

MAGIS Beamline Vacuum Systems Status

MAGIS100-WA.09.05 Vacuum System

- ✓ Pumps & infrastructure intermediate design review – complete
- ✓ Beamtube procurement – complete
- Chamber, controls, instrumentation intermediate design reviews – on deck
- Vacuum chambers processing and fabrication – in progress
- In-vacuum optics outgassing tests and design – in progress
- Re-entrant viewports design/procurement – in progress
- Procure long lead time items – in progress
- Build and test modular section - upcoming

In-vacuum optics outgassing



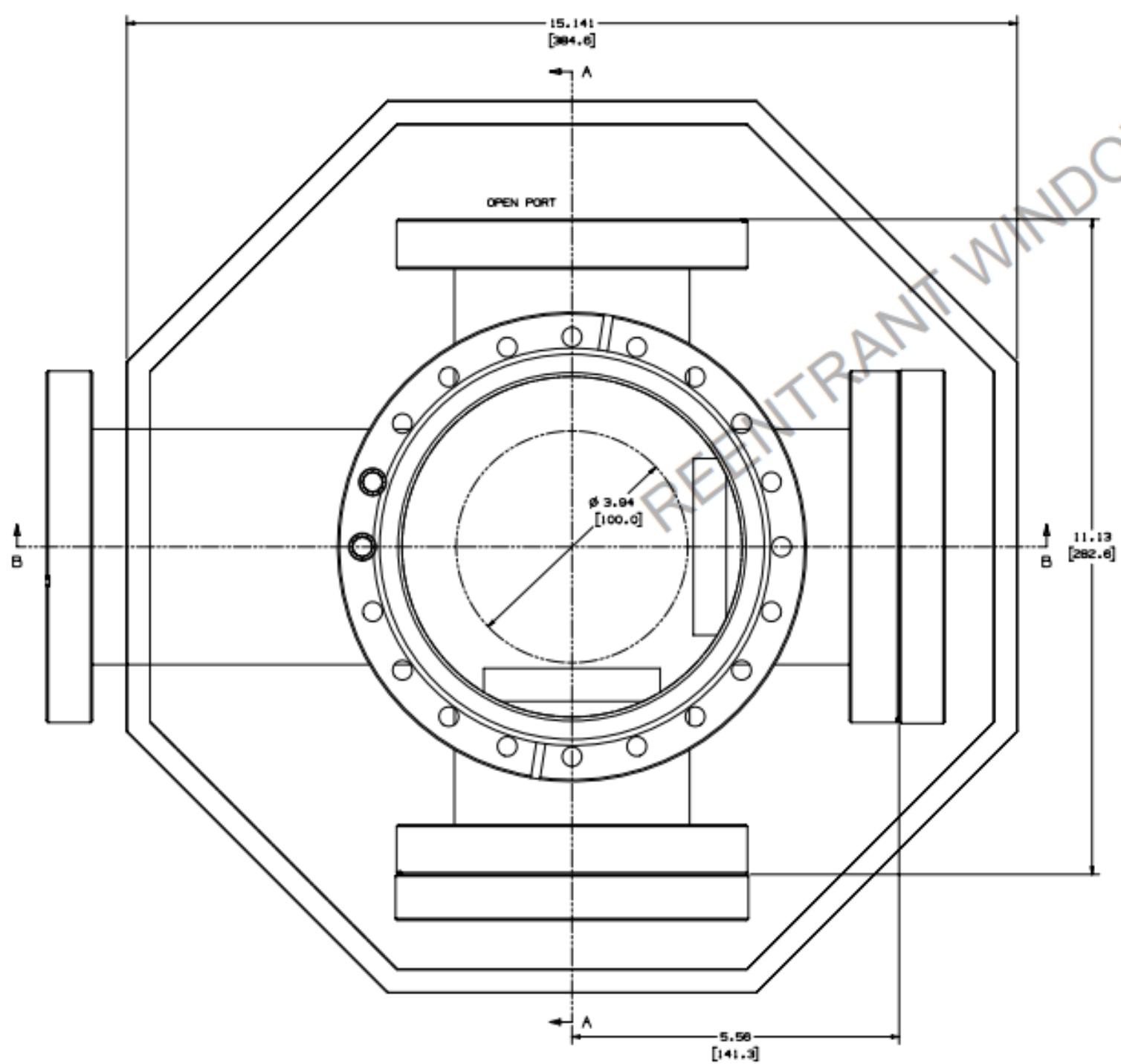
Outgassing test setup

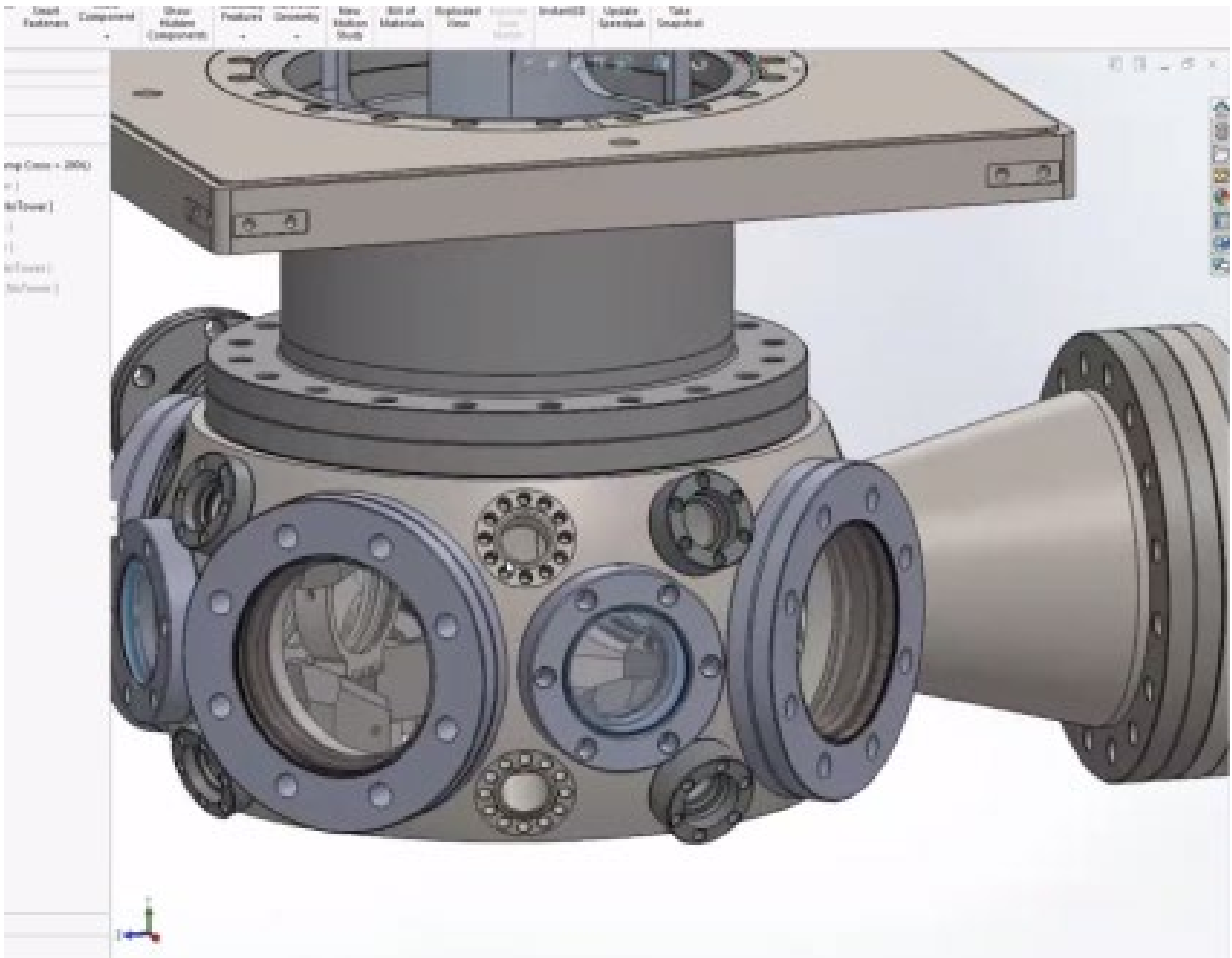


Lens test sample G-3117T

Sample	cleaning method	test date	test time, hrs	q, torr-L/(s*cm ²)
STRESS-JGS2-Wafer- F-1872C; SN F-227 = Ta2O5 & SIO2 Ion assisted	Simple Green soak, DI water rinse, high purity isopropyl wipe	3/11/22	48	indeterminate
STRESS-JGS2-Wafer- G-3117T; F-752 = Hf & SIO2	Simple Green soak, DI water rinse, high purity isopropyl wipe	3/25/22	48	1.3E-08
STRESS-JGS2-Wafer- F-1872C; SN F-227 = Ta2O5 & SIO2 Ion assisted	F-1872C + First Contact™* applied & removed using UHV practices	4/15/22	48	4.0E-09
STRESS-JGS2-Wafer- G-3117T; F-752 = Hf & SIO2, extended pumpdown	Simple Green soak, DI water rinse, high purity isopropyl wipe	3/25/22	200	6.5E-09

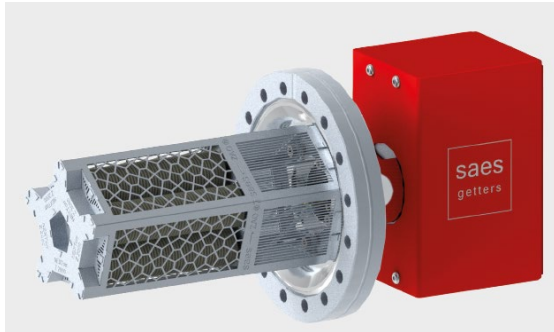
Outgassing tests of available lens coatings aided in selection. Test setup recently upgraded for additional testing of G-3117T that includes bakeout.





Noah storyboard (3/2/22)

Pumps Considered – Gamma IP/NEG & IP/TSP



SAES Z2000.

SAES IP/NEG

- NEG insertion minimizes conductance
- $\mu < 1.0001$ (advertised)
- Activation 500°C, 60 min
- Long cables available
- < 15 lbs
- In-vacuum length 6.4”, outside length 6”



Gamma 200 L/s ion pump



Gamma 3-filament TSP



Gamma TSP sputter shield

Gamma IP/TSP

- Noble diode option available
- Fire in minutes
- Long cables not an option, fire from basket
- Effective pump speed to be confirmed
- Need to keep filaments “warm” during bake

Design questions

- Confirm pump selection with Molflow, likely 200 L/s Gamma + TSP but SAES has new NEX Torr Z2000 that is attractive due to size, weight (<15 lbs)
- Confirm allowable IP neck diameter through magnetic shielding