

## Tool Life of PM-HSS Cutting Tools when Milling of Titanium Alloy

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**Machining of titanium alloys meets with poor life of a cutting tool. It is caused by a low thermal conductivity and by a high strength-to-weight ratio of the alloys. Various approaches for cost-effective and productive machining titanium alloys are still researched. One of methods can be using the cutters made of modern high-speed steel (HSS) as a product of a powder metallurgy (PM) process. These materials (PM-HSS) possess better and homogeneous mechanical properties than conventional high-speed steel. The PM-HSS cutters equipped with any effective coating allow increase cutting speed to the level which is typical for uncoated cemented carbide, while price of the tool is lower. In the article several PM-HSS cutting tool materials were compared to conventional cobalt based HSS from the tool life point of view. It was proved that conventional high-speed steel offers very long tool life and high tool performance at speed of 30 m/min. However the regular tooth pitch significantly decreases tool life for this cutting tool material. The main benefit of PM-HSS cutters can be fully utilized when cutting speed about 50 m/min is applied. The cutters coated by effective thermal barrier showed longer tool life and higher performance of the cutting tools.**

**Keywords:** titanium alloy; milling; high-speed steel; tool life

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