Career and Transfer Center

Monroe Community College

Career Profile:

Machine Trades: Tooling & Machining

Machinists use machine tools, such as lathes, milling machines, and spindles, to produce precision metal parts. Although they may produce large quantities of one part, precision machinists often produce small batches or one-of-a-kind items. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations needed to make machined products that meet precise specifications.

Before they machine a part, machinists must carefully plan and prepare the operation. These workers first review blueprints or written specifications for a job. Next, they calculate where to cut or bore into the workpiece (the piece of metal that is being shaped), how fast to feed the metal into the machine, and how much metal to remove. They then select tools and materials for the job, plan the sequence of cutting and finishing operations, and mark the metal stock to show where cuts should be made.

After this layout work is completed, machinists perform the necessary machining operations. They position the metal stock on the machine tool—spindle, drill press, lathe, milling machine, or other—set the controls, and make the cuts. During the machining process, they must constantly monitor the feed and speed of the machine. Machinists also ensure that the workpiece is being properly lubricated and cooled, because the machining of metal products generates a significant amount of heat. The temperature of the workpiece is a key concern because most metals expand when heated; machinists must adjust the size of their cuts relative to the temperature.

Some machinists, often called **Production Machinists**, may produce large quantities of one part, especially parts requiring the use of complex operations and great precision. Production machinists work with complex computer numerically controlled (CNC) cutting machines.

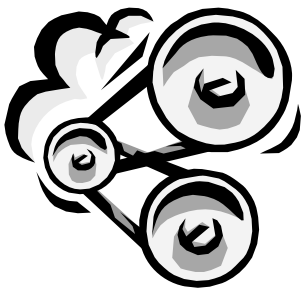
Salary Information:

- Apprentice Training: Precision Machining Trades, Associate in Applied Science
  $34,000 Median Salary (Follow-up Study, Monroe Community College Graduates, 2008)
- Machinist
  $37,490 Average Salary (U.S. Bureau of Labor Statistics, 2008)
- ***Machinist for the Rochester, New York area:***
  $35,800 Median Salary Range (Career One Stop, 2008)

  [*Salary varies based on education/advanced degree, work-experience & setting/location.]

Additional Information:

- The National Tooling and Machining Association: www.ntma.org
- The Precision Machined Products Association: www.pmpa.org
- The Rochester Tooling and Machining Association: www.rtma.org



RR0510 Adapted from the Occupational Outlook Handbook 2010-2011, www.bls.gov/oco/