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Potential of the Recycling of Grinding Sludge by various Powder Metallurgical Processes

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Abstract

The metalworking industry produces a large amount of waste material by machining. In contrast to conventional machining, the waste material generated during a grinding process is not purely metallic, but consists of abrasives, water, lubricants and metal chips. This mixture is called grinding sludge. In terms of ecological and economical aspects, the recycling of these waste materials is very promising. By separating the individual components of the grinding sludge, the recycling potential of the individual components becomes visible. This study focuses on the recycling of the metallic part. For this purpose, various powder metallurgical processes were performed. The produced samples and their properties were then compared with samples made of conventional PM powder.

Keywords: Recycling, Upcycling, Grinding Sludge, Grinding chips, Powder Metallurgy, Circular Economy, Life Cycle Engineering