CLAIMS

1. An edge ring for a plasma processing system, the edge ring comprising:

a first annular body configured to surround a substrate support during plasma processing;

an upper surface,

a lower surface;

a radially inner surface;

a radially outer surface; and

N spacers arranged in N spaced locations on the radially outer surface of the edge ring to reduce variations in a predetermined gap between the first annular body of the edge ring and a structure separate from the edge ring as the edge ring is heated and cooled during plasma processing, where N is an integer greater than or equal to 3 and less than or equal to 8.

2. The edge ring of claim 1, wherein the N spacers are arranged with a spacing of 360º/N.

3. The edge ring of claim 1, wherein at least one of the N spacers includes a projection formed on the radially outer surface of the edge ring.

4. The edge ring of claim 3, further comprising a coating covering the projection.

5. The edge ring of claim 4, wherein the coating includes an insulating material.

6. The edge ring of claim 5, wherein the coating is selected from a group consisting of polytetrafluoroethylene (PTFE), perfluoroalkoxy polymer (PFA), aluminum oxide deposited using atomic layer deposition, yttrium oxide deposited using atomic layer deposition, and yttrium fluoride deposited using atomic layer deposition.

7. The edge ring of claim 1, wherein N = 5.

8. An edge ring system comprising the edge ring of claim 1, wherein the edge ring corresponds to a first edge ring, the edge ring system further comprising:

a second edge ring including a second annular body configured to surround the substrate support during plasma processing.

9. The edge ring system of claim 8, wherein the first edge ring is an upper edge ring and the second edge ring is a lower edge ring.

10. The edge ring system of claim 9, further comprising a lift pin to lift the upper edge ring relative to the lower edge ring to adjust a height of the upper surface of the upper edge ring relative to a substrate on the substrate support.

11. The edge ring system of claim 8, wherein the first edge ring is a lower edge ring and the second edge ring is an upper edge ring.