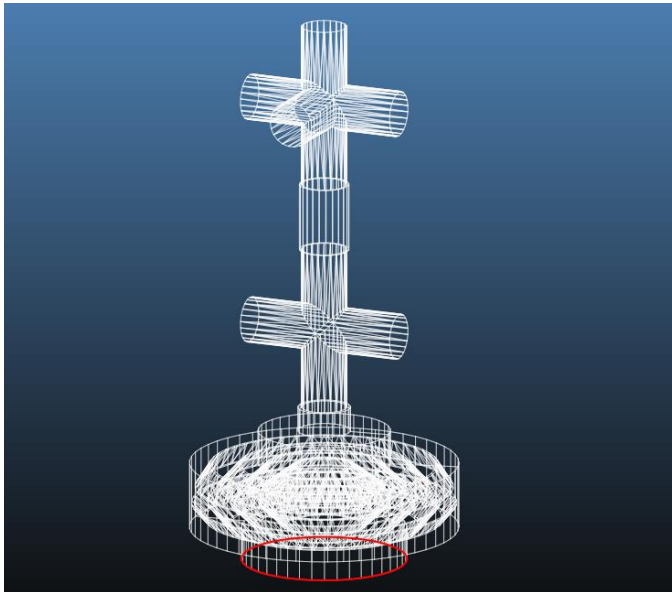


Applied Ion Systems

Molfow+ Simulations of a Small Scale Multipurpose High Vacuum System Facet Parameter Assignments

I. Diffusion Pump Inlet and O-Ring



Simulation 1: Unbaked System, Pumped for <1 Hour

Pumping Speed – 600 l/s

Total Outgassing Load (Viton) – 9.708×10^{-5} mbar*l/s

Simulation 2: Unbaked System, Pumped for >24 Hours

Pumping Speed – 600 l/s

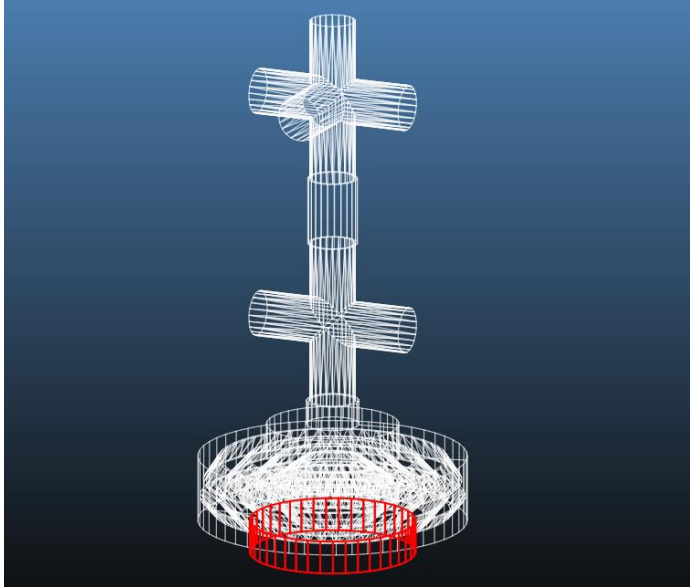
Total Outgassing Load (Viton) – 6.049×10^{-6} mbar*l/s

Simulation 3: Baked System, Pumped for >24 Hours

Pumping Speed – 600 l/s

Total Outgassing Load (Viton) – 3.774×10^{-6} mbar*l/s

II. Adapter Plate 1



Simulation 1: Unbaked System, Pumped for <1 Hour

Outgassing Rate (Aluminum) – $1.066 \times 10^{-6} \text{ mbar} \cdot \text{l/s/cm}^2$

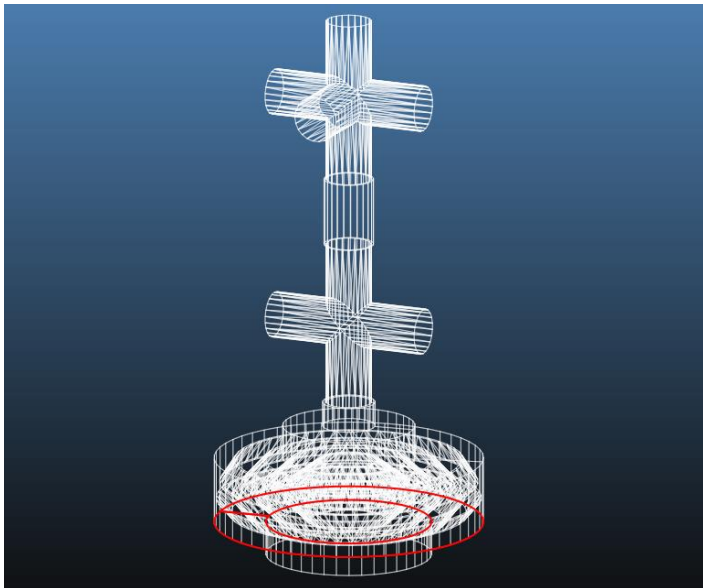
Simulation 2: Unbaked System, Pumped for >24 Hours

Outgassing Rate (Aluminum) – $1.333 \times 10^{-10} \text{ mbar} \cdot \text{l/s/cm}^2$

Simulation 3: Baked System, Pumped for >24 Hours

Outgassing Rate (Aluminum) – $6.665 \times 10^{-13} \text{ mbar} \cdot \text{l/s/cm}^2$

III. Adapter Plate 1 O-Ring and Adapter Plate 1 Top Surface



Simulation 1: Unbaked System, Pumped for <1 Hour

Total Outgassing Load (Viton and Aluminum) – 3.035×10^{-4} mbar*s

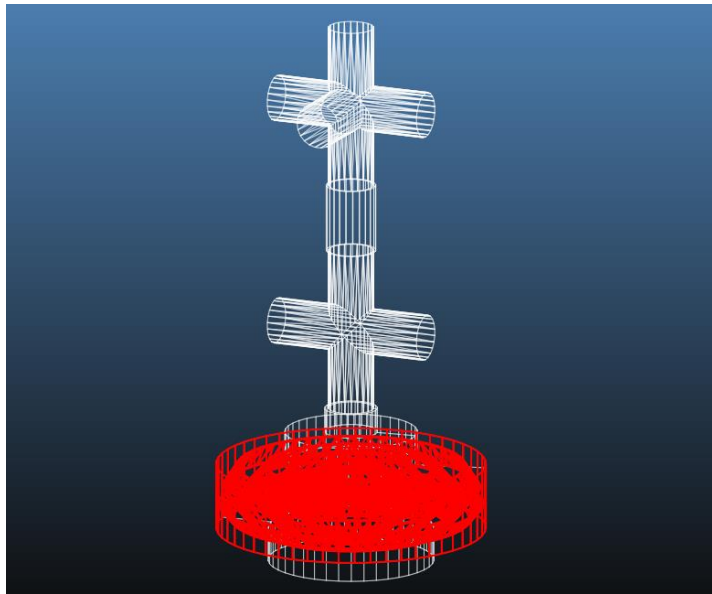
Simulation 2: Unbaked System, Pumped for >24 Hours

Total Outgassing Load (Viton and Aluminum) – 7.431×10^{-6} mbar*s

Simulation 3: Baked System, Pumped for >24 Hours

Total Outgassing Load (Viton and Aluminum) – 5.535×10^{-6} mbar*s

IV. Baffle



Simulation 1: Unbaked System, Pumped for <1 Hour

Outgassing Rate (Stainless Steel) – 6.665×10^{-8} mbar*s/cm²

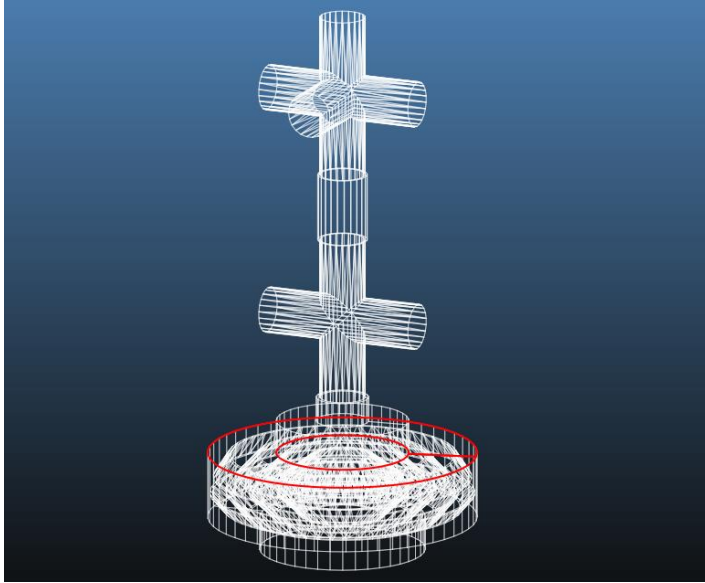
Simulation 2: Unbaked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – 1.333×10^{-10} mbar*s/cm²

Simulation 3: Baked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – 3.999×10^{-13} mbar*s/cm²

V. Baffle O-Ring and Adapter Plate 2 Bottom Surface



Simulation 1: Unbaked System, Pumped for <1 Hour

Total Outgassing Load (Viton and Aluminum) – 3.527×10^{-4} mbar*l/s

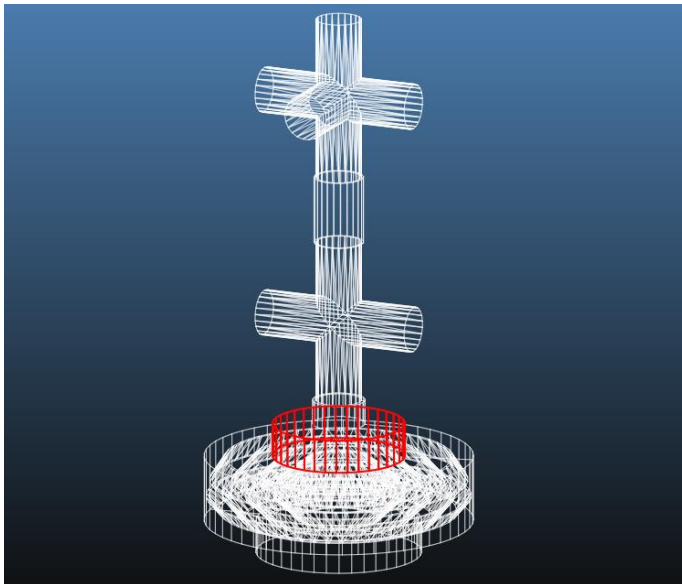
Simulation 2: Unbaked System, Pumped for >24 Hours

Total Outgassing Load (Viton and Aluminum) – 7.499×10^{-6} mbar*l/s

Simulation 3: Baked System, Pumped for >24 Hours

Total Outgassing Load (Viton and Aluminum) – 6.599×10^{-6} mbar*l/s

VI. Adapter Plate 2



Simulation 1: Unbaked System, Pumped for <1 Hour

Outgassing Rate (Aluminum) – $1.066 \times 10^{-6} \text{ mbar}^*1/\text{s}/\text{cm}^2$

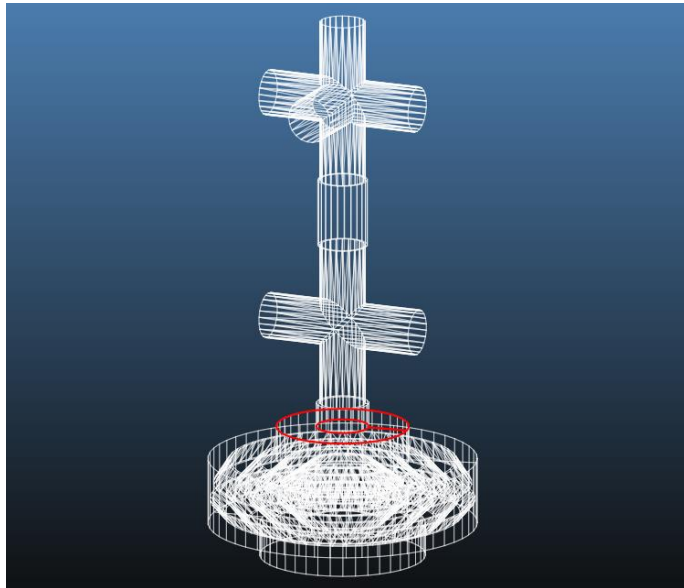
Simulation 2: Unbaked System, Pumped for >24 Hours

Outgassing Rate (Aluminum) – $1.333 \times 10^{-10} \text{ mbar}^*1/\text{s}/\text{cm}^2$

Simulation 3: Baked System, Pumped for >24 Hours

Outgassing Rate (Aluminum) – $6.665 \times 10^{-13} \text{ mbar}^*1/\text{s}/\text{cm}^2$

VII. Adapter Plate 2 O-Ring and Zero Clearance Reducer Bottom Surface



Simulation 1: Unbaked System, Pumped for <1 Hour

Total Outgassing Load (Viton and Stainless Steel) – $4.484 \times 10^{-5} \text{ mbar}^*1/\text{s}$

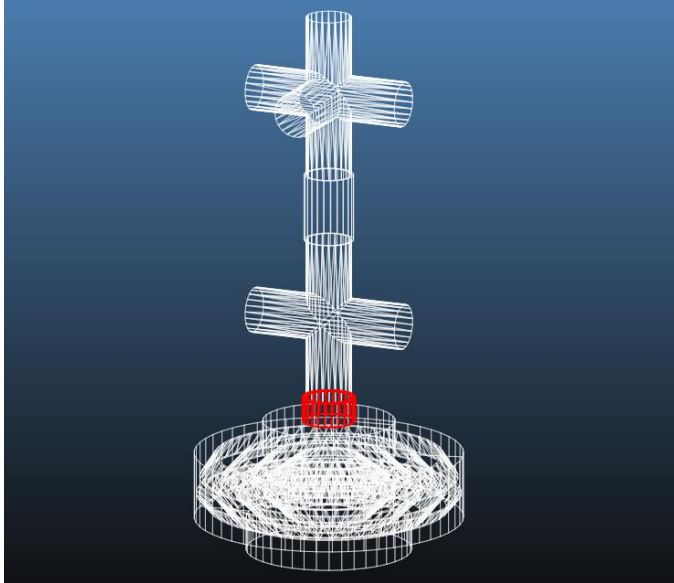
Simulation 2: Unbaked System, Pumped for >24 Hours

Total Outgassing Load (Viton and Stainless Steel) – $4.055 \times 10^{-6} \text{ mbar}^*1/\text{s}$

Simulation 3: Baked System, Pumped for >24 Hours

Total Outgassing Load (Viton and Stainless Steel) – $3.140 \times 10^{-6} \text{ mbar}^*1/\text{s}$

VIII. Zero Clearance Reducer



Simulation 1: Unbaked System, Pumped for <1 Hour

Outgassing Rate (Stainless Steel) – $6.665 \times 10^{-8} \text{ mbar} \cdot \text{l/s/cm}^2$

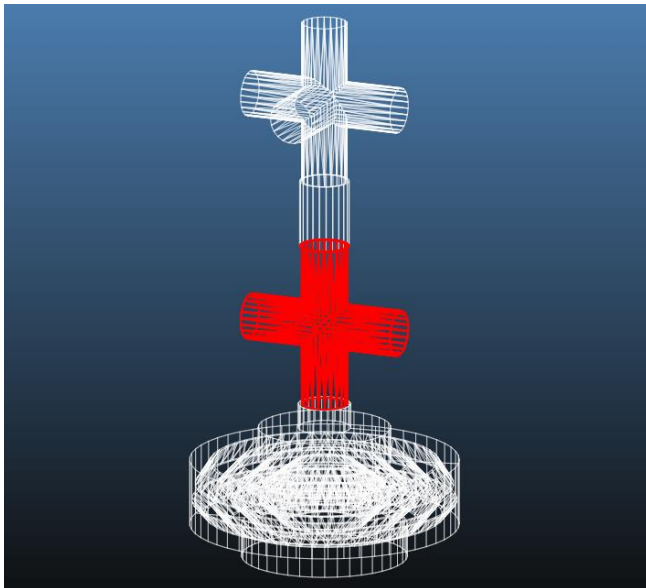
Simulation 2: Unbaked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – $1.333 \times 10^{-10} \text{ mbar} \cdot \text{l/s/cm}^2$

Simulation 3: Baked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – $3.999 \times 10^{-13} \text{ mbar} \cdot \text{l/s/cm}^2$

IX. Four-Way Cross



Simulation 1: Unbaked System, Pumped for <1 Hour

Outgassing Rate (Stainless Steel) – $6.665 \times 10^{-8} \text{ mbar}^*1/\text{s}/\text{cm}^2$

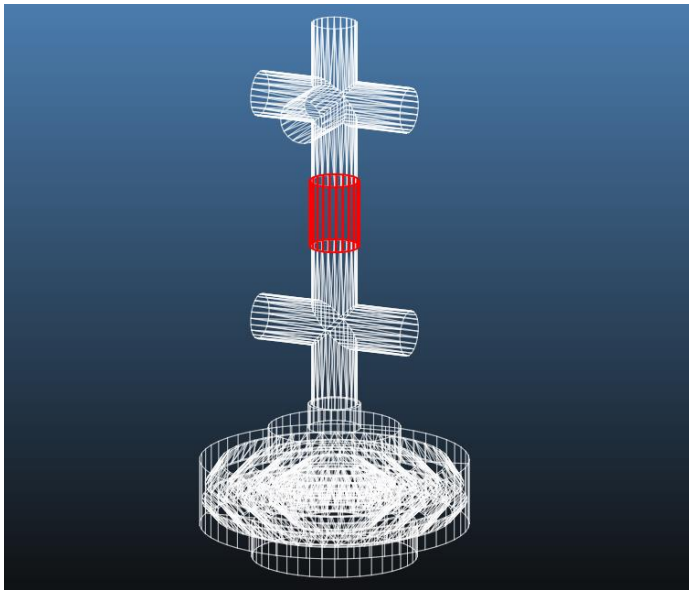
Simulation 2: Unbaked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – $1.333 \times 10^{-10} \text{ mbar}^*1/\text{s}/\text{cm}^2$

Simulation 3: Baked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – $3.999 \times 10^{-13} \text{ mbar}^*1/\text{s}/\text{cm}^2$

X. Gate Valve



Simulation 1: Unbaked System, Pumped for <1 Hour

Total Combined Outgassing Load (O-rings and Stainless Steel) – $2.454 \times 10^{-5} \text{ mbar}^*1/\text{s}$

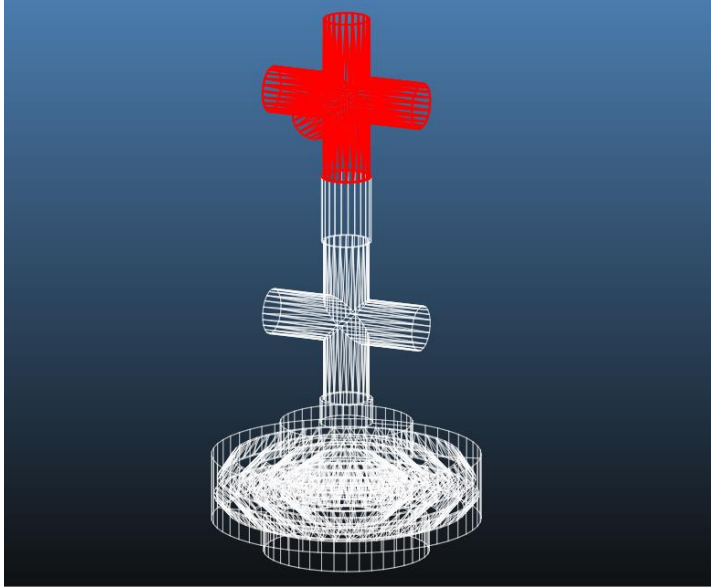
Simulation 2: Unbaked System, Pumped for >24 Hours

Total Combined Outgassing Load (O-rings and Stainless Steel) – $1.652 \times 10^{-6} \text{ mbar}^*1/\text{s}$

Simulation 3: Baked System, Pumped for >24 Hours

Total Combined Outgassing Load (O-rings and Stainless Steel) – $1.168 \times 10^{-6} \text{ mbar}^*1/\text{s}$

XI. Five-Way Cross



Simulation 1: Unbaked System, Pumped for <1 Hour

Outgassing Rate (Stainless Steel) – $6.665 \times 10^{-8} \text{ mbar} \cdot \text{l/s/cm}^2$

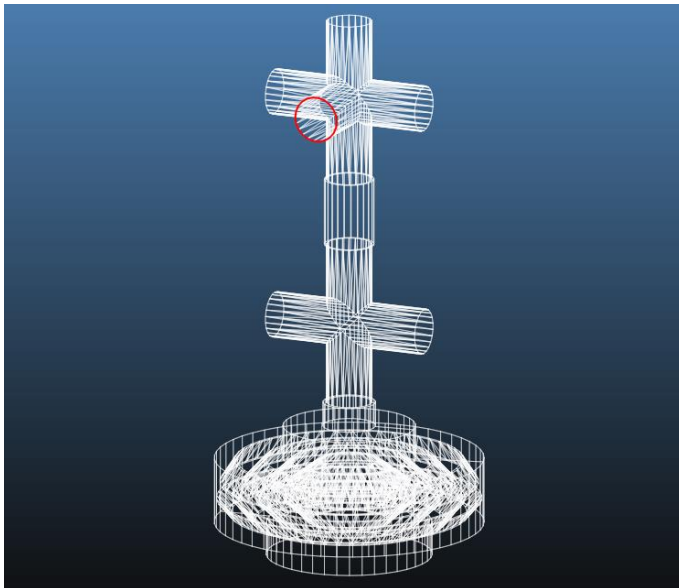
Simulation 2: Unbaked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – $1.333 \times 10^{-10} \text{ mbar} \cdot \text{l/s/cm}^2$

Simulation 3: Baked System, Pumped for >24 Hours

Outgassing Rate (Stainless Steel) – $3.999 \times 10^{-13} \text{ mbar} \cdot \text{l/s/cm}^2$

XII. Viewport



Simulation 1: Unbaked System, Pumped for <1 Hour

Outgassing Rate (Glass) – 1.333×10^{-7} mbar*l/s/cm²

Simulation 2: Unbaked System, Pumped for >24 Hours

Outgassing Rate (Glass) – 6.665×10^{-9} mbar*l/s/cm²

Simulation 3: Baked System, Pumped for >24 Hours

Outgassing Rate (Glass) – 2.666×10^{-9} mbar*l/s/cm²