CLAIMS

1. A chamber lid assembly comprising:

   a lid having:

   a channel having an upper portion and a lower portion, wherein the channel extends along a central axis of the lid;

   a housing having an inner region and at least partially defining two or more annular channels surrounding the channel; and

   a tapered bottom surface extending from the lower portion of the channel to a peripheral portion of the chamber lid assembly; and

   an insert comprising a coupling lid having a truncated portion, the insert configured to at least partially define the upper portion of the channel to provide a desired gas flow characteristic into the upper portion of the channel and having a plurality of apertures formed therein disposed adjacent the two or more annular channels in the housing, the plurality of apertures fluidly coupled with the two or more annular channels.

2. The chamber lid assembly of claim 1, wherein the housing further comprises an annular manifold disposed on a base with the annular manifold defining the inner region.

3. The chamber lid assembly of claim 2, wherein the two or more annular channels are disposed in a vertically spaced manner along the central axis.

4. The chamber lid assembly of claim 1, wherein each of the annular channels is coupled with a fluid delivery line and each fluid delivery line is coupled with one or more fluid sources.

5. The chamber lid assembly of claim 1, wherein each annular channel circumferentially spans the inner region and provides for fluid communication in 360°.

6. The chamber lid assembly of claim 2, further comprising a purge line disposed in the annular manifold.

7. The chamber lid assembly of claim 6, wherein the purge line comprises a horizontal gas transport line coupled with one or more gap purge lines that are fluidly coupled with the inner region.

8. The chamber lid assembly of claim 7, wherein at least one gap purge line is coupled with the inner region above the two or more annular channels and at least one gap purge line is coupled with the inner region below the two or more annular channels.

9. The chamber lid assembly of claim 7, wherein each gap purge line further comprises a circumferentially formed annular channel that spans the inner region.

10. The chamber lid assembly of claim 7, wherein the purge line further comprises a vertically disposed line disposed in the annular manifold.

11. The chamber lid assembly of claim 2, wherein the coupling lid having the truncated portion is adapted to be coupled to a top portion of the housing, the insert further comprising a vertical body at least partially defining the upper portion of the channel and adapted to be disposed in and flush with the inside of the annular manifold.

12. The chamber lid assembly of claim 11, wherein the insert further comprises one or more sets of the plurality of apertures disposed along a horizontal plane through the vertical body to be coupled with each annular channel and provide a multi-aperture inlet between each annular channel and the upper portion.

13. The chamber lid assembly of claim 11, wherein the upper portion of the channel is defined by the vertical body to comprise a cylindrical shape.

14. The chamber lid assembly of claim 13, wherein the vertical body of the insert further comprises a cylindrical upper portion and an expanding bottom portion with the expanding bottom portion disposed below a bottom set of a plurality of apertures.

15. The chamber lid assembly of claim 14, wherein the bottom set of a plurality of apertures comprises between 2 and 10 apertures.

16. The chamber lid assembly of claim 11, wherein each of the apertures is disposed from about 0° to 60° in a horizontal manner from the vertical body and is disposed from about 0° to 60° in a vertical manner from the vertical body.

17. The chamber lid assembly of claim 1, wherein each of the apertures is a rectangular shape, a cylindrical tube, or a tear drop shape.

18. The chamber lid assembly of claim 12, wherein each set of the plurality of apertures is vertically disposed from one another along the central axis.