

CHARACTERIZATION AND PERFORMANCE OF CoCrMo POWDER FOR ADDITIVE MANUFACTURING

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New manufacturing technologies, such as Direct Metal Laser Sintering (DMLS), allow the production of high-quality metal tools and prototypes of extremely complex geometries, but in order to achieve consistent and predictable properties and ensure high quality of 3D printed objects, the materials have to possess certain characteristics.

In this study, we analyze the characteristics of a cobalt-chrome-molybdenum-based super alloy powder by using standardized measurement methods such as scanning electron microscopy (SEM) with an energy dispersive X-ray spectrometer (EDS) (powder pictures shown in Fig. 1), X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Auger electron spectroscopy and particle induced X-ray emission (PIXE).

The results of these analyses meet the powder chemical composition provided by the powder manufacturer, however individual particle chemical composition shows significant differences. The CoCrMo powder has a wide particle size distribution, most of the particles have a spherical shape with a grainy surface, but agglomerates with a smoother surface are present as well.

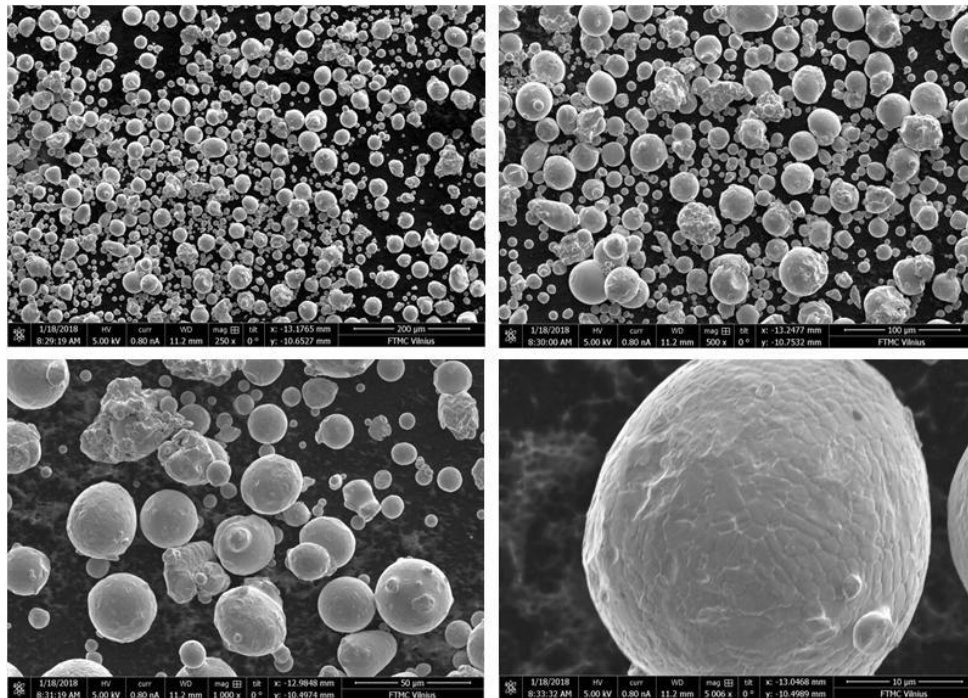


Fig. 1. SEM pictures of the CoCrMo powder