

# Occupational Profile: Chemical Engineers

## GENERAL OCCUPATION DESCRIPTION

Design chemical plant equipment and devise processes for manufacturing chemicals and products, such as gasoline, synthetic rubber, plastics, detergents, cement, paper, and pulp, by applying principles and technology of chemistry, physics, and engineering.

Source: O\*NET online. <http://online.onetcenter.org>

## REQUIRED EDUCATION

As shown in the table to right, 100% of interviewed employers reportedly require a four-year degree or more.

Required Education	
Percent of Employers Requiring HS Diploma or Less	0%
Percent of Employers Requiring 2-Year Degree or Equiv	0%
Percent of Employers Requiring BS Diploma or More	100%

Source: Bureau of Labor Statistics

## WAGES

Chemical Engineer is considered a low to high-wage occupation, with very good possibility for wage advancement with experience. Employers in Greater Phoenix and the State of Arizona generally pay lower as compared with the overall United States.

Location	Pay Period	2005				
		10%	25%	Median	75%	90%
United States	Hourly	\$23.73	\$29.32	\$37.09	\$45.58	\$54.79
	Yearly	\$49,400	\$61,000	\$77,100	\$94,800	\$114,000
Greater Phoenix	Hourly	\$24.49	\$27.05	\$30.58	\$40.62	\$47.51
	Yearly	\$50,964	\$56,291	\$63,637	\$84,530	\$98,868
Arizona	Hourly	\$22.13	\$25.20	\$30.76	\$39.20	\$46.62
	Yearly	\$46,000	\$52,400	\$64,000	\$81,500	\$97,000

Source: Bureau of Labor Statistics

As shown in the table to right, a national comparison of wages for this occupation reveals Arizona ranks 40<sup>th</sup> in terms of median wages.

RANK	Location	Median Wage 2005	
		Hourly	Annual
1	District of Columbia	\$46.90	\$97,600
2	Idaho	\$46.38	\$96,500
3	Louisiana	\$41.63	\$86,600
4	Virginia	\$41.43	\$86,200
5	Alaska	\$41.30	\$85,900
40	ARIZONA	\$30.76	\$64,000

Source: Bureau of Labor Statistics

The table below provides a comparison of wages by sub-industry for the Greater Phoenix region (2005). As shown, the main employment sector, "Professional, Scientific, and Technical Services" pays less than the other main employment sector "Computer and Electronic Product Manufacturing."

Wages by Industry: Greater Phoenix MSA (2005)	Rounded Employment	Mean Wage	10th Percentile Wage	25th Percentile Wage	Median Wage	75th Percentile Wage	90th Percentile Wage
Professional, Scientific, and Technical Services	80	\$33.45	\$23.32	\$25.06	\$27.98	\$42.06	\$51.30
Computer and Electronic Product Manufacturing	40	\$34.02	\$25.66	\$29.04	\$33.17	\$39.18	\$43.71

## EMPLOYMENT

As shown in the table below, this occupation has a projected 19% growth rate over 10 years (between 2003 and 2013) for the Greater Phoenix region. There are an average projected 7 job openings each year, comprised of 3 new jobs and 4 positions vacated by individuals leaving the field (due to retirement, death, career changes, or other reasons).

	10-YEAR CHANGE			AVERAGE ANNUAL		
	Employment		Percent Change	Job Openings	Growth	Separations
United States	2004	2014				
Chemical engineers	30,600	33,900	11%	1,240	n/a	n/a
Arizona	Employment		Percent Change	Job Openings	Growth	Separations
	2004	2014				
Chemical engineers	300	400	32%	20	n/a	n/a
Greater Phoenix	Employment		Percent Change	Job Openings	Growth	Separations
	2003	2013				
Chemical engineers	147	175	19%	7	3	4

Source: Bureau of Labor Statistics

\*Job Openings refers to the average annual job openings due to growth and net replacement.

Source: Bureau of Labor Statistics

\*\*N/A is displayed in cases where data is not available or cannot be published because of federal data privacy standards.

## Comparison of employment projections for top five regions for Chemical Engineer

As shown in the table to right, a national comparison reveals the State of Arizona ranks 4<sup>th</sup> in terms of projected 10-year growth for this occupation (32%).

RANK	Location	Employment		Percent Change
		2004	2014	
1	Idaho	210	310	49%
2	Colorado	500	720	42%
3	Utah	150	210	40%
4	ARIZONA	300	400	32%
5	Tennessee	590	770	30%

Source: Bureau of Labor Statistics

## Employment by Industry

The table below shows the industries that most commonly employ Chemical Engineer, and the proportion of employment accounted for at the national level. As shown, “Engineering, surveying, mapping, building inspection, and drafting services” is the largest employer for this occupation (14%).

Percent of Employment Nationally by Industry	
Percent	Industry
14%	Engineering, surveying, mapping, building inspection, and drafting services
13.3%	Research and development in the physical, engineering, and life sciences
11.8%	Basic chemical manufacturing
5.7%	Petroleum and coal products manufacturing
5.6%	Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing
4.2%	Pharmaceutical and medicine manufacturing
3.8%	Federal Government, excluding Postal Service

Source: Bureau of Labor Statistics

### Geo-Location Overlay of Employers with 25 or More Employees that Potentially Employ Occupation (n = 121)

