

EXPERT INDUCTOR DESIGN



PRECISION SOLUTIONS



HIGH POWER APPLICATIONS

- BRAZING
- SHRINK FITTING
- ANNEALING
- SOLDERING
- HARDENING
- METAL MELTING
- SHELL ANNEALING
- CARBIDE TIPPING
- CURING PLASTISOL
- CATHETER TIPPING
- CRYSTAL GROWING
- ATMOSPHERIC BRAZING
- FORGING
- GETTER FIRING
- BONDING
- HEATING
- HOT FORMING
- LEVITATION
- MATERIAL TESTING
- STAKING
- PIN SEALING
- PLASTIC REFLOW
- CAP SEALING
- CURING COATING
- METAL-GLASS SEALING
- MOCVD
- SUSCEPTOR HEATING



# Our Promise to You: Proven Heating 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 25 years of experience, Ambrell provides effective precision 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 innovative engineers and scientists are responsible for over 25 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.

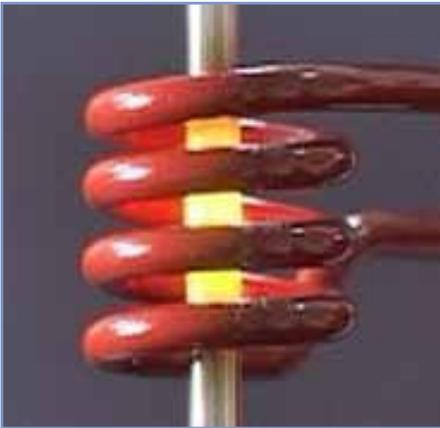
### Components of induction systems:

- **Power supply:** generates alternating current at frequencies between 750 Hz 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 (0.75-400 kHz) and power (50 watts to 1200kW)
- 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 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 one of our Applications Labs near you to work directly with our team.



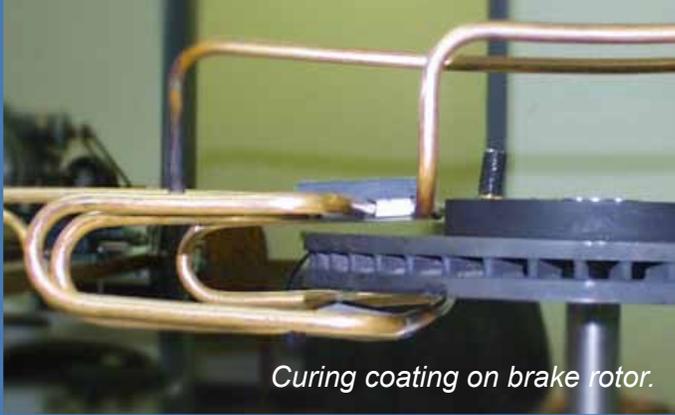
*Consumer products.*



*Inserting threaded inserts into plastic.*



*Oil and gas drill bit insert brazing.*



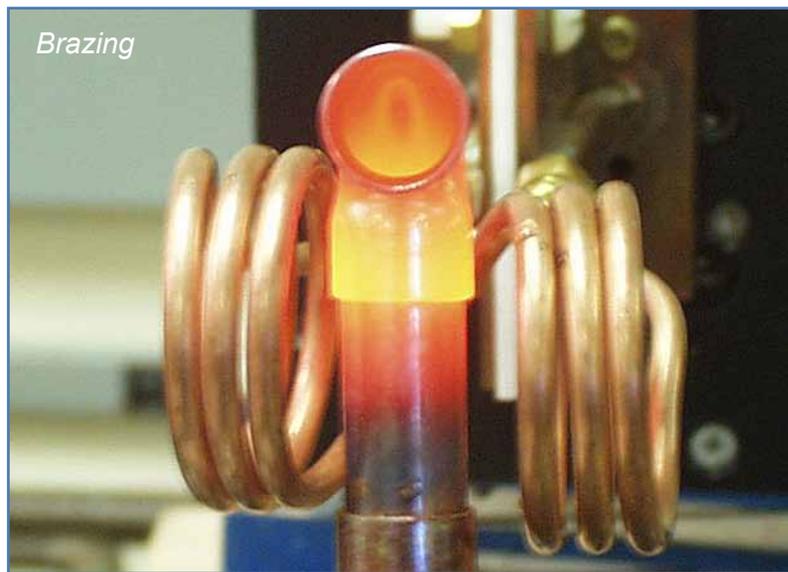
*Curing coating on brake rotor.*



*Fasteners:  
Thread patching and hot heading.*



*Pipe bending.*



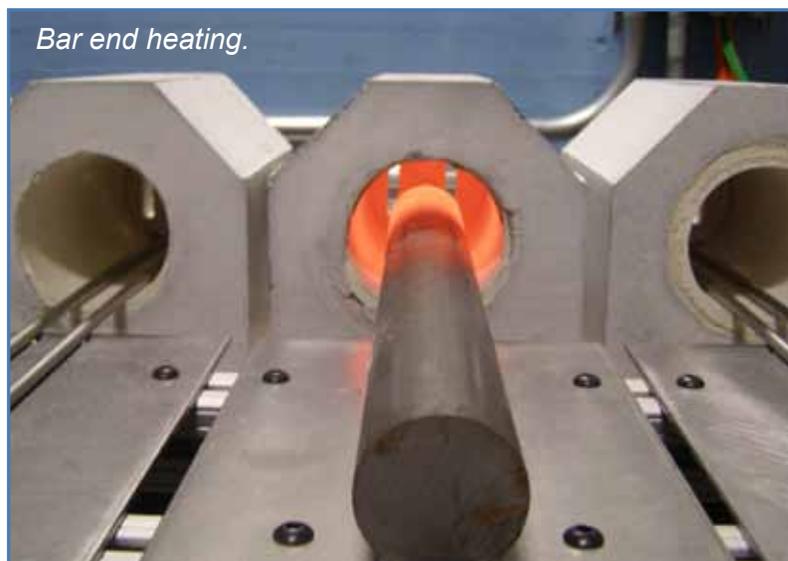
*Brazing*

## 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



*Bar end heating.*

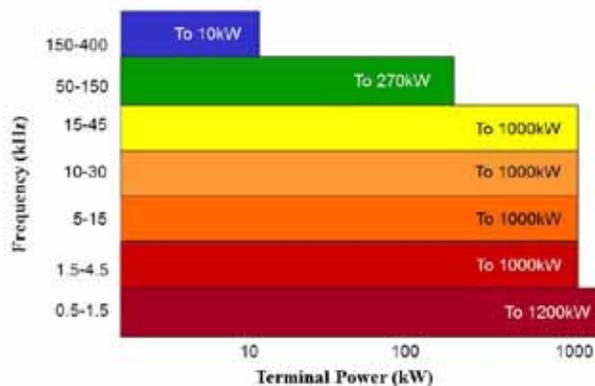
# Flexible Solutions

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

Our 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 1200 kilowatts over a frequency range of 0.75 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





**Understanding your requirements is the cornerstone of our commitment to quality solutions.**

## **You Are the Expert in Your Business. We Are the Experts in Making it More Efficient.**

You are the expert on your products and services; bring your heating challenges to our experts. We'll apply our extensive knowledge of applications and techniques to develop your custom solution.

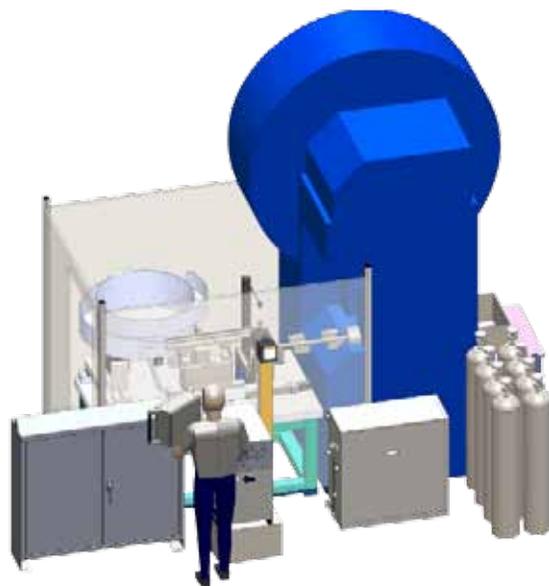
Partner with Ambrell for the very best technology, service and support to meet your unique heating requirements, cost-effectively, on-time and with confidence.

### **How We Can Help**

- Application analysis to understand your unique requirements
- Feasibility testing in our labs to determine the optimal equipment and settings
- Designing the most efficient coil configurations, fabrication and testing in-house
- Building and testing your heating system in our ISO 9001:2008 certified U.S. manufacturing facility

### **Factory-trained Technicians for Service**

- On-site system set-up and start-up
- Training your staff for optimum results
- Preventive maintenance
- Post-installation service
- Emergency service



*We partner with automation experts who provide a proven full turnkey solution.  
(Image provided by NuTek Industrial.)*





“The worldwide Ambrell team is dedicated to supplying the finest induction heating solutions, products, service and applications. We are committed to providing local resources and innovative solutions in key locations to support our customers promptly and professionally. We are the best at what we do, and will continue to improve our global organization to provide you with superior value.”

*- Richard Rosenbloom, Ambrell CEO and Chairman*



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