



AA Registry Unit Plan

## CNC Machinists and Tool and Die Makers

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What Machinists and Tool and Die Makers Do [About this section](#)

Machinists typically use blueprints, sketches, or computer-aided design (CAD) and computer-aided manufacturing (CAM) files.

Machinists and tool and die makers set up and operate a variety of computer-controlled and mechanically controlled equipment to produce precision metal parts, instruments, and tools.

### Duties

Machinists typically do the following:

- Read detailed drawings or files, such as blueprints, sketches, and those for computer-aided design (CAD) and computer-aided manufacturing (CAM)
- Set up, operate, and disassemble manual, automatic, and computer numerically controlled (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
- Verify that completed products meet requirements

Tool and die makers typically do the following:

- Read detailed drawings or files—such as blueprints, sketches, specifications, and those for CAD and CAM—to make tools, molds, and dies

- Compute and verify dimensions, sizes, shapes, and tolerances of workpieces
- Set up, operate, and disassemble conventional, manual, and CNC machine tools
- File, grind, and adjust parts so that they fit together
- Test completed tools and dies to ensure that they meet specifications
- Smooth and polish the surfaces of tools and dies

*Machinists* use lathes, milling machines, grinders, and other machine tools to produce precision metal parts. Many machinists must be able to use both manual and CNC machinery. CNC machines control the cutting tool speed and do all necessary cuts to create a part. The machinist programs instructions into the CNC machine to determine the cutting path, cutting speed, and feed rate.

Although workers may produce large quantities of one part, precision machinists often produce small batches or single items. The parts that machinists make include steel bolts, titanium bone screws, and automobile pistons.

Some machinists repair broken parts or make new parts that an [industrial machinery mechanic](#) discovers in a machine. The machinist refers to engineering drawings to create the replacement.

Some manufacturing processes use lasers, water jets, and electrified wires to cut the workpiece. As [engineers](#) design and build new types of machine tools, machinists must learn new machining properties and techniques.

*Tool and die makers* construct precision tools or metal forms, called dies, that are used to cut, shape, and mold metal, plastics, and other materials.

Tool and die makers use CAD to develop products and parts. They enter designs into computer programs that produce blueprints for the required tools and dies. CNC programmers, described in the [metal and plastic machine workers](#) profile, convert CAD designs into CAM programs that contain instructions for a sequence of cutting-tool operations. Machinists normally operate CNC machines, but tool and die makers often are trained to both operate CNC machines and write CNC programs and thus may do either task.