Claims

1. An apparatus for substrate processing, comprising:

a dual-chamber body, wherein the dual-chamber body comprises:

a first processing volume on a first side of a central plane;

a second processing volume on a second side of the central plane;

an equalization port connecting the first processing volume and the second processing volume;

a first plurality of gas inject passages formed through an outer surface of a first exterior sidewall of the dual-chamber body and in fluid communication with the first processing volume;

a second plurality of gas inject passages formed through an outer surface of a second exterior sidewall of the dual-chamber body and in fluid communication with the second processing volume;

a first exhaust port formed through an outer surface of a third exterior sidewall of the dual-chamber body opposite and across the first processing volume from the first plurality of gas inject passages, the first exhaust port in fluid communication with the first processing volume, wherein a first flow path plane is defined between the first plurality of gas inject passages and the first exhaust port; and

a second exhaust port formed through an outer surface of a fourth exterior sidewall of the dual-chamber body opposite and across the second processing volume from the second plurality of gas inject passages, the second exhaust port in fluid communication with the second processing volume, wherein a second flow path plane is defined between the second plurality of gas inject passages and the second exhaust port, and wherein both the first flow path plane and the second flow path plane are at an angle of 80 degrees to 100 degrees with respect to a longitudinal axis that extends through both the first processing volume and the second processing volume;

one or more upper window assemblies disposed over the dual-chamber body;

a first lower window positioned adjacent the first processing volume;

a second lower window positioned adjacent the second processing volume;

a first substrate support positioned in the first processing volume;

a second substrate support positioned in the second processing volume;

a first lower lamp assembly positioned adjacent the first lower window; and

a second lower lamp assembly positioned adjacent the second lower window.

2. The apparatus of claim 1, wherein the first plurality of gas inject passages and the first exhaust port are centered along the first flow path plane and the second plurality of gas inject passages and the second exhaust port are centered along the second flow path plane.

3. The apparatus of claim 1, further comprising a shared gas panel fluidly coupled to both the first processing volume and the second processing volume.

4. The apparatus of claim 1, further comprising a shared exhaust fluidly coupled to both the first processing volume and the second processing volume.

5. The apparatus of claim 1, wherein the first plurality of gas inject passages comprise five or more gas inject passages parallel to one another and the second plurality of gas inject passages comprise five or more gas inject passages parallel to one another.

6. The apparatus of claim 1, wherein the first plurality of gas inject passages and the second plurality of gas inject passages are spaced along an inner wall of a first processing chamber and a second processing chamber, respectively.

7. An apparatus for substrate processing, comprising:

a dual-chamber body, wherein the dual-chamber body comprises:

a first processing volume formed by a first cavity on a first side of a reference plane;

a second processing volume formed by a second cavity on a second side of the reference plane;

an equalization port connecting the first processing volume and the second processing volume;

a first plurality of gas inject passages formed through an outer surface of a first exterior sidewall of the dual-chamber body and in fluid communication with the first processing volume;

a second plurality of gas inject passages formed through an outer surface of a second exterior sidewall of the dual-chamber body and in fluid communication with the second processing volume;

a first exhaust port formed through an outer surface of a third exterior sidewall of the dual-chamber body opposite and across the first processing volume from the first plurality of gas inject passages, the first exhaust port in fluid communication with the first processing volume, wherein a first flow path plane is defined between the first plurality of gas inject passages and the first exhaust port;

a second exhaust port formed through an outer surface of a fourth exterior sidewall of the dual-chamber body opposite and across the second processing volume from the second plurality of gas inject passages, the second exhaust port in fluid communication with the second processing volume, wherein a second flow path plane is defined between the second plurality of gas inject passages and the second exhaust port, and wherein both the first flow path plane and the second flow path plane are at an angle of 80 degrees to 100 degrees with respect to a longitudinal axis that extends through both the first processing volume and the second processing volume;

one or more upper window assemblies disposed over the dual-chamber body;

a first lower window positioned adjacent the first processing volume;

a second lower window positioned adjacent the second processing volume;

a first substrate support positioned in the first processing volume;

a second substrate support positioned in the second processing volume;

a first lower lamp assembly positioned adjacent the first lower window; and

a second lower lamp assembly positioned adjacent the second lower window.

8. The apparatus of claim 7, further comprising a shared gas panel.

9. The apparatus of claim 7, further comprising a shared exhaust.

10. The apparatus of claim 7, wherein the dual-chamber body further comprises an upper groove formed around an outer diameter of each of the first processing volume and the second processing volume.

11. The apparatus of claim 10, wherein the one or more upper window assemblies comprises two upper window assemblies, and each of the two upper window assemblies further comprises:

an inner window; and

outer window supports, wherein the outer window supports are at least partially disposed within the upper groove.

12. The apparatus of claim 7, wherein the one or more upper window assemblies comprises a single upper-window.

13. The apparatus of claim 7, wherein the one or more upper window assemblies are disposed between the dual-chamber body and a lid assembly.

14. The apparatus of claim 7, wherein each of the first processing volume and the second processing volume have an inner liner formed therein.

15. A dual-chamber body for substrate processing, comprising:

a chamber body;

a first processing volume formed through the chamber body on a first side of a reference plane;

a second processing volume formed through the chamber body on a second side of the reference plane;

a first plurality of gas inject passages formed through an outer surface of a first exterior sidewall of the dual-chamber body and in fluid communication with the first processing volume;

a second plurality of gas inject passages formed through an outer surface of a second exterior sidewall of the dual-chamber body and in fluid communication with the second processing volume;

a first exhaust port formed through an outer surface of a third exterior sidewall of the dual-chamber body opposite and across the first processing volume from the first plurality of gas inject passages, the first exhaust port in fluid communication with the first processing volume, wherein a first flow path plane is defined between the first plurality of gas inject passages and the first exhaust port;

a second exhaust port formed through an outer surface of a fourth exterior sidewall of the dual-chamber body opposite and across the second processing volume from the second plurality of gas inject passages, the second exhaust port in fluid communication with the second processing volume, wherein a second flow path plane is defined between the second plurality of gas inject passages and the second exhaust port, and wherein both the first flow path plane and the second flow path plane are at an angle of 80 degrees to 100 degrees with respect to a longitudinal axis that extends through both the first processing volume and the second processing volume; and

an equalization port connecting the first processing volume and the second processing volume.

16. The dual-chamber body of claim 15, wherein both the first plurality of gas inject passages and the second plurality of gas inject passages comprise five or more gas inject passages parallel to one another.