CLAIMS

1. A process kit for use in a physical vapor deposition chamber, comprising:

a shield comprising an inner wall with an innermost diameter configured to surround a target when disposed in the physical vapor deposition chamber, wherein a ratio of a surface area of the shield to a planar area of the inner diameter is 3 to 10,

wherein the inner wall comprises a bottom area configured to engage a first ring;

wherein the first ring is configured to rest on the bottom area when a substrate support is in a lower position and to rest on an outer periphery of the substrate support when the substrate support is in an upper position; and

wherein a plurality of concentric vertical fins are coupled to at least one of:

a side surface of the first ring that rests on the outer periphery of the substrate support when the substrate support is in the upper position; or

the bottom area of the inner wall below the outer periphery of the substrate support.

2. The process kit of claim 1, wherein the shield is made of at least one of an aluminum alloy or stainless steel.

3. The process kit of claim 1, wherein the inner wall comprises a plurality of alternating bends that extend in generally 90º increments from top, down, outwards, down, inwards, and down forming an entire generally C shape between alternating bends.

4. The process kit of claim 3, wherein the plurality of alternating bends form a vertical square wave with rounded transitions when viewed along a cross-section of two consecutive bends.

5. The process kit of claim 3, wherein the plurality of alternating bends are symmetrical with each other.

6. The process kit of claim 3, wherein the plurality of alternating bends are asymmetrical with each other.

7. The process kit of claim 1, wherein the plurality of concentric vertical fins are spaced-apart at 0.38 cm to 0.5 cm.

8. The process kit of claim 3, wherein the plurality of concentric vertical fins have a height that is equal to an entire C shape between alternating bends.

9. The process kit of claim 1, wherein the inner wall comprises a plurality of spaced-apart concentric walls extending upward from a bottom of the shield to define a plurality of vertical wells.

10. The process kit of claim 9, wherein a height of each of the plurality of spaced-apart concentric walls progressively decreases from an outermost wall to an innermost wall.

11. A substrate processing apparatus, comprising:

a chamber body having a substrate support disposed therein;

a target coupled to the chamber body opposite the substrate support;

an RF power source to form a plasma within the chamber body; and

a shield comprising an inner wall with an innermost diameter configured to surround the target when disposed in a physical vapor deposition chamber, wherein a ratio of a surface area of the shield to a planar area of the inner diameter is 3 to 10,

wherein the inner wall comprises a bottom area configured to engage a first ring;

wherein the first ring is configured to rest on the bottom area when a substrate support is in a lower position and to rest on an outer periphery of the substrate support when the substrate support is in an upper position; and

wherein a plurality of concentric vertical fins are coupled to at least one of:

a side surface of the first ring that rests on the outer periphery of the substrate support when the substrate support is in the upper position; or

the bottom area of the inner wall below the outer periphery of the substrate support.

12. The substrate processing apparatus of claim 11, wherein the shield is made of at least one of an aluminum alloy or stainless steel.

13. The substrate processing apparatus of claim 11, wherein the inner wall comprises a plurality of alternating bends that extend in generally 90º increments from top, down, outwards, down, inwards, and down forming an entire generally C shape between alternating bends.

14. The substrate processing apparatus of claim 13, wherein the plurality of alternating bends form a vertical square wave with rounded transitions when viewed along a cross-section of two consecutive bends.

15. The substrate processing apparatus of claim 13, wherein the plurality of alternating bends are symmetrical with each other.

16. The substrate processing apparatus of claim 13, wherein the plurality of alternating bends are asymmetrical with each other.

17. The substrate processing apparatus of claim 11, wherein the plurality of concentric vertical fins are spaced-apart at 0.38 cm to 0.5 cm.