Claims

1. A physical vapor deposition (PVD) chamber, comprising:

a pedestal disposed within a processing region of the PVD chamber, the pedestal having an upper surface that is configured to support a workpiece thereon;

a lid assembly comprising a first target, a first target spacing adapter, a second target, and a second target adapter, wherein

a first surface of the first target defines a first zone of the processing region, the first target spacing adapter providing a center of the first surface a first distance from a plane of the upper surface of the pedestal;

a second surface of the second target defines a second zone of the processing region, the second target adapter providing a center of the second surface a second distance from the plane of the upper surface of the pedestal;

the first target spacing adapter is positioned between the first target and the pedestal, the first target spacing adapter comprising one or more first cooling channels and a first magnetic confinement assembly; and

the second target spacing adapter is positioned between the second target and the pedestal, the second target spacing adapter comprising one or more second cooling channels and a second magnetic confinement assembly.

2. The PVD chamber of claim 1, wherein:

the first surface is tilted at a first angle in relation to the plane of the upper surface of the pedestal; and

the second surface is tilted at a second angle in relation to the plane of the upper surface of the pedestal, the second angle different from the first angle.

3. The PVD chamber of claim 1, wherein:

the first surface is tilted at a first angle in relation to the plane of the upper surface of the pedestal; and

the second surface is tilted at a second angle in relation to the plane of the upper surface of the pedestal, the second angle opposing the first angle.

4. The PVD chamber of claim 1, wherein,

the first magnetic confinement assembly is disposed between the first target and the pedestal and configured about a first center axis of the first zone, the first center axis passing through the first target and the upper surface of the pedestal; and

the second magnetic confinement assembly is disposed between the second target and the pedestal and configured about a second center axis of the second zone, the second center axis passing through the second target and the upper surface of the pedestal.

5. The PVD chamber of claim 4, further comprising a system controller that is configured to simultaneously control a first voltage bias for the first target and a second voltage bias for the second target, wherein the system controller is further configured to control a first field generated by the first magnetic confinement assembly according to a first sputtering profile and a second field generated by the second magnetic confinement assembly according to a second sputtering profile.

6. The PVD chamber of claim 4, wherein:

the first one or more channels are fluidly coupled with a first heat exchanger to control a first temperature profile of the first magnetic confinement assembly; and

the second one or more channels are fluidly coupled with the first heat exchanger or a second heat exchanger to control a second temperature profile of the second magnetic confinement assembly.

7. The PVD chamber of claim 1, further comprising:

a first magnetron disposed over a portion of the first target, and in a region of the lid assembly that is maintained at atmospheric pressure; and

a second magnetron disposed over a portion of the second target, and in the region of the lid assembly that is maintained at atmospheric pressure.

8. The PVD chamber of claim 1, wherein the first target and the second target are configured to deposit a same material onto different areas of the workpiece simultaneously.

9. The PVD chamber of claim 1, wherein the upper surface of the pedestal is configured to receive a square or rectangular workpiece having sides that have a length of about 500 mm or greater.

10. A physical vapor deposition (PVD) chamber, comprising:

a pedestal disposed within a processing region of the PVD chamber, the pedestal having an upper surface that is configured to support a workpiece thereon;

a lid assembly comprising a first target, a first target spacing adapter, a second target, and a second spacing adapter, wherein:

a first surface of the first target defines a first zone of the processing region, the first target spacing adapter providing a center of the first surface a first distance from a plane of the upper surface of the pedestal;

a second surface of the second target defines a second zone of the processing region, the second target spacing adapter providing a center of the second surface a second distance from the plane of the upper surface of the pedestal;

the first target spacing adapter is positioned between the first target and the pedestal, the first target spacing adapter comprising one or more first cooling channels and a first magnetic confinement assembly;

the second target spacing adapter is positioned between the second target and the pedestal, the second target spacing adapter comprising one or more second cooling channels and a second magnetic confinement assembly; and

a computer readable medium storing instructions that when executed by a processor of a system that includes the PVD chamber, cause the system to simultaneously control a first voltage bias for the first target and a second voltage bias for the second target.

11. The PVD chamber of claim 10, wherein:

the first magnetic confinement assembly is disposed between the first target and the pedestal and configured about a first center axis of the first zone, the first center axis passing through the first target and the upper surface of the pedestal; and

the second magnetic confinement assembly is disposed between the second target and the pedestal and configured about a second center axis of the second zone, the second center axis passing through the second target and the upper surface of the pedestal.

12. The PVD chamber of claim 11, comprising executable instructions that are further configured to cause the system to control a first field generated by the first magnetic confinement assembly according to a first sputtering profile and a second field generated by the second magnetic confinement assembly according to a second sputtering profile.

13. The PVD chamber of claim 10, further comprising:

a first magnetron disposed over a portion of the first target, and in a region of the lid assembly that is maintained at atmospheric pressure; and

a second magnetron disposed over a portion of the second target, and in the region of the lid assembly that is maintained at atmospheric pressure.

14. The PVD chamber of claim 10, wherein the first target and the second target are configured to deposit a same material onto different areas of the workpiece simultaneously.

15. A method for performing physical vapor deposition (PVD), comprising:

disposing a workpiece on an upper surface of a pedestal that is configured to support the workpiece thereon, the pedestal disposed within a processing region of a PVD chamber;

sputtering material from a first target onto the workpiece in a first zone of the processing region and material from a second target onto the workpiece in a second zone of the processing region, wherein a first target spacing adapter provides a center of a first

surface of the first target a first distance from a plane of the upper surface, and wherein a second target spacing adapter provides a center of a second surface of the second target a second distance from a plane of the upper surface, wherein

the first target spacing adapter is positioned between the first target and the pedestal, the first target spacing adapter comprising a first one or more cooling channels and a first magnetic confinement assembly; and

the second target spacing adapter is positioned between the second target and the pedestal, the second target spacing adapter comprising a second one or more cooling channels and a second magnetic confinement assembly; and

controlling a first voltage bias for the first target during sputtering the material from the first target and a second voltage bias for the second target during sputtering the material from the second target.

16. The method of claim 15, further comprising:

simultaneously controlling a first magnetron according to a first scanning pattern for the first target during sputtering the material from the first target and a second magnetron according to a second scanning pattern for the second target during sputtering the material from the second target.

17. The method of claim 15, wherein:

sputtering the material from the first target onto the workpiece and sputtering the material from the second target onto the workpiece comprise depositing a seed layer on the workpiece, including in vias in the workpiece.

18. The method of claim 17, further comprising:

performing a metal deposition process to form a metal layer on the seed layer and in the vias.

19. The method of claim 15, further comprising:

controlling a first field generated by a first magnetic confinement assembly configured about the first zone of processing region according to a first sputtering profile; and

controlling a second field generated by a second magnetic confinement assembly configured about the second zone of processing region according to a second sputtering profile.

20. The method of claim 19, further comprising:

directing a fluid to the first one or more cooling channels fluidlly coupled with a first heat exchanger to control a first temperature profile of the first magnetic housing; and

directing a fluid to the second one or more cooling channels fluidlly coupled with the first heat exchanger or a second heat exchanger to control a second temperature profile of the second magnetic housing.