

The Effects of Composition and Process Variables on the Characteristics of Cu-Sn P/M Alloy

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Abstrak

Bronze (Cu - Sn) are the most commonly used materials for self lubricating bearings produced by powder metallurgy process. The characteristics and the performance of these bearings are highly dependent on the chemical composition and the microstructure, especially the fraction of open porosity. While the microstructure fully dependent on the control of the compaction and sintering process. In this study, the effects of three parameters were investigated : (1) the Sn content (5 % , 10 % and 15 %); (2) the compaction pressure (200 MPa, 300 MPa and 400 MPa); and (3) the sintering temperature (800°C, 850°C and 900°C) on the characteristics of Cu-Sn P/M alloys.

The increase in compaction pressure will increase the green density and the green strength, while the increase in Sn content will decrease the green strength. In general, the increase in sintering temperature will decrease the sintered density followed by the swelling of the sintered. The increase in sintering temperature also decrease the macrohardness and the compressive strength. The amount of porosity and the second phase , 8 phase - Cu₃₁Sn, formed during sintering is increased with the increase in Sn content and then followed by the increase in grain size.