

RUN FASTER

THE COLD HARD FACTS

11 Things Every Plant Manager Should Know About 5ME's Liquid Nitrogen-Based Cryogenic Machining System

1. Reduces Cutting Temperature to Increase Efficiency

Traditional Cutting Fluids are at ambient temperature – about 70°F. 5ME Cryogenic Machining uses LN₂ at -321°F. The roughly 400°F temperature differential counteracts the tool cutting edge heat produced in machining.

2. Enables Faster Processing Speeds

5ME's exclusive technology allows super-cooled liquid nitrogen to run through your spindle or turret and inside the tool, keeping temperatures significantly lower and enabling you to run up to 5x faster. Faster processing speeds mean higher throughput.

3. Increases Tool Life

When utilizing Cryogenic Machining, it is possible to realize a double-digit increase in tool life. Increased tool life means higher productivity.

4. Improves Surface Integrity and Part Quality

- Reduces White Layer / Alpha Layer
- Reduces Residual Stress
- Reduces Burr Formation
- Reduces Surface (Grain Boundary) Distortion

5. Effective for a Multitude of Difficult to Machine Materials

- Titanium
- Hardened and Stainless Steels
- Inconel
- Nodular Iron
- Compacted Graphite Iron
- Stellite
- Carbon Fiber Composites
- Composite/Metal Stacks



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6. Can be Utilized in Many Key Applications and Operations

- Aerospace – Aero-Structure, Aero-Engine
- Automotive/Truck – Cylinder Blocks, Cylinder Heads, Crankshafts, Rods, Turbo Components
- Energy – Fracking Pumps, Subsea Components, Turbines, Cladded Components

7. Brand Agnostic

Can be easily retrofit onto virtually any machine on your shop floor, regardless of brand.

8. Protects Your Machine's Critical Components

5ME's Cryogenic Machining System uses tube-in-tube, vacuum-jacketed feed lines to deliver Liquid Nitrogen from an external bulk storage tank to the cutting zone. This protects the integral machine components from being exposed to the low temperatures.

9. Greener and More Economical

- Liquid Nitrogen evaporates into a non-toxic, non-greenhouse gas
 - Reduced Carbon Footprint
- Liquid Nitrogen replaces traditional water-based or oil-based cutting fluids which:
 - Eliminates disposal, management, and infrastructure associated with flood coolants
 - Eliminates cleaners needed to remove coolant residue from machine and parts
 - Eliminates the energy consuming pumps, required for conventional coolant systems
 - Eliminates the need to wash chips prior to recycling

10. Healthier and Safer

- No Coolant means safer, non-slip surfaces for large walk-on machines
- Eliminates bio-hazards related to aerosolized flood coolants
- Contamination-free for special machining requirements

11. 5ME's Patented Cryogenic Technology Has Won Numerous Industry Awards

- 2011 Modern Machine Award for Innovation
- 2012 New Equipment Digest King Award
- 2013 Frost & Sullivan Best Practice Award
- 2013 Approved for Titanium Rough Machining on F-35 by Lockheed Martin
- 2015 Approved for Titanium Finish Machining on F-35 by Lockheed Martin