

Abstract

A powder metallurgy is widely used as a part or a component in many products nowadays because of its light weight, no waste product and low production cost. The metal powders are injected into the desired shapes and sintered to form a near-net shape. However, some of the desired parts need to machine into the finished part because the desired shapes are complicated. The machining process may change some of the product properties such as porosity and surface crack density. This research studied the machining powder metallurgy of 316L stainless steel using the electrical discharge machining (EDM). The objective of this study is to find the effect of the parameters on surface crack density, material removal rate (MRR) and porosity. The results show that the surface porosity is reduced when machining by EDM. The surface porosity is decreased when the electrical duration of on-time and the voltage are increased and the low electric current is used. The porosity is decreased when the electrode is selected as positive polarity. The results also show that the increasing of electric current and duration of on-time cause the increasing of surface crack density and MRR. On the other hand, the increasing of duration of off-time reduces the surface crack density. The results of this research may be applied when the powder metallurgy stainless steel is machined by using EDM.