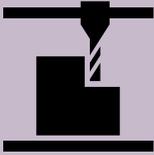


Fabricated Metal Products Manufacturing

Fabricated Metal Products Manufacturing



DeKalb County Indicators

Employment (2015) = **595**
 Employment Trend (2009–2015) = **-5.3%**
 Location Quotient (2015) = **1.5**
 Average Annual Earnings per Job (2015) = **\$55,455**

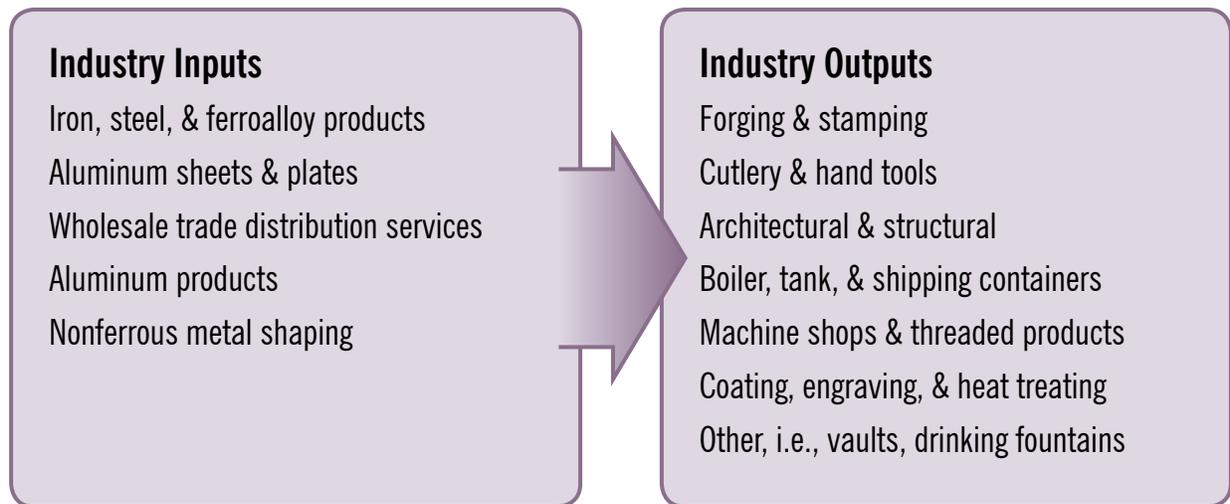
DeKalb County Region Indicators

Employment (2015) = **16,819**
 Employment Trend (2009–2015) = **7.0%**
 Location Quotient (2015) = **2.8**
 Average Annual Earnings per Job (2015) = **\$55,170**

CLUSTER SUMMARY

The fabricated metal products manufacturing cluster contains businesses related to the manufacturing of metal products from nails and screws to boilers and building frames (Figure 1). The cluster is divided into sub-sectors based on the uses of its end products. These include metal forges and manufacturers of hand tools, structural metals, tanks, threaded products, and heat-treated metals.

Figure 1: Fabricated Metal Products Manufacturing Cluster Input and Output Examples



Source: Adapted from 2015 IMPLAN data and U.S. Bureau of Labor Statistics, *Industries At A Glance*, 2017.

Related to fabricated metal products manufacturing are several supplier industries which provide materials, products and services necessary for production. According to IMPLAN data, 19.1% of production costs are in iron/steel products such as steel bars that are shaped into the desired products. Aluminum sheets and plates represent an additional 12.3% of production costs. Some fabricated metal products manufacturing sub-sectors may be interdependent, such as engine manufacturers that produce components for construction metal products, or hand tools manufacturers that use metals processed by heat treating firms. The firms in the cluster also purchase services as inputs, such as distribution services that bring inputs to their location.

REGIONAL OVERVIEW

The fabricated metal products manufacturing cluster in the DeKalb County region, which includes adjoining counties, had 687 establishments in 2015 and employed 16,819 people at an average wage of \$55,170 (Figure 2). DeKalb County firms account for 3.5% of regional employment in this cluster. Rockford and Aurora have much higher employment concentrations.

Location Quotients (LQs) are used to evaluate local business development opportunities. LQs are the ratio of the employment percentage represented by a given industry in the county to the percentage that industry represents in the nation. A ratio greater than 1.0 = higher local concentration and a likelihood of exports from the county; a ratio less than 1.0 may suggest goods or services are imported into the region.

Figure 2: Summary Characteristics of the Fabricated Metal Products Manufacturing Cluster

Indicator	DeKalb County	Reference Region
Number of Firms (2015)	32	687
Firm Change (2009-2015)	14.3%	-1.4%
Firm Location Quotient (2015)	2.4	2.8
Employment (2015)	595	16,819
Employment Change (2009-2015)	-5.3%	7.0%
Employment Location Quotient (2015)	1.5	2.8
Average Annual Earnings* per Job (2015)	\$55,455	\$55,170

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2015.

* Note: Although the words “wages” and “earnings” are often used interchangeably, they are different. Wages refers to compensation paid by an employer on an hourly, weekly or monthly basis. Earnings can include wages paid by an employer but also other sources such as interest, dividends, and contractor or business income.

The fabricated metal products cluster in DeKalb County gained new firms between 2009 and 2015, but total employment decreased 5.3% compared to a 7.0% increase in the larger region. This trend is consistent with the broader manufacturing sector, which decreased in DeKalb County. Sub-sectors in the fabricated metal products cluster represented in DeKalb County include cutlery and hand tools, machine shops, coating/engraving/heat treating metals, and others (Figure 3).

Figure 3: Fabricated Metal Products Manufacturing Sub-Sectors Based on Employment Concentration in DeKalb County

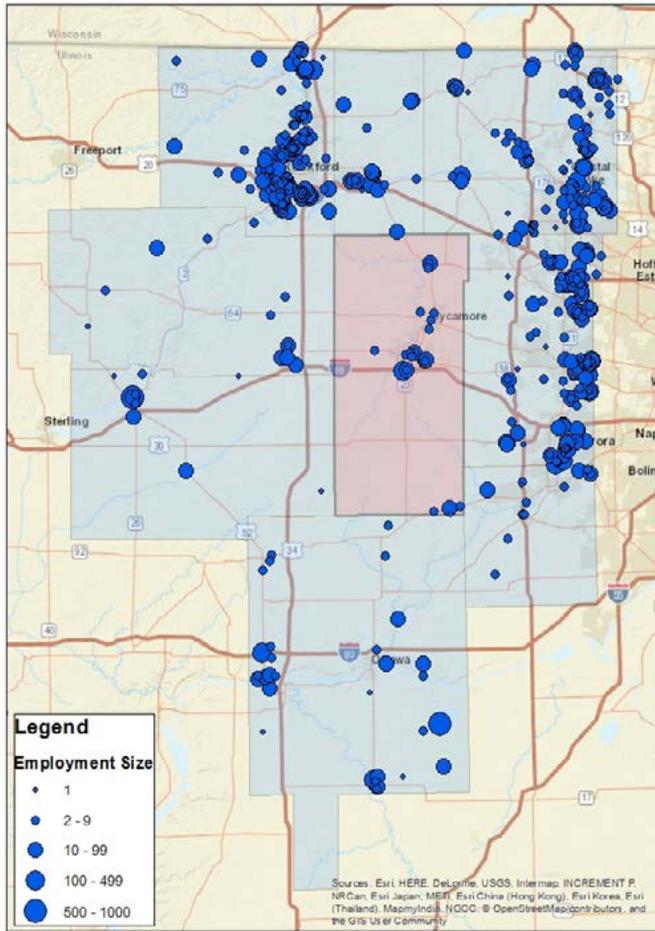
Sub-sector Description	Establishments LQ	Employment LQ
Industry Cluster Total	2.4	1.5
Forging & stamping	3.6	Disclosure
Cutlery & hand tools	6.3	Disclosure
Architectural & structural metals	1.2	Disclosure
Boiler, tank, & shipping containers	4.3	Disclosure
Machine shops & threaded products	2.6	1.9
Coating, engraving, & heat-treating metals	4.7	2.0
Other, i.e., vaults, drinking fountains	1.2	Disclosure

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2015.

Data for employment in some manufacturing sub-clusters is suppressed due to having a small number of manufacturers, but the two largest sub-sectors with published employment data in DeKalb County are machine shops and coating of metals. Of the 595 fabricated metal products manufacturing jobs in DeKalb County, 184 jobs (30.1%) are in machine shops and 75 jobs (12.6%) are in the coating of metals.

The fabricated metal products manufacturing cluster in DeKalb County and the larger region is represented by several mid-size and larger employers, with the largest company employing 1,000 (Figure 4). Metal products manufacturers are densely concentrated in Kane, McHenry, and Winnebago counties. In DeKalb County, most of the metal products companies are located within DeKalb and Sycamore, although there are mid-sized manufacturers in other areas, such as Sycamore Precision in Genoa (85 employees) and Alfredo’s Iron Works Inc. in Cortland (23 employees).

Figure 4. Fabricated Metal Products Cluster
Firms by Employment Size,
DeKalb County and the Reference Region



Source: Decisiondata.net, 2017.

The largest metal products manufacturer in the larger region is Neisewander Enterprises Inc. a manufacturer of garage doors based in Dixon, with 1,000 employees. Another major manufacturer is the Rockford-based Estwing Manufacturing Company (500 employees), which makes hand tools and outdoor cutting equipment such as hammers, machetes, and wood splitters.

Several large and mid-sized metal products manufacturers are in DeKalb County (Figure 5). Custom Aluminum Products manufactures a diversified array of aluminum products, employing approximately 150 people in Genoa. The DeKalb Forge Company, a division of Forge Resources Group (FRG), produces closed die forging of carbon, stainless steel, alloys, and aluminum and employs 100 people. Sycamore Precision in Genoa is a machine shop that fabricates metal products components such as valves and pistons and employs 100 people.

CST Industries Inc., located in the city of DeKalb, manufactures storage tanks for oil, gas, wastewater, etc, and employs 85 people. Precision Enterprises is an aluminum casting foundry that machines aluminum parts for a variety of industries including medical equipment and employs approximately 80 people. FRG fabricates parts for the aerospace, heavy truck, mining, railroad, construction, agriculture, recreational vehicle and motorcycle industries. Alfredo’s Iron Works, Inc. in Cortland manufactures ornamental metal works, such as fences and outdoor furniture and employs 23 people.

Figure 5: Major Employers in the Fabricated Metals Cluster, DeKalb County

Business Name	Employees	City	Industry Description
Custom Aluminum Products	150	Genoa	Extruded Aluminum Doors, Windows, Diversified Product Shapes, Fabrication & Finishing
DeKalb Forge Company	100	DeKalb	Iron & Steel Forging
Sycamore Precision	100	Genoa	Machine Shops
CST Industries Inc.	85	DeKalb	Prefabricated Metal Building & Component Manufacturing
Precision Enterprises	80	Somonauk	Aluminum Castings and Machining
Alfredo’s Iron Works, Inc.	23	Cortland	Ornamental & Architectural Metal Work Manufacturing

Source: DeKalb County Economic Development Corporation, Illinois Manufacturers Directory, 2018, and Dun & Bradstreet Inc., 2017.

INDUSTRY TRENDS ¹

Demand for fabricated metal products typically follows the business cycle closely due to the nature of the industries that use metal products. Major institutional users of metal products include construction companies and automotive manufacturers, both of which are typically sensitive to recessions. Another challenge facing metal products manufacturers is the offshoring of larger manufacturers that purchase their products. As companies move overseas in pursuit of lower labor costs, they typically purchase components from local suppliers at the new location instead.

¹ Summarized from industry reports by Hoovers’ Inc., a Dun & Bradstreet Company.

However, scientific and technological advances are improving the competitiveness of metal products manufacturers in the U.S. The development of powder metal parts allows manufacturers to fabricate products like automotive parts at a lower cost and with lighter weight, which in some cases improves product performance. The average motor vehicle now contains approximately 40 pounds of powder metal parts.

Additionally, metal products manufacturers are investing in production software and equipment that can be set up and change functions faster, allowing them to better meet time-sensitive needs of customers. This trend is driven by the adoption of just-in-time inventory management practices by other manufacturing sectors.

Several opportunities exist within the cluster. As fabricated metal products are increasingly being used in more sophisticated products such as autonomous machines, the components also require tighter specifications and more engineering. Manufacturers that invest in new production skills and technology will be well-positioned in the competition to supply the fabricators of advanced products.

Lasers are being incorporated into metalworking equipment for cutting and welding, reducing production costs and improving precision. Laser-assisted arc welding can be used in rapid, repeated production of parts directly from CAD files, eliminating the need for manual tooling. As production technology becomes more versatile, some metal products manufacturers can diversify their offerings with nonmetallic products. For example, a manufacturer of metallic door frames could also produce plastic or wooden frames.

To meet new product design challenges, advances in CAD software have enabled virtual prototyping where new product models can be tested digitally before a model is built. Further, the emergence of additive manufacturing or 3D printing is rapidly changing how metal product manufacturers operate. 3D printing is less capital-intensive than traditional production because it requires less metal products and fewer tools. Further, waste is reduced because each product is made with only the amount of metal required. Additive manufacturing is currently being used mainly for rapid prototyping, i.e., developing many smaller-scale models of a potential product to identify the optimal product design. However, 3D printing may advance to the point where it replaces current mass-production processes.

SUPPLY CHAIN

This analysis examines three aspects of supply chain: the value of supply chain inputs; the amount of inputs being produced outside DeKalb County for the industry segments studied (represented in most cases by the gap between total input purchases and inputs purchased within the region); and stages along the supply chain that are areas of competitive advantage or that provide an opportunity to attract businesses.

Areas with large gaps in the fabricated metal products supply chain represent opportunities for DeKalb County to capture the most value from a specific stage in the production or delivery of products and services. This may inform strategy by indicating where along the value chain an investment will have the highest impact on the regional economy and may indicate opportunities for business retention or expansion. Conversely, stages along the supply chain that are underperforming also offer opportunities for business attraction and/or entrepreneurship. It is important when reviewing data relating to industry inputs to compare both the supply gap as well as the total value of inputs, as certain services or components that maintain a high percentage may be of low value to the regional economy. Similarly, certain inputs, regardless of the total value purchased outside the region, may be of high strategic importance to the region in efforts to build a stronger industry cluster.

Supply Chain

An essential component for an industry sector is the local supply chain. While not all inputs (goods or services) that an industry sector needs can be produced in the local economy, it is desirable to meet as many of the sector's needs locally as possible. This analysis reveals the source and amount of purchases among the unique niches within an industry. Identifying total industry economic outputs and areas outside the region from which goods and services are being purchased helps determine which areas of the industry supply chains are strongest. It also assists in identifying the best growth opportunities for DeKalb County.

Regional Inputs

The dollar value of production inputs that are purchased from businesses within the DeKalb County region.

Gross Inputs

Total dollar amount of inputs used by the industry within each sector.

Regional Supply Gap

Difference between gross and county inputs: a sizeable gap value indicates that a large amount of inputs are imported into the region, rather than produced within.

The supply chain information provided shows the flows of trade both within DeKalb County and from outside the region that support metal products-related industries. The key sectors that may be appropriate targets for expansion appear as imports (gaps) from outside the county, but still within the industry cluster (Figure 6). These gaps are then analyzed in terms of county strengths and potential areas for targeting and support and are placed into a supply chain framework to determine the stages of the supply chain with the strongest presence in DeKalb County. To fully develop the fabricated metal products manufacturing cluster, economic developers in DeKalb County might consider focusing on those sectors without a strong regional presence currently but with significant development potential.

Figure 6: DeKalb County Key Supply Chain Gaps, Fabricated Metal Products Cluster (\$ Millions)

Industry Description	Regional Supply Gap	Regional Inputs	Gross Inputs	Percent Purchased Outside of Region
Iron & steel & ferroalloy products	\$-517.1	\$5.9	\$23.0	98.9%
Aluminum sheets, plates, & foils	-155.3	2.4	157.7	98.5
Management of companies & enterprises	-79.1	12.9	91.9	86.1
Aluminum products	-78.2	0.3	78.5	99.6
Rolled, drawn, extruded, & alloyed copper	-54.2	0.3	54.5	99.4
Machined products	-53.6	6.1	59.7	89.8
Steel wire	-51.5	0.8	52.4	98.3
Nonferrous metal, except copper & aluminum, shaping	-48.4	0.4	48.9	99.0
Balls & roller bearings	-46.9	7.6	54.5	86.1
Paints & coatings	-45.4	4.1	49.6	91.5

Source: IMPLAN, 2015.

For example, the fabricated metal products manufacturing cluster requires \$523 million in intermediate inputs (i.e., the products or services required to create a finished product) from iron/steel/ferroalloy products. However, nearly all this material is produced outside the region. This suggests an opportunity for an existing firm or new business to satisfy the local demand for metallic products. Another closely related opportunity is aluminum sheets and foils. The fabricated metal products cluster requires \$157.7 million in aluminum sheets/plates/foils, of which only \$2.4 million was produced in DeKalb County.

Iron and Steel Mills and Ferroalloy Manufacturing (NAICS Sector 331110)

This industry comprises establishments engaged primarily in forming raw iron or steel into forms usable in other industries. Example products of this sector include steel bars and plates, wheels, and iron ore.

WORKFORCE REQUIREMENT, SUPPLY AND DEMAND

Retaining a skilled local workforce has been an ongoing issue for manufacturing in general, including in the metal products cluster. The challenge of finding and retaining a skilled workforce has intensified due to the retirement of experienced workers in the Baby Boom generation. Even as industry employment has experienced a net decline over the past decades (a trend that is expected to continue), succeeding generations of potential workers are smaller in absolute numbers and younger workers are not choosing careers in manufacturing.

The largest employee age group in the fabricated metal products manufacturing cluster in DeKalb County is pre-retirees, ages 45-64, at 57.2% (Figure 7). This age group includes experienced workers that will need to be replaced in the future. An estimated 5.0% of metal products employees are currently of retirement age, and 32.9% are of prime working ages 25-44. Lower annual wages for metal products employees under age 25 could be explained by limited hours in seasonal or temporary/internship positions as young adults complete their postsecondary education.

INDUSTRY CLUSTER PROFILE

Figure 7: Fabricated Metal Products Manufacturing Cluster Employment and Wages by Age Group, DeKalb County

Age Group	Percent of Total Employment	Average Annual Wage
Under 25 Years	4.9%	\$35,775
25-44 Years	32.9	52,721
45-64 Years	57.2	63,081
65 Years & Older	5.0	59,777

Source: U.S. Census Bureau, Quarterly Workforce Indicators, 2015.

Approximately 61.4% of the employment is in production (Figure 8). The next largest employment category is office/administrative support occupations, which typically have lower wages. Ensuring that appropriately skilled production workers are available at competitive compensation rates will be critical to maintaining this manufacturing sector in the region.

Figure 8: Fabricated Metal Products Cluster Staffing Patterns

Occupation Type	Percent of National Cluster Employment	County Median Wage All Industries	Region Median Wage
Production occupations	61.4%	\$33,079	\$34,430
Office & administrative support occupations	10.4	31,712	32,235
Management occupations	5.6	81,756	81,279
Transportation & material moving occupations	5.0	30,549	29,674
Architecture & engineering occupations	3.8	66,903	72,646
Installation, maintenance, & repair occupations	3.7	43,979	46,192
Business & financial operations occupations	3.0	51,504	55,661
Construction & extraction occupations	2.9	61,541	59,224
Sales & related occupations	2.5	23,246	23,692
All other occupations	1.7	52,145	50,914

Source: U.S. Bureau of Labor Statistics and Illinois Department of Employment Security, Occupational Employment Statistics, 2016.

As mentioned above, a major challenge for employers is the looming demand for replacement workers as older workers retire. The Illinois Department of Employment Security projects that 960 openings for production workers will become available per year between 2012 and 2022, with a slight majority coming from replacements (Figure 9).

Figure 9: Occupational Employment, Projected Demand by Selected Worker Classifications, Workforce Investment Board Region 5*

Occupation Type	Employment		Employment Change 2012-2022		Average Annual Job Openings		
	2012	2022	Number	Percent	Growth	Replacements	Total
Total, All Occupations	282,136	333,489	51,353	18.2%	5,215	6,645	11,860
Office & Administrative Support	38,831	44,430	5,599	14.4	585	876	1,461
Sales & Related	29,095	34,025	4,930	16.9	494	896	1,390
Production	27,431	31,295	3,864	14.1	417	543	960
Transportation & Material Moving	21,834	26,920	5,086	23.3	509	535	1,044
Management	18,935	21,456	2,521	13.3	271	380	651
Construction & Extraction	11,778	15,169	3,391	28.8	339	205	544
Business & Financial Operations	10,482	12,916	2,434	23.2	244	203	447
Architecture & Engineering	3,983	4,644	661	16.6	66	93	159

Source: Illinois Department of Employment Security, 2012-2022 Employment Projections.

*Workforce Investment Area 5 includes the counties of DeKalb, Kane, and Kendall.

Because of the competition with surrounding metro areas for workers with specific skills or experience, compensation levels are a concern for local businesses. For example, the projected demand for production workers in the counties of Boone, Winnebago, and McHenry is estimated to be 1,059 openings per year between 2012 and 2022². The estimated average annual wage for production workers is \$33,079 in DeKalb County compared to \$34,430 for the larger region. Although only a 4.1% difference, this could put local employers at a competitive disadvantage relative to other areas offering similar jobs at higher wages. Given the intense competition for skilled workers, companies will need to monitor compensation trends to recruit and retain qualified employees.

ECONOMIC IMPACT

For every 100 jobs created in the fabricated metal products manufacturing cluster in DeKalb County, an additional 71 jobs are supported or created in other industry sectors. This also results in the generation of another \$15.5 million in value-added, as well as an additional \$9.1 million in employee compensation (Figure 10).

For every 100 jobs created in the fabricated metal products manufacturing cluster in Reference Region, an additional 73 jobs are supported or created in other industry sectors. This also results in the generation of another \$15.8 million in value-added, as well as an additional \$9.4 million in employee compensation.

Figure 10. Economic Impact Summary of 100 New Jobs Created in the Fabricated Metal Products Manufacturing Cluster, DeKalb County and Reference Region

Indicator	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Multiplier
Employment (DeKalb County only)	100	30	42	171	1.71
Value-Added (DeKalb County only)	\$11,097,331	\$1,905,840	\$2,542,291	\$15,545,462	1.40
Employee Compensation (DeKalb County only)	\$6,972,689	\$992,777	\$1,159,608	\$9,125,074	1.31
Employment (Reference Region)	100	32	41	173	1.73
Value-Added (Reference Region)	\$10,310,531	\$2,506,943	\$2,957,955	\$15,775,429	1.53
Employee Compensation (Reference Region)	\$6,640,613	\$1,370,218	\$1,358,733	\$9,369,564	1.41

Source: IMPLAN, 2015.

The industries most affected by job creation in the fabricated metal products manufacturing cluster in DeKalb County include wholesale trade, employment services, restaurants, real estate and hospitals (Figure 11). These job impacts are the result of business-to-business purchases by companies within the cluster, as well as by the household spending of their employees

Figure 11. Employment Impacts of 100 New Jobs Created in the Fabricated Metal Products Manufacturing Cluster on Other Industries, DeKalb County

Industry Impacted in DeKalb County	Jobs
Total, All Affected Industries	71
Wholesale trade	5
Employment services	4
Limited-service restaurants	4
Full-service restaurants	3
Real estate	2
Hospitals	2
Truck transportation	2
Marketing research and all other miscellaneous professional, scientific, and technical services	2
All other industries	46

Source: IMPLAN, 2015.

Similar impacts can be measured in the Reference Region where the industries most affected by job creation in the fabricated metal products manufacturing cluster also include business support services, services to buildings and general merchandise retailers though the number of jobs created or supported differs somewhat (Figure 12).

² Source: Illinois Department of Employment Security, 2012-2022 Employment Projections.

INDUSTRY CLUSTER PROFILE

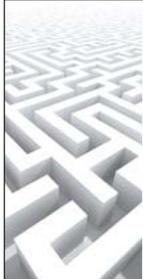
Figure 12. Employment Impacts of 100 New Jobs Created in the Fabricated Metal Products Manufacturing Cluster on Other Industries, Reference Region

Industry Impacted in Reference Region	Job
Total, All Affected Industries	73
Wholesale trade	6
Employment services	4
Limited-service restaurants	3
Full-service restaurants	3
Real estate	3
Hospitals	2
Truck transportation	2
Marketing research and all other miscellaneous professional, scientific, and technical services	2
Retail - General merchandise stores	2
Services to buildings	2
Business support services	2
All other industries	44

Source: IMPLAN, 2015

KEY TAKEAWAYS

- » The fabricated metal products manufacturing cluster in DeKalb County has a concentration of firms that is 2.4 times the national average and an employment concentration 1.5 times the national average. The surrounding region also ranks above the national average. Employment in the metal products cluster has decreased slightly in DeKalb County since 2009, although employment grew moderately in surrounding counties.
- » DeKalb County has an especially high concentration of employment in firms that coat, engrave, and heat-treat metals.
- » The county fabricated metal products manufacturing cluster is specialized and has the potential for further development based on its supply chain relationships to other industries in the region and the surrounding metro areas.
- » Opportunities likely exist for machine shops to work with metal products manufacturers to develop new locally-sourced products. However, more work will be needed to identify and develop those opportunities.
- » The emergence of autonomous, computerized “smart machines” offers opportunity for fabricated metal products manufacturers to develop more advanced computer components, but it will require investment in engineers and new technology. This would require further research to determine the viability of such opportunities.
- » The expected wave of retiring Baby Boomers will create most of the demand for new workers, despite static, or even declining, overall employment in the manufacturing overall. Since other industries will experience the same challenges, competition for skilled workers will be brisk given the relatively limited number of potential younger workers.
- » The fabricated metal products manufacturing cluster in DeKalb County supports 595 jobs and contributes for \$83.4 million to the county’s economy. In the Reference Region, the cluster supports 16,819 jobs and contributes for \$1.8 billion to the regional economy.



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