

Solving Your Process Heating Problems



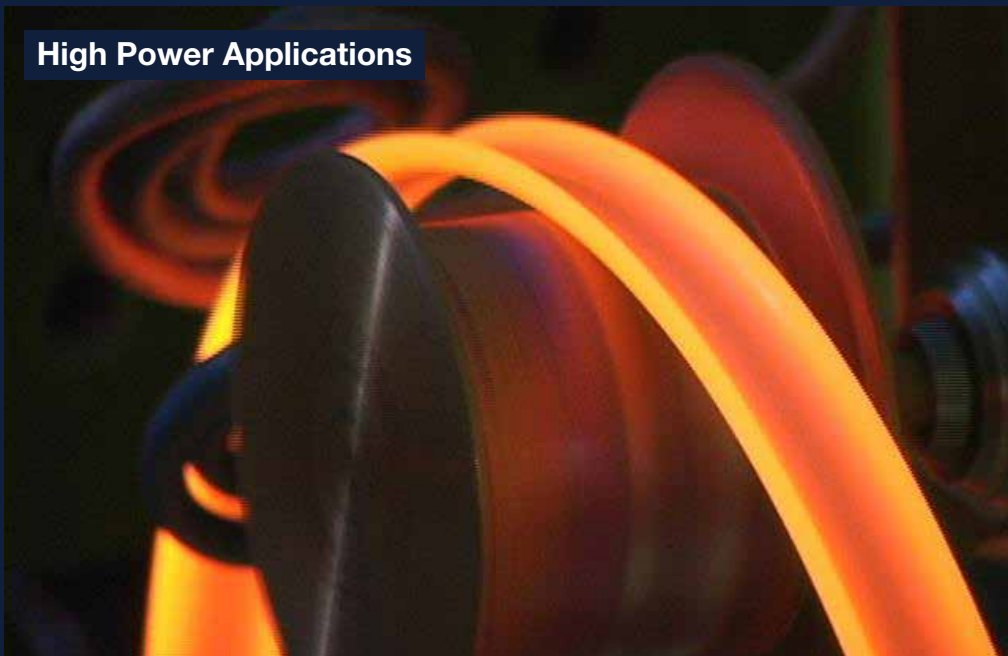
Ambrell[®]
INDUCTION HEATING SOLUTIONS
an inTEST Company

Expert Coil Design



Precision Solutions

High Power Applications



Experience the Excellence.™

Proven Solutions Before You Invest in Our Products.

The ultimate test of our equipment is performance on the job. But, even before your system is delivered, your solution will be developed through a comprehensive process review by our engineering team. A feasibility test will be performed in our applications lab and a written and video-recorded solution will be provided to ensure proven results.



With a reputation for quality, built on over 30 years of experience, Ambrell provides innovative heating solutions. Our equipment is installed in over 50 countries and supported by a network of dedicated induction heating experts.

If you want to improve your heating application – anywhere in your process – consult with our team for high-efficiency and cost-effective solutions. Ambrell's technical experts design and manufacture a range of systems to bring you the highest quality induction heating solutions available.

Ambrell's engineers and scientists are responsible for over 30 patents and some of the latest induction heating advances on the market today. By reinvesting over 10% of revenue, we are dedicated to inventing, developing and introducing cutting-edge technology to improve our customers' manufacturing processes.

What is Induction Heating?

Induction heating is an efficient, rapid, non-contact and safe flameless method to heat electrically conductive materials. This process relies on induced electrical currents within the material to produce heat. Michael Faraday discovered the phenomenon of electromagnetic induction in 1831, and its uses are widespread throughout today's modern manufacturing processes.

Components of Induction Systems

- **Power supply:** generates alternating current at frequencies between 2 kHz and 400 kHz.
- **Workhead (heat station):** contains resonant and system-matching components.
- **Coil:** wraps around or near the part to heat; unique to every application; precisely delivers power.
- **Cooling system:** for the coil and the power supply.

Manufacturing and Research

Ambrell equipment is used by a variety of manufacturers – both large and small – and for research by leading universities, research centers and material testing laboratories.

Maximize the Productivity of Your Heating Application



Engineered with the most advanced induction heating technology, our innovative, state-of-the-art equipment will generate an accelerated return on investment by:

Improving Your Productivity

- Increase production rates with faster heating cycles
- Reduce defect rates with repeatable, reliable heating processes
- Eliminate variability from operator-to-operator, shift-to-shift



Improving Your Energy Efficiency

- Use less energy – immediate heating
- Generate heat only where needed – no wasted energy
- Eliminate harmful exhaust gases
- Reduce energy costs with our high AC mains power factor
- Convert AC mains to induction power with our advanced product designs



Integrating Easily into Your Process

- Requires a small footprint
- Integrates well into production cells
- Uses compact workhead, optimizing work space
- Integrates with automated controls systems (analog & digital I/O)
- User-friendly operator interface
- Built-in operator safety features



Incorporating Ease-of-Use Features

- Easily adjustable tap settings, interchangeable coils
- Convenient bench models
- Wide range of frequencies (2-400 kHz) and power (50 watts to 1,000 kW)
- Interchangeable induction coils

Every Application is Customized

Ambrell products are custom-designed to fit each of our customers' unique applications. Our systems are continually replacing outdated heating methods worldwide for their speed, consistency and precision.

Expert Designs and Solutions



Our application engineers from THE LAB at Ambrell apply decades of induction heating experience and knowledge to your heating application and have provided heating solutions for thousands of system solutions across a

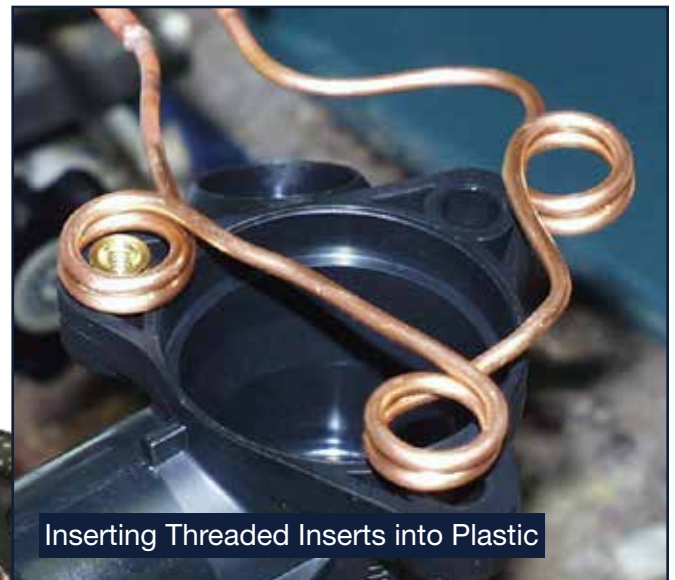
wide range of industries.

Our scope of knowledge is constantly increasing as new uses of induction heating principles are developed in our labs in cooperation with our customers. In fact, we may have already solved your heating challenge.

Before we recommend any system, our application engineers will analyze your process, heat your parts and make recommendations. We encourage you to schedule a visit to THE LAB to work directly with our team. And, if you can't make it, we'll send you a video and lab report.



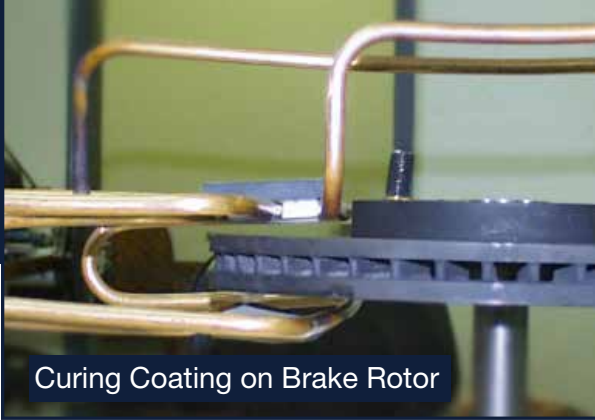
Consumer Products



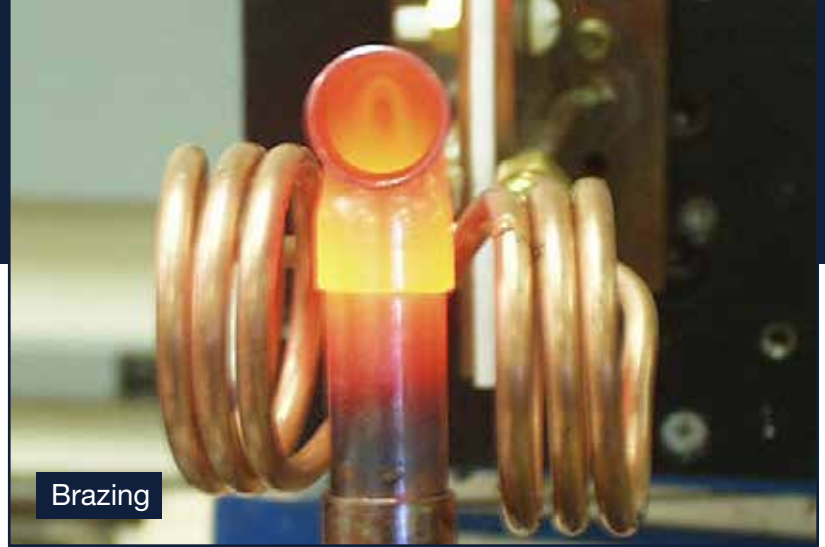
Inserting Threaded Inserts into Plastic

Oil and Gas Drill
Bit Insert
Brazing

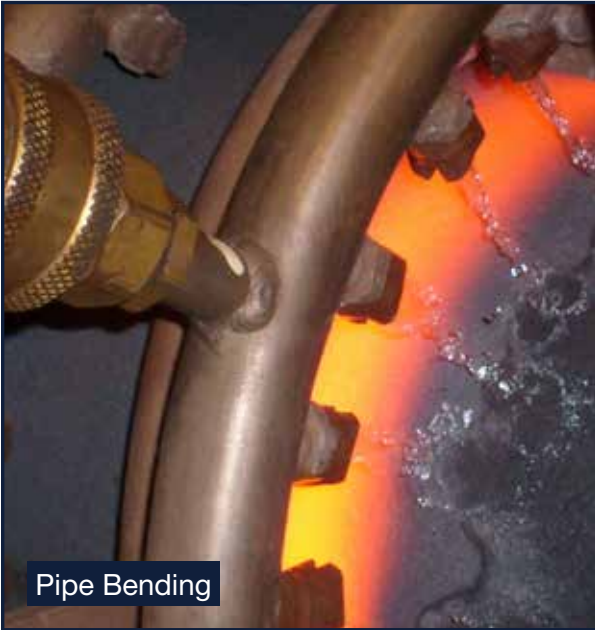




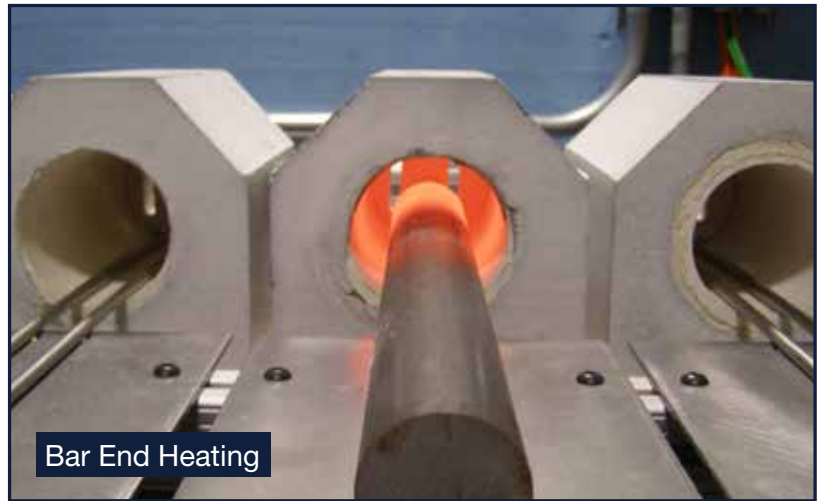
Curing Coating on Brake Rotor



Brazing



Pipe Bending



Bar End Heating

Heating Versatility

- **Very quick heat cycles** – as short as milliseconds
- **Very long heat cycles** – as long as days
- **Heating of very small parts** – down to nanoparticles
- **Heating of very large parts** – such as undersea piping and steel billets

Markets Served

- Aerospace
- Automotive
- Consumer Products
- Forging and Casting
- Oil and Gas
- Medical
- Semiconductor
- Solar and Wind Energy



Fasteners:
Thread Patching and Hot Heading

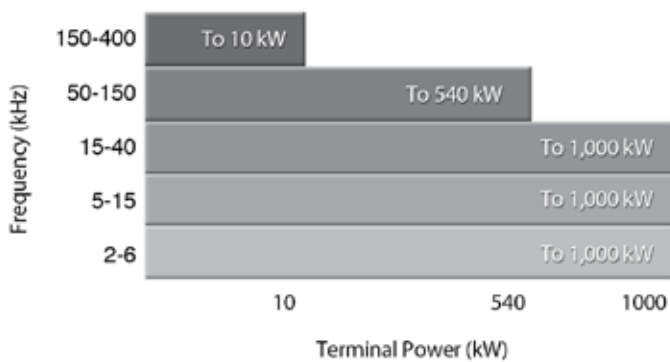
Flexible Solutions

Our systems allow for the placement of the power supply to be up to 200 feet from the work area and have a small footprint, or they can be integrated into a fully automated production process.

A Wide Range of Systems for Many Applications

EASYHEAT™ and EKOHEAT® with VPA Technology™ induction heating systems are right-sized for a multitude of applications. Whether heating nanoparticles, forming tiny medical devices, preheating large turbine blades or welding undersea pipe for the oil and gas industry, we can help improve your process.

Delivering power from 50 watts to 1,000 kilowatts over a frequency range of 2 to 400 kilohertz, we can deliver the optimal solution for your heating challenge.



System Features and Benefits

- Heats only your part; reducing wasted energy
- Easy-to-use display and control interface
- Movable workheads for versatile integrations
- 100% duty-cycle for demanding, automated processes
- Auto-tuning heats parts of many sizes, compositions and geometries
- Automation-ready with digital, 0-10 volt and 4-20 mA I/O
- RS 485 interface for serial control, monitoring and data logging
- eVIEW software for temperature and process monitoring
- Accepts a range of international mains voltages
- Configurable heating profiles for semi-automatic control and process management
- Range of water-cooling systems for varying ambient conditions
- CE marked



Free Application Testing From THE LAB



With a Reputation for Delivering Extraordinary Results, Our Applications Laboratory is the Gold Standard in the Industry.

Ambrell's Applications Laboratory – known in the industry as THE LAB – is where we solve our customers' most challenging heating applications every day.

Dr. Girish Dahake, Sr. Vice President, Global Applications, leads a worldwide team of elite engineers who are uniquely qualified to assist you with your heating process needs. Under the guidance of Dr. Dahake, our engineers have evaluated thousands of applications in THE LAB, so it's likely we have already assessed an application similar to yours.

Our team of engineers is world-renowned for producing extraordinary results. Our innovative and effective induction heating solutions consistently deliver performance excellence in one application after another. It's why THE LAB is the gold standard in the industry.

Have our team of expert engineers design and test the optimal solution for your application, free of charge. All it takes are three easy steps:

- 1. Send us your parts and process requirements.**
- 2. Our engineers will analyze your process and heat your parts to develop the right solution for your specific application.**
- 3. You will receive your parts back for inspection as well as a video of the heating process of your parts, and a laboratory report with a system recommendation.**

We also invite you to visit THE LAB where you can experience our state-of-art testing facility, which is fully equipped with Ambrell induction heating systems and hundreds of proven coils. In addition, you can interface with our engineers and see first-hand how they design prototype coils and develop effective solutions to maximize the efficiency of your heating process.



"Induction heating is a precise, repeatable and efficient method of heating. However, in order to maximize the benefits of induction, it's critical to have the correct system and coil design. Our global team of highly-skilled engineers look forward to assessing your application and making the right recommendation for your process."

Dr. Girish Dahake
Sr. Vice President, Global Applications

For more information, contact us today at +1 585 889 9000 or visit thelab.ambrell.com



About Ambrell

Founded in 1986, Ambrell Corporation, an inTEST Company, is a global leader in the induction heating market. We are renowned for our application knowledge and engineering expertise. In addition, our exceptional product quality and outstanding service and support are at the core of our commitment to provide a superior customer experience.

We are headquartered in the United States with additional operations in Europe including the United Kingdom and the Netherlands. All Ambrell products are designed, engineered and built at our manufacturing plant in the United States, which is an ISO 9001-certified facility. Over the last three decades we have expanded our global reach through an extensive distribution and OEM network, and today we have more than 15,000 systems installed in over 50 countries.



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