

Claims

1. A dome assembly for use in a processing chamber, comprising:
an upper dome comprising:
a central window portion; and
a peripheral flange engaging the central window portion at a circumference of the central window portion, wherein the peripheral flange has a fillet radius of about 0.5 inches to about 2 inches, and wherein a tangent line on an inside surface of the central window portion that passes through an intersection of the central window portion and the peripheral flange is at an angle of about 8° to about 16° with respect to a planar upper surface of the peripheral flange.
2. The dome assembly of claim 1, wherein the tangent line is at an angle of about 10° with respect to the planar upper surface of the peripheral flange.
3. The dome assembly of claim 1, wherein the planar upper surface of the peripheral flange is substantially parallel to a horizontal plane defined by a substrate receiving surface of a substrate support disposed within the processing chamber.
4. The dome assembly of claim 1, wherein the central window portion has a thickness of about 3.5 mm to about 6 mm.
5. The dome assembly of claim 4, wherein the central window portion has a radius of curvature of about 900 mm to about 2500 mm along the extent of the central window portion.
6. The dome assembly of claim 1, wherein an outer peripheral surface of the peripheral flange is subjected to a lateral pressure of about 45 psi to about 200 psi or greater during processing.

7. The dome assembly of claim 1, wherein the peripheral flange is made from an opaque or optically transparent material and the central window portion is formed from an optically transparent material.

8. The dome assembly of claim 1, wherein the peripheral flange has a width of about 10 mm to about 70 mm and the central window portion has an outer diameter of about 130 mm to about 250 mm.

9. The dome assembly of claim 1, further comprising:

a lower dome disposed opposing the upper dome, wherein the upper dome and the lower dome generally define an internal region of the processing chamber, the lower dome having a central opening, the lower dome comprising:

a peripheral flange having a planar bottom surface; and

a bottom extended radially between the peripheral flange and the central opening, wherein a tangent line on an outside surface of the bottom that passes through an intersection of the bottom and the peripheral flange of the lower dome is at an angle of about 8° to about 16° with respect to the planar bottom surface of the peripheral flange of the lower dome.

10. The dome assembly of claim 9, wherein the tangent line on the outside surface of the bottom is at an angle of about 10° with respect to the planar bottom surface of the peripheral flange of the lower dome.

11. The dome assembly of claim 9, wherein the planar bottom surface of the peripheral flange of the lower dome is substantially parallel to a horizontal plane defined by a substrate receiving surface of a substrate support disposed within the processing chamber.

12. The dome assembly of claim 9, wherein the bottom has a thickness of about 4 mm to about 10 mm.

13. The dome assembly of claim 9, wherein the peripheral flange of the lower dome is made from an opaque or optically transparent material and the bottom is formed from an optically transparent material.

14. The dome assembly of claim 9, wherein the peripheral flange of the lower dome has a width of about 10 mm to about 90 mm and the bottom has an outer diameter of about 300 mm to about 600 mm.

15. A processing chamber for processing a substrate, comprising:
an upper dome, comprising:

a central window portion, wherein the central window portion is formed from an optically transparent material; and

an upper peripheral flange engaging the central window portion at a circumference of the central window portion, wherein the upper peripheral flange is made from an opaque or optically transparent material, wherein the upper peripheral flange has a fillet radius of about 0.5 inches to about 2 inches, and a tangent line on an inside surface of the central window portion that passes through an intersection of the central window portion and the upper peripheral flange is at an angle of about 8° to about 16° with respect to a planar upper surface of the upper peripheral flange; and

a lower dome disposed opposing to the upper dome, wherein the upper dome and the lower dome generally define an internal region of the processing chamber, the lower dome having a central opening, the lower dome comprising:

a lower peripheral flange, wherein the lower peripheral flange is made from an opaque or optically transparent material; and

a bottom extended radially outward to connect the lower peripheral flange and the central opening, wherein the bottom is formed from an optically transparent material, and a tangent line on an outside surface of the bottom that passes through an intersection of the bottom and the lower peripheral flange is at an angle of about 8° to about 16° with respect to a planar bottom surface of the lower peripheral flange; and

a substrate support disposed within the processing chamber, the substrate support comprising a substrate receiving surface that is substantially parallel to the planar upper surface of the upper peripheral flange.

16. The processing chamber of claim 15, wherein the central window portion has a thickness of about 3.5 mm to about 6 mm and the bottom has a thickness of about 4 mm to about 10 mm.

17. The processing chamber of claim 15, wherein the central window portion has a radius of curvature of about 900 mm to about 2500 mm along the extent of the central window portion.

18. The processing chamber of claim 15, wherein the upper peripheral flange has a width of about 10 mm to about 70 mm and the central window portion has an outer diameter of about 130 mm to about 250 mm, and wherein the lower peripheral flange has a width of about 10 mm to about 90 mm and the bottom has an outer diameter of about 300 mm to about 600 mm.

19. A processing chamber for processing a substrate, comprising:

an upper dome, comprising:

a central window portion having a thickness of about 3.5 mm to about 6.0 mm; and

an upper peripheral flange engaging the central window portion at a circumference of the central window portion, wherein the upper peripheral flange has a fillet radius of about 0.5 inches to about 2 inches, and wherein a tangent line on an inside surface of the central window portion that passes through an intersection of the central window portion and the upper peripheral flange is at an angle of about 8° to about 16° with respect to a planar upper surface of the upper peripheral flange; and

a lower dome disposed opposing to the upper dome, wherein the upper dome and the lower dome generally define an internal region of the processing chamber, the lower dome having a central opening, the lower dome comprising:

- a lower peripheral flange; and

- a bottom extended radially between the lower peripheral flange and the central opening, wherein the bottom has a thickness of about 3.5 mm to about 10 mm, and a tangent line on an outside surface of the bottom that passes through an intersection of the bottom and the lower peripheral flange is at an angle of about 8° to about 16° with respect to a planar bottom surface of the lower peripheral flange.