CLAIMS

1. An edge ring for use with a wafer having a diameter D and a thickness T comprising:

an outer portion having an outer bottom surface;

an inner portion having a top surface, an inner bottom surface, and an inner edge; and a raised section having a raised bottom surface, wherein:

the outer bottom surface defines a first reference plane that is coplanar with at least a portion thereof;

the inner bottom surface defines a second reference plane that is parallel to the first reference plane and coincident with at least a portion of the inner bottom surface;

the inner bottom surface is between the first reference plane and the top surface;

the inner bottom surface is at least a distance T away from the first reference plane;

the inner edge has a nominal inner diameter less than D;

the raised section extends from the inner bottom surface towards the first reference plane and is raised relative to at least portions of the inner bottom surface that are at a same radial distance from a center of the edge ring as the raised section; and

the raised section bottom surface is between the first reference plane and the second reference plane and separated from the first reference plane and the second reference plane by non-zero distances

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2. The edge ring of claim 1, wherein the inner portion has one or more recessed sections, each of the one or more recessed sections has a recessed bottom surface between the second reference plane and the top surface.

3. The edge ring of claim 2, wherein the inner portion has three recessed sections.

4. The edge ring of claim 1, wherein each recessed section of the one or more recessed sections starts at the inner edge of the inner portion and extends towards an outer edge of the inner portion.

5. The edge ring of claim 1, wherein each recessed bottom surface of the one or more recessed sections is at least 10 um away from the second reference plane.

6. The edge ring of claim 1, wherein each recessed section of the one or more recessed sections has an arcuate outer edge.

7. The edge ring of claim 1, wherein each recessed section of the one or more recessed sections has a straight outer edge.

8. The edge ring of claim 1, wherein the inner portion has one or more angular sectors in which the inner edge is between a circular region centered within the edge ring and an outer edge of the inner portion.

9. The edge ring of claim 8, wherein the inner portion has three angular sectors.

10. The edge ring of claim 8, wherein the inner edge at each of the one or more angular sectors is between the circular region and a reference circle concentric with the circular region and having a diameter D.

11. The edge ring of claim 8, wherein the inner edge at each of the one or more angular sectors is an arcuate shape.

12. The edge ring of claim 8, wherein the inner edge at each of the one or more angular sectors is straight.

13. The edge ring of claim 1, wherein the raised section bottom surface is at least 300 um above the first reference plane.

14. The edge ring of claim 1, wherein the edge ring further includes an overhang section with material within a circular region centered within the edge ring and having a diameter equal to the nominal inner diameter and the overhang section has an overhang inner edge that is a chord of the circular region.

15. The edge ring of claim 1, wherein the edge ring further includes an overhang section with material within a circular region centered within the edge ring and having a diameter equal to the nominal inner diameter and the overhang section is sector-shaped.

16. The edge ring of claim 1, wherein the edge ring further includes an overhang section with material within a circular region centered within the edge ring and having a diameter equal to the nominal inner diameter and the overhang section is U-shaped.

17. The edge ring of claim 1, wherein the edge ring further includes an overhang section with material within a circular region centered within the edge ring and having a diameter equal to the nominal inner diameter and the overhang section has an overhang section bottom surface between the first reference plane and the second reference plane.

18. The edge ring of claim 1, wherein the inner edge has a nominal inner diameter within 95% and 99.9% of D.

19. The edge ring of claim 1, wherein the edge ring is made of a ceramic material.

20. The edge ring of claim 1 further comprising a plurality of fingers, wherein:

each finger has a base, a radially inward-extending portion supported by the base, and a roller configured to rotate relative to the inward-extending portion, and

the base of each finger is connected with the outer bottom surface.

21. The edge ring of claim 1 wherein D is approximately 300 mm.

22. The edge ring of claim 1 wherein T is approximately 775 um.