NTMA INDIANA CHAPTER

Machinist Careers

What is a Machinist?

Machinists are part of the manufacturing industry. They use machine tools, such as lathes, milling machines, and grinders, to produce precision metal parts. Many machinists must be able to use both manual and CNC machinery.

Although sometimes manufacturers may produce large quantities of one part, ***precision machinists*** often produce small batches or one-of-a-kind items. The parts that machinists make range from simple steel bolts to titanium bone screws for orthopedic implants. Hydraulic parts, antilock brakes, and automobile pistons are other widely known products that machinists make.

CNC machines control the cutting tool speed and do all necessary cuts to create a part. The machinist determines the cutting path, the speed of the cut, and the feed rate by programming instructions into the CNC machine.

Some machinists repair or make new parts for existing machinery. After an industrial machinery mechanic discovers a broken part in a machine, a machinist remanufactures the part. The machinist refers to blueprints and performs the same machining operations that were used to create the original part in order to create the replacement. Some manufacturing processes use lasers, water jets, and electrified wires to cut the workpiece.

Tool and die makers construct precision tools or metal forms, called dies, that are used to cut, shape, and form metal and other materials. They produce jigs and fixtures—devices that hold metal while it is bored, stamped, or drilled—and gauges and other measuring devices. Dies are used to shape metal in stamping and forging operations. They also make metal molds for die casting and for molding plastics, ceramics, and composite materials.

Median Annual Pay (2023)=$54K

Machinists and tool and die makers typically do the following:

- Read blueprints, sketches, or computer-aided design (CAD) and computer-aided manufacturing (CAM) files
- Set up, operate, and disassemble conventional, manual, automatic, and CNC machine tools
- Align, secure, and adjust cutting tools and workpieces—monitor the feed and speed of machines
- Turn, mill, drill, shape, and grind machine parts to specifications—file, grind, and adjust parts so that they fit together properly
- Measure, examine, and test completed products for defects—test completed tools and dies to ensure that they meet specifications
- Smooth and polish the surfaces of parts or products, tools and dies—present finished workpieces to customers and make modifications if needed
- Compute and verify dimensions, sizes, shapes, and tolerances of work pieces.

Job Skills:

Number of Jobs in the U.S. (2023)=357K

- ***Analytical skills.*** Machinists and tool and die makers must understand technical blueprints, models, and specifications so that they can craft precision tools and metal parts.
- ***Manual dexterity.*** Machinists' and tool and die makers' work must be accurate. For example, machining parts may demand accuracy to within .0001 of an inch, a level of accuracy that requires workers' concentration and dexterity.
- ***Math skills and computer-application experience***. Workers must be experienced in using computers to work with CAD/CAM technology, CNC machine tools, and computerized measuring machines.
- ***Mechanical skills.*** Machinists and tool and die makers must operate milling machines, lathes, grinders, laser and water cutting machines, wire electrical discharge machines, and other machine tools.
- ***Physical stamina.*** Machinist and tool and die makers must stand for extended periods and perform repetitious movements.
- ***Technical skills.*** Machinists and tool and die makers must understand computerized measuring machines and metalworking processes, such as stock removal, chip control, and heat treating and plating.

More Information:

The ***National Tooling & Machining Assocation (NTMA)*** is the national representative of the custom precision manufacturing industry in the United States. Our nearly 1200 members design and manufacture special tools, dies, jigs, fixtures, gages, special machines, and precision machined parts. Some firms specialize in experimental research and development work.

The ***Indiana Chapter*** can connect you to training, scholarships and jobs in the precision machining field. Contact us at 317.653.5787 or info@intma.org.