ACTG/IMPAACT LTC-Hosted BRI Shipping Training

16 January 2026

Agenda

- ACTG Repository Shipment Scheduling Tool
- Proper Handling of LN2 Dry Shippers
- Proper Notification of Shipments to BRI
- LN2 Safety, PPE, and Equipment
- Maintaining Cold-Chain for PBMC Handling During Shipment QC in the LDMS
- Network Shipping Memos

Liquid Nitrogen Hazards

- Liquid nitrogen (LN2, and its vapor) can rapidly freeze skin tissue and eye fluid
  - Result in cold burns, frostbite and permanent eye damage
- Asphyxiation
  - LN2 expands 695 times in volume when it vaporizes and has no warning properties such as color or odor
  - If O2 levels drop below 19.5% there is a risk of oxygen deficiency
  - LN2 must be handled in a room that is well ventilated
- Pressure Buildup
  - Containers must be equipped with pressure relief devices
  - LN2 must never be contained in a closed system

Safety Practices When Handling LN2

- Work with LN2 and store LN2 in a well-ventilated room/area
- Handle LN2 slowly to minimize boiling and splashing
- Use tongs when removing objects immersed in LN2 liquid
- Do not transport LN2 in wide-mouthed dewars without lids
- Only store LN2 in containers with loose fitting lids
- Never touch non-insulated vessels containing cryogenic liquids
- Never tamper with safety deices (e.g., cylinder valves or regulators)
- Do not store LN2 for long periods in an uncovered container
- Do not fill cylinders or dewars to more than 80% capacity

LN2 Tank Safety

high pressure tanks (230 PSI) to withdraw gaseous nitrogen. **Never** use a 230 PSI tank for LN2 transfers. Standard LN2 tanks are 22PSI.

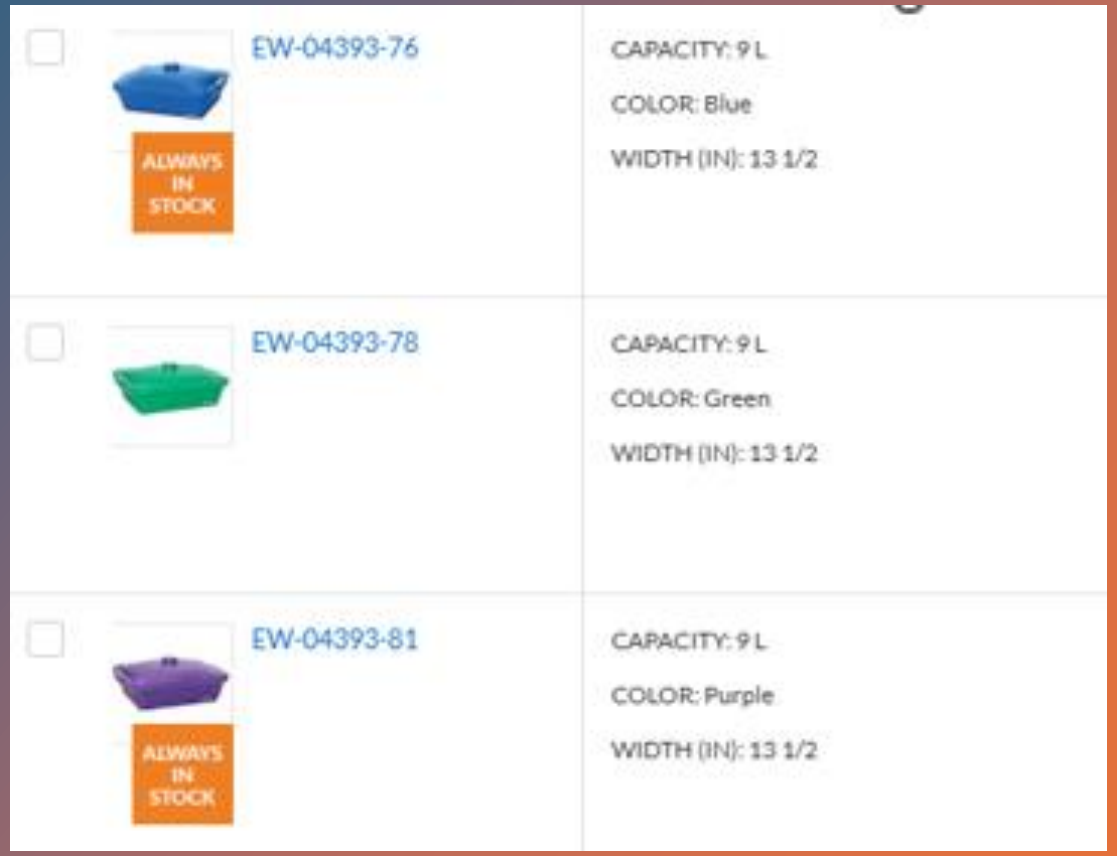
- ***Pressure Builder Valve*** – If pressure gets too low (under 15 PSI), open pressure builder valve for 30 minutes at a time to increase pressure.
- ***Pressure Relief Valve*** – The pressure relief valve will open automatically and release pressure if the tank is over 22 PSI.
- ***Vent Valve*** – if the pressure is too high for the pressure relief valve to correct, open the vent valve to vent out some of the gas.
- If any of the valves or the pressure gauge is not working, contact local LN2 vendor. **Do not tamper with**

Personal Protective Equipment

- Eye Protection
  - Safety glasses or chemical splash goggles
  - Full-face shield
- Skin Protection
  - Loose-fitting thermal insulated or leather gloves
    - They should be quickly removed if LN2 is spilled on them
    - Thermal gloves only provide short-term protection from accidental contact
  - Long sleeve shirts and trousers without cuffs
  - Solid shoes that cover the whole foot
- O2 sensor to monitor oxygen levels in the area – O2 levels should be tracked daily.

Pictures of PPE, Equipment, and Process Examples

Phase Separator

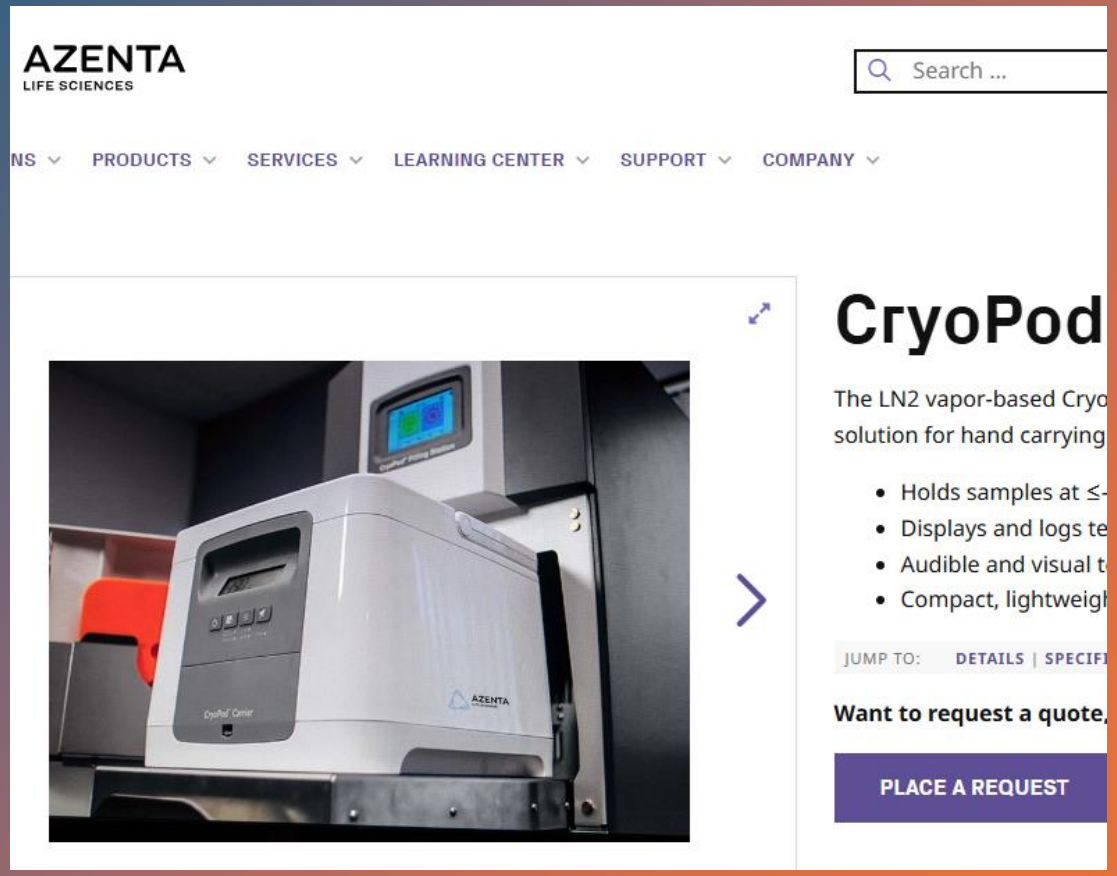


- https://www.coleparmer.com/p/cole-parmer-eva-ice-pans/72831

- Cole-Parmer EVA Ice Pans - Argos Technologies – 9L

- These pans are mess-free and offer superior insulation for any cryogenic medium.

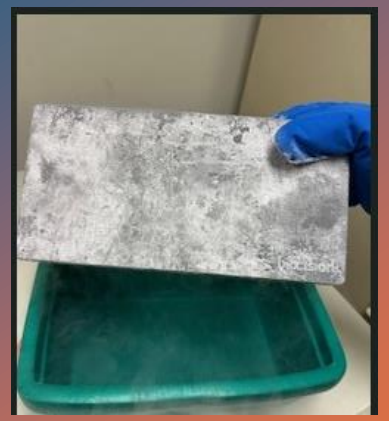
- Ethylene vinyl acetate (EVA) is leakproof and will not “sweat”. It is compatible with ice, dry ice, LN2, alcohol and saline solutions.



- [CryoPod® Carrier for Biological Material Transport | Azenta Life Sciences]

- The LN2 vapor-based CryoPod Carrier provides a safe, portable, and trackable solution for hand carrying temperature-sensitive biological materials.

- It holds specimens at ≤-150°C for over 3 hours
- It displays and logs temperature, date, and time
- There are audible and visual temperature alarms
- It is compact, lightweight, and portable



This is an example of the ice pan that is used and rated for use with LN2.

Biocision cool block (now AZENTA) is removed from -80C freezer and placed in the ice pan (Cool Cell block will also work). You just need a thermo-conductive block rated to go down to LN2 temps to support your cryo box.

LN2 is dispensed from the tilting pour dewar, enough to surround the flat block. This is allowed to equilibrate for 5-10 minutes.

Now the cryo boxes can be removed from long-term LN2 storage, placed onto the freezer system in “vapor phase” and cryovial bar-codes can be scanned.

This is an example of an LN2 transfer pan using smaller cool cell racks and a Cole-Parmer EVA Ice pan and an insulated dewar for transferring LN2 from a 22PSI tank.

Example Procedures:

Before the Transfer

- Ensure transfer is done in a well-ventilated area, **never** in an enclosed space (e.g., closet)
- Wear proper lab attire (lab coat, long pants, shoes that completely cover feet) and PPE (chemical goggles, face shield, cryogenic gloves, cryogenic apron (if using one)
- Ensure the phase separator (if using one) is attached to the nitrogen hose. It allows for a steady stream, reducing splashing of nitrogen. Without the phase separator, liquid nitrogen may pour out erratically which leaves a higher risk of causing burns.

Transfer Procedure

resistance when hand tightening the nut. If there is resistance, stop and reposition the hose. Forcing the hose can ruin the threads and may result in an improper seal and nitrogen leakage.

- Put on gloves and use an adjustable crescent wrench (other wrenches can damage/dull the ridges on the nut) to fully tighten the nut.
- Insert the hose into the dewar. Continue to hold the hose as you slowly open the liquid nitrogen valve.
- Keep an eye on the dewar to make sure it is not overfilling with LN2.
- When you are done filling the dewar, close the liquid valve and then slowly lower hose to the ground. **Careful!** Dropping or throwing the hose to the ground can result in breaking the phase separator.
- Close the dewar.
- Leave the hose attached to the tank until it is warmed up to room temp and no longer frosted. Use the

QC Procedure

- Prepare the transfer pan
  - Place the pre-chilled (-80°C) cooling block(s) in the LN2 transfer pan/bucket
  - Carefully pour LN2 from the Dewar into the transfer pan
- Allow the transfer pan to equilibrate for 5-10 minutes
- Transfer boxes from LN2 vapor phase to the transfer pan, placing them on top of the cooling block(s)
- Working quickly, perform QC in the vapor phase of the transfer pan. Use forceps or other device to handle the cryovials during scanning.
- When complete, return QC’d storage boxes back to LN2 vapor phase until shipped.

Videos on safe handling of LN2:

- https://www.youtube.com/watch?v=THAlCKM1RS8
- https://www.youtube.com/watch?v=0kfEKIEprhM
- https://www.youtube.com/watch?v=itzBjQCyo-I
- https://www.youtube.com/watch?v=2pQWXx7LCRE
- https://www.youtube.com/watch?v=Rp7bmxKEUME

Network Shipping Memos

IMPAACT
International Maternal Pediatric Adolescent AIDS Clinical Trials Network

Memo

To: IMPAACT Clinical Research Sites and Labs

From: Kim Enders, Grants & Contracts Manager, IMPAACT Finance & Contracts

Date: August 6, 2025

Re: JHU NIAID/Pharma Funded Protocol Specimen Shipping

The IMPAACT shipping accounts listed below and managed by Johns Hopkins University will be used to ship IMPAACT protocol specimens to the central specimen repository at BRI or to a designated testing laboratory. **These account numbers are specific to IMPAACT protocols funded by JHU only and should NOT be shared with entities outside the network.**

FOR INTERNATIONAL SHIPMENTS:

- World Courier Account Number: 18658
- Biocair Account Number: IMPA2100

FOR US DOMESTIC SHIPMENTS:

- FedEx Account Number: 873030658

In order to use these accounts, you must adhere to the following guidelines:

1. **The "Billing Reference" line must always include the IMPAACT Protocol number(s) associated with the specimens/shipment. Example: "NWCS 662 study".**

   NOTE: Shipments whose Protocol(s) cannot be verified will be rejected for payment and will be rebilled to the Site/Lab Shipper on record.

2. Any non-IMPAACT protocol specimens that are mistakenly shipped using these account numbers will be rebilled to the Site/Lab Shipper on record. Any rebilling fees incurred will be charged back to the Shipper on record as well.

3. If applicable, Collect Billing approval requests should be sent to IMPAACT-LOC@jhmi.edu . Requests must always reference the specific IMPAACT Protocol(s) associated with the shipment in order to receive approval.

Sites/Labs who do not adhere to the above guidelines will be prohibited from using these accounts for future shipments.

ACTG

To: ACTG Clinical Research Sites and Labs

From: ACTG Leadership Operating Center

Date: November 25, 2025

RE: ACTG LOC Transition from UCLA to UNC

Effective December 1st, the University of North Carolina at Chapel Hill (UNC) will be taking over as the Leadership Operating Center (LOC). As such, new shipping accounts have been created.
Please use the following accounts for any shipments after November 30th, 2025.

FedEx billing account # 209643998
World Courier billing account # 800060147

NOTE: The Biocair account is THEU1200

Failure to use these new accounts may result in your site having to cover these shipments with site funding, so please distribute this memo to all your site staff.

As a reminder, the following continues to apply:

The ACTG Leadership and Operations Center (LOC) can be billed for a shipment if:

- The location is an ACTG funded site.
- The shipment is specifically required within the protocol.
- The contents are solely ACTG samples.
- IQA-Sites must request approval before using our account(s). Please reach out to ACTGShipping@med.unc.edu

Prohibited Uses:

- Requesting samples from a CLOSED study
- Purchasing shipping supplies
- IMPAACT related shipments. If you are trying to ship ACTG and IMPAACT samples together we advise you create two separate shipments and bill each account accordingly. If the ACTG LOC finds charges not pertaining to ACTG protocols the site will be responsible for payment.

Required information for shipments:

Shipper’s Responsibilities

Core Responsibilities

- **Classification:** Determine if the goods are dangerous and classify them correctly (e.g., Biological Substance, Category B).
- **Packaging:** Use approved, compliant packaging, assemble it correctly, and ensure it's suitable for the material and quantity, removing old markings.
- **Marking & Labeling:** Apply accurate hazard labels, UN numbers, and proper shipping names to packages.
- **Documentation:** Complete the Shipper's Declaration for Dangerous Goods accurately, providing all necessary details for handling and emergency response (e.g., for Biological Substance, Category A)
- **Training:** Ensure all personnel involved in preparing dangerous goods shipments receive mandatory, up-to-date training.
- **Compliance:** Follow all IATA Dangerous Goods Regulations (DGR) and any specific airline or local requirements.

Key Actions

- **Confirm Goods are Not Forbidden:** Verify the items aren't prohibited from air transport.
- **Provide Contact Info:** Properly label with Shipper & Consignee info
- **Obtain Permits:** Secure necessary permits (import/export).
- **Declare Details:** Declare all shipment details, special conditions, and required permits.
- **Track Packages**: Track shipments from the time they are picked up until confirmation of delivery is obtained. Shippers must follow-up with the courier if shipments are delayed to ensure the integrity of the specimens is preserved and to ensure delivery is made to the destination.

Questions / Discussion