CLAIMS

1. An apparatus for supporting a substrate, comprising:

a support member; and

a plurality of substrate contact elements protruding from the support member, wherein each of the plurality of substrate contact elements comprises:

a first contact surface to support a substrate when placed thereon; and

a second contact surface extending from the first contact surface,

wherein the second contact surface is adjacent a periphery of the substrate to prevent radial movement of the substrate,

wherein the first contact surface is at a first angle with respect to the support member and the second contact surface is at a second angle with respect to the support member, and

wherein the first angle is between about 3 degrees and 5 degrees,

wherein the plurality of substrate contact elements are coupled to the support member with a plurality of screws, and

wherein each of the plurality of screws includes a through hole to evacuate an air gap between each of the plurality of screws and the support member.

2. The apparatus of claim 1, wherein the second angle is greater than the first angle.

3. The apparatus of claim 1, wherein the first contact surface and the second contact surface form a continuous curved surface.

4. The apparatus of claim 1, wherein the first contact surface is configured to apply frictional and radial forces to prevent sliding of the substrate.

5. The apparatus of claim 1, wherein a horizontal length of the first contact surface is between about 4 mm and 7 mm.

6. An apparatus for supporting a substrate, comprising:

a support member;

a plurality of substrate contact elements protruding from the support member, wherein each of the plurality of substrate contact elements comprises:

a first contact surface to support a substrate when placed thereon; and

a second contact surface extending from the first contact surface, wherein the second contact surface is adjacent a periphery of the substrate to prevent radial movement of the substrate, wherein the first contact surface is at a first angle with respect to the support member and the second contact surface is at a second angle with respect to the support member, and wherein the first angle is between about 3 degrees and 5 degrees; and

one or more shims disposed between the support member and one or more of the plurality of substrate contact elements.

7. The apparatus of claim 6, wherein the plurality of substrate contact elements are coupled to the support member with a plurality of screws.

8. The apparatus of claim 7, wherein each of the plurality of screws includes a through hole to ensure evacuation of an air gap between each of the plurality of screws and the support member.

9. The apparatus of claim 1, wherein the plurality of substrate contact elements are formed of one or more of aluminum oxide, silicon nitride, stainless steel, or an electrically conductive plastic.

10. A substrate transfer robot for transferring a substrate, comprising:

an arm including a blade;

a plurality of substrate contact elements protruding from an upper surface of the blade, wherein each of the plurality of substrate contact elements comprises:

a first contact surface to support a substrate when placed thereon; and

a second contact surface extending from the first contact surface,

wherein the second contact surface is adjacent a periphery of the substrate to prevent radial movement of the substrate,

wherein the first contact surface is at a first angle with respect to the upper surface and the second contact surface is at a second angle with respect to the upper surface, and

wherein the first angle is between about 3 degrees and 5 degrees; and

one or more shims disposed between the upper surface of the blade and one or more of the plurality of substrate contact elements.

11. The substrate transfer robot of claim 10, wherein the second angle is greater than the first angle.

12. The substrate transfer robot of claim 10, wherein the first contact surface and the second contact surface form a continuous curved surface.

13. The substrate transfer robot of claim 10, wherein the first contact surface is configured to apply frictional and radial forces to prevent sliding of the substrate.

14. The substrate transfer robot of claim 10, wherein a horizontal length of the first contact surface is between about 4 mm and 7 mm.

15. The substrate transfer robot of claim 10, wherein the plurality of substrate contact elements are coupled to the blade with a plurality of screws.

16. The substrate transfer robot of claim 15, wherein each of the plurality of screws includes a through hole to ensure evacuation of an air gap between each of the plurality of screws and the blade.

17. The substrate transfer robot of claim 10, wherein the plurality of substrate contact elements are formed of one of aluminum oxide, silicon nitride, stainless steel, or an electrically conductive plastic.

18. The substrate transfer robot of claim 10, wherein the blade is formed of an electrically conductive titanium-doped ceramic.