

VersaProbe-type PHI XPS/AES System

Designed for PHI XPS/AES systems, "these vacuum suitcases" could be configured for a wide range of other process chambers, on the PHI system, it attaches to the existing loadlock chamber in place of the standard 'cap'. This vacuum suitcase consists of a valve, small chamber with a viewport and short manipulator. To operate, with the vacuum suitcase installed and the loadlock/suitcase pumped down, the sample puck is withdrawn into the loadlock after analysis as usual. The manipulator on the suitcase is then lowered to engage the sample puck and lift the puck above the suitcase valve. Close the valve and the puck is under vacuum. Once the loadlock is backfilled, the suitcase can be removed and taken to another instrument with the same loadlock 'cap' or the puck can be stored under vacuum. For longer term storage, a small holding pump could be added to the chamber to maintain vacuum.



NREL Transport Pod

The portable Transport POD contains a removable cassette for handling six unique sample platens. Samples can be delivered from a deposition or analytical system operating under vacuum to the portable POD. Maintaining vacuum, the POD is moved and the samples transferred in vacuum to another tool. The objective is to keep the sample from being contaminated while in transport between tools or while waiting on the next process. The cassette can be removed from the POD, loaded with platens and then reinserted into the Transport Pod. The POD carries its own pumping system and UPS for powering the POD during moves.

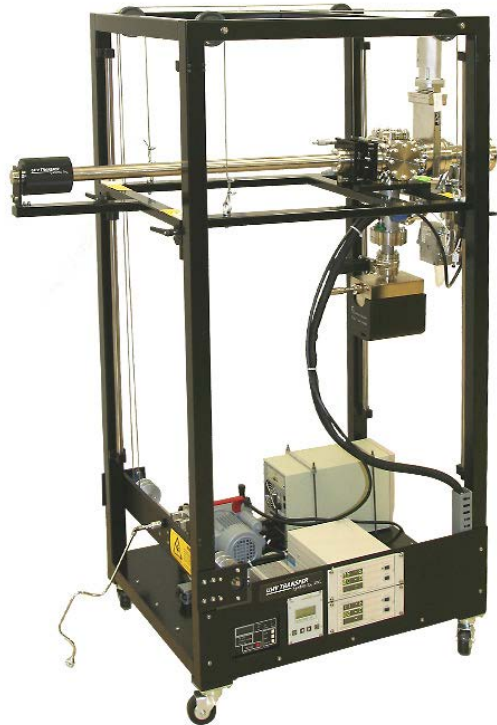
At NREL the POD is used to transport samples between SEM, XPS, AFM and deposition systems. The cart was wedge shaped so it could connect to a port on a chamber containing a centralized robot of a cluster tool. These systems have NRELs standardized interface for acceptance of the portable POD and safety interlocking for the vacuum system of the transfer station and interstitial region between the transfer station and POD. The transfers occur at a facility standardized level of 1100 mm off the floor.



NIST Omicron Multi-level Vacuum Suitcase

This portable vacuum system located at NIST is intended for in-vacuum sample transportation between multiple measurement and fabrication stations. The suitcase is a complete autonomous system mounted on a mobile cart with vertical adjustability for multiple sample transfer heights. It includes a storage chamber, buffer (interstitial) chamber, sample transporter, valves, pumps and gauges with the respective controllers and power supplies.

The system has a UPS (uninterruptible power supply) to maintain power for the ion pump and gauges for periods longer than an hour. The linear/rotary magnetic manipulator has a pincher grip for the handling of Omicron style sample holders, but pincher grips or lift devices could be fabricated for any number of different types of transfers.



University Portable Large Substrate Vacuum Suitcase

This system allows a user to keep five substrates under vacuum while transporting and interfacing to a multitude of vacuum systems. The substrates are loaded one at a time from a loadlock into a cassette. Once loaded, the motorized elevator positions the cassette to allow a manual transfer arm to pick up any one of the substrates and deliver it into whichever process or analysis chamber the system is attached. Two magnet carriages on the manual transporter provide dual-action so the substrate holder can be edge gripped for delivery and/or then "flipped" over for access to both sides of the substrates. One dry pumping station pumps the loadlock and/or the "interstitial region" which acts as the gateway between the cassette chamber and the process module. The cassette chamber is pumped by an ion pump.

The entire vacuum system resides on a frame with adjustable height features. All the electronics are run through a UPS that can power the system independent from a power source for hours.

