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## Study of Surface Quality parts Machined by Turning Using Hard Materials

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The white ceramic to zirconia based [ $\text{Al}_2\text{O}_3$  and  $\text{ZrO}_2$ ] and of titanium carbide [ $\text{Al}_2\text{O}_3 + \text{TiC}$ ] cutting tools as well as the ceramic mixed are widely coveted for the machining operations of relatively hard materials, used within hard cutting conditions. In this paper, are exposed the results of an experimental study relative for the machining of the steel after annealing 42CrMo4 with having a Brinell hardness HB 174, machined by two tools separately, white ceramic to zirconia based [ $\text{Al}_2\text{O}_3$  and  $\text{ZrO}_2$ ] and the ceramic mixed [CC650]. The testing series is devoted to the roughness main criteria of the cutting conditions influence of the machined surfaces [Ra, Rz and Rt]. To do this we have made plain factorial trials and based on multi factorial the method of experimental design, the variable parameters: cutting speed, feed per revolution and the cutting depth. The results, to which we arrived, show that the white ceramic is comparable to that of rectified surfaces after the machining operation classic. The results comparison show that the machined steel by mixed ceramic give a very good surface states with high cutting speeds [180 ; 250 m/min] in relation to others cutting tools. The mathematical models expressing the relation between the studied parameters and the parameters used while the experiments have made the comparison object [Gilbert type, Taylor generalized model] as well as a comparison of theoretical and practical results has been made to the nuance CC650.

### **Biography:**

Miss Aouad Raziak holds a Bachelor of Mechanical Manufacturing (1999), Diploma academic studies applied DEUA (2002), State Engineer in Mechanical Engineering (2005), Magister in integrated design of mechanical systems and industrial application (2010), Now 4th year PhD enrolment (2015) in mechanical engineering at the University of brothers of Mentouri Constantine, Algeria. My domain is recherche machining and mechanical fabrication.