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Necking mechanism under various sintering process parameters – A review

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Abstract

The process of sintering involves applying pressure and heat to the materials without melting them in order to fuse the particles together into a solid mass. The fusion between the particles are also known as interparticles necking which plays an important role in producing high-density products. Increasing in necking size between particles will allow the formation of smaller pore sizes which help to produce stronger and higher hardness materials. The necking also plays an essential role in producing high porosity products that are commonly used for medical applications which still required high tensile value and hardness. For this, proper process parameters were required to produce larger necking growth. To get a better understanding of this matter, the effect of powder and processing parameters will be reviewed in this article. The parameters for different processes such as conventional sintering, microwave sintering, selective laser melting, and others will be discussed in this paper as well. © 2023 The Author(s)

Author Keywords

Densification; Grain boundary; Necking mechanism; Particle bonding; Powder particle; Sintering process

Index Keywords

Ductile fracture, Hardness, Medical applications, Melting, Pore size, Selective laser melting, Sintering; Applying pressure, Densifications, Grain-boundaries, Interparticles, Necking mechanism, Particle bondings, Powder particles, Process parameters, Sintering process, Solid mass; Grain boundaries

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