

CLAIMS:

1. A substrate processing system comprising:
a chamber body defining a transfer region;
a first lid plate seated on the chamber body along a first surface of the first lid
5 plate, wherein the first lid plate defines a plurality of apertures through the first lid plate, wherein
the first lid plate further defines a recessed ledge about each aperture of the plurality of apertures
in a second surface of the first lid plate opposite the first surface of the first lid plate;
a plurality of lid stacks equal to a number of apertures of the plurality of
apertures, each lid stack of the plurality of lid stacks seated on the first lid plate on a separate
10 recessed ledge defined in the second surface of the first lid plate, wherein the plurality of lid
stacks at least partially define a plurality of processing regions vertically offset from the transfer
region; and
a second lid plate coupled with the plurality of lid stacks, wherein the plurality of
lid stacks are positioned between the first lid plate and the second lid plate.
2. The substrate processing system of claim 1, further comprising a plurality
15 of substrate supports disposed about the transfer region, each substrate support of the plurality of
substrate supports vertically translatable along a central axis of the substrate support between a
first position and a second position.
3. The substrate processing system of claim 2, wherein each substrate
20 support of the plurality of substrate supports is aligned with a lid stack of the plurality of lid
stacks.
4. The substrate processing system of claim 3, wherein each processing
region of the plurality of processing regions is defined from below by an associated substrate
support in the second position.
5. The substrate processing system of claim 1, wherein each processing
25 region of the plurality of processing regions is fluidly coupled with the transfer region and
fluidly isolated from above from each other processing region of the plurality of processing
regions.

6. The substrate processing system of claim 1, wherein the transfer region comprises a transfer apparatus rotatable about a central axis and configured to engage substrates and transfer substrates among a plurality of substrate supports within the transfer region.

7. The substrate processing system of claim 1, wherein the second lid plate
5 defines a plurality of apertures through the second lid plate, each aperture of the plurality of apertures accessing a lid stack of the plurality of lid stacks, and wherein the substrate processing system further comprises:

a remote plasma unit fluidly coupled with each aperture of the plurality of apertures defined in the second lid plate.

8. The substrate processing system of claim 1, wherein each lid stack of the
10 plurality of lid stacks comprises a pumping liner defining an exhaust plenum positioned along the recessed ledge of an associated aperture through the first lid plate.

9. The substrate processing system of claim 8, wherein each lid stack further
15 comprises a faceplate seated on the pumping liner and at least partially defining an associated processing region from above, wherein each lid stack further comprises a blocker plate seated on the faceplate, and wherein the substrate processing system further comprises:

an annular faceplate heater seated on the faceplate radially outward of the blocker plate.

10. A substrate processing system comprising:
20 a chamber body defining a transfer region;
a plurality of substrate supports distributed about the transfer region within the chamber body;

a first lid plate seated on the chamber body, wherein the first lid plate defines a
25 plurality of apertures through the first lid plate equal to a number of substrate supports of the plurality of substrate supports, wherein each aperture of the plurality of apertures is axially aligned with a substrate support of the plurality of substrate supports, and wherein each aperture of the plurality of apertures is characterized by a diameter greater than a diameter of an associated substrate support of the plurality of substrate supports;

a plurality of lid stacks equal to a number of apertures of the plurality of apertures, each lid stack of the plurality of lid stacks seated on the first lid plate overlying an aperture of the plurality of apertures of the first lid plate; and

5 a second lid plate coupled with the plurality of lid stacks, wherein the plurality of lid stacks are positioned between the first lid plate and the second lid plate.

11. The substrate processing system of claim 10, wherein the plurality of lid stacks at least partially define a plurality of processing regions vertically offset from the transfer region, and wherein each lid stack comprises a faceplate at least partially defining from above an associated processing region of the plurality of processing regions.

10 12. The substrate processing system of claim 10, wherein each substrate support of the plurality of substrate supports is vertically translatable along a central axis of the substrate support between a first position and a second position.

13. The substrate processing system of claim 10, further comprising a transfer apparatus positioned within the transfer region and rotatable about a central axis, wherein the
15 transfer apparatus is configured to engage substrates and transfer substrates among the plurality of substrate supports within the transfer region.

14. The substrate processing system of claim 10, wherein the second lid plate defines a plurality of apertures through the second lid plate, each aperture of the plurality of apertures axially aligned with a substrate support of the plurality of substrate supports, and
20 wherein the substrate processing system further comprises:

a remote plasma unit seated on the second lid plate and fluidly coupled with each aperture of the plurality of apertures defined in the second lid plate.

15. A substrate processing system comprising:
a chamber body defining a transfer region;
25 a first lid plate seated on the chamber body along a first surface of the first lid plate, wherein the first lid plate defines a plurality of apertures through the first lid plate;
a plurality of faceplates, each faceplate of the plurality of faceplates seated on the first lid plate overlying an aperture of the plurality of apertures of the first lid plate, wherein the

plurality of faceplates at least partially define a plurality of processing regions vertically offset from the transfer region; and

- 5 a second lid plate coupled with the plurality of faceplates, wherein the plurality of faceplates are positioned between the first lid plate and the second lid plate, and wherein at least one structural support extends between the first lid plate and the second lid plate about the plurality of faceplates.