The Lincoln Electric Company

Founded in 1895 by John C. Lincoln, The Lincoln Electric Company is the world leader in the design, development and manufacture of arc welding products, robotic arc welding systems, plasma and oxyfuel cutting equipment and has a leading global position in the brazing and soldering alloys market. Headquartered in Cleveland, Ohio, Lincoln Electric has a global network of manufacturing, distribution, sales and technical support covering more than 160 countries.

INNOVATION
With a long history of innovation in arc welding equipment and consumables, Lincoln Electric has been providing cutting-edge products and comprehensive welding process solutions to our customers for nearly 120 years. We operate the industry’s most comprehensive research and product development program, supported by our R&D centers around the world.

CUSTOMER COMMITMENT & SUPPORT
High-quality products and great customer service are important aspects of the Lincoln Electric story, but it’s our unmatched welding expertise that truly sets us apart. If there’s a better way for you to weld, we’ll help you find it. If automation can improve your bottom line, we’ll guide you through the decision-making process. If there’s a method that can help you reduce costs, we’ll show you how – and why.

We are driven by customer satisfaction and known as the supplier of choice in the many industries we serve. We continuously strive to exceed customer expectations and are not simply known as a provider of equipment and consumables, but as a provider of complete welding solutions.
THE POWER GENERATION INDUSTRY
Welding Solutions to Meet the Most Demanding Requirements – Yours.

INDUSTRY CHALLENGES
Access to abundant and affordable electrical energy is closely linked to economic prosperity. As global economies continue to expand, the demand for electrical energy is forecast to grow. However, with increased demand come certain challenges:

- Improving efficiencies to get more electrical output from each unit of input
- Balancing the need for electrical power with the concerns over CO₂ and other by-products of burning fuels
- Helping countries become less dependent on imported fuels for electrical generation

There are many implications as the industry responds to these challenges. Typical temperatures and pressures in thermal plants continue to increase. The preference for natural gas plants over coal is driving additional change, while new plant designs to burn waste, bio fuels and biomass are making their way into service. Although safety concerns still exist, some see nuclear energy as an important source of electricity. Finally, the use of renewable energy sources like wind, hydro, solar and geothermal is becoming an important component of many energy strategies.

LINCOLN ELECTRIC PROVIDES SOLUTIONS
Our industry specialists are knowledgeable in every aspect of welding for the energy industries. We offer a full matrix of equipment, consumables and automation solutions engineered to meet the welding requirements for each of the various components and base materials common to the industry.

Lincoln Electric is committed to advancing the science and technology of welding for customers in the power generation industry. That’s why we invest in the largest application engineering, automation and R&D support centers in the industry. Highly trained and experienced technologists, engineers and doctorate-level experts are available to customers to troubleshoot problems in the field and develop new process or consumable solutions on actual customer parts. This industry-leading technical support team has one focus — providing you with the best welding solutions for your particular needs.
LNG

Turbine plants powered by natural gas are popular because of falling gas prices and cleaner emissions – as much as 30 percent less CO₂ when compared to coal. In addition, competitive construction costs for new plant construction and the ability to power up gas turbines quickly to react to changes in the demand for electricity are driving this popularity.

The cleaning, liquefaction, storage, transportation and regasification of natural gas pose some unique welding challenges. The extremely cold temperatures encountered in this process require special welding materials and welding procedures.

Lincoln Electric understands these challenges. For many years, we have provided comprehensive welding solutions for the 9% Ni steels, controlled ferrite stainless and aluminums used for very low-temperature service.

Best-Fit Solutions

Consumables
- Supercore® 625P
- Nyloid 2
- Controlled Ferrite Stainless
- Techalloy™ C276 / P2007 flux
- Indalco® Alloy 5183
- Outershield® MC460 VD-H

Equipment
- Power Wave® AC/DC 1000® SD
- Portable inverters and feeders
- Engine Driven Welders
- Arc Products Orbital Pipe Welding Systems
NUCLEAR ENERGY

Nuclear energy has the potential to produce unlimited electrical power without any greenhouse gas emission. Many believe it could be the perfect choice to solve the need for abundant electrical power. However, there are a number of safety concerns and public perception challenges.

The American Society of Mechanical Engineers (ASME) has created a set of standards to address some of these concerns. Specifically, ASME Section III details the requirements of “Safety Related Components” in nuclear power plants.

Lincoln Electric is on the leading edge of the nuclear industry and has a readily available portfolio of welding consumables that meet or exceed the requirements of ASME Section III. As part of these requirements, we must allow our customers to audit our production and quality systems. After numerous audits, Lincoln has passed each one without a single negative finding.

In addition to Section III consumables, innovative equipment like the PowerWave® family of welding power sources can control all aspects of the welding process, including proprietary software that monitors and creates records to ensure total quality.

Industry knowledge, a large portfolio of industry-specific consumables, unique equipment solutions and knowledgeable application support make Lincoln Electric an ideal partner for fabrication or repair in the nuclear sector.

THERMAL ENERGY

High temperatures in thermal plants are needed to extract the maximum amount of energy, and at the same time reduce undesirable emissions. Each fuel source has different challenges, but whether the fuel is coal, oil, gas, biomass, biofuels or waste, Lincoln Electric understands the welding needs associated with each. With specific welding and surfacing solutions for every component — including boilers, steam pipe, water walls, coal pulverizers, scrubbers, absorbers and pressure vessels — Lincoln Electric’s capabilities in the thermal power industry are second to none.

Stainless steels, high-alloy steels, chrome-moly, 9% chrome creep resistant alloys and general fabrication materials are common in the sector. In addition to consumables, Lincoln has the right welding and automation equipment to do the job, whether in the shop or on the construction site.

And with unmatched applications expertise and technical support, Lincoln Electric is the first choice for your welding and cutting needs.

Best-Fit Consumable Solutions

NUCLEAR ("N" Designators)

- Excalibur® 7018 MR N Mild Steel and Low-Alloy SMAW
- Lincolnweld® LA84 Wire/MIL800-H™ Flux
- Lincolnweld® LA100 Wire/MIL800-H™ Flux
- Blue Max® Stainless Wire/P2007™ Flux
- SuperArc® L-52 N and L-56® N GTAW and GMAW

THERMAL

- Excalibur® Mild Steel and Low-Alloy SMAW
- UltraCore® Mild Steel and Low-Alloy FCAW
- Metrode® CrMo Chromet® SMAW
- Metrode® CrMo Coremet® FCAW
- Weartech™ and NanoSteel® Wear-Resistant Alloys
By 2030, wind, solar and geothermal energy will fulfill 14 percent of the global demand for electricity. The increase is driven by the desire for a renewable, non-carbon emission energy, as well as decreased dependence on non-domestic fuel sources.

To meet this growing demand, multiple sources of renewable energy are currently under development, and Lincoln’s experience, welding process knowledge and products are positioned to help our customers be successful. Today, wind and hydroelectric power are the most common forms of renewable energy.

Whether the wind energy is generated onshore or offshore, Lincoln’s complete solutions for wind tower fabrication have helped customers around the world achieve higher levels of productivity and quality.

The future for wind is larger generators, taller towers and more offshore development. These trends will mean thicker and/or higher strength materials, plus stronger and tougher weld metal requirements for the towers. You can count on Lincoln to be ready with the equipment and consumables for any changes.

By 2025, hydroelectric power generation is estimated to account for 20 percent of all new electrical generation capacity. Lincoln has a full line of consumable materials and welding knowledge to assist customers that fabricate the various 410NiMo water turbines, the penstock, water controls and other structural components that comprise a modern hydroelectric power plant.
To capture the best wind and produce more electricity, wind towers are getting taller and offshore wind farms are becoming more common. This trend requires towers, and their foundations, to withstand extreme environmental and dynamic loading conditions. As a result, thicker and higher-strength steel plates are being used more frequently in these types of applications.

Regardless of the material thickness or type, Lincoln Electric has consumable solutions that meet the most stringent mechanical requirements. Our extensive experience in the construction of offshore structures for the oil and gas industry allows us to provide proven solutions for use in offshore towers and foundations. Those solutions include specialized submerged arc welding flux and electrodes, such as Lincolnweld WTX and L-61, which have been engineered to provide the strength, impact properties and excellent weld bead appearance required for onshore and offshore towers. In addition, patented technology within the Power Wave platform of welding machines lowers operating costs and significantly improves productivity - meaningful benefits for fabricators in this industry.
CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customer’s particular purpose is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.