



## WAGE DATA

Rate Type / Statistical Type	Entry level	Mean	Experienced
Annual wage or salary	\$39,477	\$48,159	\$55,900
Hourly wage	\$18.70	\$23.92	\$27.25

## JOB DESCRIPTION

Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, mathematics, metal properties, layout, and machining procedures.

Sample of reported job titles: Gear Machinist, Journeyman Machinist, Machine Operator, Machine Repair Person, Machinist, Maintenance Machinist, Maintenance Specialist, Production Machinist, Set-Up Machinist, Tool Room Machinist

## DUTIES

- Calculate dimensions or tolerances, using instruments such as micrometers or vernier calipers.
- Machine parts to specifications, using machine tools, such as lathes, milling machines, shapers, or grinders.
- Set up, adjust, or operate basic or specialized machine tools used to perform precision machining operations.
- Align and secure holding fixtures, cutting tools, attachments, accessories, or materials onto machines.
- Measure, examine, or test completed units to check for defects and ensure conformance to specifications, using precision instruments, such as micrometers.
- Monitor the feed and speed of machines during the machining process.
- Maintain machine tools in proper operational condition.
- Study sample parts, blueprints, drawings, or engineering information to determine methods or sequences of operations needed to fabricate products.
- Operate equipment to verify operational efficiency.
- Check work pieces to ensure that they are properly lubricated or cooled.

## TOOLS and TECHNOLOGY

Tools used in this occupation:

**Calipers** — Dial calipers, Hermaphrodite calipers, Outside spring calipers, Vernier calipers

**Drill press or radial drill** — Radial drill presses, Radial drills, Sensitive drill presses

**Hammers** — Ball peen hammers, Composition hammers, Machinists' hammers, Sledgehammers

**Height gauges** — Gauges, Planer gauges, Vernier height gauges

**Horizontal turning center** — Engine lathes, Flywheel lathes, Horizontal lathes, Turning lathes

Technology used in this occupation:

**Analytical or scientific software** — Armchair Machinist software, CNC Consulting Machinists' Calculator, EditCNC software, Kentech Trig Calculator

**Computer aided design CAD software** — Autodesk AutoCAD software

**Computer aided manufacturing CAM software** — CNC Mastercam, CNC TurboCAD/CAM, JETCAM software

**Project management software** — Kentech Kipware software

**Spreadsheet software** — Microsoft Excel

## KNOWLEDGE

**Mathematics** — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

**Mechanical** — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

**Production and Processing** — Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.

**English Language** — Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

**Design** — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.

## SKILLS

**Operation Monitoring** — Watching gauges, dials, or other indicators to make sure a machine is working properly.

**Critical Thinking** — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Operation and Control** — Controlling operations of equipment or systems.

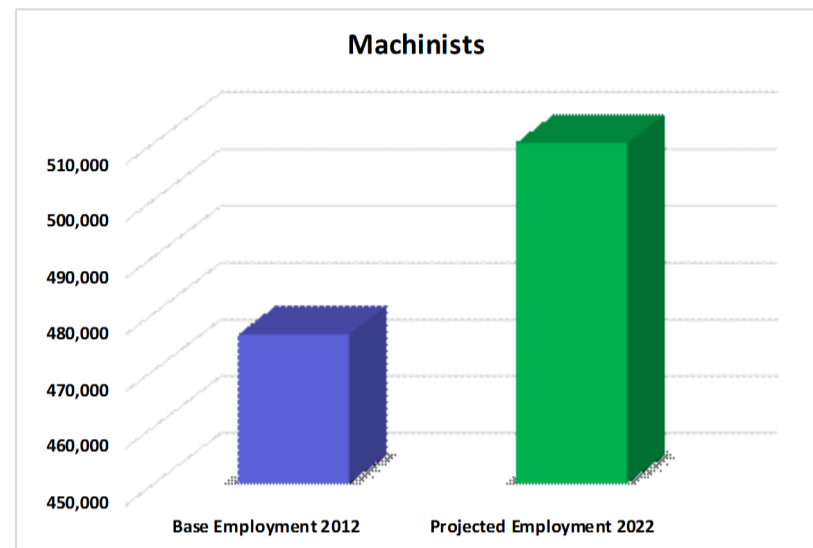
**Active Listening** — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

**Coordination** — Adjusting actions in relation to others' actions.

**Monitoring** — Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

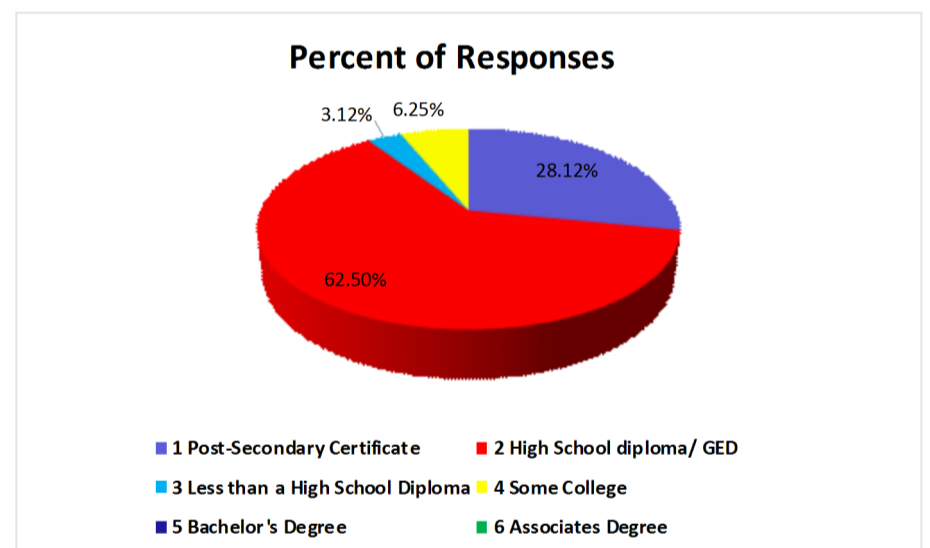
**Reading Comprehension** — Understanding written sentences and paragraphs in work related documents.

## EMPLOYMENT PROJECTION



## EDUCATION

The graph below shows the results of a national survey listing the most common required level of education for Machinists.



## EDUCATION FOR THIS JOB

- 2014 Catalogue of Colorado Advanced Manufacturing Program and Skill Resources  
<http://www.coloradomanufacturingcareers.com/>
- Approved Colorado Community College Manufacturing Cluster education programs  
<http://www.coloradocommunitycolleges.com/go/programs/skilled-trades-technical-sciences/>  
<http://www.coloradocommunitycolleges.com/go/>
- Colorado Four Year Colleges and Universities  
<http://higher.ed.colorado.gov/academics/colleges/public4year.asp>
- Locations to Get Manufacturing Certificates  
<http://www.coloradomanufacturingcareers.com/>

