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HEAT TREATMENT AND CHARACTERIZATION OF SINTERED HIGH-SPEED STEEL FOR VALVE SEAT INSERT APPLICATION

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The aim of this work was the characterization of valve seat inserts (VSI) subjected to heat treatments. The VSI were produced with three different alloys modified from the AISI M3:2, M2 and D2. These alloys modifications were intended as an alternative to replace cobalt and lead used in the original alloy due to their high cost and toxicological effect. The VSI were submitted to different heat treatments, such as: air quenching and oil quenching, both followed by double tempering with different temperatures. The VSI mechanical and metallurgical properties were performed according to standardized apparent density (ASTM C 373-88), apparent hardness (ASTM E 92-82) and radial crush strength (MPIF Standard 35) tests. The VSI characterizations also were carried out using scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS) and light optical microscopy (LOM). The VSI produced with alloy M3/2 showed the best results in the hardness test and radial crush strength.