

Claims:

1. A process kit for use in a processing chamber, the process kit comprising:
an inner liner having:
a plurality of first inlet holes disposed on an injection side of the inner liner and configured to be in fluid communication with a gas injection assembly of a processing chamber; and
a plurality of first outlet holes disposed on an exhaust side of the inner liner and configured to be in fluid communication with a gas exhaust assembly of the processing chamber;
a top plate and a bottom plate attached to an inner surface of the inner liner, the top plate and the bottom plate forming an enclosure together with the inner liner;
a cassette disposed within the enclosure, the cassette comprising a plurality of shelves configured to retain a plurality of substrates thereon;
a first ring reflector disposed outside of the inner liner; and
an edge temperature correcting element disposed between the inner liner and the first ring reflector.
2. The process kit of claim 1, further comprising:
an outer liner outside of the first ring reflector, wherein
the outer liner comprises material selected from opaque quartz and silicon-carbide (SiC) coated graphite.
3. The process kit of claim 1, wherein
the inner liner comprises material selected from clear quartz and silicon-carbide (SiC) coated graphite, and
the top plate and the bottom plate comprise material selected from clear quartz, opaque quartz, silicon-carbide (SiC) coated graphite.
4. The process kit of claim 1, wherein
the first ring reflector comprises material selected from opaque quartz or silicon-carbide (SiC) coated graphite, and
the plurality of shelves comprises silicon-carbide (SiC) coated graphite.

5. The process kit of claim 1, wherein the edge temperature correcting element comprises two graphite heaters surrounding the inner liner.
6. The process kit of claim 1, wherein the edge temperature correcting element comprises a lamp between the inner liner and the first ring reflector.
7. The process kit of claim 1, wherein the edge temperature correcting element comprises a toroidal lamp encircling the inner liner.
8. The process kit of claim 1, wherein
 - the edge temperature correcting element comprises a second ring reflector surrounding the inner liner, and
 - the second ring reflector comprises material selected from opaque quartz or silicon-carbide (SiC) coated graphite.
9. A processing chamber, comprising:
 - a housing structure having a first side wall and a second side wall opposite the first side wall in a first direction;
 - a gas injection assembly coupled to the first side wall;
 - a gas exhaust assembly coupled to the second side wall;
 - a quartz chamber disposed within the housing structure;
 - a process kit disposed within the quartz chamber, the process kit comprising a cassette having a plurality of shelves configured to retain a plurality of substrates thereon;
 - a plurality of upper lamp modules disposed on a first side of the quartz chamber and configured to provide radiative heat to the plurality of substrates;
 - a plurality of lower lamp modules disposed on a second side of the quartz chamber opposite the first side in a second direction perpendicular to the first direction and configured to provide radiative heat to the plurality of substrates; and
 - a lift-rotation mechanism configured to move the cassette in the second direction and rotate the cassette about the second direction,

wherein the process kit further comprises:

an inner liner having:

a plurality of first inlet holes disposed on an injection side of the inner liner and configured to be in fluid communication with the gas injection assembly; and

a plurality of first outlet holes disposed on an exhaust side of the inner liner and configured to be in fluid communication with the gas exhaust assembly;

a top plate and a bottom plate attached to an inner surface of the inner liner, the top plate and the bottom plate forming an enclosure together with the inner liner, the cassette being disposed within the enclosure;

a first ring reflector disposed outside of the inner liner; and

an edge temperature correcting element disposed between the inner liner and the first ring reflector.

10. The processing chamber of claim 9, wherein
the process kit further comprises an outer liner, and
the outer liner comprises material selected from opaque quartz and silicon-carbide (SiC) coated graphite.
11. The processing chamber of claim 9, wherein
the inner liner comprises material selected from clear quartz and silicon-carbide (SiC) coated graphite,
the top plate and the bottom plate comprise material selected from clear quartz, opaque quartz, silicon-carbide (SiC) coated graphite,
the first ring reflector comprises material selected from opaque quartz or silicon-carbide (SiC) coated graphite, and
the plurality of shelves comprises silicon-carbide (SiC) coated graphite.
12. The processing chamber of claim 9, wherein the edge temperature correcting element comprises two graphite heaters surrounding the inner liner.

13. The processing chamber of claim 9, wherein the edge temperature correcting element comprises a lamp between the inner liner and the first ring reflector.
14. The processing chamber of claim 9, wherein the edge temperature correcting element comprises a toroidal lamp encircling the inner liner.
15. The processing chamber of claim 9, wherein
the edge temperature correcting element comprises a second ring reflector surrounding the inner liner, and
the second ring reflector comprises material selected from opaque quartz or silicon-carbide (SiC) coated graphite.
16. A processing system comprising:
a processing chamber comprising:
a housing structure having a first side wall and a second side wall opposite the first side wall in a first direction;
a gas injection assembly coupled to the first side wall;
a gas exhaust assembly coupled to the second side wall;
a quartz chamber disposed within the housing structure;
a process kit disposed within the quartz chamber, the process kit comprising:
a cassette having a plurality of shelves configured to retain a plurality of substrates thereon;
an inner liner having:
a plurality of first inlet holes disposed on an injection side of the inner liner and configured to be in fluid communication with the gas injection assembly; and
a plurality of first outlet holes disposed on an exhaust side of the inner liner and configured to be in fluid communication with the gas exhaust assembly; and

a top plate and a bottom plate attached to an inner surface of the inner liner, the top plate and the bottom plate forming an enclosure together with the inner liner, the cassette being disposed within the enclosure;

a first ring reflector disposed outside of the inner liner; and

an edge temperature correcting element disposed between the inner liner and the first ring reflector;

a plurality of upper lamp modules disposed on a first side of the quartz chamber and configured to provide radiative heat to the plurality of substrates;

a plurality of lower lamp modules disposed on a second side of the quartz chamber opposite the first side in a second direction perpendicular to the first direction and configured to provide radiative heat to the plurality of substrates;

a lift-rotation mechanism configured to move the cassette in the second direction and rotate the cassette about the second direction; and

a transfer robot configured to transfer the plurality of substrates into and from the process kit disposed in the processing chamber.

17. The processing system of claim 16, wherein
the process kit further comprises an outer liner outside of the first ring reflector,
and
the outer liner comprises material selected from opaque quartz and silicon-carbide (SiC) coated graphite.

18. The processing system of claim 16, wherein
the inner liner comprises material selected from clear quartz and silicon-carbide (SiC) coated graphite,
the first ring reflector comprises material selected from opaque quartz or silicon-carbide (SiC) coated graphite, and
the plurality of shelves comprises silicon-carbide (SiC) coated graphite.

19. The processing system of claim 16, wherein the edge temperature correcting element comprises two graphite heaters surrounding the inner liner.

20. The processing system of claim 16, wherein the edge temperature correcting element comprises a lamp between the inner liner and the first ring reflector.
21. The processing system of claim 16, wherein the edge temperature correcting element comprises a toroidal lamp encircling the inner liner.
22. The processing system of claim 16, wherein
the edge temperature correcting element comprises a second ring reflector surrounding the inner liner, and
the second ring reflector comprises material selected from opaque quartz or silicon-carbide (SiC) coated graphite.