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# Investigation of Wear Behavior of Precipitation-Strengthened Nickel-Copper Based K-500 Alloy Produced by Powder Metallurgy

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The present study investigates the effects of the ageing parameters of the precipitation-strengthened nickel-copper based K-500 alloy produced by powder metallurgy on the wear behavior of the alloy. After the cold pressing the prepared alloy powders under 600 MPa pressure, the samples were sintered under vacuum ( $10^{-6}$  mbar) at 1150 °C for 2 h and then cooled in the furnace. Produced K-500 alloy samples were taken into solution at 980 °C for 1 h and quenched. Ageing process was carried out at 480 °C for four different time periods (6, 8, 10, and 12 h). Aged samples were examined transmission electron microscope (TEM + EDS), X-ray diffraction (XRD), hardness and density measurements. The wear tests were carried out at  $1 \text{ ms}^{-1}$  constant sliding speed, under 40 N load and for five different sliding distances (400–2000 m). The results showed that there is  $\gamma' \text{ Ni}_3(\text{Al, Ti})$  inter-metallic phase coexisting with  $\text{Al}_{0.9}\text{Ni}_{4.22}$ ,  $\text{AlNi}_3$  and NiO phases. According to the hardness measurements, the highest hardness values were obtained with samples aged for 8 h. In wear tests with 2000 m sliding distance, the lowest weight loss was observed for the samples aged for 8 h.

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