

Claims

1. An edge ring for use in a plasma processing chamber, the edge ring having an annular body that is configured to surround a substrate support of the plasma processing chamber, comprising:
the annular body having a bottom side, a top side, an inner side, and an outer side;
a plurality of fastener holes fabricated within the annular body along the bottom side,
wherein each of the plurality of fastener holes extends from a horizontally oriented surface of the bottom side towards the top side, wherein the horizontally oriented surface extends from a vertically oriented inner surface of the inner side to the plurality of fastener holes, wherein each of the plurality of fastener holes has a threaded inner surface formed within the bottom side for receiving a fastener used for attaching the annular body to a support ring; and
a curved edge formed between the top side and the outer side.
2. The edge ring of claim 1, wherein the edge ring is consumable and replaceable.
3. The edge ring of claim 1,
wherein the inner side has an angled surface that is contiguous with a horizontally oriented inner surface, and the vertically oriented inner surface is contiguous with the horizontally oriented inner surface,
wherein the bottom side is horizontally oriented and contiguous with the outer side and the vertically oriented inner surface,
wherein the outer side is a vertically oriented surface,
wherein the curved edge is adjacent to the top side and to the outer side.
4. The edge ring of claim 1, wherein the substrate support is a chuck and the support ring is a tunable edge sheath ring, wherein the bottom side has a first portion that is capable of being conductively coupled via a conductive gel to the chuck, a second portion that is capable of being conductively coupled via a conductive gel to the tunable edge sheath ring, and a third portion that is capable of being adjacent to a base ring.
5. The edge ring of claim 1, wherein the plurality of fastener holes are spaced at equal distances on the bottom side.

6. The edge ring of claim 1, wherein one of the plurality of fastener holes is partially enclosed by a top surface of a slot formed within the bottom side of the edge ring and a side surface of the slot.
7. The edge ring of claim 6, wherein a gap between the top surface of the slot and one of the plurality of fasteners when received in the slot is less than one millimeter to reduce chances of arcing in the gap.
8. The edge ring of claim 1, wherein the edge ring has an outer diameter ranging from and including 13.6 inches to 15 inches, wherein the outer diameter is limited by the outer side.
9. The edge ring of claim 1, wherein the top side has an outer diameter greater than 13.6 inches and at most 15 inches to reduce chances of arcing from the top side to a cover ring when placed adjacent to the outer side.
10. The edge ring of claim 1, wherein the curved edge reduces chances of arcing from the curved edge to a cover ring when placed adjacent to the outer side.
11. The edge ring of claim 1, wherein all edges of the edge ring are arced.