CLAIMS

1. A method of increasing a reaction chamber batch size, the method comprising:
   (a) processing a portion of a batch of wafers within the reaction chamber, wherein the processing results in at least some off-target deposition of material on interior surfaces of the reaction chamber;
   (b) without cleaning the chamber, conducting a mid-batch reaction chamber processing to stabilize the off-target deposition material accumulated on interior surfaces of the reaction chamber comprising depositing a dielectric film coating that binds to the material on the interior surfaces of the reaction chamber; and
   (c) processing another portion of the batch of wafers within the reaction chamber.

2. The method of claim 1, further comprising:
   repeating (b) – (c) until the processing of the batch of wafers is complete.

3. The method of claim 1, further comprising:
   seasoning the interior surfaces of the reaction chamber prior to batch processing therein.

4. The method of claim 3, wherein the seasoning the interior surfaces of the reaction chamber involves applying a coating of the same material that is used for deposition on the batch of wafers during (a) or (c).

5. The method of claim 1, wherein (a) or (c) involves depositing a material on a wafer of the batch of wafers.

6. The method of claim 3, wherein the seasoning comprises applying a coating to interior surfaces of the reaction chamber by atomic layer deposition (ALD) while no wafers are present in the reaction chamber.

7. The method of claim 1, further comprising:
   (d) cleaning the reaction chamber interior surfaces following completion of (c).

8. The method of claim 2, further comprising:
   (d) cleaning the reaction chamber interior surfaces after processing of the batch of wafers is complete.

9. The method of claim 1, wherein (b) is conducted at specified intervals of a total batch accumulation limit of the batch of wafers.

10. The method of claim 9, wherein the total batch accumulation limit is the thickness of accumulated material on interior surfaces of the reaction chamber beyond which processing is compromised such that cleaning of the reaction chamber is required prior to further processing.

11. The method of claim 9, wherein the specified intervals occur prior to a detrimental level of material accumulation on interior surfaces of the reaction chamber that results in flaking of the material and production of wafer defects and/or particles.

12. The method of claim 1, wherein the compressive stress of the deposited film coating is enhanced by adjusting any one or more selected from a group consisting of: radio frequency (RF) power levels, reaction chamber pressure, or RF processing time.

13. The method of claim 12, further comprising:

(d) grounding the reaction chamber.

14. The method of claim 8, wherein plasma used to conduct (d) is supplied by a remote plasma clean unit.

15. The method of claim 1, wherein the dielectric material that is deposited in (b) is SiO_2.

16. The method of claim 1, wherein each wafer of the batch of wafers has a diameter between 200 mm and 450 mm.

17. The method of claim 16, wherein each wafer of the batch of wafers has a diameter of 300 mm.

18. A plasma processing apparatus for processing a substrate, the apparatus comprising:

a reaction chamber comprising:

interior chamber surfaces,

a substrate support for supporting a substrate within the reaction chamber, and

an exhaust port for removing material from the reaction chamber;

a remote plasma chamber comprising:

a plasma generator for generating plasma within the remote plasma chamber,

an inlet for delivering gas to the remote plasma chamber,

an outlet for providing plasma generated in the remote plasma chamber to the reaction chamber; and

a controller configured to execute instructions for:

(a) processing a portion of a batch of wafers within the reaction chamber, wherein the processing results in at least some off-target deposition of material on interior surfaces of the reaction chamber;

(b) without cleaning the chamber, conducting a mid-batch reaction chamber processing to stabilize the off-target deposition material accumulated on interior surfaces of the reaction chamber comprising depositing a dielectric film coating that binds to the material on the interior surfaces of the reaction chamber; and

(c) processing another portion of the batch of wafers within the reaction chamber.

19. The apparatus of claim 18, wherein the plasma processing apparatus is remote from the reaction chamber.

20. The apparatus of claim 18, wherein the controller is further configured to execute instructions for:

(d) cleaning the interior surfaces of the reaction chamber following completion of (c).