WHAT IS CLAIMED IS:

~~1. A method for producing a spheroidized powder from a feed material comprising Yttrium Stabilized Zirconia (YSZ), the method comprising:~~

~~introducing a feed material comprising YSZ particles into a microwave plasma torch; and~~

~~melting and spheroidizing the YSZ particles within a plasma generated by the microwave plasma torch to form spheroidized powder.~~

~~2. A method for producing a spheroidized powder from a feed material comprising Aluminum (Al) or Al alloy, the method comprising:~~

~~introducing a feed material comprising Al or Al alloy particles into a microwave plasma torch; and~~

~~melting and spheroidizing the Al or Al alloy particles within a plasma generated by the microwave plasma torch to form spheroidized powder.~~

~~3. The method of Claim 2, wherein the Al or Al alloy comprises Al 6000 series or Aluminum Silicon Magnesium (AlSiMg).~~

~~4. The method of Claim 3, wherein the AlSiMg comprises AlSi10Mg.~~

~~5.~~1.A method for producing a spheroidized powder from a feed material comprising water atomized alloy, the method comprising:

introducing a feed material comprising water atomized alloy particles into a microwave plasma torch, wherein the introducing the feed material into the microwave plasma torch comprises injecting the feed material after a microwave plasma applicator for processing in the plume or exhaust of the microwave plasma torch and, wherein the collective average or median aspect ratio of the feed material is between 5:1 to 20:1; and

melting and spheroidizing the water atomized alloy particles within a plasma generated by the microwave plasma torch to form spheroidized powder, wherein the spheroidized powder comprises a median sphericity of at least 0.91 and a particle size distribution of 15 µm to 105 µm.

~~6.~~2.The method of Claim ~~5~~1, wherein the water atomized alloy comprises metal injection molded (MIM) 17-4 Stainless Steel.

~~7.~~3.The method of Claim ~~5~~1, wherein the water atomized alloy comprises Inconel Alloy 625 (IN625).

~~8.~~4.A method for producing a spheroidized powder from a feed material comprising Tantalum (Ta), the method comprising:

introducing a feed material comprising Ta particles into a microwave plasma torch, wherein the introducing the feed material into the microwave plasma torch comprises injecting the feed material after a microwave plasma applicator for processing in the plume or exhaust of the microwave plasma torch and, wherein the collective average or median aspect ratio of the feed material is between 5:1 to 20:1; and

melting and spheroidizing the Ta particles within a plasma generated by the microwave plasma torch to form spheroidized powder, wherein the spheroidized powder comprises a median sphericity of at least 0.91 and a particle size distribution of 15 µm to 105 µm.

~~9.~~5.A method for producing a spheroidized powder from a feed material comprising Titanium Nitride (TiN), the method comprising:

introducing a feed material comprising TiN particles into a microwave plasma torch; and

melting and spheroidizing the TiN particles within a plasma generated by the microwave plasma torch to form spheroidized powder.

~~10.~~6. A method for producing a spheroidized powder from a feed material comprising Rhenium (Re), the method comprising:

introducing a feed material comprising Re particles into a microwave plasma torch, wherein the introducing the feed material into the microwave plasma torch comprises injecting the feed material after a microwave plasma applicator for processing in the plume or exhaust of the microwave plasma torch and, wherein the collective average or median aspect ratio of the feed material is between 5:1 to 20:1; and

melting and spheroidizing the Re particles within a plasma generated by the microwave plasma torch to form spheroidized powder, wherein the spheroidized

powder comprises a median sphericity of at least 0.91 and a particle size distribution of 15 µm to 105 µm.

~~11.~~7. A method for producing a spheroidized powder from a feed material comprising Tungsten (W), the method comprising:

introducing a feed material comprising W particles into a microwave plasma torch, wherein the introducing the feed material into the microwave plasma torch comprises injecting the feed material after a microwave plasma applicator for processing in the plume or exhaust of the microwave plasma torch and, wherein the collective average or median aspect ratio of the feed material is between 5:1 to 20; and

melting and spheroidizing the W particles within a plasma generated by the microwave plasma torch to form spheroidized powder, wherein the spheroidized powder comprises a median sphericity of at least 0.91 and a particle size distribution of 15 µm to 105 µm.

~~12.~~8. A method for producing a spheroidized powder from a feed material comprising Molybdenum (Mo), the method comprising:

introducing a feed material comprising Mo particles into a microwave plasma torch, wherein the introducing the feed material into the microwave plasma torch comprises injecting the feed material after a microwave plasma applicator for processing in the plume or exhaust of the microwave plasma torch and, wherein the collective average or median aspect ratio of the feed material is between 5:1 to 20:1; and

melting and spheroidizing the Mo particles within a plasma generated by the microwave plasma torch to form spheroidized powder, wherein the spheroidized powder comprises a median sphericity of at least 0.91 and a particle size distribution of 15 µm to 105 µm.

~~13.~~9. The method of any one of the preceding claims, wherein the introducing the feed material into the microwave plasma torch comprises introducing the feed material into an exhaust of the microwave plasma torch or into a plume of the microwave plasma torch.

~~14. The method of any one of the preceding claims, wherein the collective average or median aspect ratio of the feed material is between 5:1 to 20:1.~~

~~15.~~10. The method of any one of the preceding claims, further comprising sieving the feed material before introducing the feed material into the microwave plasma torch.

~~16.~~11. The method of any one of the preceding claims, wherein the spheroidized powder has a medium sphericity of at least 0.75.

~~17.~~12. The method of any one of the preceding claims, wherein the spheroidized powder has a medium sphericity of at least 0.91.

~~18.~~13. The method of any one of the preceding claims, wherein the spheroidized powder has a particle size distribution of 15 to 45 microns.

~~19.~~14. The method of any one of the preceding claims, wherein the spheroidized powder has a particle size distribution of 45 to 105 microns.

~~20.~~15. A spheroidized powder formed by the method of any one of the preceding claims.