

Manufacturing in Maricopa County, Arizona

“Everything not made by God is manufactured by someone.”

– Dante Fierros, president of Tempe-based [Nichols Precision](#)

“I don't spend my time pontificating about high-concept things; I spend my time solving engineering and manufacturing problems.”

– Elon Musk

“The rumors of the demise of the U.S. manufacturing industry are greatly exaggerated.”

– Elon Musk

“I have come to a resolution myself as I hope every good citizen will, never again to purchase any article of foreign manufacture which can be had of American make be the difference of price what it may.”

– Thomas Jefferson

“Manufacturing, science and engineering are ... incredibly creative. I'd venture to say more so than creative advertising agencies and things that are known as the creative industries.”

– Sir James Dyson

Tolleson Union High School District career and technical education: *focusing on the future, today*

Manufacturing Overview

What do you think of when you hear the word “manufacturing?” Do you think of robotics, cutting edge electronics, precision tools, innovative processes, the forefront of science and technology, or the frontiers of space? If not, think again. Manufacturing isn't what it used to be. Manufacturing today means a highly skilled workforce carrying out sophisticated high tech research, design, and fabrication.

Manufacturing **in the U.S.** is growing:

- Creates more wealth than any other single industryⁱ
- U.S.-based production projected to increase in the next five yearsⁱⁱ

Manufacturing **in Arizona** is growing:ⁱⁱⁱ

- 1200 companies in aerospace and defense = only 25% of Arizona manufacturing
 - 150,000+ jobs
 - \$2.8 billion in exports
- Additional manufacturing areas
 - computer and electronic products
 - transportation equipment
 - food, beverage, and tobacco products
 - chemical products
- Arizona manufacturers need employees
 - 80% of Arizona manufacturers cannot fill important jobs^{iv}
 - 75% of manufacturers report a significant shortage of skilled resources^v

- manufacturing jobs provide a 77% pay premium^{vi}

Manufacturing in **Maricopa County** is growing:

- Produced more than \$18 billion in output in 2013^{vii}
- Employed 86,000 in 2014
- Will employ 95,000 by 2024^{viii}
- Median earnings between \$21.48 per hour and \$30.33 per hour
- Projected demand will increase by as much as 25.2% by 2024^{ix}

Top 5 manufacturing job vacancies* with annual salary by experience (PayScale.com)		
Occupation	Experience	
	Less than 5 years	5 – 10 years
Welder	\$35,864	\$39,190
Machinist	\$38,602	\$47,116
Mechanical Drafter	\$34,551	\$44,042
Team Assembler	\$26,980	\$30,512
First Line Supervisor	\$47,846	\$50,753

Stand out from the crowd: nationally recognized industry certifications^{xi}

- Boost entry level salaries
- Provide professional growth
- Increase marketability
- Support local, regional, and national mobility
- Available through area community college programs offer courses leading to certifications that most

Manufacturing Employers in Maricopa County

Major Manufacturing Companies in Maricopa County Arizona^{xii}		
Boeing	Hypercom Corp	ON Semiconductor
Bose	Intel Corp	PepsiCo
Cavco Industries	Interface, Inc.	PING
Daisy Brand	Isola Group	Quaker Oats
Dunn Edwards	Landis Plastics	Rogers Corporation
Freescale Semiconductor	Medtronic	Sara Lee
Frito Lay	Microelectronics Center	Shamrock Foods
Gruber Industries, Inc.	Mitel	Suntron Corporation
Hamilton Sundstrand	Microchip Technology	TRW
Holsum Bakery	NXP Semiconductors	

Top Manufacturing Employers in Maricopa County: Research, Design, and Fabrication

Honeywell Aerospace: components for business aviation, military aircraft and tanks, helicopters, manned and unmanned space operations, and automotive turbo engines (5 locations in Maricopa County)

“Honeywell Aerospace innovates and integrates thousands of products and services to advance and easily deliver safe, efficient, productive and comfortable experiences worldwide.”^{xiii}

Honeywell International Inc. and Honeywell Electronic Chemicals: components for home and business electronics; energy and utilities; security; building construction and maintenance; oil, gas, petrochemical, and biofuels industries; and first responders (3 locations in Maricopa County)

“Honeywell invents and manufactures technologies to address some of the world’s toughest challenges initiated by revolutionary macro trends in science, technology and society” in aerospace, automation and smart technology, performance chemicals and technology, and transportation systems.^{xiv}

Intel Corporation: computer products like processors, motherboards and development boards, chipsets, solid state drivers, servers, networking and communications components, software, modems, expansion modules, and NUCs [next unit of computing – a handheld palm-sized computer] (2 locations in Maricopa County)

“Our mission: Utilize the power of Moore's Law to bring smart, connected devices to every person on earth.”

“Our vision: If it is smart and connected, it is best with Intel.”^{xv}

General Dynamics Information Technology: cloud computing, cyber security, network operations and security, virtual and electronic healthcare systems, wireless systems infrastructure and integration, business operations and management, and defense training and simulation (1 location in Maricopa County)

“General Dynamics Information Technology provides information technology (IT), systems engineering, professional services and simulation and training to customers in the defense, federal civilian government, health, homeland security, intelligence, state and local government and commercial sectors. ... the company delivers IT enterprise solutions, manages large-scale, mission-critical IT programs and provides mission support services.”^{xvi}

Five Key Occupations in the Industry

Industrial Engineers¹

What Industrial Engineers Do

Industrial engineers find ways to eliminate wastefulness in production processes. They devise efficient ways to use workers, machines, materials, information, and energy to make a product or provide a service.

Work Environment

Depending on their tasks, industrial engineers work both in offices and in the settings they are trying to improve. For example, when observing problems, they may watch workers assembling parts in a factory or staff carrying out their tasks in a hospital. When solving problems, they may be in an office at a computer looking at data that they or others have collected.

How to Become an Industrial Engineer

Industrial engineers need a bachelor's degree, typically in industrial engineering. However, many industrial engineers have degrees in mechanical engineering, manufacturing engineering, industrial engineering technology, or general engineering.

¹ U.S. Bureau of Labor Statistics *Occupational Outlook Handbook*: Industrial Engineers (<http://www.bls.gov/ooh/architecture-and-engineering/industrial-engineers.htm>)

Supervisors of Production and Operating Workers²

What Industrial Production Managers Do

Industrial production managers oversee the daily operations of manufacturing and related plants. They coordinate, plan, and direct the activities used to create a wide range of goods, such as cars, computer equipment, or paper products.

Work Environment

Industrial production managers held about 172,700 jobs in 2012. Most industrial production managers work full time and almost half worked more than 40 hours per week in 2012.

How to Become an Industrial Production Manager

Industrial production managers typically need a bachelor's degree and 1 to 5 years of related work experience.

Team Assemblers³

What Assemblers and Fabricators Do

Assemblers and fabricators assemble finished products and the parts that go into them. They use tools, machines, and their hands to make engines, computers, aircraft, ships, boats, toys, electronic devices, control panels, and more.

Work Environment

Most assemblers and fabricators work in manufacturing plants. Some of the work may involve long periods of standing or sitting. Although workers may be exposed to harmful chemicals or fumes, the work is not inherently dangerous. Most work full time, and they sometimes work evenings and weekends.

How to Become an Assembler or Fabricator

The education level and qualifications needed to enter these jobs vary depending on the industry and employer. Although a high school diploma is enough for most jobs, experience and additional training is needed for more advanced assembly work.

Machinists⁴

What Machinists and Tool and Die Makers Do

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

Work Environment

Machinists and tool and die makers work in machine shops, toolrooms, and factories. Although most work full time during regular business hours, overtime is somewhat common, as is evening and weekend work.

How to Become a Machinist or Tool and Die Maker

Machinists train in apprenticeship programs, vocational schools, community and technical colleges, or informally on the job. To become a fully trained tool and die maker takes a combination of several years of technical instruction and on-the-job training. A high school diploma is necessary.

Inspectors⁵

What Quality Control Inspectors Do

Quality control inspectors examine products and materials for defects or deviations from specifications.

Work Environment

Working conditions vary by industry, establishment size, and specific duty. Most quality control inspectors work full time during regular business hours. Overtime may be required to meet production deadlines.

² U.S. Bureau of Labor Statistics *Occupational Outlook Handbook*: Industrial Production Managers (<http://www.bls.gov/ooh/management/industrial-production-managers.htm>)

³ U.S. Bureau of Labor Statistics *Occupational Outlook Handbook*: Assemblers and Fabricators (<http://www.bls.gov/ooh/production/assemblers-and-fabricators.htm>)

⁴ U.S. Bureau of Labor Statistics *Occupational Outlook Handbook*: Machinists and Tool and Die Makers (<http://www.bls.gov/ooh/production/machinists-and-tool-and-die-makers.htm>)

⁵ U.S. Bureau of Labor Statistics *Occupational Outlook Handbook*: Quality Control Inspectors (<http://www.bls.gov/ooh/production/quality-control-inspectors.htm>)

How to Become a Quality Control Inspector

Most quality control inspectors need a high school diploma and receive on-the-job training that typically lasts as little as 1 month or up to 1 year.

Resources for More Information

Honeywell Aerospace (<https://aerospace.honeywell.com/>)

Honeywell International Inc. (<http://honeywell.com/Pages/Home.aspx>)

Honeywell Electronic Chemicals (<http://honeywell.com/Pages/Home.aspx>)

Intel Corporation (<http://www.intel.com/content/www/us/en/homepage.html>)

General Dynamics Information Technology (<http://www.gdit.com/>)

U.S. Bureau of Labor Statistics *Occupational Outlook Handbook* (<http://www.bls.gov/ooh/>)

O*NET Online (<https://www.onetonline.org/>)

Career One Stop: your source for career exploration, training and jobs (<http://www.careeronestop.org/>)

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- ⁱ “Close the Skills Gap in Arizona: A Framework to Address the Current and Future Skills and Workforce Development Gaps,” The Manufacturing Institute, Arizona Manufacturing Partnership, p. 5 (<http://www.themanufacturinginstitute.org/~media/B85A39FAACBB4A648C5A09E2A25C1C9A.ashx>)
- ⁱⁱ “Out of Inventory: Skills Shortage Threatens Growth of US Manufacturing,” Accenture 2014 Manufacturing Skills and Training Study, Manufacturing Institute (<http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-2014-Manufacturing-Skills-Training.pdf>)
- ⁱⁱⁱ “Arizona Manufacturing: Its Evolution is Economic Prosperity”, *In Business*, Greater Phoenix, June 2014 (http://inbusinessmag.com/in-business/arizona-manufacturing#.VSVUD_nF9ql)
- ^{iv} “Close the Skills Gap in Arizona: A Framework to Address the Current and Future Skills and Workforce Development Gaps,” The Manufacturing Institute, Arizona Manufacturing Partnership, p. 2 (<http://www.themanufacturinginstitute.org/~media/B85A39FAACBB4A648C5A09E2A25C1C9A.ashx>)
- ^v “Out of Inventory: Skills Shortage Threatens Growth of US Manufacturing,” Accenture 2014 Manufacturing Skills and Training Study, Manufacturing Institute (<http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-2014-Manufacturing-Skills-Training.pdf>)
- ^{vi} “Close the Skills Gap in Arizona: A Framework to Address the Current and Future Skills and Workforce Development Gaps,” The Manufacturing Institute, Arizona Manufacturing Partnership, p. 2 (<http://www.themanufacturinginstitute.org/~media/B85A39FAACBB4A648C5A09E2A25C1C9A.ashx>)
- ^{vii} U.S. Bureau of Economic Analysis, Phoenix-Mesa-Scottsdale, AZ (MSA – metropolitan statistical area), retrieved April 2015, Real GDP by metropolitan area (millions of chained 2009 dollars)
- ^{viii} “Meeting the Workforce Needs of Business through Sector Strategies – Growing Regional Economies with Industry Partnerships – Engaging in Business Driven Partnerships,” Maricopa Community Colleges, Workforce Development, December 2014 (<http://www.cgc.maricopa.edu/Academics/Careers/Documents/Arizona%20Targeted%20Industries.pdf>)
- ^{ix} “Landscape of the Manufacturing Sector in Maricopa County”, Prepared by the Maricopa County Community College District Workforce Development Department, February 2015, p. 3-4 (https://www2.maricopa.edu/sites/default/files/Manufacturing%20Landscape%20-%20Maricopa%20County%20-%202015_4.pdf)
- ^x “Landscape of the Manufacturing Sector in Maricopa County”, Prepared by the Maricopa County Community College District Workforce Development Department, February 2015, p. 3-4 (https://www2.maricopa.edu/sites/default/files/Manufacturing%20Landscape%20-%20Maricopa%20County%20-%202015_4.pdf)
- ^{xi} “Arizona manufacturing jobs still a path to middle class,” AZCentral.com, February 28, 2011 (<http://archive.azcentral.com/business/articles/20110228arizona-middle-class-jobs-factory.html#ixzz3WpgdDJL2>)
- ^{xii} Greater Phoenix Economic Council, Key Industries (<http://www.gpec.org/home>)
- ^{xiii} Honeywell Aerospace, “About Us” (<https://aerospace.honeywell.com/en/about>)

^{xiv} Honeywell International and Honeywell Chemical, “About Us” (<http://honeywell.com/About/Pages/our-company.aspx>)

^{xv} Intel Corporation, “Intel Facts” (<http://www.intel.com/content/www/us/en/company-overview/company-facts.html?wapkw=intel+mission>)

^{xvi} General Dynamics Information Technology, “About Us” (<http://www.gdit.com/About-Us/About-Us/>)