

CLAIMS

WHAT IS CLAIMED IS:

1. An electrostatic chuck, comprising:
a support assembly, including a base;
a chuck, placed at the base and configured to carry a to-be-processed workpiece;
a fastening assembly, configured to removably fix the chuck at the base; wherein
the chuck includes a chuck body, and a first recess is formed at a second surface of the
chuck body facing the base.
2. The electrostatic chuck of claim 1, wherein the fastening assembly includes:
a pressure ring, including a pressure ring body placed at the base and surrounding the
chuck, the pressure ring body and the base being connected by a plurality of screws; and
a pressing part being placed at the pressure ring body and pressing an edge part of the
chuck.
3. The electrostatic chuck of claim 2, wherein:
a protrusion is formed at a center area of a first surface of the chuck body facing away
from the base and is configured to carry the to-be-processed workpiece; and
the pressing part is stacked at an edge area of the first surface.

4. The electrostatic chuck of claim 3, wherein a surface of the pressing part facing away from the base is lower than a surface of the protrusion for carrying the to-be-processed workpiece.

5. The electrostatic chuck of claim 1, wherein:
the fastening assembly includes a pressure ring; and
a protrusion is formed at a center area of a first surface of the chuck body facing away from the base, and the pressure ring is stacked at an edge area of the first surface to fix the chuck.

6. The chuck body of claim 2, wherein material used by the pressure ring includes a ceramic or metal material.

7. The chuck body of claim 3, wherein:
the support assembly further includes a functional part; and
the first recess and the base form a space to accommodate the functional part and pipelines connected to the functional part.

8. The chuck body of claim 5 or 7, wherein:
a distance between a surface of the protrusion facing away from the base and the second surface is 18~25 mm;
a distance between a first surface and the second surface is 10~15 mm; and
a depth of the first recess is 13~15 mm.

9. The chuck body of claim 7, the base including a base body, wherein:
- an annular protrusion is formed at a third surface of the base body facing the chuck body;
 - the annular protrusion contacts a bottom surface of the first recess;
 - a first seal ring is placed between the annular protrusion and the bottom surface of the first recess; and
 - a second recess is formed at the third surface and at an inner side of the annular protrusion and configured to form the space with the first recess; and
 - a first support, placed at the second recess, configured to support the functional part, and causing the functional part to contact the bottom surface of the first recess.
10. The electrostatic chuck of claim 9, wherein the first support includes an abutting spring.
11. The electrostatic chuck of claim 10, wherein the functional part include a water-cooled disk contacting the bottom surface of the first recess through the abutting spring.
12. The electrostatic chuck of claim 11, wherein:
- a groove is formed at a surface of the water-cooled disk facing the first recess; and
 - the functional part further includes a central air tube base configured at the groove, the central air tube base contacting the bottom surface of the first recess, and a second seal ring is placed between the central air tube base and the bottom surface of the first recess.
13. The electrostatic chuck of claim 12, wherein the functional part further includes:

a thermocouple, placed at the groove; and

a second support, placed at the groove, configured to support the thermocouple, and causing the thermocouple to contact the bottom surface of the first recess.

14. The electrostatic chuck of claim 7, wherein the protrusion and the first recess are placed concentrically, and a diameter of the first recess is smaller than a diameter of the protrusion.

15. The electrostatic chuck of claim 14, wherein an absolute difference between the diameter of the first recess and the diameter of the protrusion is 8~12 mm.

16. The electrostatic chuck of claim 1 or 5, wherein the chuck is made of an integrally formed ceramic material.

17. The electrostatic chuck of claim 16, wherein the ceramic material includes aluminium nitride (AlN) ceramic, or aluminium oxide (Al₂O₃) ceramic.

18. The electrostatic chuck of claim 16, wherein electrode terminals and a potential measurement terminal are placed at the chuck and are integrally formed by sintering with the chuck.

19. The electrostatic chuck of claim 9, wherein:

in the base body, a center hole penetrating at a thickness direction of the base body is placed at the second recess; and

the support assembly further includes a bellows placed at a bottom of the base body, connected to the center hole, and configured to accommodate the pipelines.

20. A piece of semiconductor equipment, comprising a reaction chamber, wherein:
an electrostatic chuck is placed in the reaction chamber; and
the electrostatic chuck according to any of claims 1~19.