

# Al<sub>2</sub>O<sub>3</sub> Uniformity data for Cambridge ALD tool.

Al<sub>2</sub>O<sub>3</sub> thermal recipes (TMA and H<sub>2</sub>O)

*80°C chuck, 75°C chamber and cone*

growth rate = **0.71 Å / cycle**

Chuck position thickness and uniformity

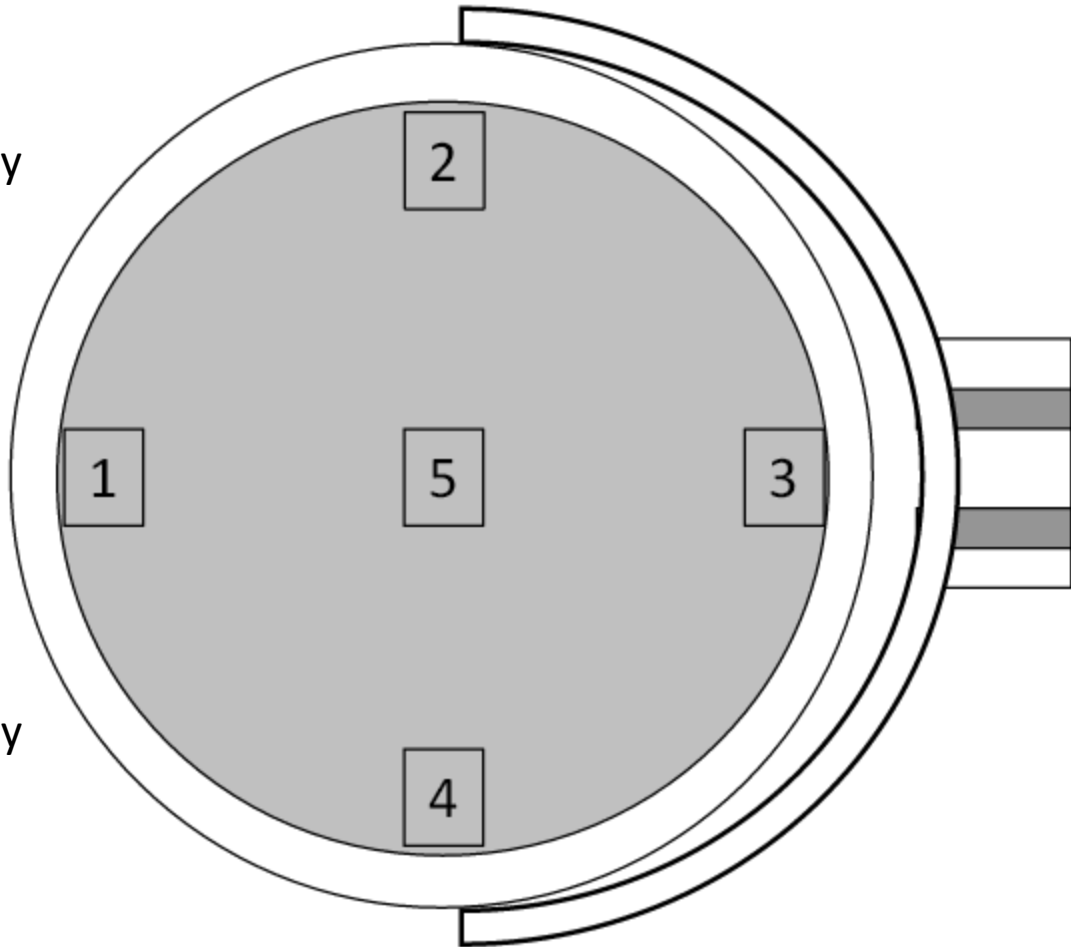
1. 15.4nm (-2.6% Δ wrt center)
2. 15.8nm (0% Δ wrt center)
3. 16.3nm (3.1% Δ wrt center)
4. 15.8nm (0% Δ wrt center)
5. 15.8nm (center)

*300°C chuck, 245°C chamber and cone*

growth rate = **0.97Å/cycle**

Chuck position thickness and uniformity

1. 21.1nm (-2.4% Δ wrt center)
2. 21.5nm (-0.4% Δ wrt center)
3. 22.3nm (3.2% Δ wrt center)
4. 21.5nm (-0.4% Δ wrt center)
5. 21.6nm (center)



# Al<sub>2</sub>O<sub>3</sub> Uniformity data for Cambridge ALD tool. After Chamber Clean

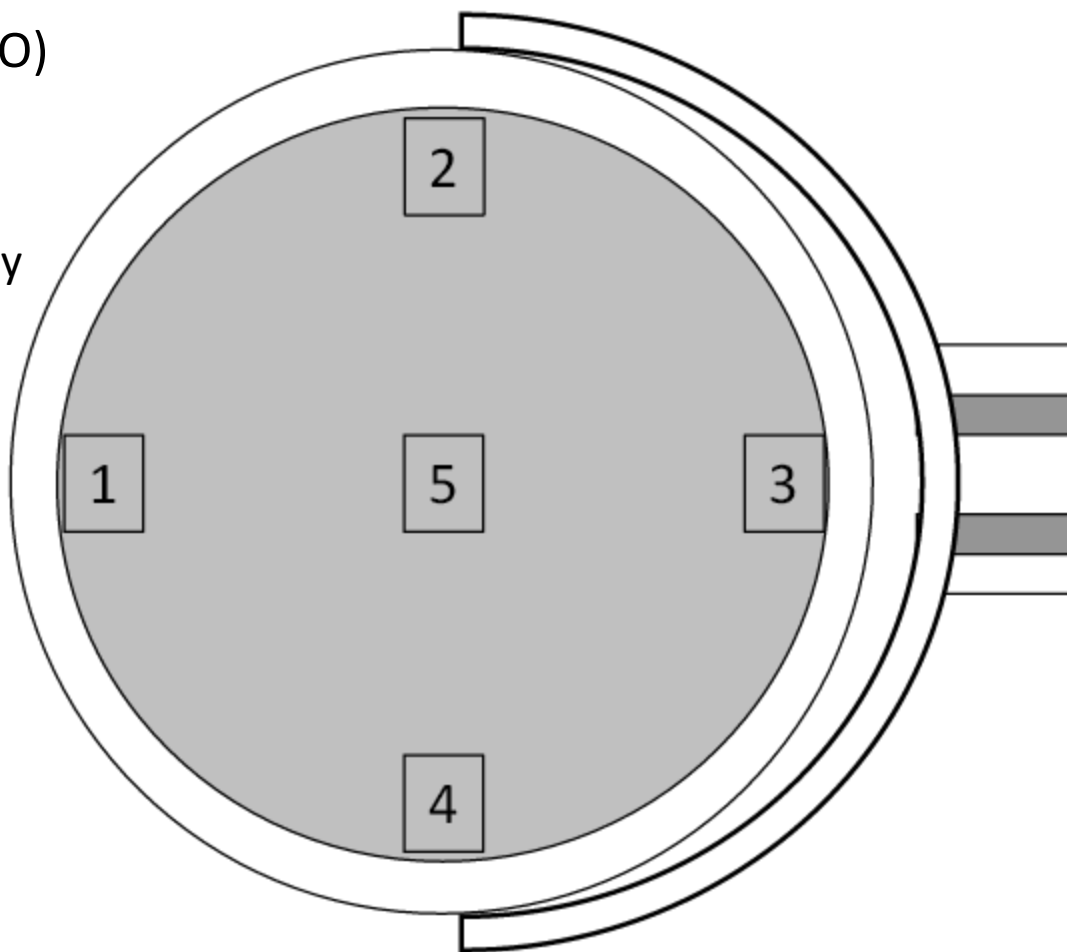
Al<sub>2</sub>O<sub>3</sub> thermal recipes (TMA and H<sub>2</sub>O)

200°C chuck, 195°C chamber and cone

growth rate = **0.98Å/cycle**

Chuck position thickness and uniformity

1. 32.1nm (-2.4% Δ wrt center)
2. 32.6nm (-0.9% Δ wrt center)
3. 33.3nm (0.3% Δ wrt center)
4. 32.4nm (-1.5% Δ wrt center)
5. 32.6nm (center)



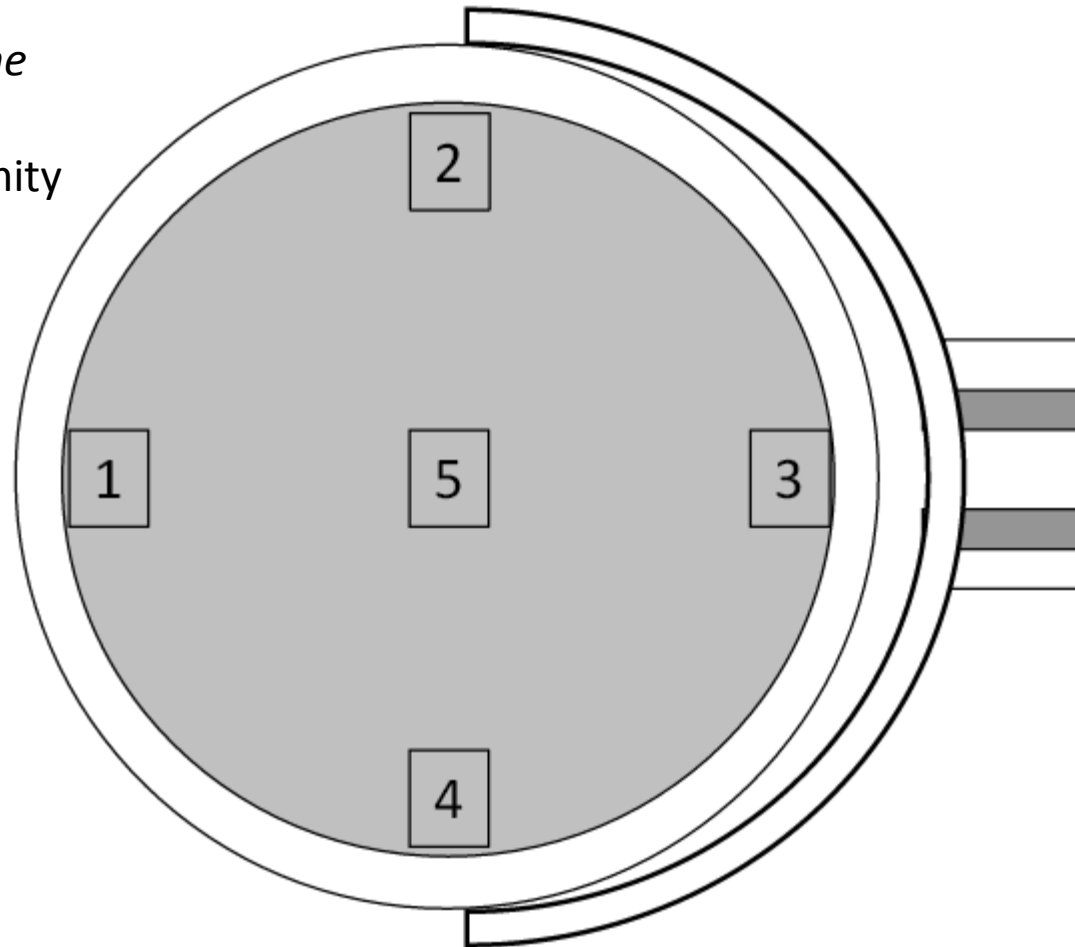
# Al<sub>2</sub>O<sub>3</sub> Uniformity data for Cambridge ALD tool.

Al<sub>2</sub>O<sub>3</sub> plasma recipes (TMA and O<sub>2</sub>)

*400°C chuck, 245°C chamber and cone*  
growth rate = **0.83Å/cycle**

Chuck position thickness and uniformity

1. 17.5nm (-4.8% Δ wrt center)
2. 17.9nm (-3.7% Δ wrt center)
3. 18.4nm (-1.1% Δ wrt center)
4. 17.9nm (-3.7% Δ wrt center)
5. 18.6nm (center)



# Al<sub>2</sub>O<sub>3</sub> Uniformity data for Cambridge ALD tool. After Plasma head clean. 1/4/16

Al<sub>2</sub>O<sub>3</sub> thermal recipee (TMA and H<sub>2</sub>O)

200°C chuck, 195°C chamber and cone

500cycles growth rate = **0.98Å/cycle**

Chuck position thickness and uniformity

1. 47.8nm (-2.25% Δ wrt center)
2. 48.4nm (-1.02% Δ wrt center)
3. 49.4nm (1.02% Δ wrt center)
4. 48.8nm (-0.20% Δ wrt center)
5. 48.9nm (center)

