

# Tool-X<sup>®</sup>

Tech Data Sheet 111  
Grinding  
Water-based MWF

**What is Tool-X?** A new line of metalworking fluids that contain a new additive - trillions of carbon-based nano-onions in solution. These nano-onions improve the lubrication along the cutting edge, preventing build-ups and improving heat transfer. The result is longer-lasting tools that cut truer, with more precision, with less force required, than with conventional metal working fluids.

**Customer:** A manufacturer of shafts for the automotive industry.

**Application:** Grinding cylinders of heat-treated 17-4 stainless steel using water-based MWF in a centerless grinding machine.

**Problem:** Insufficient tool life and requirements for cost reduction.

**Evaluation Process:** 1) Data was collected for 2 weeks using the current water-based MWF. Clean MWF was evaluated with new tools at current speeds and feeds and the number of parts between dressings was recorded. 2) The MWF was drained and replaced with Tool-X SS500 MWF. Initial focus of evaluation was the time between dressings. Upon completion of tool life evaluations, material removal rates (speeds and feeds) were increased to assess potential for cycle time improvements.

**Results:** The Tool-X nanofluid additive enhanced performance and productivity; production rates were increased by 60% by reducing cycle times from 64 to 40 seconds, while maintaining a 33% increase in the number of parts per dress (from 15 to 20 parts).

**Outcome:** Customer changed to using Tool-X SS-500 water-based MWF for its grinding operations.

**Tool-X improves machining processes.** The role of metalworking fluids is to permit tools to change the shape of materials as efficiently and effectively as possible. To achieve this objective, metalworking fluids must counteract common failure modes by reducing heat, adhesion, pressure and wear while providing lubricity under the extreme temperatures and pressures associated with metalworking. Tool-X nanofluid technology enables our metalworking fluids to attain new levels of performance.

**Tool-X Benefits:** With Tool-X, surface finish is improved (lower Ra, fewer and smaller distortions). Feeds and speeds can be increased, often by 25% or more. Tool life is extended. Problems caused by excess heat (white film layers, long chip sizes, metallurgical damage) can be avoided. Reworks, tool sharpenings, and deburring steps can be reduced or eliminated.

**With Tool-X, it's all about the numbers.** Tool-X metalworking fluids cost more than conventional fluids, as much as twice as much. But the savings that are possible, through extended tool life, increased productivity, and parts with better surface finish and better dimensional accuracy, can provide users with substantial returns on investment. Let us demonstrate how Tool-X can improve productivity and reduce expenses in your facility.

See [www.tool-x.net](http://www.tool-x.net) for more information.

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%

