What is claimed is:

1. An abrasive article comprising:

a flexible backing having opposed first and second major surfaces, wherein at least a portion the second major surface of the flexible backing includes replicated microstructures having recesses;

an abrasive layer comprising a plurality of abrasive particles retained in at least one binder, the abrasive layer disposed on the first major surface of the flexible backing; and

an adhesive,

wherein the adhesive is contained substantially in the recesses of the replicated microstructures.

2. An abrasive article according to claim 1, further comprising:

a rigid substrate in contact with at least a portion of the replicated microstructures.

3. An abrasive article according to claim 1, further comprising:

a release liner in contact with at least a portion of the adhesive.

4. An abrasive article according to claim 1, wherein the flexible backing is selected from the group consisting of densified kraft paper, poly-coated paper, metal foils, and polymeric substrate.

5. An abrasive article according to claim 4, wherein the metal foils are selected from aluminum, copper, tin, and bronze.

6. An abrasive article according to claim 4, wherein the polymeric substrate is selected from the group consisting of polyester, polycarbonate, polypropylene, polyethylene, cellulose, polyamide, polyimide, polysilicone, and polytetrafluoroethylene.

7. An abrasive article according to claim 1, wherein the abrasive particles are selected from the group consisting of fused aluminum oxide, heat treated aluminum oxide, white fused aluminum oxide, black silicon carbide, green silicone carbide, titanium diboride, boron carbide, tungsten carbide, titanium carbide, diamond, silica, iron oxide, chromia,

ceria, zirconia, titania, silicates, tin oxide, cubic boron nitride, garnet, fused alumina zirconia, sol gel abrasive particles, abrasive agglomerates, metal-based particulates, and combinations thereof.

8. An abrasive article according to claim 1, wherein the flexible backing has a Young's modulus of greater than about 0.5 GPa.

9. An abrasive article according to claim 8, wherein the flexible backing has a Young's modulus of greater than about 2.0 GPa.

10. An abrasive article according to claim 1, wherein the replicated microstructures have a shape that comprises rods, triangles, pyramids, truncated pyramids, cones, truncated cones, cube corners, cuboids, spheres, or spheroids.

11. An abrasive article according to claim 1, wherein the replicated microstructures have a shape that comprises ridges.

12. An abrasive article according to claim 1, wherein the adhesive is selected from the group consisting of pressure-sensitive adhesives, hot melt adhesives and curable liquid adhesives.

13. An abrasive article according to claim 1, wherein the adhesive occupies greater than about 25 volume percent and less than about 120 volume percent of the volume of the recesses of the replicated microstructures.

14. A method of polishing comprising:

providing a work-piece to be polished;

contacting the work-piece with an abrasive article comprising:

a flexible backing having opposed first and second major surfaces, wherein at least a portion the second major surface of the flexible backing includes replicated microstructures having recesses;

an abrasive layer comprising a plurality of abrasive particles retained in at least one binder, the abrasive layer disposed on the first major surface of the flexible backing;

an adhesive; and

a rigid substrate in contact with at least a portion of the replicated microstructures, wherein the adhesive is contained substantially in the recesses of the replicated microstructures; and

moving the abrasive article relative to the work-piece.

15. A method of polishing according to claim 14, wherein the abrasive particles are selected from the group consisting of fused aluminum oxide, heat treated aluminum oxide, white fused aluminum oxide, black silicon carbide, green silicone carbide, titanium diboride, boron carbide, tungsten carbide, titanium carbide, diamond, silica, iron oxide, chromia, ceria, zirconia, titania, silicates, tin oxide, cubic boron nitride, garnet, fused alumina zirconia, sol gel abrasive particles, abrasive agglomerates, metal-based particulates, and combinations thereof.

16. A method of polishing according to claim 14, wherein the replicated microstructures have a shape that comprises rods, triangles, pyramids, truncated pyramids, cones, truncated cones, cube corners, cuboids, spheres, or spheroids.

17. A method of polishing according to claim 14, wherein the replicated microstructures have a shape that comprises ridges.

18. A method of polishing according to claim 14, wherein the adhesive is selected from the group consisting of pressure-sensitive adhesives, hot melt adhesives and curable liquid adhesives.

19. A method of polishing according to claim 14, wherein the adhesive occupies greater than about 25 volume percent and less than about 120 volume percent of the volume of the recesses of the replicated microstructures.

20. A method of polishing according to claim 14, further comprising a release liner disposed on the adhesive.

What is claimed is:

1. An abrasive article comprising:

a flexible backing having opposed first and second major surfaces, wherein at least a portion the second major surface of the flexible backing includes replicated microstructures having recesses;

an abrasive layer comprising a plurality of abrasive particles retained in at least one binder, the abrasive layer disposed on the first major surface of the flexible backing; and

an adhesive,

wherein the adhesive is contained in the recesses of the replicated microstructures.

2. An abrasive article according to claim 1, further comprising:

a rigid substrate in contact with at least a portion of the replicated microstructures.

3. An abrasive article according to claim 1, further comprising:

a release liner in contact with at least a portion of the adhesive.

4. An abrasive article according to claim 1, wherein the flexible backing is selected from the group consisting of densified kraft paper, poly-coated paper, metal foils, and polymeric substrate.

5. An abrasive article according to claim 4, wherein the metal foils are selected from aluminum, copper, tin, and bronze.

6. An abrasive article according to claim 4, wherein the polymeric substrate is selected from the group consisting of polyester, polycarbonate, polypropylene, polyethylene, cellulose, polyamide, polyimide, polysilicone, and polytetrafluoroethylene.

7. An abrasive article according to claim 1, wherein the abrasive particles are selected from the group consisting of fused aluminum oxide, heat treated aluminum oxide, white fused aluminum oxide, black silicon carbide, green silicone carbide, titanium diboride, boron carbide, tungsten carbide, titanium carbide, diamond, silica, iron oxide, chromia, ceria, zirconia, titania, silicates, tin oxide, cubic boron nitride, garnet, fused alumina zirconia, sol gel abrasive particles, abrasive agglomerates, metal-based particulates, and combinations thereof.

8. An abrasive article according to claim 1, wherein the flexible backing has a Young's modulus of greater than about 0.5 GPa.

9. An abrasive article according to claim 8, wherein the flexible backing has a Young's modulus of greater than about 2.0 GPa.

10. An abrasive article according to claim 1, wherein the replicated microstructures have a shape that comprises rods, triangles, pyramids, truncated pyramids, cones, truncated cones, cube corners, cuboids, spheres, or spheroids.

11. An abrasive article according to claim 1, wherein the replicated microstructures have a shape that comprises ridges.

12. An abrasive article according to claim 1, wherein the adhesive is selected from the group consisting of pressure-sensitive adhesives, hot melt adhesives and curable liquid adhesives.

13. An abrasive article according to claim 1, wherein the adhesive occupies greater than about 25 volume percent and less than about 120 volume percent of the volume of the recesses of the replicated microstructures.

14. A method of polishing comprising:

providing a work-piece to be polished;

contacting the work-piece with an abrasive article comprising:

a flexible backing having opposed first and second major surfaces, wherein at least a portion the second major surface of the flexible backing includes replicated microstructures having recesses;

an abrasive layer comprising a plurality of abrasive particles retained in at least one binder, the abrasive layer disposed on the first major surface of the flexible backing;

an adhesive; and

a rigid substrate in contact with at least a portion of the replicated microstructures, wherein the adhesive is contained in the recesses of the replicated microstructures; and

moving the abrasive article relative to the work-piece.

15. A method of polishing according to claim 14, wherein the abrasive particles are selected from the group consisting of fused aluminum oxide, heat treated aluminum oxide, white fused aluminum oxide, black silicon carbide, green silicone carbide, titanium diboride, boron carbide, tungsten carbide, titanium carbide, diamond, silica, iron oxide, chromia, ceria, zirconia, titania, silicates, tin oxide, cubic boron nitride, garnet, fused alumina zirconia, sol gel abrasive particles, abrasive agglomerates, metal-based particulates, and combinations thereof.

16. A method of polishing according to claim 14, wherein the replicated microstructures have a shape that comprises rods, triangles, pyramids, truncated pyramids, cones, truncated cones, cube corners, cuboids, spheres, or spheroids.

17. A method of polishing according to claim 14, wherein the replicated microstructures have a shape that comprises ridges.

18. A method of polishing according to claim 14, wherein the adhesive is selected from the group consisting of pressure-sensitive adhesives, hot melt adhesives and curable liquid adhesives.

19. A method of polishing according to claim 14, wherein the adhesive occupies greater than about 25 volume percent and less than about 120 volume percent of the volume of the recesses of the replicated microstructures.

20. A method of polishing according to claim 14, further comprising a release liner disposed on the adhesive.