

CLAIMS:

- 1 1. A semiconductor processing system comprising:
2 a chamber body comprising sidewalls and a base;
3 a substrate support extending through the base of the chamber body, wherein the
4 substrate support comprises:
5 a support platen configured to support a semiconductor substrate, and
6 a shaft coupled with the support platen;
7 a shield coupled with the shaft of the substrate support, wherein the shield
8 comprises a plurality of apertures defined through the shield; and
9 a block seated in an aperture of the shield.
- 1 2. The semiconductor processing system of claim 1, wherein the shield
2 comprises a ceramic material.
- 1 3. The semiconductor processing system of claim 1, wherein the substrate
2 support further comprises a purge channel positioned to deliver a purge gas within a region
3 between the support platen and the shield.
- 1 4. The semiconductor processing system of claim 1, wherein each aperture of
2 the plurality of apertures is characterized by a diameter of less than or about 10 mm.
- 1 5. The semiconductor processing system of claim 4, wherein the plurality of
2 apertures are sized along a gradient, and apertures proximate the shaft are characterized by a
3 larger diameter than apertures distal the shaft.
- 1 6. The semiconductor processing system of claim 1, wherein the plurality of
2 apertures are defined within an area confined by a radial distance of 80% or less of a radius of
3 the shield.
- 1 7. The semiconductor processing system of claim 1, wherein the shield is
2 positioned within 30 mm along the shaft of a backside of the support platen.
- 1 8. The semiconductor processing system of claim 1, wherein the block
2 comprises a material that is substantially opaque to infrared radiation.

1 9. The semiconductor processing system of claim 8, wherein the block
2 comprises a first block, wherein the aperture of the shield in which the first block is seated is a
3 first aperture, and wherein the semiconductor processing system further comprises a second
4 block seated in a second aperture of the shield.

1 10. The semiconductor processing system of claim 9, wherein the second
2 block comprises a material that is substantially transparent to infrared radiation.

1 11. A semiconductor processing chamber pedestal radiation shield,
2 comprising:
3 a ceramic material; and
4 a block, wherein:
5 the shield defines a central aperture coaxial with a central axis of the
6 shield,
7 the shield defines a plurality of apertures uniformly spaced about the
8 central aperture,
9 the block extends across at least one aperture of the plurality of apertures,
10 and
11 the plurality of apertures are defined within an area confined by a radial
12 distance of 90% or less of a radius of the shield.

1 12. The semiconductor processing chamber pedestal radiation shield of claim
2 11, wherein the block comprises a material that is substantially opaque to infrared radiation.

1 13. The semiconductor processing chamber pedestal radiation shield of claim
2 11, wherein the block extends across multiple apertures of the plurality of apertures.

1 14. The semiconductor processing chamber pedestal radiation shield of claim
2 11, wherein the block comprises a first block, wherein the at least one aperture across which the
3 first block extends is a first aperture, and wherein the shield further comprises a second block
4 extending across a second aperture of the shield.

1 15. The semiconductor processing chamber pedestal radiation shield of claim
2 14, wherein the second block comprises a material that is substantially transparent to infrared
3 radiation.

1 16. The semiconductor processing chamber pedestal radiation shield of claim
2 15, wherein the second block comprises quartz or sapphire.

1 17. A method of semiconductor processing comprising:
2 flowing a carbon-containing precursor into a processing chamber, wherein the
3 processing chamber comprises a faceplate and a substrate support on which a substrate is
4 disposed, wherein the substrate support extends through a base of the processing chamber,
5 wherein the substrate support comprises:
6 a support platen on which the substrate is disposed,
7 a shaft coupled with the support platen,
8 a shield coupled with the shaft of the substrate support, wherein the shield
9 comprises a plurality of apertures defined through the shield, and
10 a block covering at least one aperture of the plurality of apertures;
11 generating a plasma of the carbon-containing precursor within the processing
12 chamber; and
13 depositing a carbon-containing material on the substrate.

1 18. The method of semiconductor processing of claim 17, wherein the
2 substrate support is maintained at a temperature of at least about 600 °C during the method.

1 19. The method of semiconductor processing of claim 17, wherein the block
2 comprises a material that is substantially opaque to infrared, and wherein the block increases a
3 local temperature of the substrate support at a location vertically offset and axially aligned with
4 the block.

1 20. The method of semiconductor processing of claim 17, wherein the block
2 comprises a first block, wherein the at least one aperture covered by the first block is a first
3 aperture, wherein the substrate support further comprises a second block covering a second
4 aperture of the shield, wherein the second block comprises a material that is substantially

- 5 transparent to infrared radiation, and wherein the second block decreases a local temperature of
6 the substrate support at a location vertically offset and axially aligned with the second block.