



The 54th International October Conference on Mining and Metallurgy
18-21 October 2023, Bor Lake, Serbia
www.ioc.tfbor.bg.ac.rs

INVITED LECTURE

PRODUCTION OF METAL-BASED POWDERS BY ATOMIZATION TECHNIQUES

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Abstract

Today, with the introduction of additive manufacturing into our lives, the importance of powder metallurgy has increased. The properties of the products produced by powder metallurgical processes directly depend on the used raw material. Powder metallurgy needs different raw materials as particles for various production processes. While water and gas atomization methods are generally preferred for conventional powder metallurgical production technologies, different gas or plasma atomization techniques are preferred for additive manufacturing. Each atomization technique offers different powder properties. In this study, different atomization techniques such as water, gas, plasma, PREP and ultrasonic atomization were examined, and the characterization of the powders was presented. Titanium, nickel, copper, silver and aluminium-based powders produced within the scope of this study were also selected for characterization. These materials were examined by revealing the information in the literature. The effects of atomization techniques on the particle shape, size, size distribution and purity were studied. It has been concluded that gas atomization techniques have the ideal cost and quality combination method, especially for additive manufacturing methods.

Keywords: Powder Metallurgy, Atomization, Additive Manufacturing, Metal Powders