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Extending the Tool Life of Solid Tungsten Carbide Endmills using Cryogenics

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Abstract

The cryogenic treatment of tungsten carbide tooling has the potential to substantially extend tooling life. In preliminary investigations it has been shown that in some cases, cryogenic treatments can extend tool life by approximately 2½ times the untreated life. Due to the high cost of carbide tooling, this extended tool life has the potential to produce substantial savings for industries like STERIS Erie. This project will focus on a particular tungsten carbide endmill that is being used by STERIS Erie. The goal of the project will be to identify optimal cutting conditions when using both treated and untreated versions of the endmill and identify the possible cost savings. The four phases of the project include: identifying the untreated tool life under the existing operating parameters, isolating the optimal untreated tool life by varying the operating parameters, determining the effect of cryogenic treatments using the current operating parameters, and, finally, establishing the optimal cryogenically treated tool life.