CLAIMS

~~What is claimed is:~~

1. A method of film deposition using localized plasma to protect bevel edge of a wafer in a plasma chamber, comprising:

adjusting an electrode gap between a movable electrode and a stationary electrode, said wafer being disposed on one of said movable electrode and said stationary electrode, to a gap distance configured to prevent plasma formation over a center portion of said wafer, said gap distance also dimensioned such that a plasma-sustainable condition around said bevel edge of said wafer is formed after said adjusting;

flowing deposition gas into said plasma chamber;

maintaining, using a heater, a chuck temperature that is configured to facilitate film deposition on said bevel edge; and

generating said localized plasma from said deposition gas for depositing a film on said bevel edge.

2. The method of claim 1, wherein said gap distance is adjusted based on a feedback control system, said feedback control system configured to detect whether plasma is formed over said center portion of said wafer.

3. The method of claim 1, wherein said center portion is substantially equal to the area on said wafer where features are etched.

4. The method of claim 1, wherein said center portion is substantially equal to the area on said wafer where the surface of said wafer is substantially flat.

5. The method of claim 1, wherein said plasma chamber is configured to perform localized etching as well as localized deposition.

6. The method of claim 1, further comprising cleaning said plasma chamber using an inductive cleaning mechanism after said depositing is completed.

7. The method of claim 1, further comprising adjusting said heater temperature to minimize adhesion stress.

8. The method of claim 1, wherein said adjusting of said electrode gap is done by a mechanical actuator or by a bellows or by a belt-type gear.

9. The method of claim 1, wherein said film is chosen from one of the following: a dielectric film, a conductor film, or an organic film.

10. A method of film deposition using localized plasma to protect bevel edge of a wafer, comprising:

adjusting flow of deposition gas into a plasma chamber to a pressure configured to prevent plasma formation over a center portion of said wafer, said pressure also adjusted such that a plasma-sustainable condition around said bevel edge of said wafer is formed after said adjusting;

adjusting an electrode gap between a movable electrode and a stationary electrode, said wafer being disposed on one of said movable electrode and said stationary electrode, said distance configured to prevent plasma formation over a center portion of said wafer, said gap distance also dimensioned such that a plasma-sustainable condition around said bevel edge of said wafer is formed after said adjusting;

maintaining, using a heater, a chuck temperature that is configured to facilitate film deposition on said bevel edge; and

generating said localized plasma from said deposition gas for depositing a film on said bevel edge.

11. The method of ~~film~~ claim 10, wherein said plasma chamber is configured to perform localized etching as well as localized deposition.

12. The method of claim 10, further comprising cleaning said plasma chamber using an inductive cleaning mechanism.

13. The method of claim 10, further comprising adjusting said heater temperature to minimize adhesion stress.

14. The method of claim 10, wherein said film is chosen from one of the following: a dielectric film, a conductor film, or an organic film.

15. In a plasma chamber, a method of film deposition using localized plasma to protect bevel edge of a wafer, comprising:

adjusting an electrode gap between a movable electrode and a stationary electrode, said wafer being disposed on one of said movable electrode and said stationary electrode, to a gap distance configured to prevent plasma formation over a center portion of said wafer;

adjusting a flow of deposition gas into said plasma chamber to a pressure configured to prevent plasma formation over a center portion of said wafer, said gap distance and said pressure also adjusted such that a plasma-sustainable condition around said bevel edge of said wafer is formed after said adjusting said electrode gap and said adjusting said flow;

maintaining, using a heater, a chuck temperature that is configured to facilitate film deposition on said bevel edge; and

generating said localized plasma from said deposition gas for depositing a film on said bevel edge.

16. The method of claim 15 wherein said plasma chamber is configured to perform localized etching as well as localized deposition.

17. The method of claim 15 further comprising cleaning said plasma chamber using inductive cleaning mechanism.

18. The method of claim 15 further comprising adjusting said heater temperature ~~configured~~ to minimize adhesion stress.

19. The method of claim 15 wherein said adjusting of said electrode gap is done by a mechanical actuator or by a bellows or by a belt-type gear.