
METAL
MANUFACTURING
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METAL INDUSTRY FACTS

1. Eight states produced more than half of all the output from the fabricated metal products industry. They include California, Illinois, Indiana, Michigan, Ohio, Pennsylvania, Texas, and Wisconsin.

2. In 2017 the steel industry sold $2.5 trillion worth of products and created $500 billion value added. It is the 2nd largest industry in the world after oil and gas.

3. The average annual salary for a Machinist is $52K, a Tool and Die / Operator annual salary is $55K, and a CNC Programmer annual salary is $64K.

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METAL MANUFACTURING FACTS

4 More than 80 million tons of steel are recycled in North America each year, which is greater than paper, aluminum, plastic and glass combined.

5 The Metals (Primary, Fabricated, Machinery) Industry is responsible for 22% of Indiana manufacturing output, $22 billion in 2019.

6 Indiana is the #1 steel producer in the nation, producing approximately one-fourth of all U.S. steel production.

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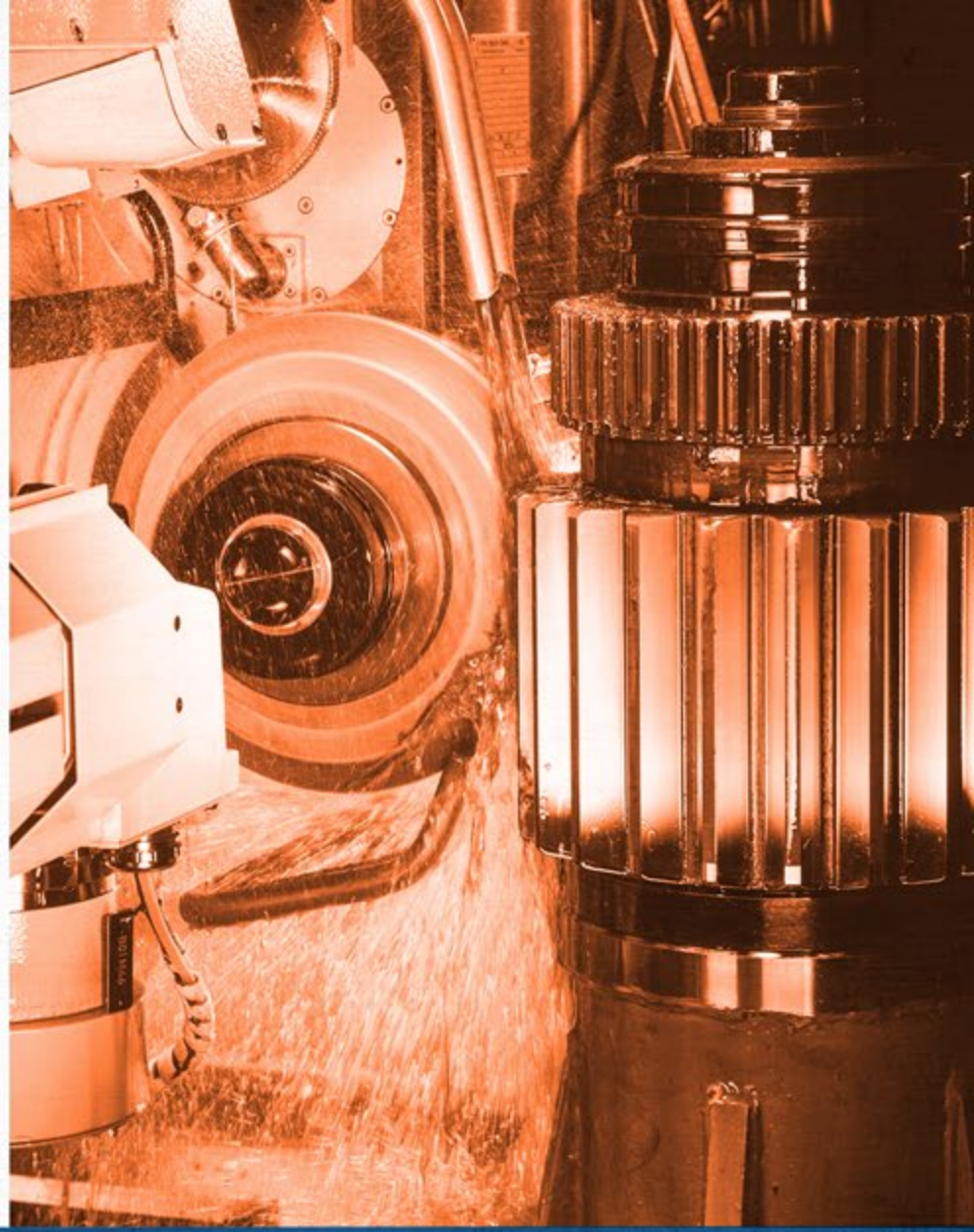
Every time you get in a car, pick up the phone, handle a tool or turn on an electronic appliance, you are looking at the result of custom metal fabrication.

Our economy relies on metal fabrication processes. Without it, we wouldn't be able to run our electrical systems or create the parts that keep our houses, kitchens, businesses, computers, and vehicles operational.

~ LaserFab



FABRICATED METAL MANUFACTURING FACTS*

1. Fabricated Metal manufacturing workers earn an average annual salary of $42,050.

2. The Fabricated Metal Industry represents 30% of all metal production.

3. Almost 1.5 million people are employed in the Fabricated Metal Industry.

4. 2023 revenue is forecast is $354.6 billion, an 8% increase since 2011.

*NATIONAL DATA

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METAL FABRICATION

- The process of manufacturing sheet metal and other flat metals into specific shapes through cutting, stamping, shaping, folding, and welding.
- Metal has a high heat resistance, strength, durability, low cost to produce (when at high volume), aesthetic qualities, and versatility.
- Metal fabricators are highly skilled specialists, trained to cut and manipulate metal with a surgeon's precision to the desired shape.

TYPES OF METAL FABRICATION

- **Cutting** – uses waterjet and laser cutting, chopping, sawing, shearing, & chiseling
- **Casting** – fabricator pours molten metal into a mold
- **Forging** – high-pressure machinery compresses raw metal, allowing a fabricator to bend and shape it
- **Punching** – turrets punch pre-designed patterns into metal
- **Turning** – a piece of metal goes onto a spinning platform, allowing technician to cut it radially with a tool as it spins
- **Extrusion** – a ram forces billets through a die, forms cylindrical parts such as pipes or wires

PRECISION MACHINING FACTS

1 Precision machining workers are among the "top five most-needed" employees in the country.

2 For every $1 invested in metal manufacturing, $1.32 is added to the economy. This is the highest multiplier effect of any industry in the world.

3 Machinists average annual salary is $45,750. Indiana is the 2nd best state in the nation to be a machinist (Wisconsin is #1).

4 In 2019, there were 460,600 machinists in the United States, with a projected need of almost 15,000 additional workers.

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PRECISION MACHINING IN MEDICINE

- Provides exact dimensions for surgical tools to fit a surgeon's hands, for a more accurate result.
- Precision machining creates complex parts for lasers and robotics that are used in surgeries.
- Joint replacements are often created from medical stainless steel or titanium for incomparable strength, resilience, and function.
- Insulin pumps, heart monitors, and defibrillators can be customized for each patient due to the tight the tolerances precision machining can achieve.
- Precision machining tolerances are so tight they can hold to .005 microns. (for reference, a human hair is 70 microns thick)

METAL 3D PRINTING APPLICATIONS

- The additive manufacturing (3D printing) market is expected to grow by $4.42 billion from 2020-2024, representing an annual growth rate of 14%
- Used to create lightweight, more complex and higher performance components for the aerospace, automotive, defense, and medical sectors.
- Advantages are faster prototyping, mass production, short batches, reduced assembly time and energy costs.
- Increasingly being used in rocket engines, heat exchanges, and various turbine parts. Ferrari and BMW use 3D printed parts in their cars.

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THANK YOU TO OUR REGIONAL CHAMPIONS!

GREATER NILES Chamber of Commerce

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RESOURCES

https://laserfab.net/blog/what-is-metal-fabrication/

https://www.bls.gov/iag/tgs/iag331.htm#workforce

https://agmetalminer.com/2020/02/19/this-morning-in-metals-indiana-no-1-once-again-last-year-in-steel-production/

https://www.thefabricator.com/thefabricator/article/shopmanagement/what-is-metal-fabrication-and-where-is-the-industry-headed-

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https://www.1pds.com/fast-facts-about-the-precision-machining-industry/

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https://www.bls.gov/ooh/production/machinists-and-tool-and-die-makers.htm

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