CLAIMS

1. A semiconductor processing method comprising:

forming a silicon oxide material on exposed surfaces of a processing region of a semiconductor processing chamber;

forming a silicon nitride material overlying the silicon oxide material;

performing a deposition process on a semiconductor substrate disposed within the processing region of the semiconductor processing chamber,

wherein the deposition process comprises depositing a carbon-containing hardmask film, the carbon-containing hardmask film comprising tungsten carbide;

wherein the semiconductor substrate is disposed on a substrate support comprising a planar support surface; and

wherein fall on particles on the semiconductor substrate are less than 200; and

performing a chamber cleaning process.

2. The semiconductor processing method of claim 1, wherein the silicon oxide material and the silicon nitride material are formed on the substrate support within the processing region of the semiconductor processing chamber.

3. The semiconductor processing method of claim 2, further comprising:

positioning the semiconductor substrate on the substrate support prior to performing the deposition process, wherein the semiconductor substrate is positioned on the silicon nitride material formed on the substrate support.

4. The semiconductor processing method of claim 1, wherein the chamber cleaning process comprises a plasma enhanced clean with a halogen-containing precursor.

5. The semiconductor processing method of claim 1, wherein the substrate support comprises a bipolar electrostatic chuck.

6. The semiconductor processing method of claim 1, wherein the silicon oxide material is formed to a first thickness, and wherein the silicon nitride material is formed to a second thickness greater than the first thickness.

7. The semiconductor processing method of claim 1, wherein the planar support surface is substantially planar across a diameter of the planar support surface.

8. The semiconductor processing method of claim 1, wherein the planar support surface is substantially planar and free of edge rings and alignment tabs on the planar support surface of the substrate support.

9. A semiconductor processing method comprising:

performing a chamber cleaning process in a processing region of a semiconductor processing chamber;

forming a silicon oxide material on exposed surfaces of the processing region of the semiconductor processing chamber;

forming a silicon nitride material overlying the silicon oxide material;

providing a semiconductor substrate to a substrate support positioned in the processing region of the semiconductor processing chamber,

wherein the substrate support is characterized by a first surface on which the semiconductor substrate is positioned; and

wherein the first surface is substantially planar across a diameter of the first surface; and

performing a deposition process on the semiconductor substrate,

wherein the deposition process comprises depositing a tungsten carbide hardmask film; and

wherein fall on particles on the semiconductor substrate are less than 200.

10. The semiconductor processing method of claim 9, wherein the silicon oxide material and the silicon nitride material are formed on the substrate support prior to providing the semiconductor substrate to the substrate support.

11. The semiconductor processing method of claim 9, wherein the silicon oxide material is formed to a first thickness, and wherein the silicon nitride material is formed to a second thickness greater than the first thickness.

12. The semiconductor processing method of claim 11, wherein the first thickness is less than or equal to 20 nm, and wherein the second thickness is greater than or equal to 50 nm.

13. The semiconductor processing method of claim 9, wherein the substrate support comprises a bipolar electrostatic chuck.

14. A semiconductor processing method comprising:

forming a silicon oxide material to a first thickness on interior surfaces of a processing region of a semiconductor processing chamber;

forming a silicon nitride material overlying the silicon oxide material, wherein the silicon nitride material is formed to a second thickness greater than the first thickness;

providing a semiconductor substrate to a substrate support positioned in the processing region of the semiconductor processing chamber,

wherein the substrate support is characterized by a first surface on which the semiconductor substrate is positioned; and

wherein the first surface is substantially planar and free of edge rings and alignment tabs on the first surface of the substrate support; and

forming a tungsten-containing material on the semiconductor substrate, wherein the tungsten-containing material is formed on an outer radial portion of the semiconductor substrate.

15. The semiconductor processing method of claim 14, further comprising:

removing the semiconductor substrate from the semiconductor processing chamber; and

performing a chamber cleaning process in the processing region of the semiconductor processing chamber.

16. The semiconductor processing method of claim 14, wherein the first thickness is less than or equal to 20 nm, and wherein the second thickness is greater than or equal to 50 nm.

17. The semiconductor processing method of claim 14, wherein the substrate support comprises a bipolar electrostatic chuck.

18. The semiconductor processing method of claim 14, wherein the first surface is substantially planar across a diameter of the first surface.

19. The semiconductor processing method of claim 14, wherein fall on particles on the semiconductor substrate are less than 200.