

Claims:

1. A substrate support for use in a substrate processing chamber, comprising:
 - a pedestal having a first side configured to support a substrate and a second side opposite the first side;
 - a plurality of substrate lift pins extending through the pedestal, wherein a plurality of first gaps are disposed between the plurality of substrate lift pins and respective ones of a plurality of substrate lift pin openings in the pedestal; and
 - vacuum lines that extend from the plurality of substrate lift pin openings and that are configured to pump down the plurality of substrate lift pin openings.
2. The substrate support of claim 1, wherein the pedestal includes a dielectric plate having an electrode embedded therein, and a cooling plate coupled to the dielectric plate, and wherein the cooling plate includes cooling channels configured to circulate a coolant.
3. The substrate support of claim 1, further comprising a plurality of process kit lift pins extending through the pedestal and disposed radially outward of the plurality of substrate lift pins, wherein a plurality of second gaps are disposed between the plurality of process kit lift pins and respective ones of a plurality of process kit lift pin openings, and wherein the vacuum lines are configured to pump down the plurality of second gaps, wherein the vacuum lines include junctions disposed in the substrate support that split the vacuum lines into a first exhaust line extending to one of the plurality of first gaps and a second exhaust line extending to one of the plurality of second gaps.
4. The substrate support of claim 1, further comprising:
 - a lower edge ring disposed about the pedestal and forming a third gap between the lower edge ring and the pedestal; and
 - a channel extending from at least one of the plurality of first gaps to the third gap such that the vacuum lines are configured to pump down the plurality of first gaps and the

third gap, wherein the pedestal includes an insulator plate coupled to a cooling plate, wherein the channel is disposed in the insulator plate.

5. The substrate support of any of claims 1 to 4, further comprising a vacuum pump coupled to the vacuum lines to pump down the plurality of substrate lift pin openings.

6. The substrate support of any of claims 1 to 4, wherein at least one of:
the plurality of substrate lift pins have an upper portion that tapers outward to provide a seal with the pedestal when the plurality of substrate lift pins are in a lower position, or,

the vacuum lines extend to sidewalls of the plurality of substrate lift pin openings.

7. A process chamber for processing a substrate, comprising:
a chamber body defining a processing volume therein;
the substrate support of any of claims 1 to 4 disposed in the chamber body and having an upper surface exposed to the processing volume; and
a vacuum pump coupled to each of the plurality of first gaps via the vacuum lines that extend to the plurality of substrate lift pin openings.

8. The process chamber of claim 7, further comprising a second vacuum pump fluidly coupled to the processing volume and configured to pump down the processing volume.

9. The process chamber of claim 8, wherein the chamber body defines a second volume disposed below the substrate support and fluidly coupled to the processing volume, wherein the second volume is upstream from the second vacuum pump, wherein the vacuum pump exhausts into the second volume.

10. The process chamber of claim 8, further comprising a rough line, and wherein the vacuum pump exhausts into the rough line at a first location and the second vacuum pump exhausts into the rough line at a second location different than the first location.

11. A process chamber for processing a substrate, comprising:
a chamber body defining a processing volume therein;
the substrate support of any of claims 1 to 4 disposed in the chamber body and having an upper surface exposed to the processing volume;
a first vacuum pump coupled to each of the plurality of first gaps and configured to pump down the plurality of first gaps to a first pressure; and
a second vacuum pump coupled to the chamber body and configured to pump down the processing volume to a process pressure.
12. The process chamber of claim 11, wherein the first vacuum pump exhausts to a second volume upstream of the second vacuum pump or to a rough line independent of the second vacuum pump.
13. The process chamber of claim 11, further comprising a plurality of process kit lift pins extending through the pedestal and disposed radially outward of the plurality of substrate lift pins, wherein a plurality of second gaps are disposed between the plurality of process kit lift pins and respective ones of a plurality of process kit lift pin openings, and wherein the first vacuum pump is coupled to the each of the plurality of second gaps and configured to pump down the plurality of second gaps.
14. The process chamber of claim 11, wherein the pedestal includes a dielectric plate having an electrode embedded therein, and a cooling plate coupled to the dielectric plate, and further comprising:
a lower edge ring disposed about the dielectric plate, wherein a third gap is disposed between the lower edge ring and the dielectric plate, and wherein the first vacuum pump is fluidly coupled to the third gap via a channel; and
a first o-ring and a second o-ring disposed between the lower edge ring and the pedestal, and wherein the third gap is disposed between the first o-ring and the second o-ring.

15. The process chamber of claim 11, wherein the chamber body defines a lower volume disposed below the substrate support, wherein the first vacuum pump is disposed in the lower volume.