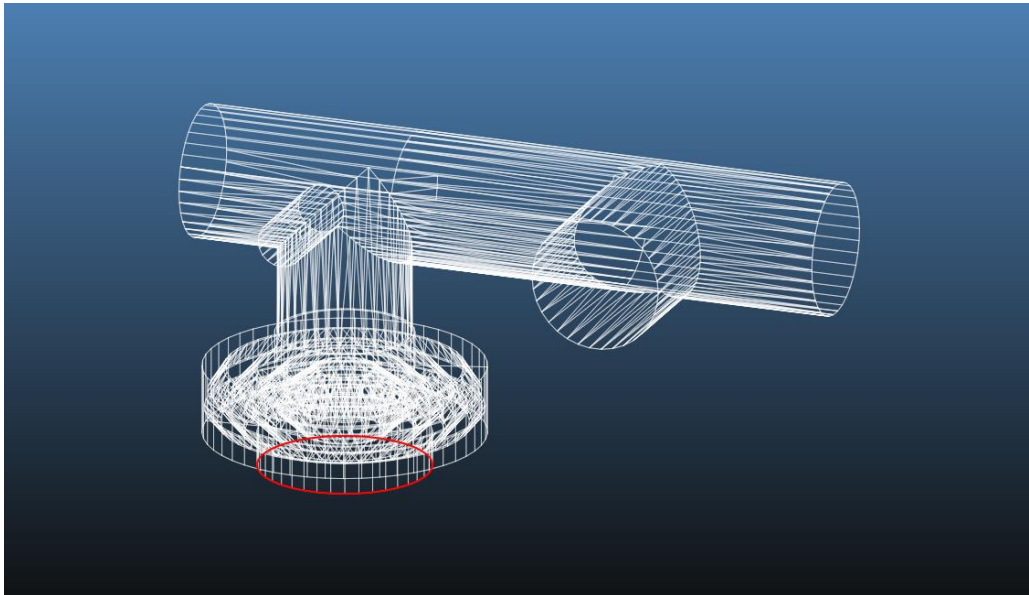


# Applied Ion Systems

## Molfow+ Simulations of a Micro Propulsion Testing Chamber 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) –  $9.708 \times 10^{-5}$  mbar\*l/s

#### **Simulation 2: Unbaked System, Pumped for >24 Hours**

Pumping Speed – 600 l/s

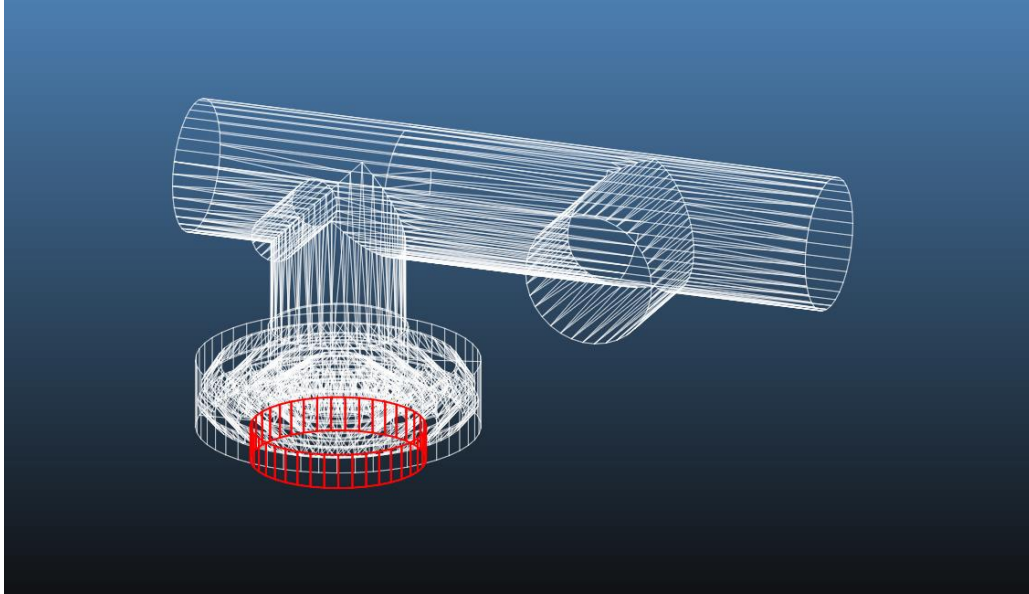
Total Outgassing Load (Viton) –  $6.049 \times 10^{-6}$  mbar\*l/s

#### **Simulation 3: Baked System, Pumped for >24 Hours**

Pumping Speed – 600 l/s

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

### II. Adapter Plate 1



**Simulation 1: Unbaked System, Pumped for <1 Hour**

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

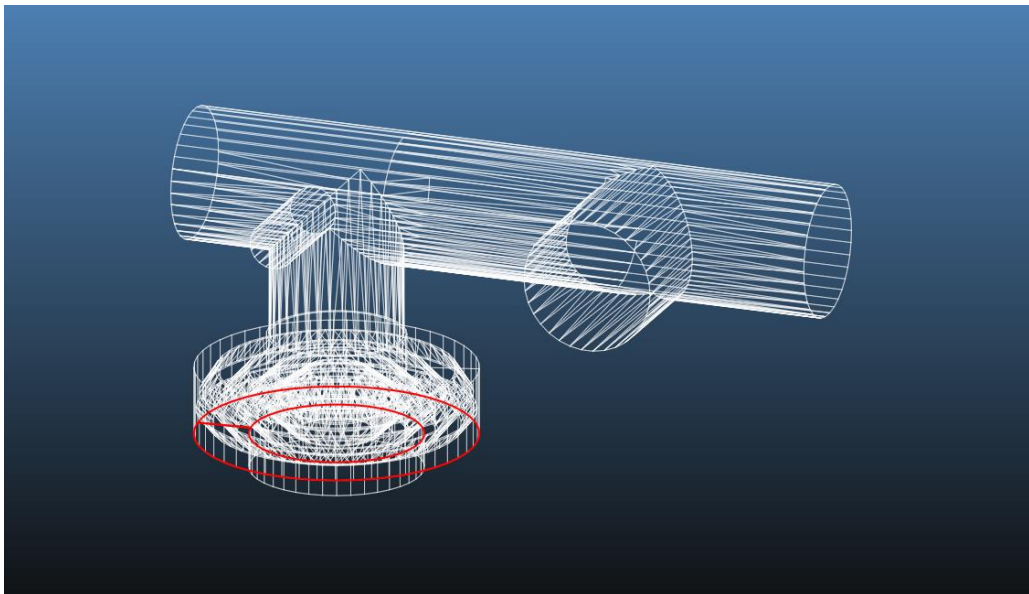
**Simulation 2: Unbaked System, Pumped for >24 Hours**

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) –  $3.035 \times 10^{-4}$  mbar\*s

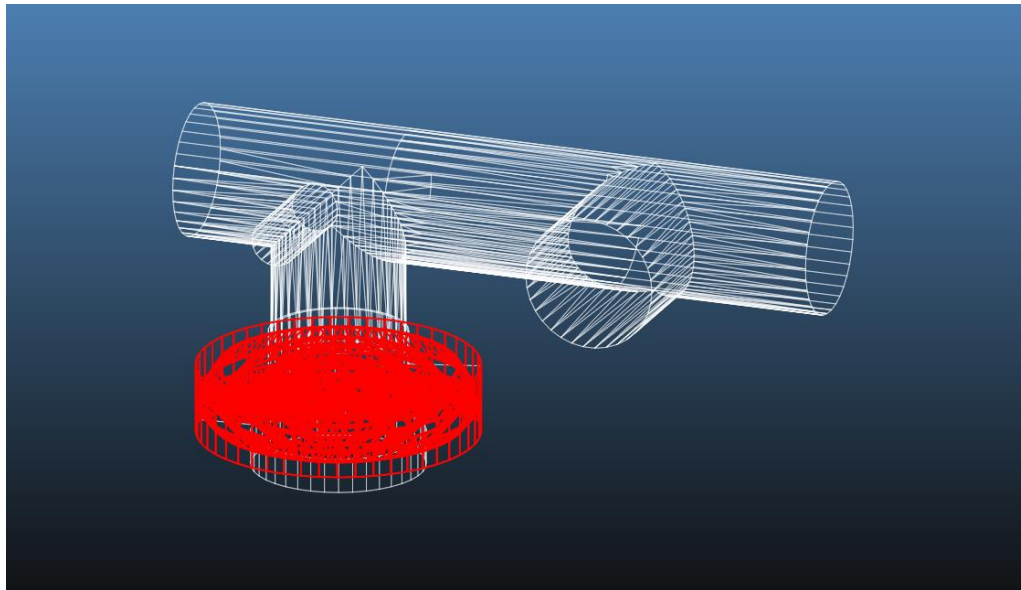
**Simulation 2: Unbaked System, Pumped for >24 Hours**

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

**Simulation 3: Baked System, Pumped for >24 Hours**

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

**IV. Baffle**



**Simulation 1: Unbaked System, Pumped for <1 Hour**

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

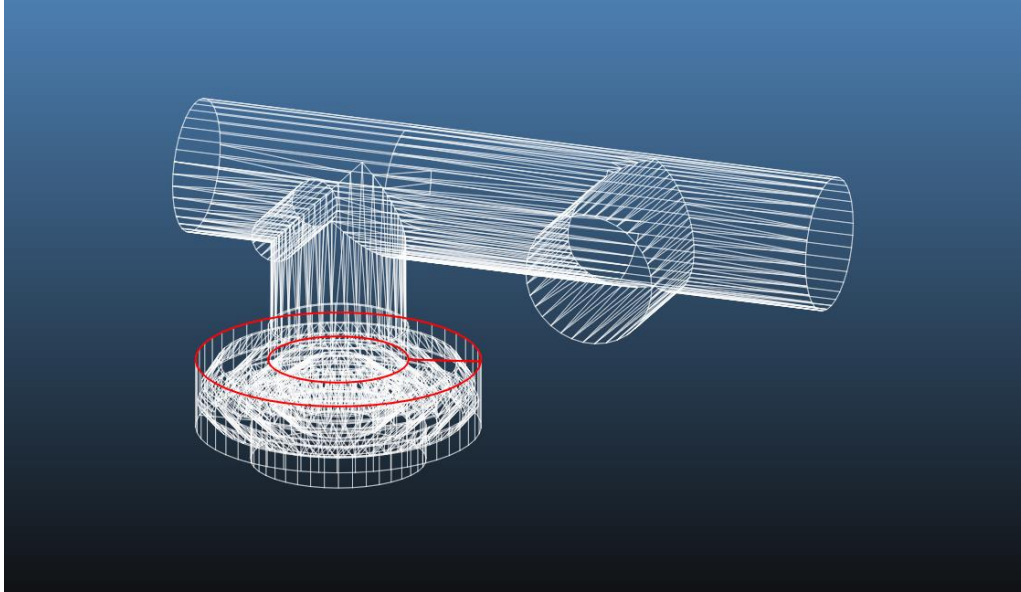
**Simulation 2: Unbaked System, Pumped for >24 Hours**

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

**Simulation 3: Baked System, Pumped for >24 Hours**

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

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



**Simulation 1: Unbaked System, Pumped for <1 Hour**

Total Outgassing Load (Viton and Aluminum) –  $3.527 \times 10^{-4}$  mbar\*1/s

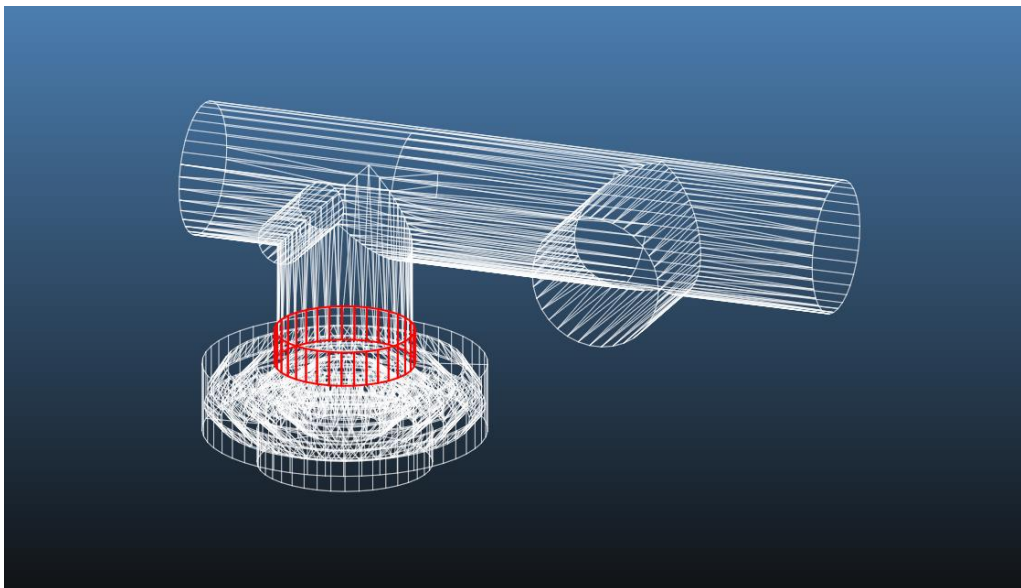
**Simulation 2: Unbaked System, Pumped for >24 Hours**

Total Outgassing Load (Viton and Aluminum) –  $7.499 \times 10^{-6}$  mbar\*1/s

**Simulation 3: Baked System, Pumped for >24 Hours**

Total Outgassing Load (Viton and Aluminum) –  $6.599 \times 10^{-6}$  mbar\*1/s

**VI. Adapter Plate 2**



**Simulation 1: Unbaked System, Pumped for <1 Hour**

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

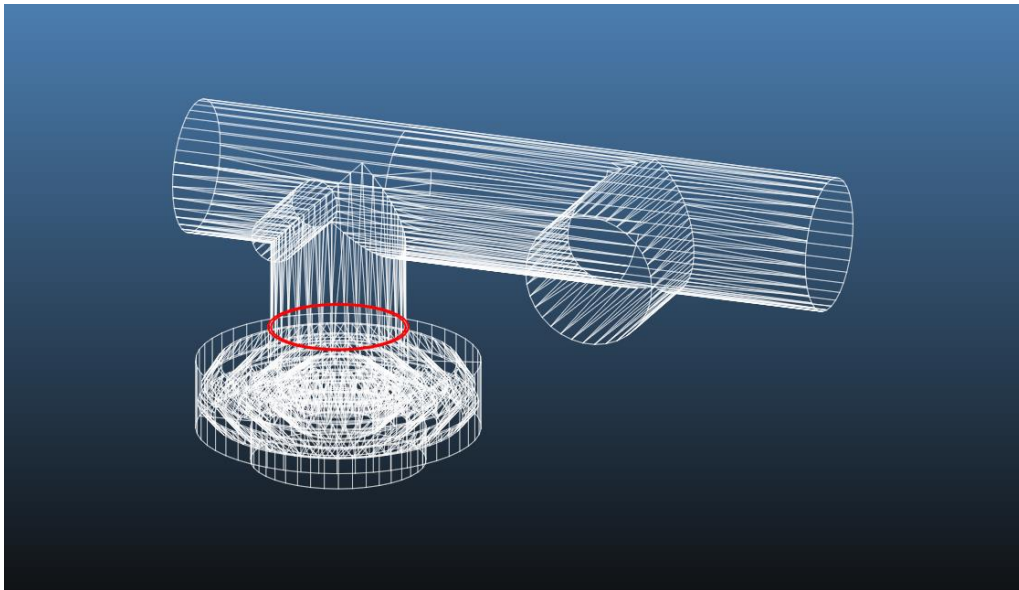
**Simulation 2: Unbaked System, Pumped for >24 Hours**

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

## VII. Adapter Plate 2 O-Ring



**Simulation 1: Unbaked System, Pumped for <1 Hour**

Total Outgassing Load (Viton and Stainless Steel) –  $4.031 \times 10^{-5} \text{ mbar} \cdot \text{l/s}$

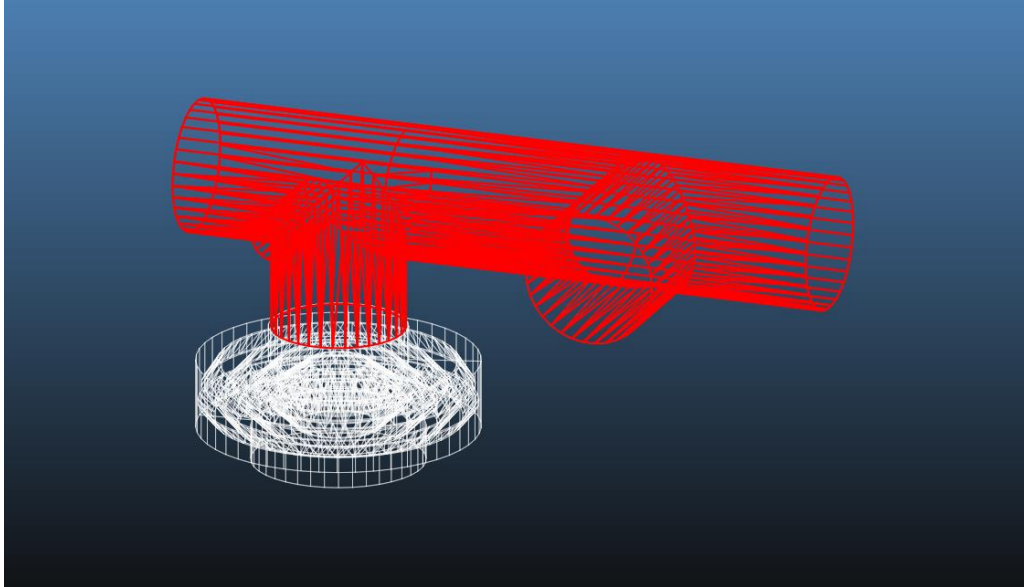
**Simulation 2: Unbaked System, Pumped for >24 Hours**

Total Outgassing Load (Viton and Stainless Steel) –  $4.046 \times 10^{-6} \text{ mbar} \cdot \text{l/s}$

**Simulation 3: Baked System, Pumped for >24 Hours**

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

## VIII. Chamber



**Simulation 1: Unbaked System, Pumped for <1 Hour**

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

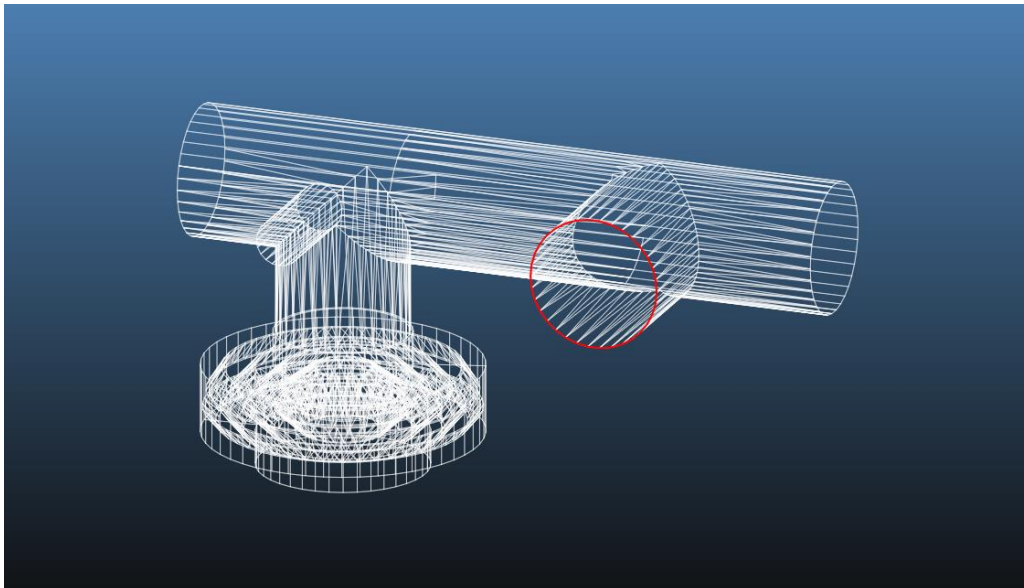
**Simulation 2: Unbaked System, Pumped for >24 Hours**

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. Viewport**



**Simulation 1: Unbaked System, Pumped for <1 Hour**

Outgassing Rate (Glass) –  $1.333 \times 10^{-7}$  mbar\*l/s/cm<sup>2</sup>

**Simulation 2: Unbaked System, Pumped for >24 Hours**

Outgassing Rate (Glass) –  $6.665 \times 10^{-9}$  mbar\*l/s/cm<sup>2</sup>

**Simulation 3: Baked System, Pumped for >24 Hours**

Outgassing Rate (Glass) –  $2.666 \times 10^{-9}$  mbar\*l/s/cm<sup>2</sup>