










Welding Occupations

Labor Market Analysis: San Diego County

May 2022

Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED EDUCATION FOR MAJORITY OF OCCUPATIONS ANALYZED
 <p>Proceed with New Program</p>	 	 	<input type="checkbox"/> Bachelor's Degree+ <input type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input checked="" type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less than a HS Diploma <input type="checkbox"/> Apprenticeship
SUPPORT FOR PROGRAM MODIFICATION?	NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING	NUMBER OF ANNUAL JOB OPENINGS	
 	<p>LOW</p> 	<p>HIGH</p> 	

This brief provides labor market information about *Welding Occupations* to assist the San Diego and Imperial Counties Community Colleges with program development and strategic planning. *Welding Occupations* include “Assemblers and Fabricators, All Other,” “Structural Iron and Steel Workers,” “Structural Metal Fabricators and Fitters,” “Welders, Cutters, Solderers, and Brazers,” and “Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders.” According to available labor market information, *Welding Occupations* in San Diego County have a labor market demand of 1,543 annual job openings (while average demand for a single occupation in San Diego County is 245 annual job openings), and two institutions supply 143 awards for these occupations, suggesting that there is a supply gap in the labor market. Entry-level wages except for “Structural Metal Fabricators and Fitters,” Welding, Soldering, and Brazing,” and “Machine Setters, Operators, and Tenders” and median wages for these occupations are above the living wage. This brief recommends proceeding with a new program and supports a program modification because 1) these occupations’ entry-level and median earnings are above the living wage and 2) a supply gap exists for these occupations. Colleges should note that **employers typically require a high school diploma or equivalent as the minimum educational requirement for these occupations.**

Introduction

This report provides labor market information in San Diego County for the following occupational codes in the Standard Occupational Classification (SOC)¹ system:

- **Assemblers and Fabricators, All Other** (SOC 51-2099): All assemblers and fabricators not listed separately.
- **Structural Iron and Steel Workers** (SOC 47-2221): Raise, place, and unite iron or steel girders, columns, and other structural members to form completed structures or structural frameworks. May erect metal storage tanks and assemble prefabricated metal buildings.
- **Structural Metal Fabricators and Fitters** (SOC 51-2041): Fabricate, position, align, and fit parts of structural metal products.
- **Welders, Cutters, Solderers, and Brazers** (SOC 51-4121): Use hand-welding, flame-cutting, hand-soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.
- **Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders** (SOC 51-4122): Set up, operate, or tend welding, soldering, or brazing machines or robots that weld, braze, solder, or heat treat metal products, components, or assemblies. Includes workers who operate laser cutters or laser-beam machines.

For the purpose of this report, these occupations are referred to as *Welding Occupations*.

¹ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc).

Projected Occupational Demand

Between 2021 and 2026, *Welding Occupations* are projected to decrease by 254 net jobs or two percent (Exhibit 1a). Employers in San Diego County will need to hire 1,543 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

Exhibit 1a: Number of Jobs for Welding Occupations (2011-2026)²

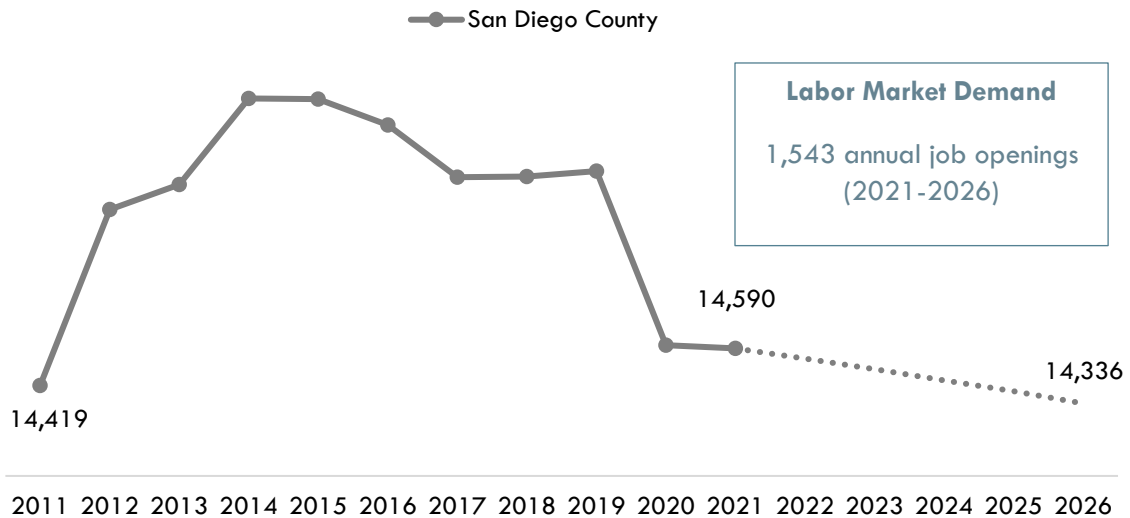


Exhibit 1b disaggregates the projected number of jobs change by occupation. “Assemblers and Fabricators, All Other” are projected to have the most labor market demand between 2021 and 2026, with 888 annual job openings.

Exhibit 1b: Number of Jobs for Welding Occupations in San Diego County (2021-2026)³

Occupational Title	2021 Jobs	2026 Jobs	2021 - 2026 Net Jobs Change	2021 - 2026 % Net Jobs Change	Annual Job Openings (Demand)
Assemblers and Fabricators, All Other	8,512	8,221	-291	-3%	888
Welders, Cutters, Solderers, and Brazers	4,206	4,276	70	2%	461
Structural Metal Fabricators and Fitters	1,160	1,106	-54	-5%	116
Structural Iron and Steel Workers	596	617	21	3%	66
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	116	116	0	0%	12
Total	14,590	14,336	-254	-2%	1,543

² EMSI 2022.1; QCEW, Non-QCEW, Self-Employed.

³ EMSI 2022.1; QCEW, Non-QCEW, Self-Employed.

Earnings

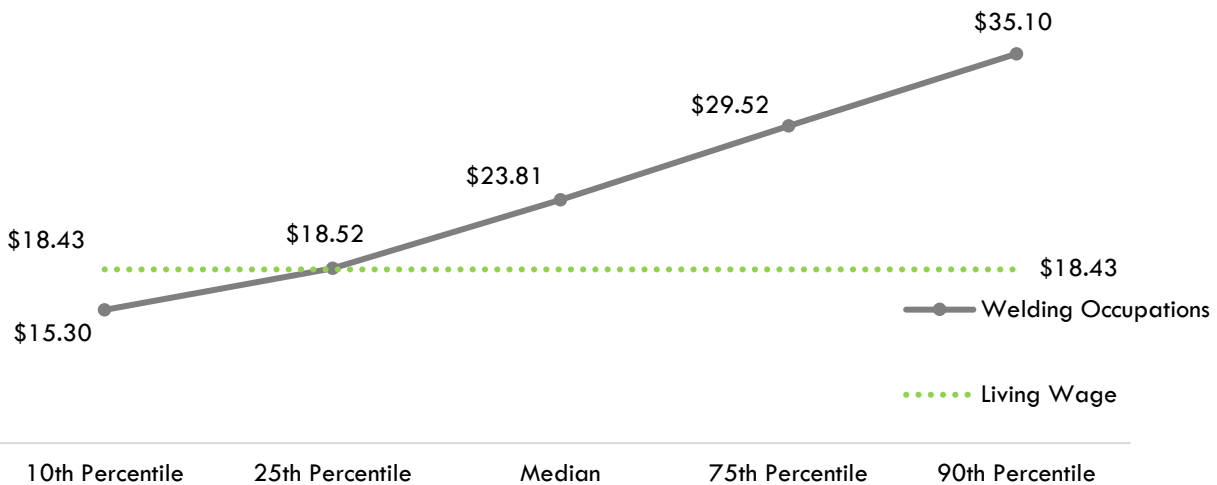
Exhibit 2a disaggregates hourly earnings by occupation. The entry-level hourly earnings for *Welding Occupations* range from \$13.66 to \$26.21.

Exhibit 2a: Hourly Earnings for *Welding Occupations* in San Diego County⁴

Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Structural Iron and Steel Workers	\$26.21	\$36.12	\$42.81
Welders, Cutters, Solderers, and Brazers	\$19.64	\$25.29	\$30.44
Structural Metal Fabricators and Fitters	\$17.88	\$23.04	\$28.94
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	\$15.20	\$18.96	\$23.69
Assemblers and Fabricators, All Other	\$13.66	\$15.63	\$21.69

On average, the entry-level hourly earnings for *Welding Occupations* are \$18.52; this is more than the living wage for a single adult in San Diego County, which is \$18.43 per hour (Exhibit 2b).⁵

Exhibit 2b: Average Hourly Earnings⁶ for *Welding Occupations* in San Diego County⁷



⁴ EMSI 2022.1; QCEW, Non-QCEW, Self-Employed.

⁵ "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightccd.org/family-needs-calculator/.

⁶ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

⁷ EMSI 2022.1; QCEW, Non-QCEW, Self-Employed.

Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.⁸ There are **two** TOP codes and **four** CIP codes related to *Welding Occupations* (Exhibit 3).

Exhibit 3: Related TOP and CIP Codes for Welding Occupations⁹

TOP or CIP Code	TOP or CIP Program Title
TOP 0956.40	Sheet Metal and Structural Metal
TOP 0956.50	Welding Technology
CIP 15.0614	Welding Engineering Technology/Technician
CIP 48.0506	Sheet Metal Technology/Sheetworking
CIP 48.0508	Welding Technology/Welder
CIP 48.0511	Metal Fabricator

According to TOP data, **one** community college supplies the region with awards for these occupations, **Palomar College**. According to CIP data, **one** non-community-college institution supplies the region with awards, **CET-San Diego** (Exhibit 4).

Exhibit 4: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Year 2016-17 through PY2019-20 Average)

TOP or CIP Code	TOP or CIP Program Title	3-Yr Annual Average CC Awards (PY17-18 to PY19-20)	Other Educational Institutions 3-Yr Annual Average Awards (PY16-17 to PY18-19)	3-Yr Total Average Supply (PY16-17 to PY19-20)
0956.40	Sheet Metal and Structural Metal	11	0	11
	• Palomar	11	0	
0956.50	Welding Technology	60	0	60
	• Palomar	60	0	
48.0508	Welding Technology/Welder	0	72	72
	• CET-San Diego	0	72	
			Total	143

⁸ TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).

⁹ This brief uses a conservative estimate of program supply and only calculates awards from the TOP codes listed in Exhibit 3.

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply¹⁰ suggests that there is a **supply gap** for these occupations in San Diego County, with **1,543** annual openings and **143** awards. Comparatively, there are **18,091** annual openings in California and **2,410** awards, suggesting that there is a supply gap across the state¹¹ (Exhibit 5).

Exhibit 5: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

	Demand (Annual Openings)	Supply (Total Annual Average Supply)	Supply Gap or Oversupply
San Diego	1,543	143	1,400
California	18,091	2,410	15,681

Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

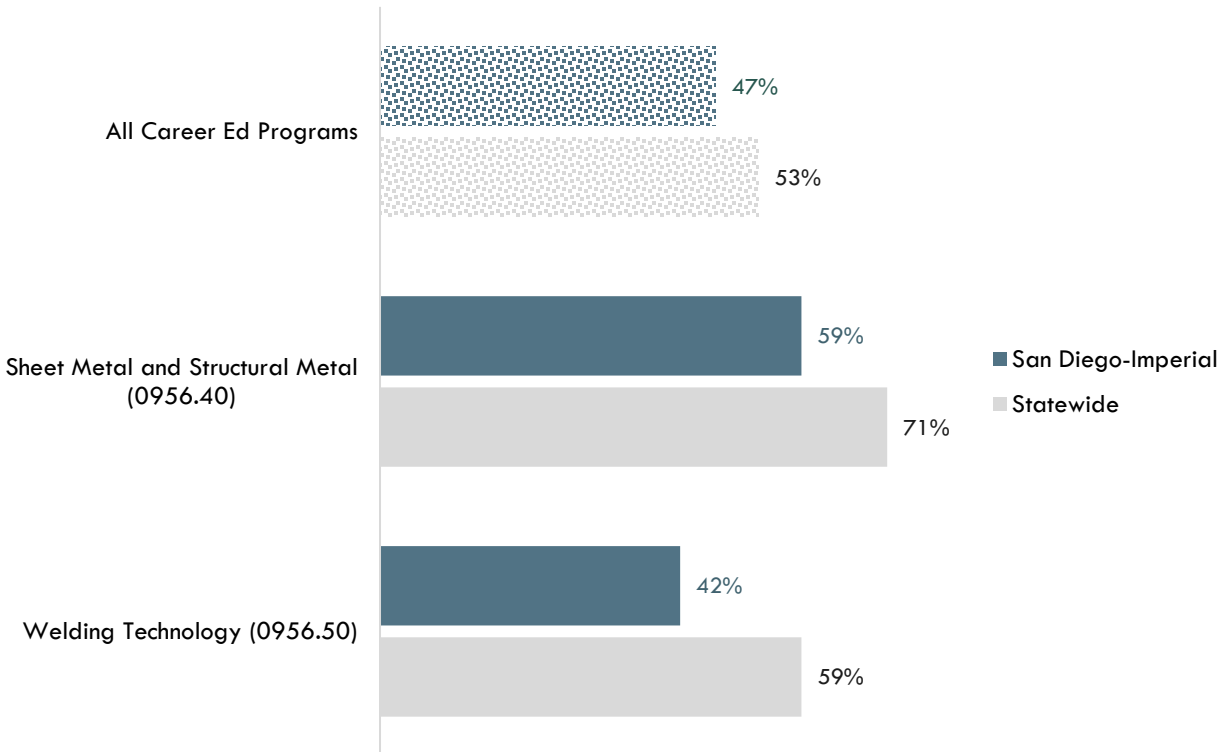
¹⁰ Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

¹¹ "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/Supply-and-Demand.aspx.

Student Outcomes and Regional Comparisons

According to the California Community Colleges LaunchBoard, 42 to 59 percent of students in the San Diego-Imperial region earned a living wage after completing a program related to *Welding Occupations*, compared to 59 to 71 percent statewide and 53 percent of students in Career Education programs in general across the state (Exhibit 6a).¹²

Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program, PY2018-19¹³

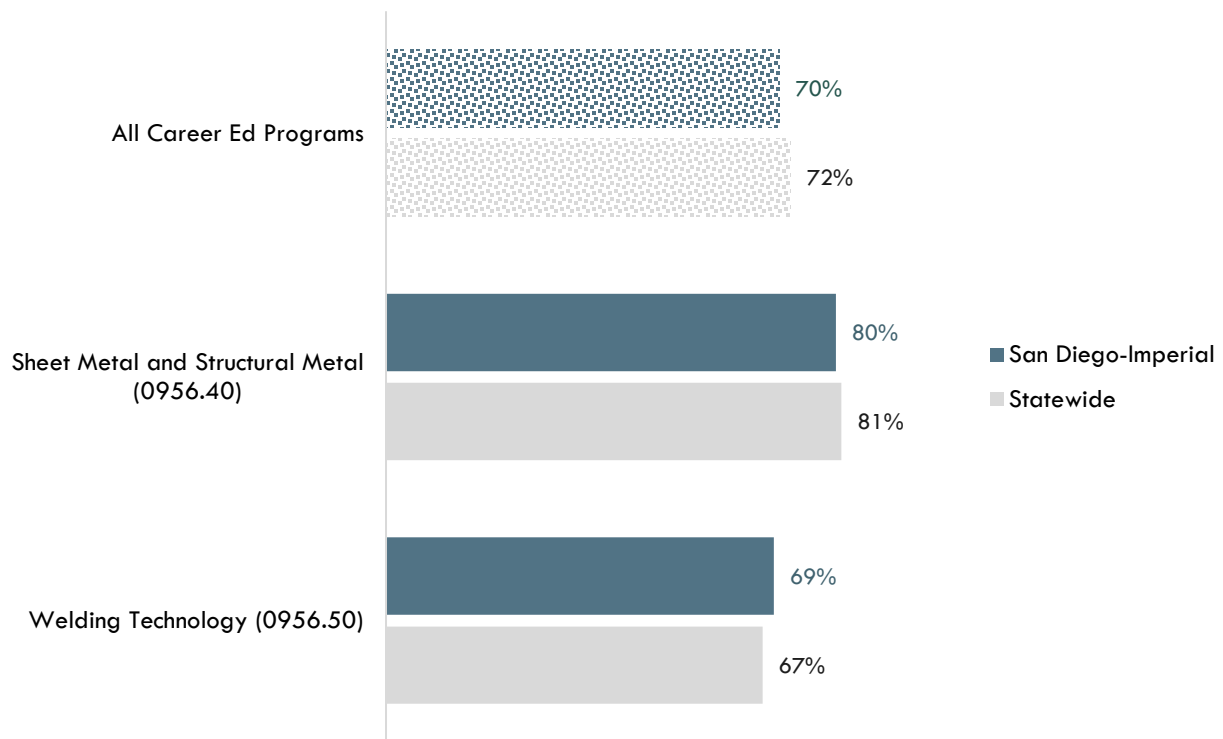


¹² "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹³ Among completers and skills builders who exited, the proportion of students who attained a living wage.

According to the California Community Colleges LaunchBoard, 69 to 80 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a program related to *Welding Occupations*, compared to 67 to 81 percent statewide and 72 percent of students in Career Education programs in general across the state (Exhibit 6b).¹⁴

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2017-18¹⁵



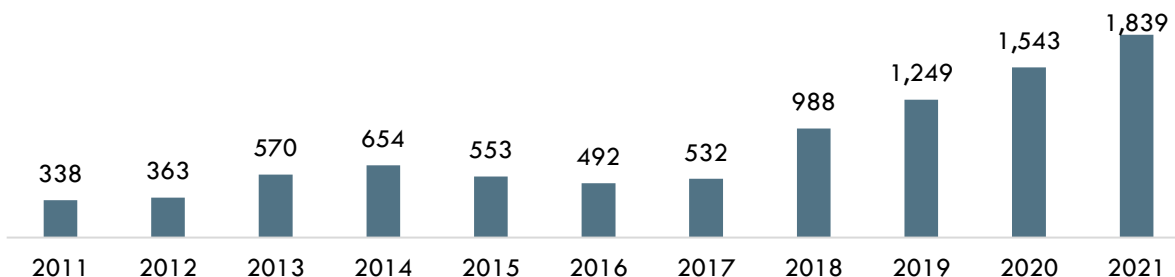
¹⁴ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹⁵ Most recent year with available data is Program Year 2017-18. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2011 and 2021, there was an average of 829 online job postings per year for *Welding Occupations* in San Diego County (Exhibit 7). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1 b). Employers may post a position multiple times for various reasons, such as increasing the pool of applicants, for example.

Exhibit 7: Number of Online Job Postings for *Welding Occupations* in San Diego County (2011-2021)¹⁶



Top Employers

Between January 1, 2019 and December 31, 2021, the top five employers in San Diego County for *Welding Occupations* were [General Dynamics](#), [L3Harris](#), [General Atomics](#), [BAE Systems](#), [Propulsion Controls Engineering](#) based on online job postings (Exhibit 8).

Exhibit 8: Top Employers for *Welding Occupations* in San Diego County¹⁷

Top Employers	
<ul style="list-style-type: none">• General Dynamics• L3Harris• General Atomics• BAE Systems• Propulsion Controls Engineering	<ul style="list-style-type: none">• Epsilon Systems• Serco• Ameri-Force• Ultimate• U.S. Government

¹⁶ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2011-2022.

¹⁷ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019-2021.

Education, Skills, and Certifications

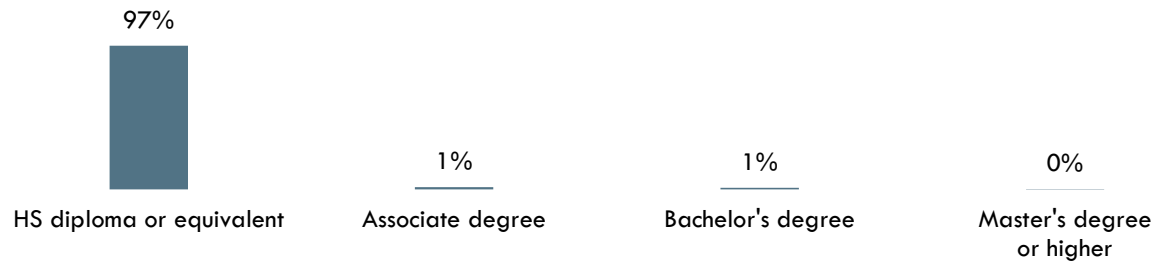
Welding Occupations have a national educational attainment of a [high school diploma or equivalent](#) (Exhibit 9a).

Exhibit 9a: National Educational Attainment for *Welding Occupations*¹⁸

Occupational Title	Typical Entry-Level Education
Assemblers and Fabricators, All Other	High school diploma or equivalent
Structural Iron and Steel Workers	High school diploma or equivalent
Structural Metal Fabricators and Fitters	High school diploma or equivalent
Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	High school diploma or equivalent

Based on online job postings between January 1, 2019 and December 31, 2021 in San Diego County, employers posted a [high school diploma or equivalent](#) as the educational requirement for *Welding Occupations* (Exhibit 9b).¹⁹

Exhibit 9b: Educational Requirements for *Welding Occupations* in San Diego County²⁰



*may not total 100 percent due to rounding

¹⁸ EMSI 2022.1; QCEW, Non-QCEW, Self-Employed.

¹⁹ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019-2021.

²⁰ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified April 9, 2021. bls.gov/emp/tables/educational-attainment.htm.

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2019 and December 31, 2021.

Exhibit 10: Top Skills for Welding Occupations in San Diego County²¹

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Welding • Hand Tools • Repair • Soldering • Power Tools • Mig and Tig Welding • Shielded Metal Arc Welding • Gas-metal Arc Welding • Microscope • Welding Equipment • Manual Dexterity • Flux Core Welding • Machinery • Personal Protective Equipment • Packaging 	<ul style="list-style-type: none"> • Physical Abilities • Detail-Oriented • Communication Skills • English • Organizational Skills • Work Area Maintenance • Computer Literacy • Troubleshooting • Teamwork / Collaboration • Problem Solving • Microsoft Excel • Writing • Written Communication • Preventive Maintenance • Verbal / Oral Communication 	<ul style="list-style-type: none"> • Microsoft Excel • Microsoft Word • Enterprise Resource Planning • Microsoft PowerPoint • SAP • Word Processing • Microsoft Access • Database Software

²¹ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019-2021.

Exhibit 11 lists the top certification that appeared in online job postings between January 1, 2019 and December 31, 2021.

Exhibit 11: Top Certification for *Welding Occupations* in San Diego County²²

Top Certification in Online Job Postings

1. Welding Certification
 2. Security Clearance
 3. OSHA Safety 10 Hour
 4. IPC Certification
 5. Occupational Safety and Health Administration Certification
 6. OSHA Forklift Certification
 7. Competent Person Certification
 8. Certified Welding Inspector (CWI)
 9. American Board of Surgery Certification (ABS)
 10. Hazardous Materials Certification
 11. Basic Computers Certificate
 12. AWS D1.1
 13. Soldering Certification
 14. ISO 9000 Quality Management
 15. Electronic Assembly
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²² Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019-2021.

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Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

This workforce demand report uses state and federal job projection data that was developed before the economic impact of COVID-19. The COE is monitoring the situation and will provide more information as it becomes available. Please consult with local employers to understand their current employment needs.