# **Advanced Manufacturing**



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### A PROFILE OF LINCOLN'S ADVANCED MANUFACTURING INDUSTRY CLUSTER



### INTRODUCTION

Advanced manufacturing, and its related services, has been a major growth industry in Lincoln, Nebraska for over two decades. During this time the breadth of the industry has expanded with the increased dissemination of technology to nearly every industry and sector of the economy. Advanced manufacturing business benefit from Lincoln's central location, highly educated workforce, low labor costs, low cost of living, low traffic congestion costs, and business-friendly climate.

### WHY LINCOLN?

Lincoln, a centrally-located community of 3000,000, is well positioned to cultivate this industry through its highly educated workforce<sup>1</sup>, existing advanced manufacturing technology presence, extensive university research and outstanding quality of life.



EDUCATION ATTAINMENT, AGE 25 AND OVER, LINCOLN METROPOLITAN AREA, 2012

Lincoln offers the ambiance of a friendly small town and the amenities, attractions and entertainment opportunities of a major metropolitan area. Lincoln is both the state capital and home to the flagship campus of the University of Nebraska; as a result it provides a greater range of offerings than might be expected in a community of its size. Efficient transportation, a stable business environment, advanced health-care technology and an excellent educational system are just a few of the reasons why Lincoln ranks highly in livability studies. As described in the pages that follow, Lincoln has significant cost advantages in terms of cost-of-living, wages, space costs, and other business costs. The University of Nebraska-Lincoln provides research services while colleges throughout the region graduate students in relevant majors for the advanced manufacturing industry. Lincoln also has an established cluster of advanced manufacturing firms.

U.S. Census Bureau, Table DP02, Lancaster County, 2012.

### COST COMPARISONS



Lincoln's cost of living compares favorably with comparison metropolitan areas nationwide.<sup>2</sup>

Base = 100, National Average

In addition to Lincoln's exceptional amenities and educated workforce, Lincoln has nearly the lowest cost industrial space among peer metropolitan areas. <sup>3</sup> These particular rent costs refer to buildings in industrial settings - building space especially well suited to the advanced manufacturing industry.



Annual Rent per Square Foot: Industrial Property Asking Rent November 2013

<sup>2</sup> Council for Community and Economic Research, "(previously Accra) Cost of Living Index 3Q 2013." Published Oct. 2013. <sup>3</sup> Source: LoopNet Real Estate Research, http://www.loopnet.com

Lincoln ranks lowest with regard to relative wage costs.<sup>4</sup> This completes a perfect combination of unique amenities, low cost of living, and an attractive business environment through a highly educated workforce.



### RELATIVE WAGES FOR PRODUCTION WORKERS, 2011

Base = 100, National Average

We provide detailed salary information for selected advanced manufacturing occupations on the next page. Average unemployment insurance tax rate on taxable wages, average price for industrial gas per thousand cubic feet, industrial electric service typical industrial bill, and top state corporate income tax rate can be found on page 6. Lincoln is among the three lowest cost metro areas among comparison cities for average unemployment insurance tax rate, price for industrial gas, and typical industrial electric bill service rates.

<sup>4</sup>U.S. Bureau of Labor Statistics, National Compensation Survey, "Pay relatives for major occupational groups in metropolitan areas," http://www.bls.gov/ncs/ocs/sp/nctb1893.pdf; Last Modified Date: May 25, 2011.

ANNUAL SALARY

### AVERAGE ANNUAL SALARY, LINCOLN MSA, 2013 (MAY)

	ENTRY	EXPERIENCE	MEAN
TOTAL ALL OCCUPATIONS	\$19,407	\$51,826	\$41,020
ARCHITECTURE AND ENGINEERING OCCUPATIONS	\$40.875	\$78.913	\$66,233
Mechanical Engineers	\$52,200	\$82,319	\$72,279
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SALES AND RELATED OCCUPATIONS	\$17,317	\$40,427	\$32,724
Sales Reps, Wholesale and Manufacturing, Except Tech. and Sci. Products	\$32,443	\$65,115	\$54,224
LIFE, PHYSICAL AND SOCIAL SCIENCE OCCUPATIONS	\$35,281	\$64,399	\$54,693
Chemists	\$46,761	\$81,087	\$69,644
PRODUCTION OCCUPATIONS	\$22.377	\$41.864	\$35,368
First-Line Supervisors of Production and Operating Workers	\$40,763	\$67,659	\$58,694
Tool and Die Makers	\$35,541	\$53,567	\$47,559
Mixing and Blending Machine Setters, Operators, and Tenders	\$27,053	\$43,336	\$37,908
Machinists	\$27,636	\$41,524	\$36,895
Cutting, Punching, Press Machine Setters, Ops., Tenders, Metal and Plastic	\$31,000	\$40,068	\$37,045
Inspectors Testers Sorters Samplers and Weighers	\$28,364	\$45,610	\$39,861
Welders, Cutters, Solderers, and Brazers	\$27,761	\$41,501	\$36,922
Dental Laboratory Technicians	\$22,299	\$42,054	\$35,469
Packaging and Filling Machine Operators and Tenders	\$21,313	\$29,282	\$26,626
Team Assemblers	\$20,201	\$39,797	\$33,265
Molding, Coremaking, Casting Mach. Setters, Ops., Tenders, Metal & Plastic	\$22,903	\$39,721	\$34,115
Electrical and Electronic Equipment Assemblers	\$18,845	\$28,705	\$25,418
TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS	\$18,264	\$39,109	\$32,160
Packers and Packagers, Hand	\$17,387	\$23,749	\$21,629

### SELECTED BUSINESS COSTS FOR ADVANCED MANUFACTURING INDUSTRY (THREE LOWEST COST METRO AREAS LISTED IN BOLD)

	Average Unemployment Insurance Tax Rate on		Avg. Price Industrial Gas/ Thousand Cubic Feet	e Typical Industrial Bill, Service Rates in Effect, at January 1, 2013 (City)		Top State Corporate	
Metropolitan Area[1]	2012 (State Average)	Right-to- Work State?	(State Avg.)	75kW, 50mWh	1000kW, 400mWh	Tax Rate 2013	
Lincoln	2.41%	Yes	\$4.34	\$2,566	\$27,802	7.81%	
Atlanta	2.80%	Yes	\$4.60	\$3,772	\$39,768	6.00%	
Charlotte	1.89%	Yes	\$6.37	\$2,751	\$26,633	6.90%	
Chicago	4.00%	No	\$5.64	\$4,523	\$35,474	9.50%	
Dallas	3.18%	Yes	\$3.02	\$3,178	\$30,056	0.00%	
Huntsville (AL)	3.44%	Yes	\$4.35	\$3,710	\$33,011	6.50%	
Kansas City	2.33%	No	\$7.93	\$3,153	\$31,026	6.25%	
Milwaukee	4.41%	No	\$5.81	\$4,648	\$37,360	7.90%	
Minneapolis/ St. Paul	2.56%	No	\$4.48	\$3,516	\$33,597	9.80%	
Newark (NJ)	3.25%	No	\$7.87	\$6,302	\$40,473	9.00%	

[1] For metropolitan areas located in multiple states (Chicago, Kansas City, and Newark), the state averages from the state where the metropolitan areas' economic activity is concentrated are utilized (Illinois, Missouri, and New Jersey, respectively).

[2] Tax may be eligible for use of credits earned in state incentive program.

Sources:

A. U.S. Department of Labor Office of Unemployment Insurance Division of Fiscal and Actuarial Services (2012), Significant Measures of State Unemployment Insurance Tax Systems (Avg. Tax Rate) for Average Unemployment Insurance Tax Rates: http://workforcesecurity. doleta.gov/unemploy/pdf/sigmeasuitaxsys12.pdf

B. US Census Bureau, 2012 Statistical Abstract, Labor Union Membership by State for Right-to-Work State: http://www.census.gov/compendia/statab/cats/labor\_force\_employment\_earnings/work\_stoppages\_and\_unions.html

C. US Energy Information Administration, Natural Gas, for Average Industrial Price: http://www.eia.gov/dnav/ng/ng\_sum\_lsum\_a\_EPG0\_PIN\_DMcf\_a.htm

D. Lincoln Electric System, National Electric Rate Survey '13, Average Price/KWH: http://www.les.com/quick\_links/rate\_survey. aspx?look=b

E. Tax Foundation for State Corporate Tax Rates: http://taxfoundation.org/article/state-corporate-income-tax-rates-2000-2013

### EDUCATION RESOURCES

Lincoln's Advanced Manufacturing sector benefits from the vast array of programs that support the development of a specialized workforce for this industry.

The University of Nebraska-Lincoln (UNL) and Nebraska Wesleyan University both provide an excellent array of programs related to the field. In addition to which there are a number of programs and other institutions tailored to the needs of the advanced manufacturing production sector. While UNL is certainly the backbone of engineering research and education in Lincoln, there are many institutions that offer 2-year and 4-year degree programs in this field: Concordia College, Doane College, Kaplan University, Nebraska Institute of Technology, Nebraska Wesleyan University, Southeast Community College, and Union College. In particular, Southeast Community College has an extensive program in Mechanic and Repair Technologies.

In 2011 alone, the colleges and universities in Lincoln graduated nearly 480 students with bachelor's degrees in majors related to this sector, another 300 with associate's degrees, and well over 100 with post-graduate degrees.

Bachelor's Degrees Awarded	Concordia University	Doane College	Kaplan University	Nebraska Wesleyan	Peru State	Southeast Comm. College	Union College	UNL	Total
Agricultural/Biological/ Biosystems Engineering								41	41
Biochemistry				5	4			51	60
Biology/Biological Sciences, General				34	6			122	162
Chemical Engineering								17	17
Chemistry, General				2				24	27
Computer Engineering, General							1	43	43
Computer and Information Sciences, General	1		7	4	7	46	3	33	101
Electrical & Electronics Engineering								59	59
Engineering Mechanics									0
Engineering, Other									0
Industrial Engineering								13	13
Machine Tool Technology/ Machinist						26			26
Manufacturing Engineering Technician						15			15
Mechanical Engineering								67	67
Physics, General				1				9	10
Quality Control Technology/ Technician						22			22
Welding Technology/Welder						33			33
Mechanic & Repair Technologies/Technicians									
Autobody/Collision & Repair Tech./Technician						28			28
Automobile/Automotive Mech./ Technician						55			55
Diesel Mechanics Tech./ Technician						49			49
Heating/AC/Vent./Refrig. Maint. Tech./Technician						21			21
Total	1		7	46	17	295	4	479	849

A. Associates Degrees; B. Associates & Bachelors Degrees; C. Certificate Program

Source: http/nces.ed.gov.collegenavigator/

Post Graduate Degrees (M.A. & Ph.D.) Awarded	Doane College	UNL	Total
Agricultural/Biological/Biosystems Eng.		12	12
Biochemistry		5	5
Chemical Engineering		1	1
Chemistry, General		19	19
Computer and Information Sciences, General		23	23
Electrical and Electronics Engineering		5	5
Engineering Mechanics		12	12
Industrial Engineering		18	18
Mechanical Engineering		11	11
Physics, General		10	10
Total	0	116	116

Source: http://nces.ed.gov/collegenavigator/

### RESEARCH AND INDUSTRY SERVICES

The advanced manufacturing sector also benefits from the research facilities available at the University of Nebraska-Lincoln (UNL). These include:

### Jeffrey S. Raikes School of Computer Science and Management

An innovative integration of computer science and management education, including a 2-year applied software design studio. The Jeffrey S. Raikes School develops leaders for a technology driven world. It is the recognized leader in interdisciplinary computer science and business management education for high ability and highly motivated students. The Raikes School is unique in that it is the premier program bringing together the domain of computer science and information technology with business, thereby developing leaders and entrepreneurs for the increasingly information technology-driven business world.

The Design Studio is the capstone learning experience of the Jeffrey S. Raikes School. In Design Studio, student teams partner with sponsoring businesses and government agencies to develop real-world, software-based solutions meeting their client's needs. Students gain project management, teamwork, and leadership skills essential in today's professional world. Design Studio gives students and clients the ability to interact and create innovative software based solution, while benefiting from the support of Raikes School faculty and facilities.

For more information, see the source of this passage: http://raikes.unl.edu/

### **College of Engineering**

The College of Engineering celebrated its 100th anniversary in 2009. As the only engineering college in Nebraska the UNL College of Engineering provides its students with professors with national and international expertise in their fields, the latest technology, quality facilities, a vast network of successful alumni and friends of the college, and caring staff.

The college is located in two cities (Lincoln and Omaha) on three campuses (City Campus in Lincoln, the East Campus in Lincoln) and currently has 13 departments with a total of 3,089 students with 128 full time faculty members. The undergraduate program offers majors in: Agricultural Engineering, Architectural Engineering, Biological Systems Engineering, Chemical Engineering, Civil Engineering, Computer Engineering (Lincoln and Omaha), Construction Management, Construction Engineering, Electrical Engineering, Electronics Engineering, Industrial Engineering, and Mechanical Engineering. The graduate program offers Master of Science Degrees in 11 areas including Industrial Management Systems Engineering and Telecommunications Engineering; Master of Engineering with concentrations in four areas; and PhDs with specializations in 12 areas including Chemical & Bimolecular Engineering and Materials Engineering.

The college is at the forefront of cutting edge engineering research and is strong and growing especially in the areas of nanotechnology, transportation, structures, computer and electronics engineering, and materials research. The college is adding emphasis on biomechanics, materials and medicine; renewable energy production, distribution and consumption; and cyber infrastructures. The college is home to the Nebraska Center for Materials and Nanoscience, and the Center for Nontraditional Manufacturing Research

For more information, see the source of this passage: http://engineering.unl.edu/

#### **Department of Computer Science & Engineering**

Graduates from this UNL department are highly capable, creative individuals whose skills allow them to work seamlessly across a broad spectrum of careers. The department graduates 30 students with Bachelor's degrees and another 25 students with graduate degrees every year. The department also conducts state-of-the-art research in software engineering, informatics, and systems. The faculty receives funding from a variety of sources including: National Science Foundation (NSF), U.S. Department of Agriculture, Army Research Office, Airforce Office of Scientific Research, NASA, National Institute of Health, Microsoft and Intel.

The department also hosts a number of research labs and facilities that form an important hub for information-technology R&D in the state of Nebraska:

The Abacus Distributed Storage Lab, aims to design and develop distributed and parallel storage systems with high scalability, performance, reliability and availability.

ANDES, Advanced Networking & Distributed Experimental Systems Lab fosters research in the following core areas: high-speed computer network architectures and protocols, networking support for multimedia services, distributed heterogeneous computing, and real-time systems and protocols.

The Constraint Systems Lab investigations cover both theoretic and practical aspects of Constraint Processing, a sub-area of Artificial Intelligence. Constraint Processing provides powerful tools for modeling and solving effectively a wide variety of combinatorial problems spanning over Computer Science, Engineering, and Management.

ESQuaReD, (read as e<sup>2</sup>), the laboratory for Empirically-based Software Quality Research and Development, performs fundamental research on methodologies and tools for creating sufficiently dependable software. The focus areas are: software verification and validation, program analysis, empirical software engineering, software modeling and design, and domain specific software engineering techniques.

For more information, see the source of this passage: http://cse.unl.edu/

#### Holland Computing Center (HCC)

HCC provides various services to researchers associated with any campus of the University of Nebraska system. Agreements are also in place with corporate and non-University researchers who share common interests or needs related to high performance computing resources. The HCC houses and manages a number of supercomputers serving a broad range of functions. Firefly, a 21 TFlop supercomputer is used by scientists and engineers to study topics such as nanoscale chemistry, subatomic physics, meteorology, crashworthiness, and artificial intelligence. Other resources with specific roles include Merritt for shared memory processing; Red for LHC grid computing, analysis of the CMS particle physics experiment and deployment on the open science grid; and PrairieFire a 256 processor supercomputer that enables advanced simulation to perform product analysis, design, development, testing and manufacturing in a virtual environment.

For more information, see the source of this passage: http://hcc.unl.edu/

### Nebraska Innovation Campus (NIC)

Nebraska Innovation Campus (NIC) is a research campus designed to facilitate new and in-depth partnerships between the University of Nebraska-Lincoln (UNL) and private sector businesses. NIC is located adjacent to UNL, strategically providing access to research faculty, facilities and students. NIC is operated by the Nebraska Innovation Campus Development Corporation (NICDC), a private 501(c) (3) corporation. At full build-out, NIC will be a 2 million square foot campus with uniquely designed buildings and amenities that encourage people to create and transform ideas into global innovation. NIC aspires to be the most sustainable research and technology campus in the U.S.

For more information about NIC visit http://innovate.unl.edu/

### LINCOLN'S ADVANCED MANUFACTURING SECTOR

Lincoln's Advanced Manufacturing sector has includes a broad range of major employers including: Pfizer Inc., Lincoln Industries, Kawasaki Motors Manufacturing Corp. USA, Novartis Consumer Health Inc. and Goodyear Engineered Products. In total, Lincoln is home to dozens of advanced manufacturers. Most of these firms are listed below. Product descriptions and employment estimates are from the Nebraska Manufacturers' Directory:

Note: Please check with companies for most accurate employment data.

### **Archer Daniel Midlands Company**

Soybean products, specialty food ingredients, including soy meal and oil, animal feed www.admworld.com Total Employment: 100-249

### Benchmark Biolabs

Laboratory services & reagents for veterinary vaccine researchers; mfg vaccines www.benchmarkbiolabs.com Local employment: 20-49

### **Bosch Security Systems**

Wireless communications equipment including headsets, microphones, intercoms & antennas www.bosch.us Total Employment: 100-249

### **Capital Steel**

Steel beams for bridges Local employment: 50 - 99

### **Cleaver Brooks**

Heat recovery steam generators for a wide variety of waste heat applications www.hrsg.com Local employment: 250 - 499

#### Concrete Industries Inc.

Concrete & fabricated steel products including pre-fabricated bridge components, pre-stressed wall panels, pre-cast columns and beams, hollow core, twin tees. www.concreteindustries.com Local Employment: 100-249

#### Dynamic Fusion Inc.

Configuration, fabrication & installation of equipment for flour & feed mills Local employment: 1 - 9

### **Eidos Corporation**

Ergonomic seating devices www.eidosergonomics.com Local employment: 1 - 9

#### **Eley Corporation**

Industrial, air, garden & power cord reels www.rapidreel.com Local employment: 10 - 19

#### **Garner Industries**

Level indicators, plastic injection molding, CNC machining, plastic rain gauges www.garnerindustries.com Total Employment: 100-249

### **Geist Manufacturing**

Power extensions, outlet strips & surge suppressors; horizontal & vertical power strips www.geistmanufacturing.com\_ Local employment: 50 - 99

### **Geist Plastics**

Custom profile extrusion for the electrical, agricultural and industrial markets www.geistplastics.com Local employment: 50 - 99

### **General Dynamics**

Composites for fuel tanks, rockets & missiles, launch tubes www.generaldynamics.com Local Employment: 100-249

### Hexagon Lincoln

Composite pressure vessels, fuel tanks, utility components for aerospace & defense www.lincolncomposites.com Local Employment: 250-499

### HTI Plastics Inc.

Thermoplastic injection molded prods including pharma, food & animal health packaging www.htiplastic.com Local employment: 50 - 99

### Intometal Inc.

Metal fabrication & machine tooling www.intometal.com\_ Local employment: 50 - 99

### Kawasaki Motors Manufacturing Corp. USA

Rail passenger cars, motorcycles, industrial robots, utility vehicles www.kawasaki.com Local employment: 1500-2000

### Land and Sky Manufacturing

Memory foam, natural latex, flotation & air mattresses, contour pillows & mattress pads www.landandsky.com Local employment: 50 - 99

### LENCO PMC Inc.

Custom injection molding, two-color & over molding, mold design, molding part assembly www.lencopmc.com Local employment: 100 – 249

#### **Lester Electrical**

Industrial battery chargers, custom elec. products & power mgmt systems for elec. vehicle & stationary power market www.lesterelectrical.com Total Employment: 100-249

### **Lincoln Industries**

Custom & production plating, metal anodizing & hard coating www.lincolnindustries.com\_ Local employment: 500 - 999

### Lincoln Tool & Design Co.

Custom tool, die & machine shop services; plastic injection molding www.lintool.com Local employment: 20 - 49

### **Matheson Tri-Gas**

Industrial, medical & specialty gases; welding equipment & supplies www.linweld.com Local employment: 100 - 249

### **Mapes Industries**

Laminated architectural panels, canopies & walkway covers www.mapes.com Local employment: 50 - 99

#### Midwest Steel Works Inc.

Structural steel fabrication, metal fabrication, steel joists, stairs & railings, metal decking www.midweststeelworks.com\_ Local employment: 50 - 99

#### Molex

Manufacturer of electronic interconnectors www.molex.com Local employment:1,100

#### Novartis Consumer Health Inc.

Over-the-counter pharmaceuticals www.us.novartis.com Local employment: 500 – 999

### Pfizer Inc.

Veterinary pharmaceuticals & biological www.pfizer.com Local employment: 500 - 999

### Rexnord

Carbon fiber rollers www.addax.com\_ Local employment: 20-49

### **Rivers Metal Products Inc.**

Custom metal fabrication, rotational molds, trailer parts; materials sales & processing www.riversmetal.com\_ Local employment: 50 - 99

### **Snyder Industries**

Industrial storage tanks for storage & transportation of chemicals and fluids www.snydernet.com Local Employment: 100-249

### Source One

Machining, fabrication, & finishing services to industry; powder coat finishing; production painting www.sourceonex.com Total Employment: 100-249

### Speedway Motors Inc.

Specialty automotive products for racing & street rod markets www.speedwaymotors.com Local employment: 100 – 249

### Schneider Electric

Electronic circuit breakers www.squared.com Local employment: 250 - 499

### TMCO Inc.

Metal fabrication & powder coating Local employment: 100 - 249

### Tri-Con Industries Stamping Plant

Press & welding for automotive seat frames Local employment: 100 - 249

### Van Sickle Paint Manufacturing Inc.

Interior & exterior paints, stains, coatings, sealants & lubricants www.vansicklepaint.com Local employment: 10 - 19

### Veyance Technologies

Power transmission products www.goodyear.com Local Employment: 500-999

### Yasufuku USA Inc.

Rubber & plastic products for recreational vehicles & automobiles www.yuinc.com Local employment: 50 - 99