Realistic Dependence T-v_c for Recent Cutting Materials

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Cutting property of tool materials is classically considered on the base of durability tests, the result of which is dependence of tool durability on cutting speed known as T-v_c dependence. It was first developed by Taylor in 1906 to evalueate the durability of high-speed steel [1]. This relation, which is interpoled by a line in double logarithmic coordinate system, has been used also for the observation of the durability of sintered carbids and cutting tools made of ceramics. As the experiments show, T-v_c dependence for such cutting materials is considerably different from the dependence for hig-speed steel. However, they have not been examined thoroughly yet because they require complex experimental tests. In the strive to make the tests simpler, ISO 3685 standard was formed: Tool-life testing with single-point turning tools [2], which, however, prescribes to evaluate durability only in limited range of cutting speeds. The aim of this paper is a suggestion of the evalueation of tool durability by the dependence of the size of tool wear on cutting speed ($VB = f(v_c)$ for constant machining time (τ_s). The dependence has the same predication value as T-v_c dependence and considerably shorter time is necessary for its formation [3].

Keywords: machining, cutting speed, tool durability

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