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Quarterly Labor Market Report:

Spotlight on Manufacturing

By: Latoya Reed, MSW, Management Analyst

Alameda County Workforce Development Board

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Manufacturing Skills Overview in the United States

Manufacturing has shifted to a greater reliance on automation, requiring workers to have robust skills that represent both traditional and advanced manufacturing. Traditional production skills like welding and machining, are still pertinent in today's manufacturing firms, but so are technological skills, such as 3D modeling and blueprinting. While production workers are still in high-demand, they need to be agile enough to adapt to advanced manufacturing.

According to a recent article, "Manufacturing is Not Dead," four high-demand skill clusters in manufacturing have emerged across the nation[1]:

1. Traditional production skills (welding, machining, fabrication, etc.),
2. Computer-automated technologies (to aid in design and product creation),
3. Six Sigma (process improvement methodologies that improve efficiency), and,
4. Good Manufacturing Practices (to ensure quality assurance of products).

Specific in-demand skills within these four skill clusters show prominence. See Figure 1.

Figure 1.

Traditional Manufacturing	Computer-Automated Technologies (CAT)	Six Sigma	Good Manufacturing Practices
❖ Arc Welding ❖ Plasma Cutting ❖ Flame Cutting ❖ Brazing (Metal Work) ❖ Gas Metal Arc Welding ❖ Plasma Arc Welding ❖ Shielded Metal Arc Welding ❖ Gas Tungsten Arc Welding ❖ Notching ❖ Annealing (Metallurgy)	❖ Computer-Aided Manufacturing ❖ Computer-Aided Design ❖ SolidWorks (CAD) ❖ Electrical Discharge Machining ❖ Blueprinting ❖ Trigonometry ❖ Coordinate Measuring Machine (CMM) ❖ Siemens NX ❖ 3D Modeling ❖ Geometric Dimensioning and Tolerancing	❖ Continuous Improvement Process ❖ Business Process Improvement ❖ Value Stream Mapping ❖ Operational Excellence ❖ Kanban Principles ❖ Change Management ❖ DMAIC ❖ Gemba ❖ Material Flow ❖ Manufacturing Operations ❖ Material Requirements Planning	❖ Quality Management Systems ❖ Continuous Quality Improvement (CQI) ❖ Corrective and Preventive Actions ❖ Advanced Product Quality Planning ❖ Certified Global Meeting Planner ❖ Continuous Improvement Process ❖ Failure Mode Effects Analysis ❖ Business Process Improvement ❖ ISO/TS 16949 ❖ ASQ Certified

[1] Manufacturing is Not Dead: The Rise of High-Skill, High-Wage Production Jobs - http://www.economicmodeling.com/manufacturing-is-not-dead/ by Economic Modeling Specialist International (Emsi)

Manufacturing in California

In 2017, there were 1 million manufacturing jobs in California and 41,473 manufacturing establishments. Workers age 34 or under, comprised approximately 26% of the manufacturing workforce in 2017. Women comprised 32.7% of the industry, and just 5.1% of the manufacturing sector workforce consisted of African Americans, Native Hawaiians and other Pacific Islanders, Native Americans, and multi-ethnic individuals, combined. [2]

California's more prominent manufacturing sectors are: aerospace, defense, and automobile and highlight different skill set clusters than those generally seen at the national level.[3] These skills are also inclusive of continuous improvement, such as lean six sigma and quality assurance. See Figure 2.

Figure 2.

Vehicles	Industrial Design	Six Sigma	Good Manufacturing Practices
❖ Hydraulics ❖ Electrical Wirings ❖ Engines ❖ Programmable Logic Controllers ❖ Pneumatics ❖ Production Equipment Controls ❖ Blueprinting ❖ Wiring Diagram ❖ Predictive Analytics ❖ Predictive Maintenance	❖ Mechanical Engineering ❖ CATIA ❖ 3D Modeling ❖ Creo Elements/Pro ❖ Design For Manufacturability ❖ Siemens NX ❖ Product Data Management ❖ Corrective and Preventive Actions ❖ Ergonomics ❖ Machinery Design	❖ Continuous Improvement Process ❖ Lean Six Sigma ❖ Business Process Improvement ❖ Value Stream Mapping ❖ DMAIC ❖ Kanban Principles ❖ Change Management ❖ Operational Excellence ❖ Gemba ❖ Corrective and Preventive Actions	❖ Hazard Analysis and Critical Control Points ❖ Product Quality Assurance ❖ Corrective and Preventive Actions ❖ Pharmaceuticals ❖ ISO 13485 ❖ Product Quality Management ❖ ASQ Certified ❖ ISO 9000 ❖ Biotechnology ❖ Good Clinical Practice ❖ Advanced Product Quality Planning

[2] The source for number of manufacturing jobs and establishments, as well as the demographic information, is based off of Emsi data. Demographic groups with lower industry representation are included here to highlight potential opportunities for workforce development efforts.

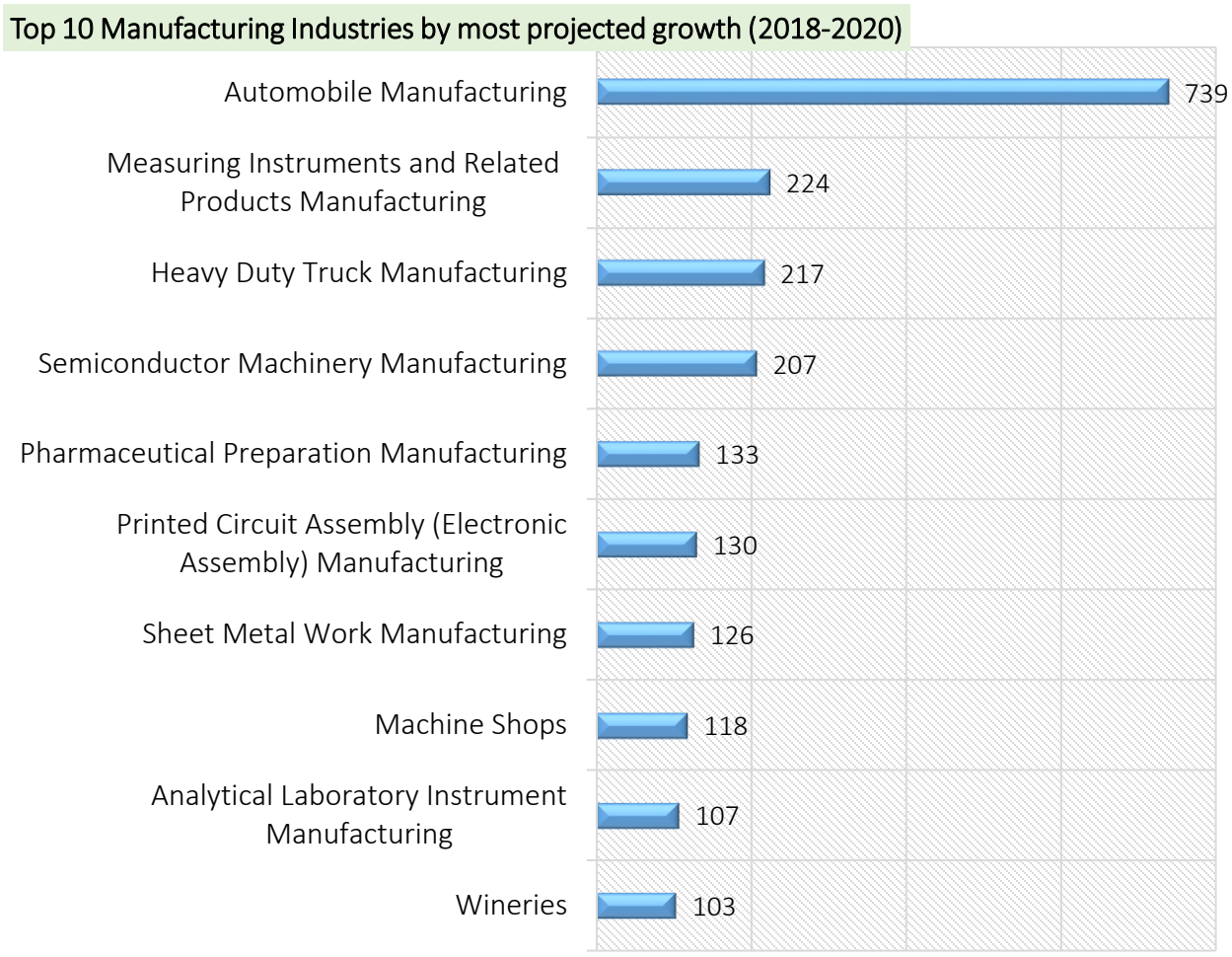
[3] Manufacturing is Not Dead: The Rise of High-Skill, High-Wage Production Jobs - http://www.economicmodeling.com/manufacturing-is-not-dead/

Manufacturing in Alameda County and Projected Industry Growth

In 2017, there were 76,202 manufacturing jobs and 1,998 manufacturing firms in Alameda County. Approximately 25% of workers were 34 years of age or under, and women comprised 33% of the industry. 7% of the manufacturing industry consisted of African Americans, Native Hawaiians and other Pacific Islanders, Native Americans, and multi-ethnic individuals, combined.[4]

Between 2018 and 2020, ten manufacturing industries in Alameda County are projected to add at least 100 jobs, with Automobile Manufacturing, Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables, Heavy Duty Truck Manufacturing, and, Semi-conductor Machinery Manufacturing, at the top of the pack. See figure 3.[5]

Figure 3.



[4] The source for number of manufacturing jobs and establishments, as well as the demographic information, is based off of Emsi data. Demographic groups with lower industry representation are included here to highlight potential opportunities for workforce development efforts.

[5] Data Source: Emsi

Manufacturing Employment in Alameda County

In 2017, fourteen occupations within Alameda County's manufacturing sectors showed prominence (with at least 1,000 individuals employed). See Figure 4.[6]

Most noticeable employment was for the Team Assembler, which according to ONET, is a bright outlook occupation.[7] A Team assembler can perform all tasks conducted by the team in the assembly process and rotates through several assembling processes. The Team Assembler may also make managerial level decisions related to production line.

Other manufacturing occupations generally, with higher levels of employment in 2017 were:

- First-Line Supervisors of Production and Operating Workers,
- Inspectors, Testers, Sorters, Samplers, and Weighers,
- Electrical and Electronic Equipment Assemblers, and,
- Packaging and Filling Machine Operators and Tenders, and Machinists.

Figure 4.

Occupation	Employed in Industry (2017)
Team Assemblers	8,274
First-Line Supervisors of Production and Operating Workers	2,370
Inspectors, Testers, Sorters, Samplers, and Weighers	2,191
Electrical and Electronic Equipment Assemblers	2,067
Packaging and Filling Machine Operators and Tenders	1,874
Machinists	1,868
General and Operations Managers	1,462
Laborers and Freight, Stock, and Material Movers, Hand	1,458
Shipping, Receiving, and Traffic Clerks	1,333
Helpers--Production Workers	1,217
Food Batch makers	1,204
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	1,139
Industrial Production Managers	1,030
Software Developers, Systems Software	1,004

[6] Data Source: Emsi

[7] ONET Online - https://www.onetonline.org/. The Team Assembler title is also considered as a type of Production Worker, and may be used synonymously in some job advertisements.

Manufacturing Staffing Patterns in Alameda County

Staffing patterns in Alameda County vary based on the manufacturing industry type, but most manufacturing industries share the Team Assembler occupation.[8] Staffing patterns in Alameda County projected for growth between 2018 and 2020, tend to be occupations that are both production-oriented and machine-related. Figure 5 includes some of the staffing patterns of Alameda County's top five manufacturing sectors. Also see the bar graph in Figure 3 for more information.

Figure 5.

Manufacturing Industry	Occupations
Automobile Manufacturing	• Team Assemblers • First-Line Supervisors of Production and Operating Workers • Production Workers • Inspectors, Testers, Sorters, Samplers, and Weighers • Industrial Engineers
Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	• Electrical and Electronic Equipment Assemblers • Software Developers of Systems • Team Assemblers • Electrical and Electronics Engineering Technicians • Architectural and Engineering Managers
Heavy Duty Truck Manufacturing	• Team Assemblers • First-Line Supervisors of Production and Operating Workers • Production Workers, All Other • Inspectors, Testers, Sorters, Samplers, and Weighers • Industrial Engineers
Semiconductor Machinery Manufacturing	• Team Assemblers • Machinists • Welders, Cutters, Solderers, and Brazers • Mechanical Engineers • First-Line Supervisors of Production and Operating Workers
Pharmaceutical Preparation Manufacturing	• Packaging and Filling Machine Operators and Tenders • Chemists • Mixing and Blending Machine Setters, Operators, and Tenders • Inspectors, Testers, Sorters, Samplers, and Weighers • Biochemists and Biophysicists

[8] Data source for staffing patterns: Emsi

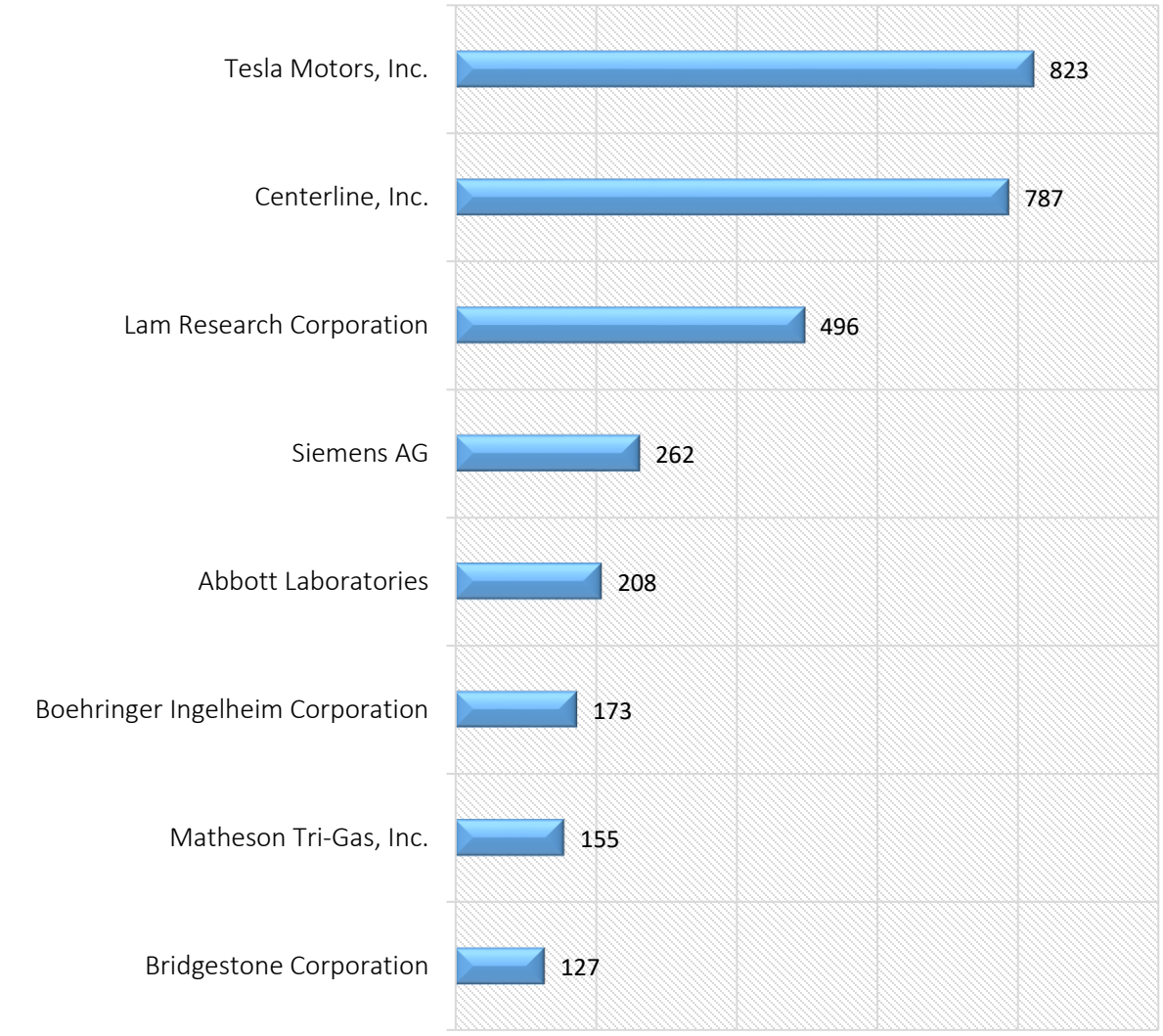
Manufacturing Job Postings

Between January 2018 and February 2018, Tesla Motors (automobile manufacturing), Centerline Inc. (spindle manufacturing), and Lam Research Corporation (semiconductor manufacturing), had the most non-duplicated job postings in Alameda County.[9] See Figure 6.

While Tesla is well-known for its electric vehicles, the company has also made advancements in clean energy generation and storage. This presents more opportunities for job seekers, with current job advertisements from Tesla pointing to the energy sector. Some of the recent job advertisements from Tesla include: sales representatives, engineers, installers, roofers, and energy specialists.

Figure 6.

Top 10 Companies with Most Frequent Job Postings



[9] Job Posting information is based off of Emsi data.

Occupations in figure 7, were represented in non-duplicated job advertisements from manufacturing companies (including companies from the bar graph above in Figure 6), between January 2018 and February 2018. See Figure 7.

These job advertisements (job ads) vary, demonstrating how occupationally diverse the manufacturing sector is in Alameda County in relation to employer demand:

- Managerial/Supervisory job ads (1,231 total)
- Truck Driver job ads (1,081 total)
- Engineering job ads (872 total)
- Retail salespersons, stock clerks, and customer services representatives (530 total)
- Software and computer occupation job ads (326 total)
- Maintenance and Repair job ads (185 total)

Figure 7.

Occupation (SOC)	Unique Postings (Jan 2018 - Feb 2018)
Heavy and Tractor-Trailer Truck Drivers	872
Industrial Engineers	636
Marketing Managers	340
First-Line Supervisors of Production and Operating Workers	294
Mechanical Engineers	236
Managers, All Other	234
Light Truck or Delivery Services Drivers	209
Stock Clerks and Order Fillers	204
Sales Managers	198
Maintenance and Repair Workers, General	185
Software Developers, Applications	170
Retail Salespersons	166
First-Line Supervisors of Retail Sales Workers	165
Customer Service Representatives	160
Computer Occupations, All Other	156