A nighttime photograph of the San Francisco skyline, featuring the Golden Gate Bridge and various skyscrapers illuminated against a dark sky with a crescent moon.

Status of Vacuum Process Facilities at SSL

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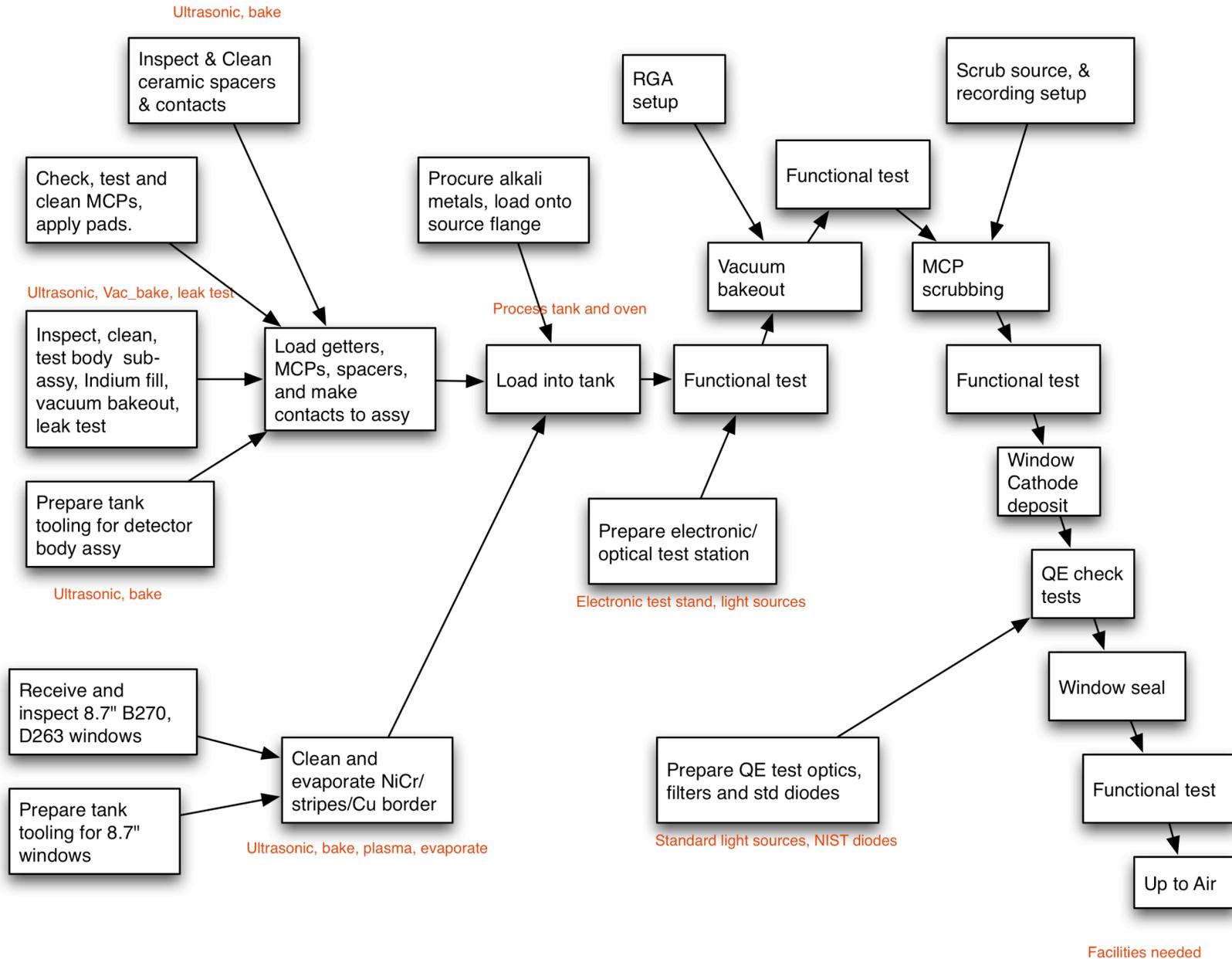


Introduction

- **Process Facilities at the Space Sciences Lab need to support the following:**
 - **Develop process for large sealed tubes of the 8” square design**
 - **New Facilities are needed for the large system**
 - **A large 8.7” format process chamber must be built**
 - Some items are currently available, oven, base, insulators, ion pump supply etc**
 - **Modifications are necessary to existing auxiliary equipment**
 - Plasma cleaner, vacuum bake station, evaporator, Hi-pot etc**
- We are in the process of upgrading the facilities and tools, and refining the program flow for device assembly and processing.**



Sealed Tube Assembly Flow





Facilities at SSL

SPECIFIC FACILITY

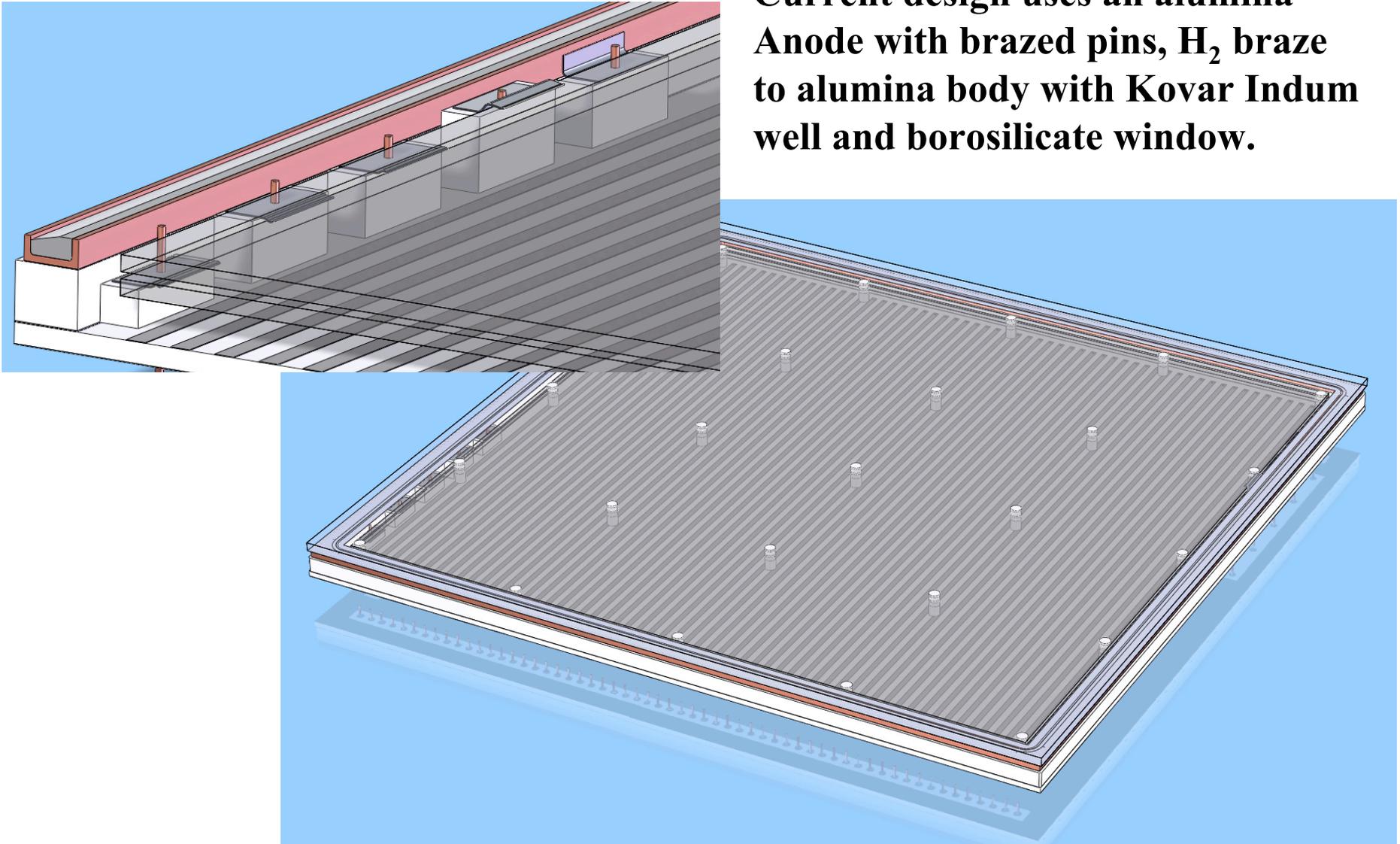
Status

- **Class 100 Assembly Benches** **OK**
- **Precision Wet Cleaning** **OK**
- **Baking** **OK**
- **Vacuum Baking** **Underway, chamber coming**
- **Plasma Etching** **Commissioning**
- **Electrode Evaporation** **OK, need tooling**
- **Hi-Pot Station** **OK, need tooling**
- **Helium Leak Checker** **OK, need tooling**
- **N₂ & Vacuum Storage** **N₂ OK, UHV chamber coming**
- **8.7” Process Chamber** **Design nearly done, parts on order, some existing**
- **Vacuum Test Chambers** **Underway, chamber coming**



8.7" Sealed Tube Configuration

Current design uses an alumina Anode with brazed pins, H₂ braze to alumina body with Kovar Indum well and borosilicate window.





Precision Wet Cleaning

Ultrasonic, chemicals and DI available





Class 100 Assembly Benches

Fully operational, tooled, with spot welder, etc





Plasma Etcher, Vacuum Bake

Plasma etcher awaits pump for commissioning



**New UHV chamber on its way for
Vac-bake/seal tests, will go on existing
pump-station.**



Leak Checker, Evaporator

Both need window specific tooling





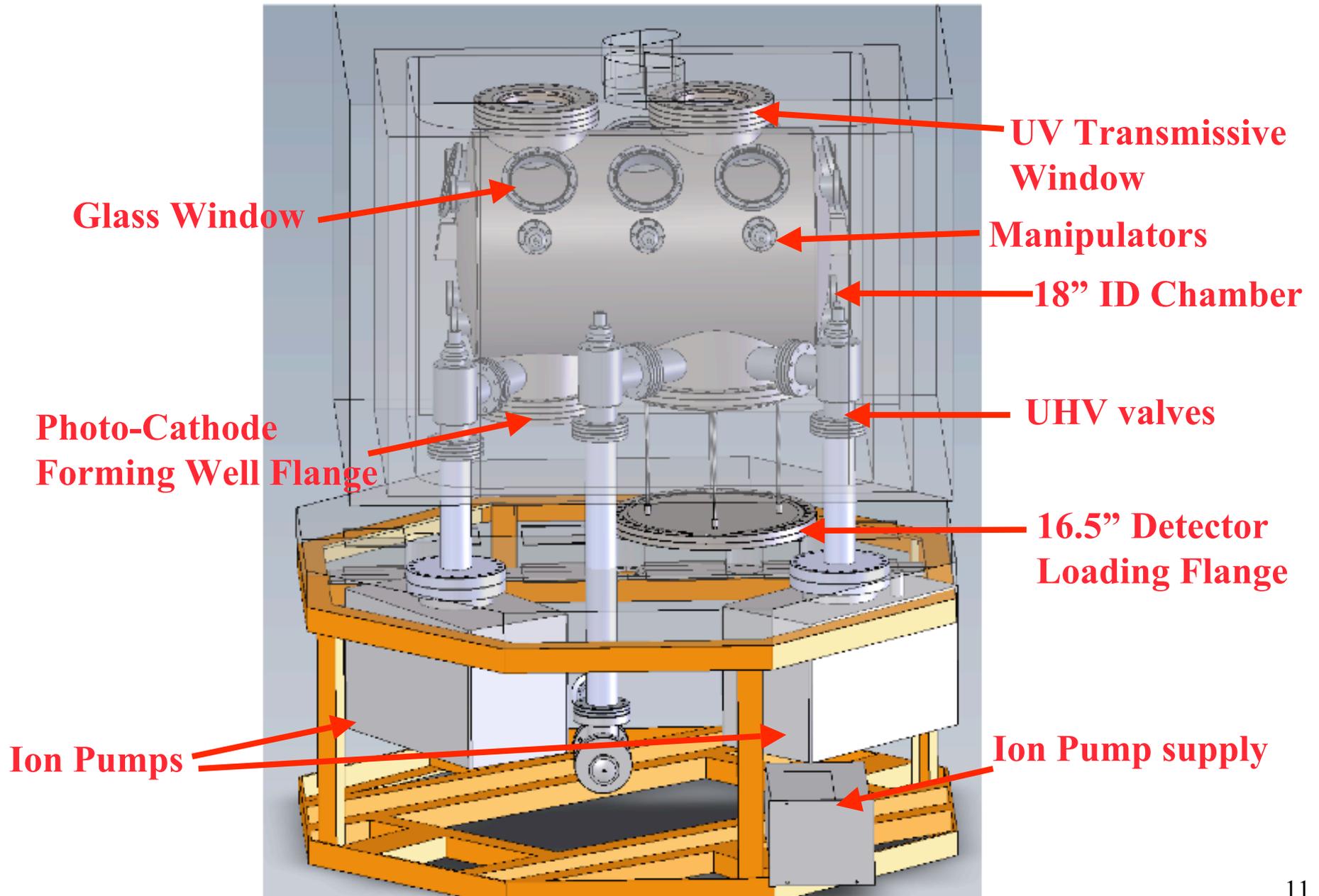
N₂ storage, Hi-Pot belljar

Both facilities are ready to use





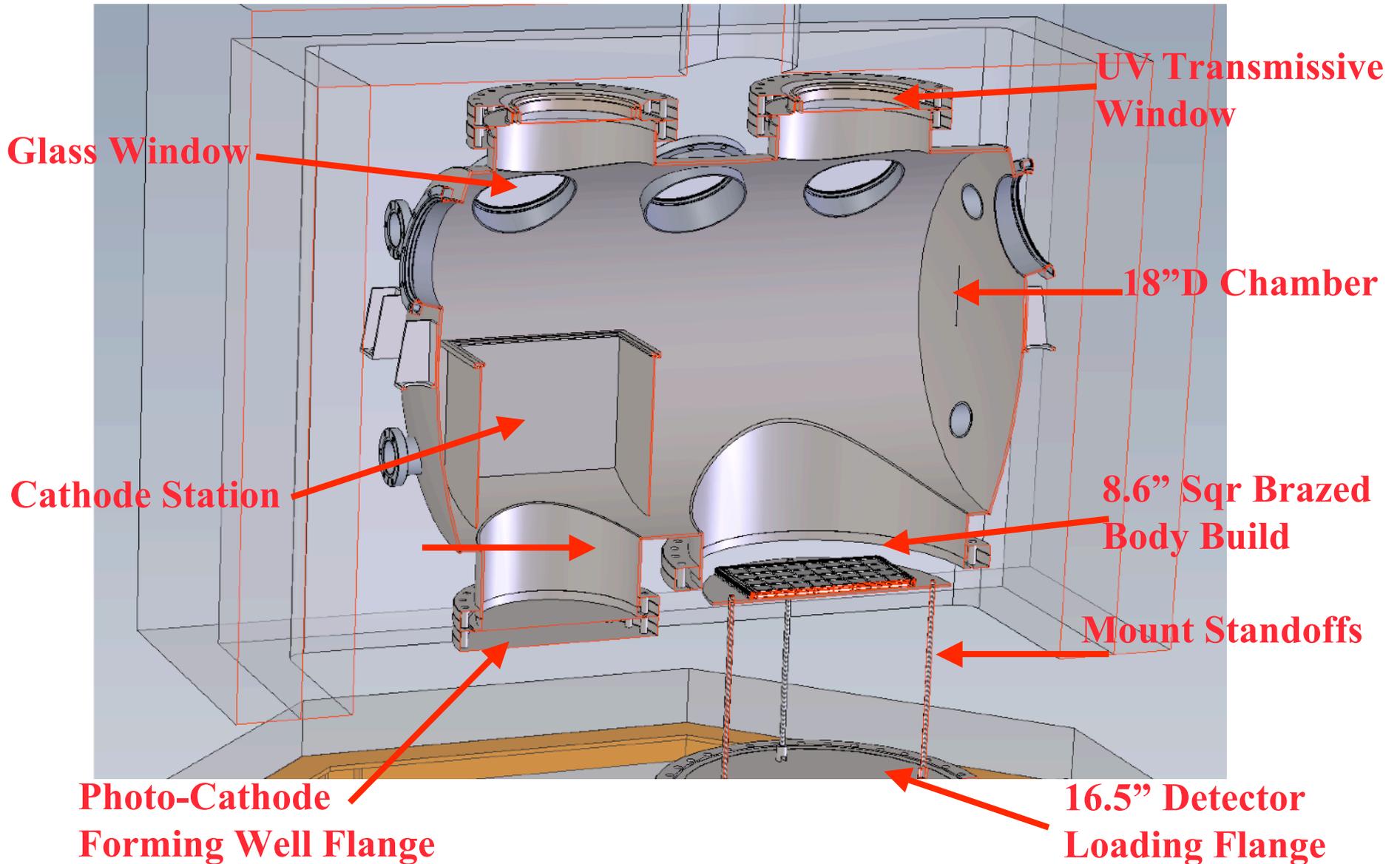
Large Process Chamber





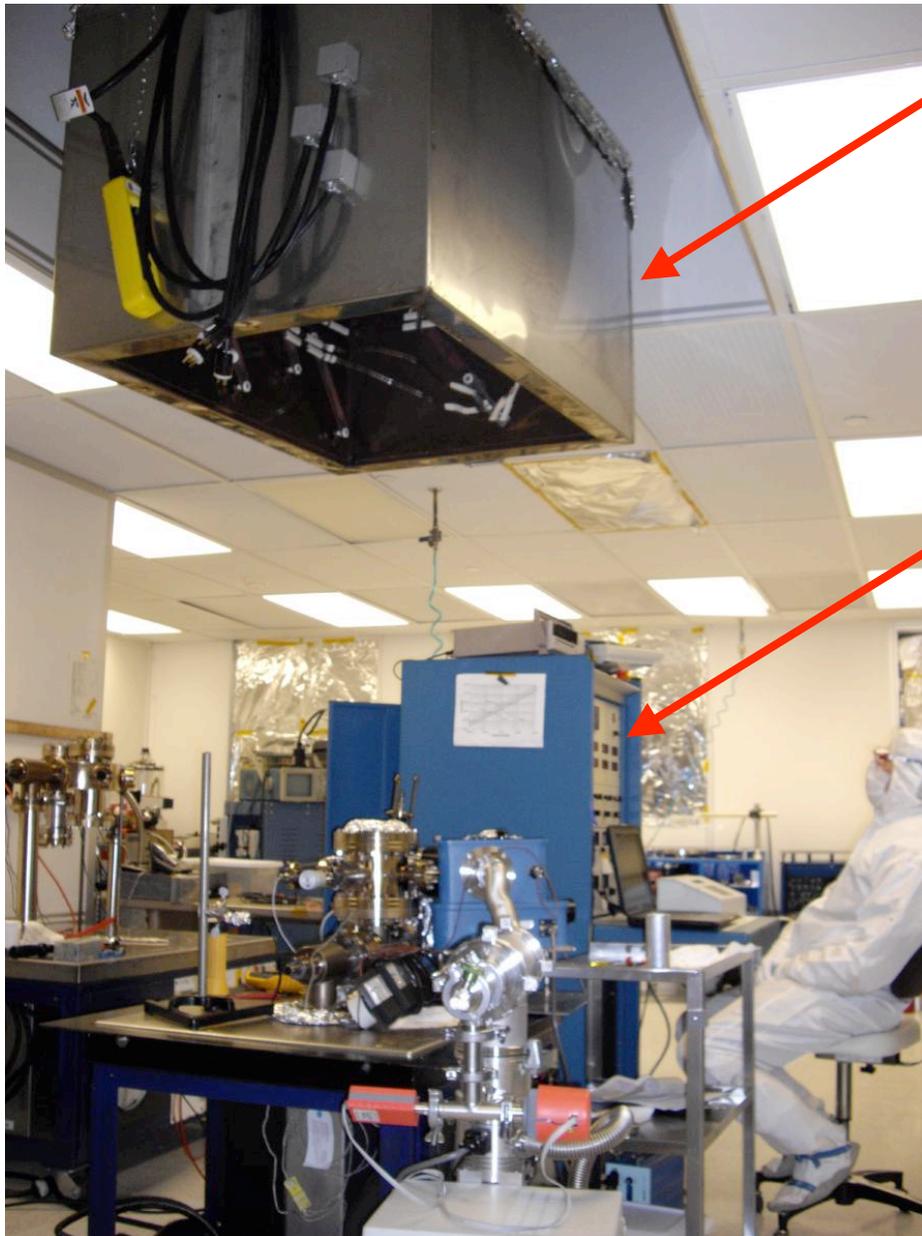
Large Process Chamber

OVERALL DIMENSIONS: 30" LONG, 18.5" WIDE, 22" HIGH





Processing Oven, Cathode Deposition



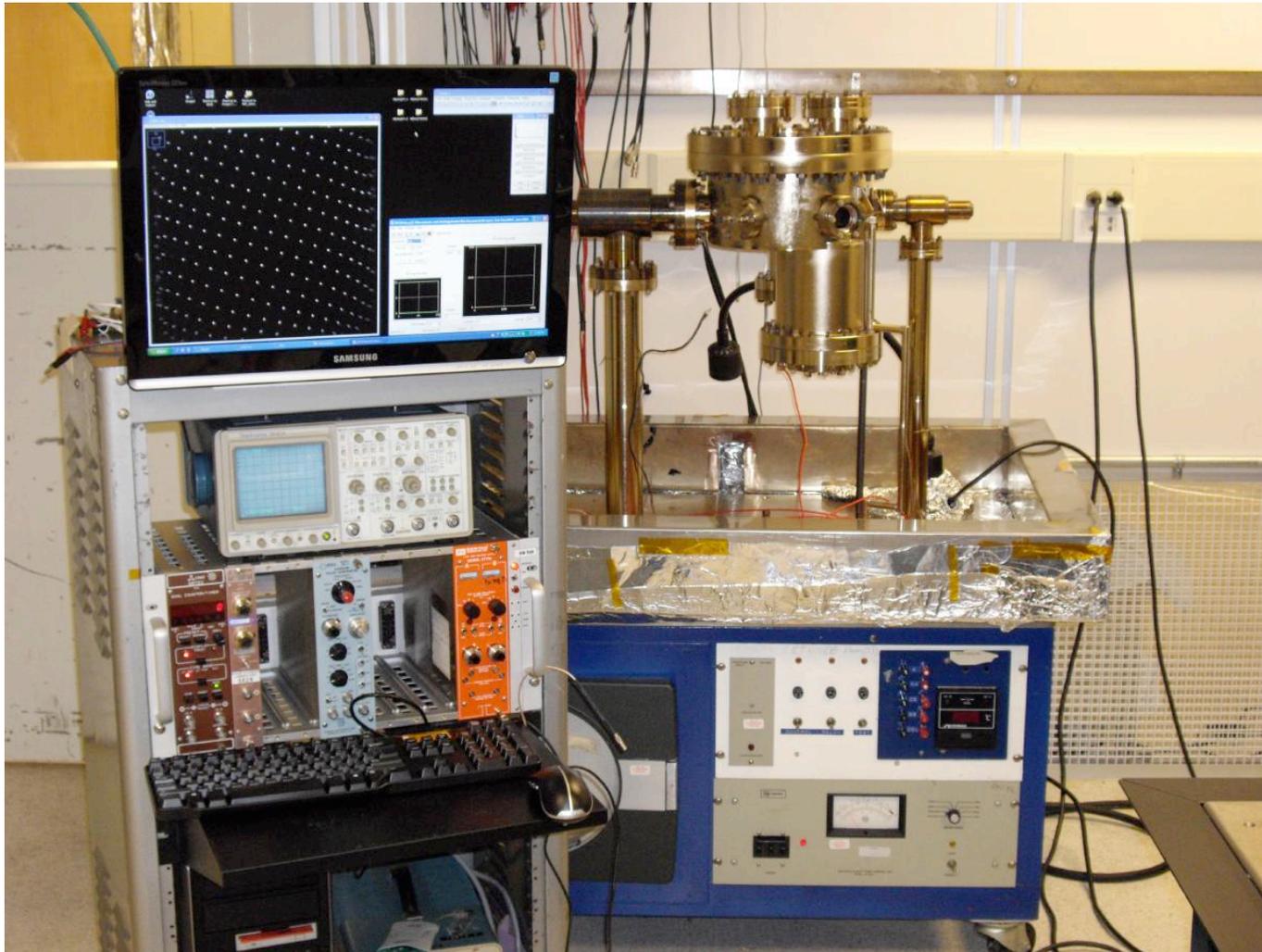
**Oven accommodates Large Format
Inside Envelope: 36" x 30" x 25" High
Defines Large Chamber Limits**

**Cathode station controls alkali metal
deposition, and monitors cathode
response**



System Diagnostics

- SSL Facilities already in place for testing photocathodes or tubes, in situ before and after sealing





Large System Equipment

- **New Large Process Chamber to Accommodate 8.7” Square**
 - Made per SSL design by outside vendor
- **New Window Handling/Transfer Fixtures**
 - Design, machine and install in chamber at SSL
- **Vacuum Flanges, Valves, Plumbing**
 - Many standard and special flanges, electrical feedthrus
 - Manipulator arm vacuum feedthrus
 - metal seal vacuum valves to withstand high temp over 400C
- **Vacuum Pumps, Controls, Gages**
 - Turbo pump cart for pumping to $<10^{-6}$ torr
 - Ion pump system for pumping to $<10^{-9}$ torr
 - Associated vacuum controls and gauges
- **Cart for Process Chamber to support all the above**
 - We have a frame to begin with