

A Study on the Sintering Behavior of Elemental Powders with FeB Addition in the Composition of Maraging Stainless Steel

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Abstract

The effect of sintering additive for the development of high strength maraging stainless steel from elemental powders was studied. The sintering parameters investigated were: sintering temperature, sintering time and wt% of FeB. In vacuum sintering, effective sintering took place between 1300 °C and 1350 °C with 1wt% FeB addition. The maximum sintered density was achieved at 1350 °C for 60 minutes with 1 wt% FeB. More than 1 wt% FeB content and temperature above 1350 °C showed decrease in sintered density. Secondary pores were observed in samples containing more than 1 wt% FeB sintered at 1350 °C for 60 min. A maximum sintered density of 7.4 g/ cm³ was achieved with 1 wt% FeB content at a sintering temperature of 1350 °C for 60 min. Maximum ultimate tensile strength (UTS) of 505 MPa was achieved with 1 wt% FeB content. Above 0.5 wt% FeB content, maximum increase in density was observed. Fracture morphologies of the sintered samples are also reported.