

AS SEEN IN
Forbes & Fortune

REBUILDING AMERICA
CLEVELAND

Innovation On Demand

Lincoln Electric's game-changing 3D metal printing solution delivers big parts fast, creating new possibilities for manufacturers.

For 127 years, Cleveland-based Lincoln Electric has singularly focused on advancing welding and cutting technologies around the world. "Now, we're the global leader in those solutions and renowned as The Welding Experts® worldwide," says Christopher L. Mapes, president and CEO.

With a proven track record of success and an expansive portfolio of cutting-edge products, comprehensive welding processes, and automated capabilities, Lincoln Electric delivers innovative solutions that keep companies moving forward.

"People traditionally associate welding with what they see on TV, but it goes beyond the helmet and sparks," Mapes says. "We've developed unparalleled expertise across metallurgy, software engineering, power electronics, and automation."

That empowers Lincoln Electric to serve diverse industries from transportation to power generation, from pipelines to shipbuilding, and more—providing unique



opportunities to help companies advance their processes through new competency and technology of additive manufacturing which include 3D large metal parts.

BENEFITS BEYOND THE BOTTOM LINE

"We make big parts in less time through 3D metal printing, which opens the door to new possibilities in productivity and design," explains Mapes. Utilizing robotic and metallurgical technologies, Lincoln Electric's wire-based process builds parts, tools, molds, and prototypes on demand. "The ability to design prototypes, test their uses in real environments, and begin parts production within a day is a game changer for manufacturing. From a productivity perspective, it reduces lead time from months to weeks and helps companies get to market faster—or get back to work quickly," he adds.

Having the world's largest wire-based 3D metal printing factory allowed Lincoln Electric to recently help Chevron U.S.A. Inc. bring a refinery back online when supply chain delays on traditionally manufactured parts challenged the planned restart schedule.

"Unplanned refinery shutdowns can cost companies millions of dollars, so our ability to respond quickly is vital to their operations and bottom line," Mapes explains. "Within days, we began production on critical parts that resolved Chevron's supply chain crunch. When speed-to-market, design flexibility, and reduced costs take priority, our printing technology provides the ultimate answer."

Beyond efficiency benefits, 3D metal printing solutions expand design freedom and provide flexibility to implement improvements on the fly. "We see 3D metal printing as a major innovation for parts production. The power to create replacement parts on demand lowers storage and inventory costs, and it helps companies be more responsive to issues by incorporating design improvements as they go," Mapes continues.

Lincoln Electric's 3D metal printing solutions also reduce waste material and encourage sustainability. "Traditional manufacturing relies on machining large metal blocks, and scrap material has to be reprocessed before being reused in the material stream, which creates a big carbon footprint," Mapes says. "Our robotic process builds objects layer by layer instead, ensuring nearly 99% of material is used the first time."

As large-format, wire-based 3D printing technology evolves, so do opportunities to drive advancements across global industries. But Lincoln Electric's dedication to unrivaled service remains unchanged.

"Our founders established Lincoln Electric on the golden rule in 1895, and we still live and lead by that guiding principle today," says Mapes. "We focus relentlessly on serving customers and driving solutions for their challenges."

LINCOLN®
ELECTRIC