

# Tool-X<sup>®</sup>

Tech Data Sheet 119  
Thread rolling 4140 Steel  
Oil-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 multinational manufacturer of fasteners for the aerospace industry.

**Application:** Thread rolling 4140 steel to manufacture three different fasteners for aerospace applications.

**Problem:** Insufficient tool life.

**Evaluation Process:** Data was collected on tool and die costs for the period 1/2011 to 6/2014 used to manufacture three parts on a thread rolling line. After cleaning, Tool-X 180 cutting oil was added and productivity and tool cost data was collected for the next nine months.

**Results:** The Tool-X 180 cutting fluid reduced tool and die costs per part by 45%, 57%, and 62% respectively for the three fasteners.

**Outcome:** Customer changed to using Tool-X 180 for its thread rolling 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, roughly 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 substantially greater 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.

	# Parts	Tool Cost/Part	Tool Costs
Part A			
Before Tool-X 180	71,987	0.1659	
Using Tool-X 180	80,000	0.0708	-57.32%
Part B			
Before Tool-X 180	96,700	0.0445	
Using Tool-X 180	164,980	0.0168	-62.25%
Part C			
Before Tool-X 180	73,000	0.4826	
Using Tool-X 180	97,800	0.2627	-45.57%

