Novel Approach to Manufacture Powders with Tailored Chemical Composition for Additive Manufacturing

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The technology of ultrasonic atomization itself is quite old, but due to technological and material limitations available in the 1950s-80s, it has been almost completely supplanted by gas and plasma atomization technologies. Nevertheless, these commonly used methods, despite obtaining spherical powders of high purity and appropriate granulation, require the use of a large amount of material. In industrial settings, this is an advantage in high-volume production, but unit manufacturing processes dedicated to specific implementations, or prototyping currently carried out with 3D printing technologies, require much smaller amounts of powder, which is provided by ultrasonic atomizers. This technique also has another significant advantage and other methods of manufacturing alloy powders. A small amount of batch materials allows, under laboratory conditions, rapid validation of the chemical composition, phase structure and mechanical properties of newly designed alloys with specific, strictly dedicated performance properties.