

Tool-X[®]

Tech Data Sheet 104
CNC Turning Center

What is Tool-X? A nanofluid additive for metalworking fluids that contains trillions of carbon-based nano-onions in solution. When used in conjunction with metalworking fluids, fluid saturated nano-onions flow between a tool and workpiece to change the characteristics of the metal working action. The result is reduced vibration, reduced machine loading and increased heat transfer away from the metal-to-metal work zone.

Application: Mori Seiki ZT 1500 Turning Center cutting 0.375" round A-286 steel with water-based coolant in a job shop environment.

Problem(s): Insufficient tool life led to higher than expected cost, restricted operator to running one machine and reduced machine capacity.

Situation: Six TiNC and one TiN coated indexable carbide cutting tools used for roughing, facing, threading, milling, and cutoff.

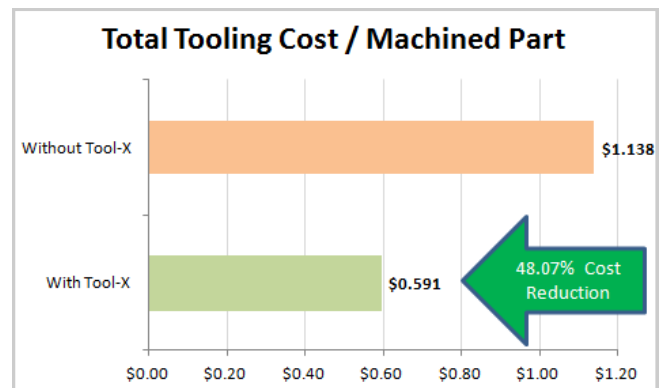
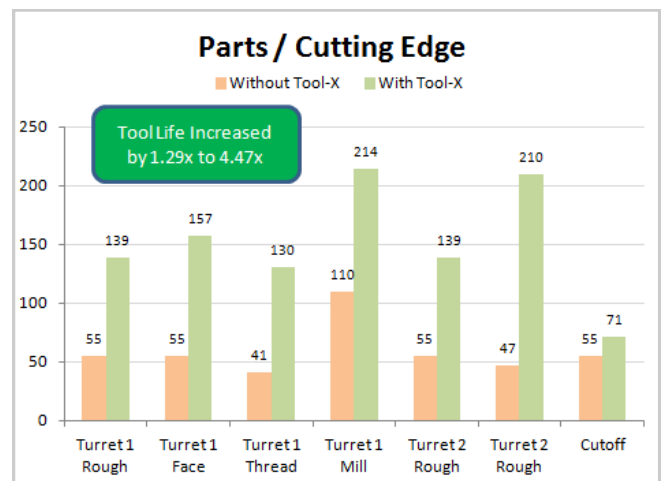
Evaluation Process: Machine sump was cleaned out and refilled with the company's existing water-based coolant, Blasocut BC40NF. Normal speeds and feeds were used to establish a baseline tool life for each cutter. Tool-X nanofluid was added to the coolant, and a two-day evaluation was run on 600 parts.

Solution: The addition of Tool-X led to increased tool life for all tools.

Results: Initial tooling cost for a set of tools was \$1.138 per finished part; this cost was reduced by \$0.547 (48.07%); tool life improvements ranged from 1.29 to 4.47 times the life.

Outcome: The evaluation resulted in a return-on-investment of 810.58% for tool life only. In addition to this, the operator was now able to run two machines due to the extended tool life and associated reduction in downtime for tool changes.

What is the role of metalworking fluids in machining? For many manufacturing applications, metalworking fluids are necessary but insufficient. The role of these fluids is to create an environment where tools can be proficiently used 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 extreme temperatures and pressures associated with metalworking, TOOL-X nanofluid technology enables metalworking fluids in such a manner as to meet these objectives and attain new levels of performance. To learn more, visit www.TOOL-X.net.



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