

Manufacturing

Industry Cluster Profile | Metropolitan Chicago Region

Overview

This report¹ provides key data for twelve manufacturing clusters that are represented in the metropolitan Chicago region's economy² Given the complexity of the manufacturing industry and its significance to the regional economy, four of the clusters are examined in greater detail than others. The Advanced Materials, Chemical and Chemical Based Products, Fabricated Metal Product Manufacturing, and Printing and Publishing clusters were selected based on their location quotient, number of jobs, and job multiplier – all viewed as indicators of the cluster's contribution to the regional economy. A detailed listing of the industries included in each cluster, as defined at the 6-digit NAICS level, are provided as an addendum to this report.

This report was developed through a partnership between The Workforce Boards of Metropolitan Chicago (WBMC) and the Metro Economic Growth Alliance (MEGA) of Chicago. The WBMC is a regional consortium of six Workforce Boards that have collaborated for the past nine years on initiatives that address workforce and economic development issues. The Workforce Boards oversee development of a workforce system that provides individuals with education and training required for career opportunities in high demand occupations and provides employers with access to a skilled, competitive workforce. The MEGA is a partnership of lead economic organizations from throughout the metropolitan Chicago region that are committed to growing the regional economy through coordinated, effective business development. The metropolitan Chicago region includes the following counties: Cook, DeKalb, DuPage, Grundy, Kane, Kankakee, Kendall, Lake, McHenry, and Will.

Significance of Manufacturing to the Region

The manufacturing sector encompasses 12,533 establishments and employs 395,014 people in the metropolitan Chicago region. During the period of 2011 to 2021, this industry is expected to lose 30,194 jobs, at a rate of -7.8% as compared to the national rate of -4.0%. However, an analysis of the region's manufacturing workforce indicates that approximately 26% of its workers are 55 years and older and approaching retirement age. Consequently, it is expected that retirements will result in a large number of openings in manufacturing occupations.

The region's average annual wages/salaries for these jobs are \$61,658, with total regional wages/salaries in excess of \$24.3 billion. With a 1.10 location quotient, this industry has a higher than average concentration of economic activity in the region when compared to the nation's economic activity in this industry overall.



A location quotient (LQ) measures how concentrated an industry cluster is in a given region as compared to the nation. An LQ greater than 1.0 means the cluster is an export industry. Industries with a high LQ are typically, but not always, export-oriented industries bringing money into the region rather than simply circulating money that is already in the region. An LQ of <1.0 means it typically has to import from outside to satisfy local demand

¹ Industry cluster reports produced by the Fond du Lac County Economic Development Corporation served as a model for the reports developed by The Workforce Boards of Metropolitan Chicago (<http://www.fcedc.com/targetedindustries.html>). The Workforce Boards used these reports to guide both content and format for presenting information relative to the metropolitan Chicago region.

² The source of data utilized for this report was the Economic Modeling Specialists, Inc.'s (EMS) 2012 2nd quarter complete employment data set. EMSI estimates are based on a methodology that combines employment information from the Illinois Department of Employment Security (IDES) with self-employment numbers and EMSI-derived estimates for unsuppressed data. More information related to EMSI data sources and methodologies for compiling projections can be found at http://www.workforceboardsmetrochicago.org/Portals/0/Uploads/Data_Sources_and_Calculations.pdf.



Cluster Definition

“An industry cluster is a group of interdependent firms and related institutions that draw a productive advantage from their geographic concentration and connections. Firms in a cluster share common resources and technologies, rely on a similar labor pool and institutions, and are linked through strong relationships and transactions in addition to co-location.”³

The chart provided below provides key facts for manufacturing clusters in the metropolitan Chicago region. Based on the location quotient, number of jobs, and job multiplier, all indicators of the cluster’s contribution to the regional economy, the following clusters have been selected as the focus of this report: Advanced Materials, Chemical and Chemical Based Products, Fabricated Metal Product Manufacturing, and Printing and Publishing.



MANUFACTURING CLUSTER METROPOLITAN CHICAGO REGION KEY FACTS

Cluster	LQ	Jobs (2012)	Projected Change in Jobs (2011 to 2021)	Job Multiplier	Average Wages/Salaries (2012)
Advanced Materials	1.34	196,497	-10,208 (-5.3%)	5.67	\$73,277
Agribusiness, Food Processing & Technology	.79	59,166	788 (1.3%)	8.99	\$53,442
Apparel and Textiles	1.04	39,648	3,239 (9%)	2.40	\$43,885
Chemicals & Chemical Based Products	1.38	82,488	-4,097 (-5.0%)	6.20	\$76,388
Computer & Electronic Product Manufacturing	0.81	26,205	-6,994 (-25.7%)	3.36	\$73,827
Electrical Equipment, Appliance & Component Manufacturing	1.79	19,680	-2,585 (-13.6%)	3.25	\$59,892
Fabricated Metal Product Manufacturing	1.59	63,656	-3,179 (-5.2%)	2.68	\$54,442
Forest & Wood Products	.90	39,548	-1,418 (-3.7%)	3.72	\$54,321
Glass and Ceramics	1.14	9,281	-784 (-8.6%)	2.98	\$46,300
Machinery Manufacturing	1.20	39,393	-3,145 (-8.1%)	3.69	\$66,429
Manufacturing Super Cluster	1.03	175,411	-16,221 (-9/5%)	3.60	\$61,744
Primary Metal Manufacturing	0.85	9,737	-895 (-10.0%)	4.42	\$62,115
Printing & Publishing	1.47	122,062	4,615 (3.8%)	4.13	\$61,360
Transportation Equipment Manufacturing	0.40	16,740	578 (3.9%)	4.10	\$61,529

³ Metropolitan Chicago's Freight Cluster: A Drill-Down Report on Infrastructure, Innovation, and Workforce, Chicago Metropolitan Agency for Planning, Summary Report, June 2012, page 8.



Core Industries

Within each cluster, there are certain industries that contribute more to the economy of the region than others. These core industries not only have high employment numbers, but also impact employment and inputs from other industries supporting them. The charts below identify the core industries for each of the selected manufacturing clusters and provides relevant information.

ADVANCED MATERIALS CLUSTER

NAICS Code	Description	2011 Jobs	2021 Jobs	Change	% Change	2012 Wages/ Salaries	2011 Establishments
326199	All Other Plastics Product Manufacturing	18,471	17,312	-1,159	-6%	\$55,116	330
325412	Pharmaceutical Preparation Manufacturing	16,073	16,653	580	4%	\$122,611	43
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	15,877	13,169	-2,708	-17%	\$115,119	180
332710	Machine Shops	10,110	12,013	1,903	19%	\$52,865	718
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	5,581	6,498	917	16%	\$55,313	146

CHEMICAL AND CHEMICAL BASED PRODUCTS CLUSTER

NAICS Code	Description	2011 Jobs	2021 Jobs	Change	% Change	2012 Wages/ Salaries	2011 Establishments
326199	All Other Plastics Product Manufacturing	18,471	17,312	-1,159	-6%	\$55,116	330
325412	Pharmaceutical Preparation Manufacturing	16,073	16,653	580	4%	\$122,611	43
424690	Other Chemical and Allied Products Merchant Wholesalers	4,168	3,398	-770	-18%	\$85,112	345
325510	Paint and Coating Manufacturing	3,889	5,467	1,578	41%	\$64,718	88
325620	Toilet Preparation Manufacturing	3,186	2,513	-673	-21%	\$103,844	51



FABRICATED METAL PRODUCT MANUFACTURING CLUSTER

NAICS Code	Description	2011 Jobs	2021 Jobs	Change	% Change	2012 Wages/ Salaries	2011 Establishments
332710	Machine Shops	10,110	12,013	1,903	19%	\$52,865	718
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	5,581	6,498	917	16%	\$55,313	146
332116	Metal Stamping	5,046	4,053	-993	-20%	\$54,938	156
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	3,907	2,900	-1,007	-26%	\$45,294	217
332721	Precision Turned Product Manufacturing	3,677	3,767	90	2%	\$51,108	124

PRINTING AND PUBLISHING CLUSTER

NAICS Code	Description	2011 Jobs	2021 Jobs	Change	% Change	2012 Wages/ Salaries	2011 Establishments
541613	Marketing Consulting Services	16,578	24,933	8,355	50%	\$67,155	1,865
541810	Advertising Agencies	14,878	16,461	1,583	11%	\$83,920	869
323110	Commercial Lithographic Printing	8,984	6,089	-2,895	-32%	\$52,783	481
541430	Graphic Design Services	8,786	10,389	1,603	18%	\$44,013	1,150
541910	Marketing Research and Public Opinion Polling	7,989	8,032	43	1%	\$64,939	330



Occupational Opportunities

The manufacturing sector represents 395,014 jobs in the metropolitan Chicago region. Over the next ten years (2011 – 2021) this industry cluster is expected to lose 30,194 jobs. However, even though the industry is expected to lose jobs overall, this is only part of the industry's employment picture. First, while there may be a reduced number of jobs overall, there are jobs in the industry that will actually increase. Additionally, there will be job openings that represent employment opportunities. Job openings occur when individuals change jobs, retire, or leave the workforce. As the manufacturing workforce ages and the economy rebounds, it is anticipated that a large number of individuals will retire in the coming years. In fact, an analysis of the region's manufacturing workforce indicates that approximately 26% of its workers are 55 years and older.⁴

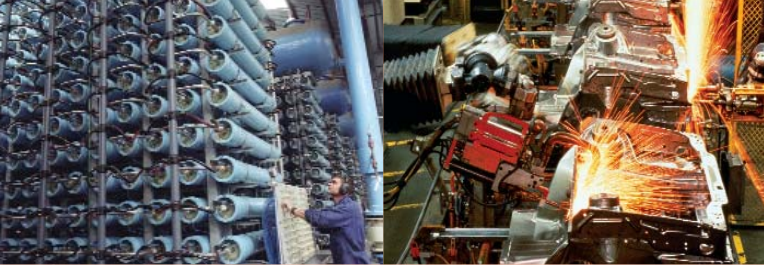
The tables provided below identify the five occupations projected to experience the largest job growth in each of the selected clusters over the next ten years. Four occupations are identified as a high growth occupation in more than one cluster. It is interesting to note that six of the high growth occupations require a Bachelor's degree or higher. The median hourly earnings for high growth occupations range from a low of \$13.89 to a high of \$53.08.

ADVANCED MATERIALS CLUSTER

SOC Code	Occupation	Jobs in Cluster 2011	Projected Jobs in Cluster 2021	New Jobs in Cluster 2011-2021	% Change	Estimated Openings in Cluster ⁵ (New & Replacement) 2011-2021	% of the Total Jobs in Cluster (2012)	Median Hourly Earnings	Education Level
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2,656	3,323	667	25%	1,062	1.4%	\$16.78	Moderate-term on-the-job training
19-1042	Medical Scientists, Except Epidemiologists	2,319	2,762	443	19%	1,083	1.2%	\$53.08	Doctoral degree
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	2,607	2,971	364	14%	963	1.4%	\$17.45	Moderate-term on-the-job training
19-4061	Social Science Research Assistants	138	422	284	206%	222	0.1%	\$24.09	Associate's degree
17-2031	Biomedical Engineers	645	919	274	42%	436	0.4%	\$39.52	Bachelor's degree

⁴ Illinois Department of Employment Security, Local Employment Dynamics, 4th quarter 2011 data for the Chicago Naperville Joliet Metropolitan Statistics Area.

⁵ Estimated openings for occupations in cluster were calculated by determining the proportion of regional jobs within the cluster and applying that rate to the projected regional openings for occupation.



CHEMICAL AND CHEMICAL BASED PRODUCTS CLUSTER

SOC Code	Occupation	Jobs in Cluster 2011	Projected Jobs in Cluster 2021	New Jobs in Cluster 2011-2021	% Change	Estimated Openings in Cluster ⁶ (New & Replacement) 2011-2021	% of the Total Jobs in Cluster (2012)	Median Hourly Earnings	Education Level
51-9023	Mixing and Blending Machine Setters, Operators, & Tenders	2,835	3,518	683	24%	1,134	3.5%	\$16.78	Moderate-term on-the-job training
19-1042	Medical Scientists, Except Epidemiologists	1,682	1,940	258	15%	786	2.2%	\$53.08	Doctoral degree
17-2031	Biomedical Engineers	409	593	184	45%	276	0.5%	\$39.52	Bachelor's degree
51-9041	Extruding, Forming, Pressing, & Compacting Machine Setters, Operators, & Tenders	809	962	153	19%	320	1.0%	\$13.89	Moderate-term on-the-job training
49-9041	Industrial Machinery Mechanics	862	938	76	9%	289	1.1%	\$23.77	Long-term on-the-job training

FABRICATED METAL PRODUCT MANUFACTURING CLUSTER

SOC Code	Occupation	Jobs in Cluster 2011	Projected Jobs in Cluster 2021	New Jobs in Cluster 2011-2021	% Change	Estimated Openings in Cluster ⁷ (New & Replacement) 2011-2021	% of the Total Jobs in Cluster (2012)	Median Hourly Earnings	Education Level
51-4011	Computer-Controlled Machine Tool Operators, Metal & Plastic	1,926	2,282	356	18%	712	3.2%	\$17.45	Moderate-term on-the-job training
51-4041	Machinists	6,441	6,692	251	4%	1,445	10.5%	\$17.68	Long-term on-the-job training
51-4121	Welders, Cutters, Solderers, & Brazers	2,404	2,572	168	7%	972	3.9%	\$16.11	Postsecondary vocational award
51-2041	Structural Metal Fabricators and Fitters	711	824	113	16%	250	1.2%	\$18.35	Moderate-term on-the-job training
13-1051	Cost Estimators	367	428	61	17%	145	0.6%	\$30.20	Bachelor's degree plus work experience

⁶ Estimated openings for occupations in cluster were calculated by determining the proportion of regional jobs within the cluster and applying that rate to the projected regional openings for occupation

⁷ Estimated openings for occupations in cluster were calculated by determining the proportion of regional jobs within the cluster and applying that rate to the projected regional openings for occupation



PRINTING AND PUBLISHING CLUSTER

SOC Code	Occupation	Jobs in Cluster 2011	Projected Jobs in Cluster 2021	New Jobs in Cluster 2011-2021	% Change	Estimated Openings in Cluster ⁸ (New & Replacement) 2011-2021	% of the Total Jobs in Cluster (2012)	Median Hourly Earnings	Education Level
13-1111	Management Analysts	5,701	7,987	2,286	40%	2,410	4.8%	\$37.44	Bachelor's or higher degree, plus work experience
41-3011	Advertising Sales Agents	6,327	7,103	776	12%	2,175	5.3%	\$26.16	Moderate-term on-the-job training
11-9199	Managers, All Other	4,601	5,339	738	16%	1,828	3.8%	\$32.18	Work experience in a related occupation
27-1024	Graphic Designers	6,651	7,283	632	10%	3,087	5.6%	\$21.66	Bachelor's degree
19-3021	Market Research Analysts	2,298	2,813	515	22%	1,123	1.9%	\$28.46	Bachelor's degree

⁸ Estimated openings for occupations in cluster were calculated by determining the proportion of regional jobs within the cluster and applying that rate to the projected regional openings for occupation.



Market Opportunities

Uncovering Gaps

A gap analysis shows how much an entire industry cluster purchases from various other industries (its “requirements”), along with how much is satisfied by those industries inside and outside the region. A gap occurs when industries that produce inputs (goods or services) needed by the cluster’s core industries are not available locally or are underdeveloped. Although not all inputs that an industry cluster needs can be produced in the local economy, identifying and closing gaps benefits the region and the competitiveness of the cluster overall. Development or expansion of businesses that can fulfill the cluster’s needs for goods and services will create jobs and keep

Gap=Market Opportunity

Recognizing the importance of manufacturing to the national economy, the federal government has focused attention and funding on revitalizing the manufacturing industry. Revitalization efforts include both economic and workforce development activities.

A gap analysis of the region’s manufacturing clusters provides an indication of the opportunities for market development, as identified in the chart that follows. Gaps identified, not all inclusive, provide opportunities in the specific cluster but also across all industries in the region. This gap provides an opportunity to assist current employers in expanding or attracting new employers to fill the unmet need.

MARKET OPPORTUNITIES

ADVANCED MATERIALS CLUSTER

Industry/Gap	Unmet Need in Cluster	2012 Annual Average Wage/Salary	# of Establishments (2011) # of Employees in Cluster (2011) ⁹
Medicinal and Botanical Manufacturing	\$1,106,157,177	\$77,893	11 establishments 205 employees
Plastics Material and Resin Manufacturing	\$1,047,490,539	\$92,512	31 establishments 1,365 employees
All Other Basic Organic Chemical Manufacturing	\$921,330,541	\$83,859	23 establishments 735 employees

CHEMICAL AND CHEMICAL BASED PRODUCTS CLUSTER

Industry/Gap	Unmet Need in Cluster	2012 Annual Average Wage/Salary	# of Establishments (2011) # of Employees in Cluster (2011) ¹⁰
Biological Product (except Diagnostic) Manufacturing	\$292,979,976	\$74,422	7 establishments 826 employees
Research and Development in Biotechnology	\$156,264,660	\$112,189	149 establishments 2,053 employees
All Other Plastics Product Manufacturing	\$93,253,760	\$55,116	330 establishments 18,471 employees

⁹Number of establishments and employees are specific to cluster unless industry/gap is not in the cluster, in which case number of industry establishments and employees in region.

¹⁰ Ibid



MARKET OPPORTUNITIES

FABRICATED METAL PRODUCT MANUFACTURING CLUSTER

Industry/Gap	Unmet Need in Cluster	2012 Annual Average Wage/Salary	# of Establishments (2011) # of Employees in Cluster (2011) ¹¹
Machine Shops	\$124,710,330	\$52,865	718 establishments 10,110 employees
Aluminum Sheet, Plate, Foil Manufacturing	\$103,152,088	\$94,193	4 establishments 140 employees
Iron and Steel Pipe Tube Manufacturing from Purchased Steel	\$48,837,199	\$69,108	23 establishments 2,221 employees

PRINTING AND PUBLISHING CLUSTER

Industry/Gap	Unmet Need in Cluster	2012 Annual Average Wage/Salary	# of Establishments (2011) # of Employees in Cluster (2011) ¹²
Motion Picture and Video Production	\$173,808,580	\$66,893	466 establishments 2,988 employees
Commercial Lithographic Printing	\$158,236,701	\$52,783	481 establishments 8,984 employees
Printing Ink Manufacturing	\$29,939,153	\$62,522	48 establishments 1,189 employees

Conclusion

This report provides key data about the manufacturing industry generally and four manufacturing industry clusters: Advanced Materials, Chemical and Chemical Based Products, Fabricated Metal Product Manufacturing, and Printing. The workforce development community can use this report to support decisions related to the investment of resources in addressing future workforce needs in the region. Entities responsible for economic development in the region can utilize the industry level data and market opportunity analysis to inform their efforts in working with employers interested in locating to or expanding in the region.

For additional data related to the manufacturing industry cluster or assistance with other labor market information needs, visit www.workforceboardsmetrochicago.com for information on contacting the Workforce Investment Board in your area.

¹¹ Number of establishments and employees are specific to cluster unless industry/gap is not in the cluster, in which case number of industry establishments and employees in region.

¹² Ibid

ADVANCED MATERIALS CLUSTER¹³

NAICS Codes	Description
212325	Clay and Ceramic and Refractory Minerals Mining
316211	Rubber and Plastics Footwear Manufacturing
322221	Coated and Laminated Packaging Paper Manufacturing
322299	All Other Converted Paper Product Manufacturing
324191	Petroleum Lubricating Oil and Grease Manufacturing
325110	Petrochemical Manufacturing
325120	Industrial Gas Manufacturing
325131	Inorganic Dye and Pigment Manufacturing
325132	Synthetic Organic Dye and Pigment Manufacturing
325181	Alkalies and Chlorine Manufacturing
325182	Carbon Black Manufacturing
325188	All Other Basic Inorganic Chemical Manufacturing
325191	Gum and Wood Chemical Manufacturing
325192	Cyclic Crude and Intermediate Manufacturing
325193	Ethyl Alcohol Manufacturing
325199	All Other Basic Organic Chemical Manufacturing
325211	Plastics Material and Resin Manufacturing
325212	Synthetic Rubber Manufacturing
325221	Cellulosic Organic Fiber Manufacturing
325222	Noncellulosic Organic Fiber Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing
325412	Pharmaceutical Preparation Manufacturing
325413	In-Vitro Diagnostic Substance Manufacturing
325414	Biological Product (except Diagnostic) Manufacturing
325510	Paint and Coating Manufacturing
325520	Adhesive Manufacturing
325611	Soap and Other Detergent Manufacturing

¹³ NAICS codes included in this cluster as defined by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelly School of Business and the Strategic Development Group.

ADVANCED MATERIALS CLUSTER

NAICS Codes	Description
325612	Polish and Other Sanitation Good Manufacturing
325613	Surface Active Agent Manufacturing
325620	Toilet Preparation Manufacturing
325910	Printing Ink Manufacturing
325920	Explosives Manufacturing
325991	Custom Compounding of Purchased Resins
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing
326121	Unlaminated Plastics Profile Shape Manufacturing
326140	Polystyrene Foam Product Manufacturing
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing
326199	All Other Plastics Product Manufacturing
326291	Rubber Product Manufacturing for Mechanical Use
326299	All Other Rubber Product Manufacturing
327112	Vitreous China, Fine Earthenware, and Other Pottery Product Manufacturing
327113	Porcelain Electrical Supply Manufacturing
327124	Clay Refractory Manufacturing
327125	Nonclay Refractory Manufacturing
327420	Gypsum Product Manufacturing
327910	Abrasive Product Manufacturing
327992	Ground or Treated Mineral and Earth Manufacturing
327993	Mineral Wool Manufacturing
331111	Iron and Steel Mills
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel
331221	Rolled Steel Shape Manufacturing

ADVANCED MATERIALS CLUSTER

NAICS Codes	Description
331222	Steel Wire Drawing
331311	Alumina Refining
331314	Secondary Smelting and Alloying of Aluminum
331315	Aluminum Sheet, Plate, and Foil Manufacturing
331316	Aluminum Extruded Product Manufacturing
331319	Other Aluminum Rolling and Drawing
331411	Primary Smelting and Refining of Copper
331419	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)
331421	Copper Rolling, Drawing, and Extruding
331422	Copper Wire (except Mechanical) Drawing
331423	Secondary Smelting, Refining, and Alloying of Copper
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)
331511	Iron Foundries
331512	Steel Investment Foundries
331513	Steel Foundries (except Investment)
331521	Aluminum Die-Casting Foundries
331522	Nonferrous (except Aluminum) Die-Casting Foundries
331524	Aluminum Foundries (except Die-Casting)
331525	Copper Foundries (except Die-Casting)
331528	Other Nonferrous Foundries (except Die-Casting)
332111	Iron and Steel Forging
332116	Metal Stamping
332117	Powder Metallurgy Part Manufacturing
332313	Plate Work Manufacturing
332322	Sheet Metal Work Manufacturing
332618	Other Fabricated Wire Product Manufacturing

ADVANCED MATERIALS CLUSTER

NAICS Codes	Description
332710	Machine Shops
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring
332911	Industrial Valve Manufacturing
332991	Ball and Roller Bearing Manufacturing
332995	Other Ordnance and Accessories Manufacturing
332997	Industrial Pattern Manufacturing
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing
333298	All Other Industrial Machinery Manufacturing
333313	Office Machinery Manufacturing
333319	Other Commercial and Service Industry Machinery Manufacturing
333511	Industrial Mold Manufacturing
333513	Machine Tool (Metal Forming Types) Manufacturing
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing
333515	Cutting Tool and Machine Tool Accessory Manufacturing
333518	Other Metalworking Machinery Manufacturing
333912	Air and Gas Compressor Manufacturing
334119	Other Computer Peripheral Equipment Manufacturing
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
334290	Other Communications Equipment Manufacturing
334411	Electron Tube Manufacturing
334412	Bare Printed Circuit Board Manufacturing
334413	Semiconductor and Related Device Manufacturing
334414	Electronic Capacitor Manufacturing
334415	Electronic Resistor Manufacturing
334416	Electronic Coil, Transformer, and Other Inductor Manufacturing
334417	Electronic Connector Manufacturing

ADVANCED MATERIALS CLUSTER

NAICS Codes	Description
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing
334419	Other Electronic Component Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables
334514	Totalizing Fluid Meter and Counting Device Manufacturing
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals
334517	Irradiation Apparatus Manufacturing
334519	Other Measuring and Controlling Device Manufacturing
335110	Electric Lamp Bulb and Part Manufacturing
335314	Relay and Industrial Control Manufacturing
335921	Fiber Optic Cable Manufacturing
335931	Current-Carrying Wiring Device Manufacturing
336322	Other Motor Vehicle Electrical and Electronic Equipment Manufacturing
336399	All Other Motor Vehicle Parts Manufacturing
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing
339112	Surgical and Medical Instrument Manufacturing
339113	Surgical Appliance and Supplies Manufacturing
339991	Gasket, Packing, and Sealing Device Manufacturing
541380	Testing Laboratories
541711	Research and Development in Biotechnology
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
541720	Research and Development in the Social Sciences and Humanities

CHEMICAL & CHEMICAL BASED PRODUCTS CLUSTER¹⁴

NAICS Codes	Description
325110	Petrochemical Manufacturing
325120	Industrial Gas Manufacturing
325131	Inorganic Dye and Pigment Manufacturing
325132	Synthetic Organic Dye and Pigment Manufacturing
325181	Alkalies and Chlorine Manufacturing
325182	Carbon Black Manufacturing
325188	All Other Basic Inorganic Chemical Manufacturing
325191	Gum and Wood Chemical Manufacturing
325192	Cyclic Crude and Intermediate Manufacturing
325193	Ethyl Alcohol Manufacturing
325199	All Other Basic Organic Chemical Manufacturing
325211	Plastics Material and Resin Manufacturing
325212	Synthetic Rubber Manufacturing
325221	Cellulosic Organic Fiber Manufacturing
325222	Noncellulosic Organic Fiber Manufacturing
325311	Nitrogenous Fertilizer Manufacturing
325312	Phosphatic Fertilizer Manufacturing
325314	Fertilizer (Mixing Only) Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing
325411	Medicinal and Botanical Manufacturing
325412	Pharmaceutical Preparation Manufacturing
325413	In-Vitro Diagnostic Substance Manufacturing
325414	Biological Product (except Diagnostic) Manufacturing
325510	Paint and Coating Manufacturing
325520	Adhesive Manufacturing
325611	Soap and Other Detergent Manufacturing
325612	Polish and Other Sanitation Goods Manufacturing

¹⁴ NAICS codes included in this cluster as defined by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelly School of Business and the Strategic Development Group.

CHEMICAL & CHEMICAL BASED PRODUCTS CLUSTER

NAICS Codes	Description
325613	Surface Active Agent Manufacturing
325620	Toilet Preparation Manufacturing
325910	Printing Ink Manufacturing
325920	Explosives Manufacturing
325991	Custom Compounding of Purchased Resins
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing
326111	Plastics Bag and Pouch Manufacturing
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing
326121	Unlaminated Plastics Profile Shape Manufacturing
326122	Plastics Pipe and Pipe Fitting Manufacturing
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing
326140	Polystyrene Foam Product Manufacturing
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing
326160	Plastics Bottle Manufacturing
326191	Plastics Plumbing Fixture Manufacturing
326192	Resilient Floor Covering Manufacturing
326199	All Other Plastics Product Manufacturing
326211	Tire Manufacturing (except Retreading)
326212	Tire Retreading
326220	Rubber and Plastics Hoses and Belting Manufacturing
326291	Rubber Product Manufacturing for Mechanical Use
326299	All Other Rubber Product Manufacturing
327111	Vitreous China Plumbing Fixture and China and Earthenware Bathroom Accessories Manufacturing
327112	Vitreous China, Fine Earthenware, and Other Pottery Product Manufacturing
327113	Porcelain Electrical Supply Manufacturing

CHEMICAL & CHEMICAL BASED PRODUCTS CLUSTER

NAICS Codes	Description
327121	Brick and Structural Clay Tile Manufacturing
327122	Ceramic Wall and Floor Tile Manufacturing
327123	Other Structural Clay Product Manufacturing
327124	Clay Refractory Manufacturing
327125	Nonclay Refractory Manufacturing
327211	Flat Glass Manufacturing
327212	Other Pressed and Blown Glass and Glassware Manufacturing
327213	Glass Container Manufacturing
327215	Glass Product Manufacturing Made of Purchased Glass
327310	Cement Manufacturing
327320	Ready-Mix Concrete Manufacturing
327331	Concrete Block and Brick Manufacturing
327332	Concrete Pipe Manufacturing
327390	Other Concrete Product Manufacturing
327410	Lime Manufacturing
327420	Gypsum Product Manufacturing
327910	Abrasive Product Manufacturing
327991	Cut Stone and Stone Product Manufacturing
327992	Ground or Treated Mineral and Earth Manufacturing
327993	Mineral Wool Manufacturing
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers
424690	Other Chemical and Allied Products Merchant Wholesalers
424710	Petroleum Bulk Stations and Terminals
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)

FABRICATED METAL PRODUCT MANUFACTURING CLUSTER¹⁵

NAICS Codes	Description
332111	Iron and Steel Forging
332112	Nonferrous Forging
332114	Custom Roll Forming
332115	Crown and Closure Manufacturing
332116	Metal Stamping
332117	Powder Metallurgy Part Manufacturing
332211	Cutlery and Flatware (except Precious) Manufacturing
332212	Hand and Edge Tool Manufacturing
332213	Saw Blade and Handsaw Manufacturing
332214	Kitchen Utensil, Pot, and Pan Manufacturing
332311	Prefabricated Metal Building and Component Manufacturing
332312	Fabricated Structural Metal Manufacturing
332313	Plate Work Manufacturing
332321	Metal Window and Door Manufacturing
332322	Sheet Metal Work Manufacturing
332323	Ornamental and Architectural Metal Work Manufacturing
332410	Power Boiler and Heat Exchanger Manufacturing
332420	Metal Tank (Heavy Gauge) Manufacturing
332431	Metal Can Manufacturing
332439	Other Metal Container Manufacturing
332510	Hardware Manufacturing
332611	Spring (Heavy Gauge) Manufacturing
332612	Spring (Light Gauge) Manufacturing
332618	Other Fabricated Wire Product Manufacturing
332710	Machine Shops
332721	Precision Turned Product Manufacturing
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing

¹⁵ NAICS codes included in this cluster as defined by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelly School of Business and the Strategic Development Group.

FABRICATED METAL PRODUCT MANUFACTURING CLUSTER

NAICS Codes	Description
332811	Metal Heat Treating
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring
332911	Industrial Valve Manufacturing
332912	Fluid Power Valve and Hose Fitting Manufacturing
332913	Plumbing Fixture Fitting and Trim Manufacturing
332919	Other Metal Valve and Pipe Fitting Manufacturing
332991	Ball and Roller Bearing Manufacturing
332996	Fabricated Pipe and Pipe Fitting Manufacturing
332997	Industrial Pattern Manufacturing
332998	Enameled Iron and Metal Sanitary Ware Manufacturing
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing

PRINTING AND PUBLISHING CLUSTER¹⁶

NAICS Codes	Description
323110	Commercial Lithographic Printing
323111	Commercial Gravure Printing
323112	Commercial Flexographic Printing
323113	Commercial Screen Printing
323114	Quick Printing
323115	Digital Printing
323116	Manifold Business Forms Printing
323117	Books Printing
323118	Blankbook, Looseleaf Binders, and Devices Manufacturing
323119	Other Commercial Printing

¹⁶ NAICS codes included in this cluster as defined by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelly School of Business and the Strategic Development Group.

PRINTING AND PUBLISHING CLUSTER

NAICS Codes	Description
323121	Tradebinding and Related Work
323122	Prepress Services
325910	Printing Ink Manufacturing
339950	Sign Manufacturing
511110	Newspaper Publishers
511120	Periodical Publishers
511130	Book Publishers
511140	Directory and Mailing List Publishers
511191	Greeting Card Publishers
511199	All Other Publishers
515111	Radio Networks
515112	Radio Stations
515210	Cable and Other Subscription Programming
519110	News Syndicates
519190	All Other Information Services
541430	Graphic Design Services
541613	Marketing Consulting Services
541810	Advertising Agencies
541820	Public Relations Agencies
541830	Media Buying Agencies
541840	Media Representatives
541850	Display Advertising
541860	Direct Mail Advertising
541870	Advertising Material Distribution Services
541890	Other Services Related to Advertising
541910	Marketing Research and Public Opinion Polling
541922	Commercial Photography

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) DEFINITIONS¹⁷**CORE INDUSTRIES****323110 Commercial Lithographic Printing**

This U.S. industry comprises establishments primarily engaged in lithographic (i.e., offset) printing without publishing (except books, grey goods, and manifold business forms). This industry includes establishments engaged in lithographic printing on purchased stock materials, such as stationery, letterhead, invitations, labels, and similar items, on a job order basis.

325412 Pharmaceutical Preparation Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing in-vivo diagnostic substances and pharmaceutical preparations (except biological) intended for internal and external consumption in dose forms, such as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.

325510 Paint and Coating Manufacturing

This industry comprises establishments primarily engaged in (1) mixing pigments, solvents, and binders into paints and other coatings, such as stains, varnishes, lacquers, enamels, shellacs, and water repellent coatings for concrete and masonry, and/or (2) manufacturing allied paint products, such as putties, paint and varnish removers, paint brush cleaners, and frit.

325620 Toilet Preparation Manufacturing

This industry comprises establishments primarily engaged in preparing, blending, compounding, and packaging toilet preparations, such as perfumes, shaving preparations, hair preparations, face creams, lotions (including sunscreens), and other cosmetic preparations.

326199 All Other Plastics Product Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing plastics products (except film, sheet, bags, profile shapes, pipes, pipe fittings, laminates, foam products, bottles, plumbing fixtures, and resilient floor coverings).

332116 Metal Stamping

This U.S. industry comprises establishments primarily engaged in manufacturing unfinished metal stampings and spinning unfinished metal products (except crowns, cans, closures, automotive, and coins). Establishments making metal stampings and metal spun products and further manufacturing (e.g., machining, assembling) a specific product are classified in the industry of the finished product. Metal stamping and metal spun products establishments may perform surface finishing operations, such as cleaning and deburring, on the products they manufacture..

332710 Machine Shops

This industry comprises establishments known as machine shops primarily engaged in machining metal and plastic parts and parts of other composite materials on a job or order basis. Generally machine shop jobs are low volume using machine tools, such as lathes (including computer numerically controlled); automatic screw machines; and machines for boring, grinding, and milling.

332721 Precision Turned Product Manufacturing

This U.S. industry comprises establishments known as precision turned manufacturers primarily engaged in machining precision products of all materials on a job or order basis. Generally precision turned product jobs are large volume using machines, such as automatic screw machines, rotary transfer machines, computer numerically controlled (CNC) lathes, or turning centers.

332813 Electroplating, Plating, Polishing, Anodizing, and Coloring

This U.S. industry comprises establishments primarily engaged in electroplating, plating, anodizing, coloring, buffing, polishing, cleaning, and sandblasting metals and metal products for the trade. Included in this industry are establishments that perform these processes on other materials, such as plastics, in addition to metals.

¹⁷ 2007 NAICS definitions found at <http://www.census.gov/eos/www/naics/>.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) DEFINITIONS**332999 All Other Miscellaneous Fabricated Metal Product Manufacturing**

This U.S. industry comprises establishments primarily engaged in manufacturing fabricated metal products (except forgings and stampings, cutlery and handtools, architectural and structural metals, boilers, tanks, shipping containers, hardware, spring and wire products, machine shop products, turned products, screws, nuts and bolts, metal valves, ball and roller bearings, ammunition, small arms and other ordnances, fabricated pipes and pipe fittings, industrial patterns, and enameled iron and metal sanitary ware).

424690 Other Chemical and Allied Products Merchant Wholesalers

This industry comprises establishments primarily engaged in the merchant wholesale distribution of chemicals and allied products (except agricultural and medicinal chemicals, paints and varnishes, fireworks, and plastics materials and basic forms and shapes).

541430 Graphic Design Services

This industry comprises establishments primarily engaged in planning, designing, and managing the production of visual communication in order to convey specific messages or concepts, clarify complex information, or project visual identities. These services can include the design of printed materials, packaging, advertising, signage systems, and corporate identification (logos). This industry also includes commercial artists engaged exclusively in generating drawings and illustrations requiring technical accuracy or interpretative skills.

541613 Marketing Consulting Services

This U.S. industry comprises establishments primarily engaged in providing operating advice and assistance to businesses and other organizations on marketing issues, such as developing marketing objectives and policies, sales forecasting, new product developing and pricing, licensing and franchise planning, and marketing planning and strategy.

541712 Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)

This U.S. Industry comprises establishments primarily engaged in conducting research and experimental development (except biotechnology research and experimental development) in the physical, engineering, and life sciences, such as agriculture, electronics, environmental, biology, botany, computers, chemistry, food, fisheries, forests, geology, health, mathematics, medicine, oceanography, pharmacy, physics, veterinary and other allied subjects.

541810 Advertising Agencies

This industry comprises establishments primarily engaged in creating advertising campaigns and placing such advertising in periodicals, newspapers, radio and television, or other media. These establishments are organized to provide a full range of services (i.e., through in-house capabilities or subcontracting), including advice, creative services, account management, production of advertising material, media planning, and buying (i.e., placing advertising).

541910 Marketing Research and Public Opinion Polling

This industry comprises establishments primarily engaged in systematically gathering, recording, tabulating, and presenting marketing and public opinion data.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) DEFINITIONS**MARKET OPPORTUNITY INDUSTRIES****323110 Commercial Lithographic Printing**

This U.S. industry comprises establishments primarily engaged in lithographic (i.e., offset) printing without publishing (except books, grey goods, and manifold business forms). This industry includes establishments engaged in lithographic printing on purchased stock materials, such as stationery, letterhead, invitations, labels, and similar items, on a job order basis.

325199 All Other Basic Organic Chemical Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing basic organic chemical products (except aromatic petrochemicals, industrial gases, synthetic organic dyes and pigments, gum and wood chemicals, cyclic crudes and intermediates, and ethyl alcohol).

325211 Plastics Material and Resin Manufacturing

This U.S. industry comprises establishments primarily engaged in (1) manufacturing resins, plastics materials, and nonvulcanizable thermoplastic elastomers and mixing and blending resins on a custom basis and/or (2) manufacturing noncustomized synthetic resins.

325411 Medicinal and Botanical Manufacturing

This U.S. industry comprises establishments primarily engaged in (1) manufacturing uncompounded medicinal chemicals and their derivatives (i.e., generally for use by pharmaceutical preparation manufacturers) and/or (2) grading, grinding, and milling uncompounded botanicals.

325414 Biological Product (except Diagnostic) Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing vaccines, toxoids, blood fractions, and culture media of plant or animal origin (except diagnostic).

325910 Printing Ink Manufacturing

This industry comprises establishments primarily engaged in manufacturing printing and inkjet inks and inkjet cartridges.

326199 All Other Plastics Product Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing plastics products (except film, sheet, bags, profile shapes, pipes, pipe fittings, laminates, foam products, bottles, plumbing fixtures, and resilient floor coverings).

331210 Iron and Steel Pipe and Tube Manufacturing from Purchased Steel

This industry comprises establishments primarily engaged in manufacturing welded, riveted, or seamless pipe and tube from purchased iron or steel.

331315 Aluminum Sheet, Plate, and Foil Manufacturing

This U.S. industry comprises establishments primarily engaged in (1) flat rolling or continuous casting sheet, plate, foil and welded tube from purchased aluminum; and/or (2) recovering aluminum from scrap and flat rolling or continuous casting sheet, plate, foil, and welded tube in integrated mills.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) DEFINITIONS**332710 Machine Shops**

This industry comprises establishments known as machine shops primarily engaged in machining metal and plastic parts and parts of other composite materials on a job or order basis. Generally machine shop jobs are low volume using machine tools, such as lathes (including computer numerically controlled); automatic screw machines; and machines for boring, grinding, and milling.

512110 Motion Picture and Video Production

This industry comprises establishments primarily engaged in producing, or producing and distributing motion pictures, videos, television programs, or television commercials.

541711 Research and Development in Biotechnology

This U.S. industry comprises establishments primarily engaged in conducting biotechnology research and experimental development. Biotechnology research and experimental development involves the study of the use of microorganisms and cellular and biomolecular processes to develop or alter living or non-living materials. This research and development in biotechnology may result in development of new biotechnology processes or in prototypes of new or genetically-altered products that may be reproduced, utilized, or implemented by various industries.