Claims:

1. An apparatus for supporting a substrate, comprising:

a support surface; and

a plurality of substrate contact elements protruding from the support surface, wherein the plurality of substrate contact elements are formed of a non-silicon based material having a hardness less than or equal to a hardness of silicon, having non-adhesiveness with silicon-based materials, having a coefficient of static friction that prevents sliding when contacting silicon-based materials, having a surface roughness less than or equal to 10 Ra, and that is electrically conductive such that particles generated from a substrate when contacting the plurality of substrate contact elements is reduced.

2. The apparatus of claim 1, wherein the support surface is part of a substrate support and the plurality of contact elements protrude from the substrate support.

3. The apparatus of claim 1, wherein the support surface is part of a substrate support and the plurality of contact elements include a plurality of lift pins disposed in the substrate support.

4. The apparatus of claim 3, wherein an upper portion of each of the plurality of lift pins is formed of the non-silicon based material.

5. The apparatus of claim 3, wherein each of the plurality of lift pins is entirely formed of the non-silicon based material.

6. The apparatus of claim 1, wherein the support surface is part of a substrate transfer robot and the plurality of contact elements include contact pads disposed on an end effector of the substrate transfer robot.

7. The apparatus of claim 1, wherein the non-silicon based material is an electrically conductive plastic.

8. The apparatus of claim 1, wherein the non-silicon based material comprises one or more of aluminum oxide or stainless steel.

9. An apparatus for supporting a substrate, comprising:

a support surface; and

a plurality of substrate contact elements protruding from the support surface and arranged to support a substrate, wherein the plurality of substrate contact elements are formed of a non-silicon based material having a hardness less than or equal to a hardness of silicon, a coefficient of static friction that prevents sliding when in contact with silicon-based materials, and a surface roughness less than or equal to 10 Ra, wherein the plurality of substrate contact elements are electrically conductive, and wherein the non-silicon based material comprises one or more of an electrically conductive plastic, aluminum oxide, or stainless steel such that particles generated from a substrate when contacting the plurality of substrate contact elements is reduced.

10. The apparatus of claim 9, wherein the support surface is part of a substrate support and the plurality of contact elements protrude from the substrate support.

11. The apparatus of claim 9, wherein the support surface is part of a substrate support and the plurality of contact elements include a plurality of lift pins disposed in the substrate support.

12. The apparatus of claim 11, wherein an upper portion of each of the plurality of lift pins is formed of the non-silicon based material.

13. The apparatus of claim 11, wherein each of the plurality of lift pins is entirely formed of the non-silicon based material.

14. The apparatus of claim 9, wherein the support surface is part of a substrate transfer robot and the plurality of contact elements include contact pads disposed on an end effector of the substrate transfer robot.

15. A substrate processing system, comprising:

a substrate support disposed in a processing chamber, the substrate support having a substrate support surface and a plurality of lift pins arranged to support a substrate above the substrate support surface when lifted with respect to the substrate support; and

a substrate transfer robot including a support surface and a plurality of contact elements arranged to support the substrate when disposed on the substrate transfer robot,

wherein at least one of the substrate support surface, the plurality of contact elements, or the plurality of lift pins are formed of a non-silicon based material having a hardness less than or equal to a silicon hardness, having non-adhesiveness with silicon-based materials, having a coefficient of static friction that prevents sliding when contacting silicon-based materials, having a surface roughness less than or equal to 10 Ra, and that is electrically conductive such that particles generated from a substrate when contacting the at least one of the substrate support surface, the plurality of substrate contact elements, or the plurality of lift pins is reduced.

16. The substrate processing system of claim 15, wherein the non-silicon based material includes an electrically conductive plastic.

17. The substrate processing system of claim 15, wherein the non-silicon based material comprises one or more of aluminum oxide or stainless steel.

18. The substrate processing system of claim 15, wherein an upper portion of each of the plurality of lift pins is formed of the non-silicon based material.

19. The substrate processing system of claim 15, wherein each of the plurality of lift pins is entirely formed of the non-silicon based material.

20. The substrate processing system of claim 15, wherein the substrate support further includes a plurality of raised contact elements extending from the substrate support to support the substrate.