CLAIMS

1. A feedthrough for providing vaporized precursor to an arc chamber comprising:

a gas line conducting vaporized precursor to the arc chamber,

a heating system to heat the gas line to reduce or prevent condensation of the vaporized precursor on an inside surface of the gas line through an actively cooled plate into the arc chamber of an implant tool, and

a support surrounding the gas line to support the gas line and maintain vacuum inside the arc chamber.

2. The feedthrough of claim 1, further comprising insulation around the gas line.

3. The feedthrough of claim 2, further comprising a sleeve over the insulation, wherein the sleeve is part of the support and maintains vacuum inside the arc chamber.

4. The feedthrough of claim 1, further comprising a thermally conductive sleeve around the gas line or support to better transfer and evenly heat the gas line.

5. The feedthrough of claim 1, further comprising a temperature sensor.

6. The feedthrough of claim 1, further comprising a vacuum seal on the plate against a portion of a vacuum chamber.

7. The feedthrough of claim 1, wherein the vaporized precursor is aluminum trichloride ($AlCl_3$).

8. A method of providing a vaporized precursor to an ion implantation device comprising,

heating a vessel to a first temperature sufficient to vaporize the precursor inside the vessel;

heating a manifold to a second temperature sufficient to prevent condensation of the vaporized precursor in the manifold,

heating the feedthrough of claim 1 to a third temperature sufficient to prevent condensation of the vaporized precursor in the gas line; and

flowing vaporized precursor from the vessel to the manifold to the feedthrough to the ion implantation device.

9. The method of claim 8, further comprising measuring the first temperature with a first temperature sensor, measuring the second temperature with a second temperature sensor, and measuring the third temperature with a third temperature sensor.

10. The method of claim 8, wherein the first temperature is not greater than the second temperature or the third temperature.