



## Grinding

### What is Tool-X?

Tool-X is a Nano fluid and uses very few chemicals. We have replaced these toxic chemicals with safe Nano Particles that are not harmful. Increases in tool life, improvement in surface finishes, and removes that rotten egg smell, increases feed and speeds are a few of the things this Nano Technology will do for you.

**Welcome to the future in metal working fluid technology.**

### What is the role of Nano technology in metal working fluids?

Nano particles added to a cutting fluid will improve the lubricating properties in the metal removal processes by reducing production time, labor hours, and energy usage (costs) which will increase throughput. The nano particles will reduce friction and heat at the cutting surface which is a major difference over a conventional chemical coolant. Not only do nano particles lower the heat, but they will transfer the heat to the sump of the machine where it can be wicked away. The ability to cut different metals like aluminum & titanium without changing coolant is a huge advantage. The level of performance over your current coolant will be dramatic and there will never be any skin irritation or rotten egg smell. See attached to this website [www.Tool-X.net](http://www.Tool-X.net)

**CUSTOMER:** A manufacturer of Camshafts for the automotive industry.

**APPLICATION:** Grinding cylinders made of heat-treated 17-4 stainless steel using Tool-X's water-based MP-101 nanofluid in their centerless grinding machine.

**PROBLEM:** Insufficient tool life and requirements for cost reductions.

#### EVALUATION PROCESS:

1) Data was collected for two (2) weeks using the current water-based metal working fluid (MWF). Clean MWF was evaluated with new tools at the current speeds & feeds with the number of parts between dressings being recorded.

2) The MWF was drained and replaced with Tool-X's MP-101 nanofluid with the initial focus of evaluating the time between dressings.

**SOLUTION:** Upon the completion of dressing time study evaluation, the material removal rates (Speeds & Feeds) were increased to assess the potential for cycle time improvements.

**RESULTS:** The Tool-X MP-101 nanofluid enhanced performance and productivity; production rates were increased by 60% by reducing cycle times from 64 to 40 seconds, while maintaining a 33.0% increase in the number of parts per dress from 15 to 20.

**OUTCOME:** Customer changed to using Tool-X's MP-101 water-based MWF for its grinding operations.

Grinding Data			
	Parts per Dress	Cycle Time (seconds)	Production Per 10 Hr Shift
Before Tool-X	15	64	9.4
After Tool-X	20	40	15.0
Change (%)	33.33%	-37.50%	60.00%

## TOOL-X, LLC

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