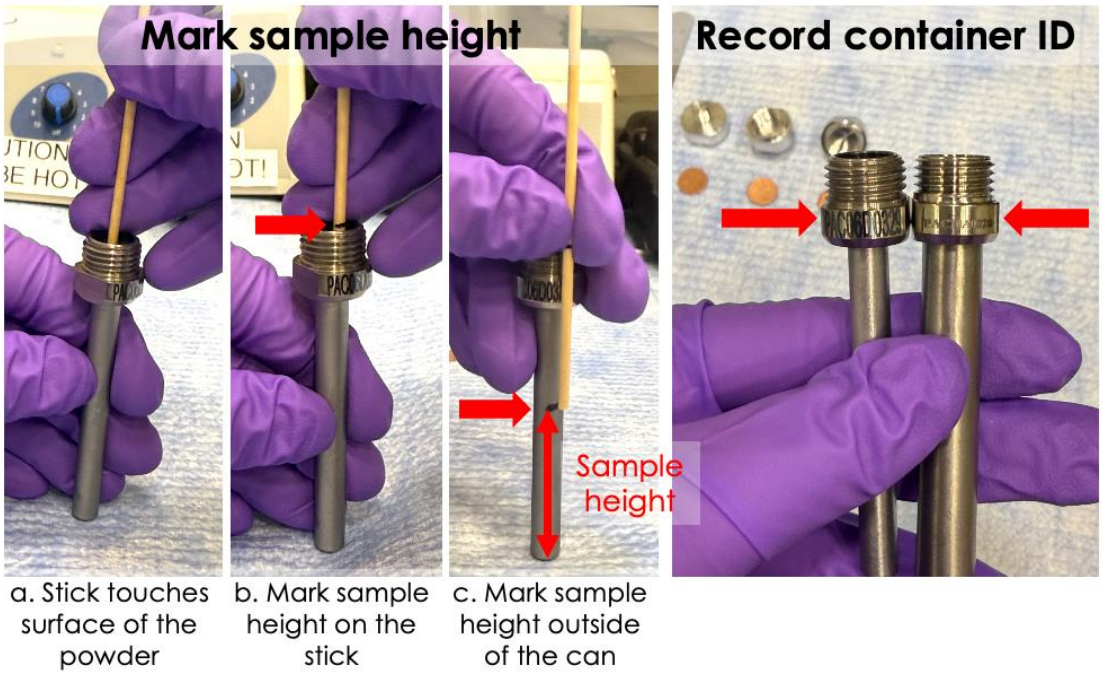

Figure 2. Measure and mark the sample height, then record the sample height (mm), container ID, and sample weight (g) in the sample loading sheet.

For air- or humidity- sensitive samples with Cu-gasket:

6. Place the Cu gasket on top of the can or inside the lid (Figure 3). Make sure to carefully center the gasket. This is necessary for a proper seal to be made. A poorly centered gasket can lead to leaks.
7. Thread lid onto the can and hand tighten, enough that the lid will not easily loosen.

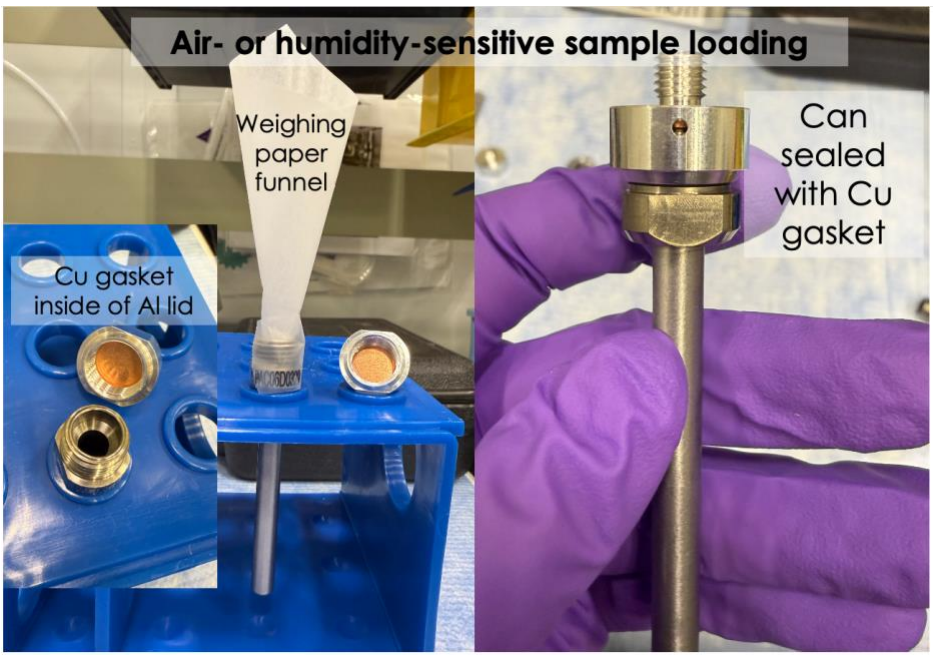

Figure 3. Air- or humidty- sensitive sample loading with Cu gasket.

How to load a PAC can for a HB-2C WAND^2 experiment at your home institution:

8. Tighten the lid using two wrenches (1/2" for the can collar and 5/8" for the lid, Figure 4).
    a. Only use wrenches with flats. Using a wrench with teeth will damage the can and may compromise your experiment.
    b. Sealing the cans requires approximately 100 in·lbs /11 N·m of torque.
9. Weigh the total weight of the can, lid, Cu gasket, and sample. Calculate the Sample Weight (g) and record it on the Sample Loading sheet.

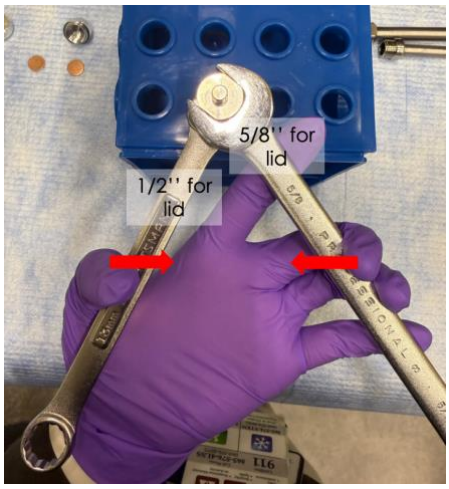

Figure 4. Tighten the lid using two wrenches.

For air-stable samples without Cu gasket:

6. Place the quartz wool in the can collar to prevent the powders from moving (Figure 5). Ensure the wool is securely positioned to avoid it falling to the bottom and being exposed to the beam.
7. Screw the lid onto the can and hand-tighten securely.
8. Weigh the total weight of the can, lid, and sample. Calculate the Sample Weight (g) and record it on the Sample Loading sheet.

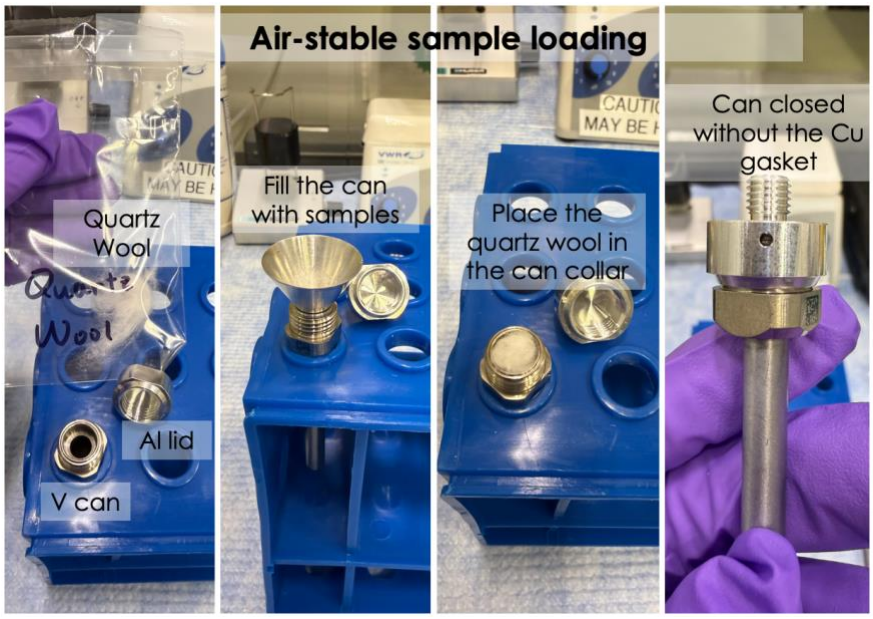

Figure 5. Air-stable sample loading with quartz wool.

Sample Shipping Requirements

1. Place each sealed can into a separate bag, labeled with the sample composition, IPTS number and PI name.
    a. Do not put any tape or stickers directly on the can or lid. Parafilm or similar is okay to use.
    b. Cans may be sent in vacuum-sealed bags if air-exposure is a concern.
2. Once all cans are filled, record the loading information (sample weight and height, etc.) in the online Sample Loading Sheet in IPTS (Figure 6). **The online Sample Loading Sheet in IPTS must be filled out before shipping mail-in or remote samples to HFIR.** Incomplete sample information will automatically reject the sample for beam time.
    a. On the proposal summary page in IPTS, click the Sample Loading Sheet button.
    b. Select loading conditions in top box and click the grey Save button.
    c. Enter all Sample Information in table and click the blue Save button.
    d. Once the form is complete, click the "Complete: Send form to sample team" button at the bottom.
3. When shipping the samples to HFIR, pack them carefully to protect from bending or crushing forces. Refer to https://neutrons.ornl.gov/users/shipping-guide for the shipping address and further instructions.

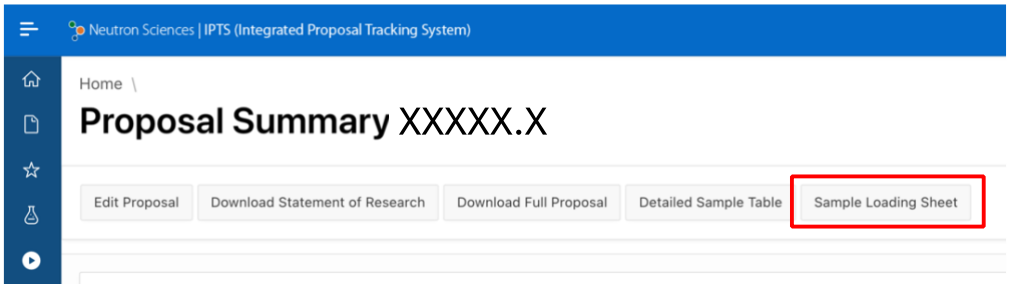

Figure 6. Online sample Loading Sheet in IPTS must be filled out before shipping samples to HFIR.