

The Effects of Powder Morphology on the Apparent Density and the Flow Rate of Metal Powders

Ibrahim Uslan¹, Yusuf Usta¹, Suleyman Saritas²

¹ Department of Mechanical Engineering, Gazi University, Turkey; ² Department of Mechanical Engineering, Tobb Economics and Technology University, Turkey

The apparent density and the flow rate are the most important parameters on the production of parts economically from the metal powders. Die filling in the commonly used compaction methods like pressing and powder injection molding depends on these parameters. Morphological properties like shape, size and size distribution of powders are effective on the apparent density and flow rate. In this study, the effects of powder morphology on these two properties have been investigated by using dendritic copper powders and atomized iron powders. Powder sizes used in the experiments were -400, +400 and +200 meshes and the mixtures of them in various ratios. Carney and Hall flowmeters have been used in the measurements. Apparent densities of sub sieve powders are lower than coarse powders. Similarly these properties of dendritic copper powders are lower than atomized iron powders. Also, addition of fine powders to coarse powders up to 50 % has increased the apparent density in both powders.