

Supplement to “Design of Gas Flow Field for a Sustainable ALD Process Chamber”

The continuity and momentum equations of a steady-state compressible laminar flow field are considered as follows.

$$\frac{\partial}{\partial x_j}(\rho U_j) = 0$$

$$\frac{\partial}{\partial x_j}(\rho U_j U_i) = -\frac{\partial P}{\partial x_i} + \frac{\partial}{\partial x_j} \left(\mu \left(\frac{\partial U_i}{\partial x_j} + \frac{\partial U_j}{\partial x_i} \right) \right) - \frac{\partial}{\partial x_i} \left(\frac{2}{3} \mu \frac{\partial U_j}{\partial x_j} \right) - \rho g \delta_{i3}$$

where ρ , U , P , μ and δ are the density, velocity, pressure and molecular viscosity of the gas, and Kronecker delta, respectively, and the subscripts $i, j=1, 2$ and 3 are the tensor components.

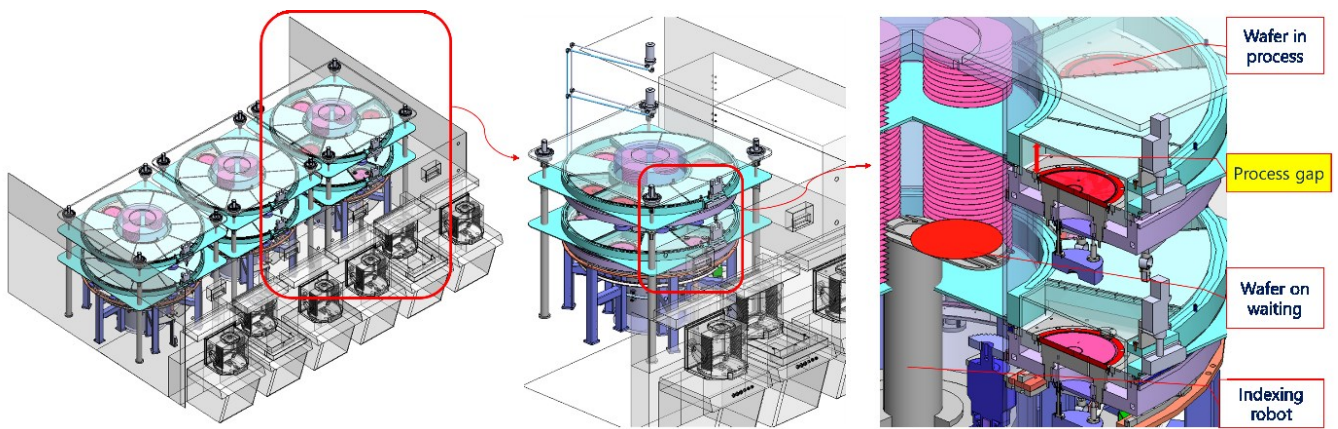


Fig. 1. Schematic diagram of the present ALD processing chamber and cluster tool.