CLAIMS

What is claimed is:

1. A sealing kit for a physical vapor deposition (PVD) vacuum chamber, comprising:

a sealing ring for the PVD vacuum chamber comprising:

a compressible portion, wherein the compressible portion comprises at least one protrusion and at least one recess;

a rigid portion adjacent the compressible portion, wherein the rigid portion has a rib that is substantially encapsulated by a secondary material;

a rim that extends from a first surface of the sealing ring and is configured to selectively couple to an isolation ring;

a removable shield that is configured to selectively couple to a first end of the compressible portion and that is configured to isolate the compressible portion from an interior of the vacuum chamber;

the isolation ring, comprising:

a first surface configured to selectively interface with the compressible portion and the rigid portion of the sealing ring when installed in the PVD vacuum chamber, wherein the first surface is generally flat;

a step-out portion configured to selectively interface with the rim of the sealing ring when installed in the PVD vacuum chamber; and

a sputtering target, comprising:

a peripheral flange surface of a first surface configured to interface with the

sealing ring, when installed in the PVD vacuum chamber, wherein the peripheral flange surface is devoid of any O-ring grooves, vent slots, and scallops and is configured to contact the sealing ring with a flat surface.

2. A sealing ring for a physical vapor deposition (PVD) vacuum chamber comprising:

a compressible portion, wherein the compressible portion comprises at least one protrusion and at least one recess;

a rigid portion adjacent the compressible portion, wherein the rigid portion has a rib that is substantially encapsulated by a secondary material;

a rim that extends from a first surface of the sealing ring and is configured to selectively couple to an isolation ring;

a removable shield that is configured to selectively couple to a first end of the compressible portion and that is configured to isolate the compressible portion from an interior of a vacuum chamber.

3. The sealing ring of claim 2, wherein the compressible portion comprises a fluorocarbon, fluoroelastomer, and/or fluorine kautschuk material.

4. The sealing ring of any one of claims 2-3, wherein the secondary material is a same material as the compressible portion and the rim.

5. The sealing ring of any one of claims 2-4, wherein the at least one protrusion extends past the first surface and a second, opposite surface of the sealing ring.

6. The sealing ring of any one of claims 2-5, wherein the at least one recess terminates prior to the first surface and a second, opposite surface of the sealing ring.

7. The sealing ring of any one of claims 2-6, wherein each of the at least one protrusion and each of the at least one recess alternate.

8. The sealing ring of any one of claims 2-6, wherein the compressible material and at least one recess are configured to entrap particulates.

9. The sealing ring of any one of claims 2-8, wherein the rib of the rigid portion is comprised of aluminum.

10. The sealing ring of any one of claims 2-9, wherein the compressible portion and the rigid portion are approximately the same length.

11. The sealing ring of any one of claims 2-10, wherein the shield is configured to snap fit with the first end of the compressible portion.

12. The sealing ring of any one of claims 2-11, wherein the shield is configured to inhibit plasma arcing and thermal degradation of the compressible portion.

13. The sealing ring of any one of claims 2-12, wherein the shield comprises polytetrafluoroethylene.

14. The sealing ring of any one of claims 2-13, wherein the rim further includes a plurality of retention tabs.

15. The sealing ring of any one of claims 2-14, wherein the sealing ring is configured to selectively interface with the isolation ring by an interference fit, thereby forming a seal between the sealing ring and isolation ring when installed in the PVD vacuum chamber.

16. The sealing ring of any one of claims 2-15, wherein the sealing ring is configured to self-center with the isolation ring using the plurality of retention tabs on the rim and a step-out portion of the isolation ring cut out of approximately 90 degrees.

17. The sealing ring of any one of claims 2-16, wherein a second surface of the sealing ring is configured to selectively interface with a sputtering target, thereby forming a seal between the sealing ring and sputtering target when installed in the PVD vacuum chamber.

18. The sealing ring of claim 17, wherein the sputtering target is devoid of any grooves, vent slots, and scallops and is configured to contact the sealing ring with a flat surface.

19. The sealing ring of claims 17 or 18, wherein the sealing ring is configured to provide a buffer between the sputtering target and the isolation ring.

20. A sealing kit for a vacuum chamber, comprising:

a sealing ring, wherein the sealing ring includes a compressible portion, a rigid portion adjacent the compressible portion, and a rim extending perpendicularly from the rigid portion,

an isolation ring configured to selectively interface with a first mating surface of the isolation ring including the rim, wherein the isolation ring includes a cut out configured to selectively accommodate and contact the rim of the sealing ring, thereby forming a seal between the isolation ring and the sealing ring when installed in a PVD vacuum chamber;

a sputtering target comprising a substantially planar first mating surface configured to selectively interface to a second mating surface of the sealing ring, thereby forming a seal between the sputtering target and the sealing ring when installed in a PVD vacuum chamber.

21. The sealing kit of claim 20, wherein the first mating surface of the sputtering target is devoid of any grooves, vent slots, and scallops.

22. The sealing kit of claims 20 or 21, wherein the compressible portion comprises at least one protrusion and at least one recess, wherein each of the at least one protrusion and each of the at least one recess alternate.

23. The sealing kit of any of claims 20-22, wherein a rib of the rigid portion is suspended in a same material that comprises the compressible material and the rim.

24. The sealing kit of any of claims 20-23, wherein the sealing ring further includes a plasma shield configured to attach to an inner perimeter side of the compressible portion.

25. The sealing kit of any of claims 20-24, wherein the sputtering target and the isolation ring each form a seal with the sealing ring.

26. The sealing kit of any of claims 20-25, wherein the sputtering target and the isolation ring are isolated from each other by the sealing ring.

27. A method for assembling the sealing kit of claim 20, comprising:

placing an isolation ring on a PVD vacuum chamber, wherein the isolation ring includes a step out on a mating surface;

placing a sealing ring on the mating surface of the isolation ring, the sealing ring having a first mating surface and a second mating surface on an opposite side of the first mating surface, wherein the first mating surface of the sealing ring includes a rim configured to selectively couple to the step out of the isolation ring and wherein the first mating surface of the sealing ring contacts the mating surface of the isolation ring;

placing a sputtering target on the second mating surface of the sealing ring, wherein the sealing ring includes a compressible portion and a shield, and wherein the sputtering target is configured to compress the compressible portion and the shield of the sealing ring;

wherein the isolation ring and the sealing ring form a seal when installed in the PVD vacuum chamber, and the sealing ring and the sputtering target form a seal when installed in the PVD vacuum chamber.

28. The method of claim 27, wherein the sputtering target and the isolation ring are isolated from each other by the sealing ring.