Study of surface state after annealing of a steel 42CrMo4 part machined by turning with a ceramic tool and a carbide tool

Razika Aouad
University of Brothers Mentouri Constantine, Algeria

This article exposed the results of an experimental study on the machining of steel annealing 42CRMO4 with Brinell hardness HB 174, with two cutters: white zirconia ceramic (Al2O3 and ZrO2) and the carbide (made of tungsten carbide WC). The test series is devoted to the study of the influence of cutting conditions on the main criteria of the roughness of the machined surfaces (Ra, Rz, and Rt), to do this we have made plain factorial trials and based on multifactorial the method of experimental design, the variable parameters: cutting speed, feed per revolution, and the depth of cut. Modeling results helped lead to mathematical models like Gilbert (Taylor model generalized). When machining of the steel pure ceramic gave very good surface states with high cutting speeds.