

CLAIMS

1. A polishing pad, comprising:
a composite polishing pad body comprising:
one or more first features formed from a first material, wherein the first material comprises a first material composition formed by depositing droplets of a second material and a third material within a plurality of layers that form at least a portion of each of the one or more first features; and
a base material layer formed from a fourth material, wherein the fourth material comprises a second material composition formed by depositing droplets of a fifth material and a sixth material within a plurality of layers that form at least a portion of the base material layer,
wherein the one or more first features extend from the base material layer, and a surface of each of the one or more first features form a polishing surface of the composite polishing pad body.
2. The polishing pad of claim 1, wherein the first material has a first hardness and the fourth material has a second hardness different from the first hardness.
3. The polishing pad of claim 2, wherein the first hardness is greater than the second hardness.
4. The polishing pad of claim 1, wherein the one or more first features and the base material layer are arranged to achieve a predetermined Young's modulus or a predetermined storage modulus and loss modulus across the composite polishing pad body.
5. The polishing pad of claim 1, wherein the first material has a higher Young's modulus than the fourth material.

6. The polishing pad of claim 1, wherein the one or more first features comprise a plurality of concentric rings separated by the base material layer.
7. The polishing pad of claim 1, wherein the one or more first features comprise a plurality of posts surrounded by the base material layer.
8. The polishing pad of claim 1, wherein the one or more first features and base material layer are formed by printing the each of the plurality of formed layers.
9. The polishing pad of claim 1, further comprising one or more observation windows, wherein the one or more observation windows are formed through and/or abut the one or more first features or the base material layer.
10. The polishing pad of claim 1, wherein the first material and the fourth material each comprises a polymer material.
11. The polishing pad of claim 10, wherein the polymer material comprises an acrylate.
12. The polishing pad of claim 1, wherein the first material comprises an acrylate.
13. A polishing pad, comprising:
 - a composite polishing pad body comprising:
 - one or more first features formed from a first material, wherein a surface of the one or more first features form a polishing surface, the first material has a first hardness, and the first material comprises a first polymer material and a second polymer material; and
 - a base material layer formed from a second material, wherein the second material has a second hardness that is less than the first hardness, and

the second material comprises the first polymer material and a third polymer material,

wherein the one or more first features extend from the base material layer, and

wherein a concentration of the first polymer material in the first material is greater than the concentration of the first polymer material in the second material.

14. The polishing pad of claim 13, wherein the one or more first features and the base material layer are formed by depositing a plurality of layers comprising the first material and the second material.

15. The polishing pad of claim 13, wherein the one or more first features and the base material layer are arranged to achieve a predetermined Young's modulus or a predetermined storage modulus and loss modulus across the composite polishing pad body.

16. The polishing pad of claim 13, wherein the one or more first features and base material layer are formed by printing.

17. The polishing pad of claim 13, further comprising one or more observation windows, wherein the one or more observation windows are formed through and/or about the one or more first features or the base material layer.

18. The polishing pad of claim 13, wherein the first polymer material comprises an acrylate.

19. The polishing pad of claim 13, wherein the first material is formed by depositing droplets of the first polymer material and the second polymer material.

20. The polishing pad of claim 13, wherein the second material is formed by depositing droplets of the first polymer material and the third polymer material.