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Fracture Toughness of a AISI M3:2 High Speed Steel Produced By Powder Metallurgy

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The aim of this work is to study and evaluate the property of fracture toughness (KIC) of a AISI M3:2 high speed tool steel produced by a Powder Metallurgy technique. The P/M M3:2 high speed steel was manufactured by cold uniaxial compaction of irregular water atomized powders followed by sintering under vacuum producing a material with density near to the theoretical. Then the samples were submitted to a heat treatment procedure and after all Chevron Notch samples were manufactured and the tests were carried out according to ASTM recommendations in order to determine the fracture toughness (KIC). The microstructure was evaluated by SEM. The primary mean carbide sizes were determined by using a digital analyzer Quantikov software. At least five samples were tested for each condition of heat treatment.

Key-words: Powder Metallurgy, Fracture Toughness (KIC), Vacuum Sintered High Speed Steel.