

CASE STUDY: CRYOGENIC MACHINING OF TITANIUM 6AL4V



Objective & Results

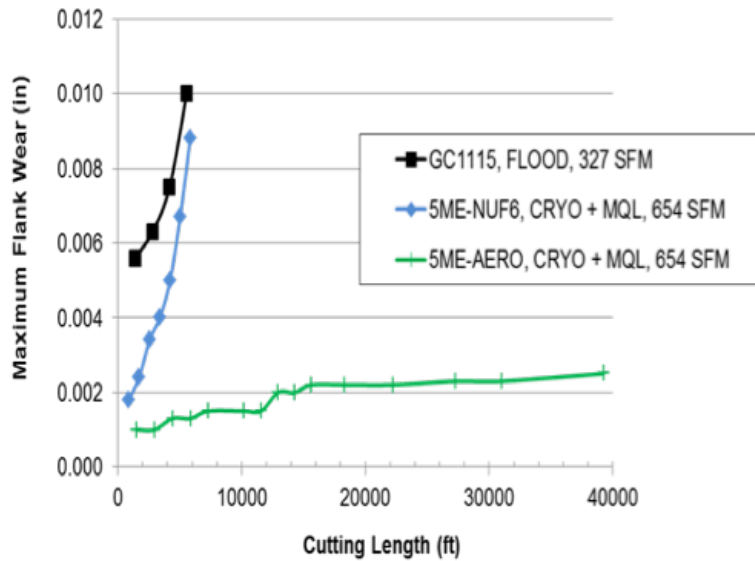
Titanium alloys are difficult and expensive to machine due to extreme heat generated at the cutting edge. The toughness of Titanium and excessive heat generated requires slower cutting parameters to maintain normal cutting temperatures and acceptable tool wear. By applying through-the-spindle and through-the-tool Cryogenic Machining Technology, the cutting edge is cooled while maintaining normal shear temperatures. The end result is a clean environment with improved tool life, increased cutting speeds, and improved surface integrity.

Cryogenic Advantages

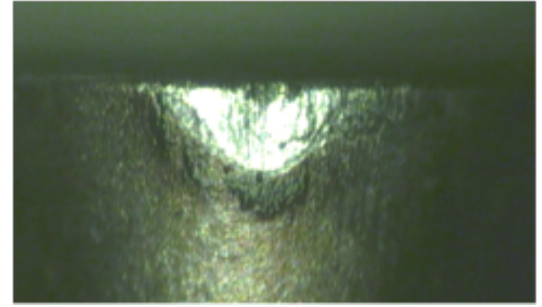
- > 100% Increase in Cutting Parameters with Equal Tool Life when using 5ME™ Carbide Insert
- > 100% Increase in Finish Cutting Parameters with 10X+ Tool Life when using 5ME™ AERO Grade Insert
- > Near Elimination of White Layer (Alpha Layer)
- > Reduction in Residual Stresses
- > Reduction in Burr Formation
- > Reduction in Surface Distortion (Grain Boundary)
- > Improved Surface Finish
- > Easy to Manage Dry Chips

Testing SOW

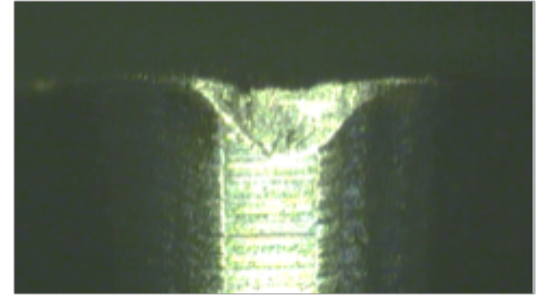
- > Material: Titanium 6Al4V Alloy
- > Test Part: Bar Stock
- > Tool: 5ME™ Cryogenic Single Point, Indexable Turning Tool
- > Parameters: 0.005" per Rev, 0.010" DOC
- > Time In Cut: 60 Min.
- > Machine: Hawk 150 HTC
- > Location: 5ME Technology Center



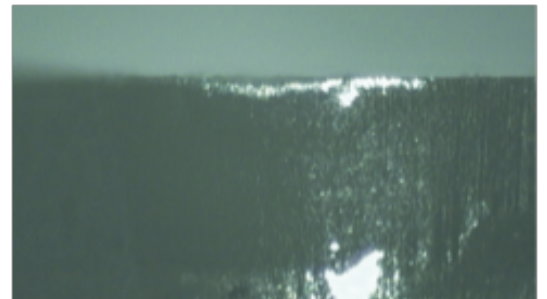
Customer Insert



5ME™ Insert



5ME™ AERO Insert



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