



Ambrell®
INDUCTION HEATING SOLUTIONS
an inTEST Company



Precision Induction Heating for the Semiconductor Industry

Experience the Excellence.™

Optimizing Crystal Growth with Induction Heating



Innovation Through Induction

Induction technology is a fast, clean, flameless method for heating electrically conductive materials. It provides a highly controlled environment for crystal growth by developing the required heat electromagnetically. Alternating current flows through an induction coil which surrounds a crucible. Eddy currents flow within and against the crucible's resistivity producing heat. While the coil itself never becomes hot, the mass is heated with unparalleled uniformity.

Great Potential, Serious Challenges

The growing demand from new energy efficiency industries represents tremendous opportunity for the semiconductor suppliers. However, there are pressing challenges when ramping up for increased production of the semiconductor industry raw materials, wafers and finished product. These processes require precision controlled heating in the manufacture of the raw materials or the crystals for wafers, or in the final semiconductor product. Let Ambrell provide a solution to your pressing challenges when ramping up your semiconductor manufacturing processes.

Ambrell is the Answer

Advanced induction heating from Ambrell can make your crystal growing and wafer manufacturing process more reliable, precise and cost effective. Our EKOHEAT products are specifically designed for semiconductor applications; they heat the crucible or wafer platen more uniformly and efficiently than resistance heating – our non-contact, electromagnetic heating technology decreases energy used, enhances productivity and delivers a superior quality semiconductor product. With Ambrell, the real end product is greater profit potential.

R&D Focused on Your Needs

We recognize that the semiconductor industry is constantly hungry for new technologies – the ongoing innovations essential for meeting escalating demands for increased performance. Ambrell has a long history and present commitment to conducting cutting-edge research and development and to continually delivering new and better manufacturing solutions for your specific needs. It's our policy to reinvest over 10% of our revenue in R&D – small wonder we hold over twenty technology patents and are recognized as the industry leader in solid-state induction heating.

Commitment to Precision

Our EKOHEAT solutions give your crystal growing system operator precise control of your heating process, and allow meticulous regulation of molten mass temperature. Our clean and exacting approach to heating in varying atmospheres supports growth of the highest-quality crystals. EKOHEAT design means output power is stringently regulated over AC line voltages from 360 to 520V, while output control is regulated from 2% to 100% of full power – to control the temperature both during the heating and cooling to ensure more of the Boule can be utilized. Accurate, frequency-agile tuning delivers the precise degree of power required for optimal quality under fluctuating load conditions, and accurately adjusts for process or set-up variations.

The Advantages of Ambrell

Smooth Process Integration

A core advantage of EKOHEAT induction heating systems is the ability to be smoothly and rapidly incorporated into your current production process. Our systems are readily customizable to your business needs — they're automation-ready, with full analog and digital I/O panels. They offer a small and minimally intrusive footprint, as well as external workheads if your process is remote. A built-in 110 or 220 Vac convenience receptacle accommodates your operation's instrumentation. In short, our solutions install with minimal downtime or modification to your existing setup—we'll have you up and running quickly with a new and more effective heating process.

Cost-efficiency and Productivity

Now more than ever, success in your business environment demands unsurpassed cost control and production efficiency. EKOHEAT systems are



designed with your bottom line in mind. Induction heating means the energy you pay for is focused exclusively into your materials, delivering measurable savings over resistive heating techniques. The reliability and consistency of induction heating reduces your defect rate and costs. Our 0.92 power factor further cuts energy costs, induction's targeted heating eliminates the expense of furnace ramp-up, and shorter heating cycles increase your production rates. The cost of water is reduced as well, through reduced cooling requirements.

The Ambrell Innovation	The Benefit to You
Choice of internal or external tank circuit	Internal tank reduces floor space near puller, while external tank minimizes clean room space
User-friendly operator interface with digital display	Provides clearer readings to reduce operator error affecting crystal quality
Power control using 4-20mA input	Supports higher crystal quality through control of power from 2% to 100% of full power
Frequency-agile design with more consistent power delivery	Better crystals, fewer defects
Easy system change-over for compatibility with different sized coils and crucibles	Improved production efficiency and lower heating costs
Quick on-time for full power	Eliminates need to scrap the Boule following short power outages, for enhanced crystal quality with less waste
Isolated high voltage output to 2500V	Higher inductance coils are powered efficiently, so larger crystals can be pulled.
Multi-zone heating through separate coils	Enables zone refining and precise control of temperature gradients for superior crystal quality
Low component count compared to other induction heaters	Fewer parts to fail, increased up time, lower part inventories and maintenance costs
Operator preset heating profiles allow "replay" of fixed processes	Reduced set-up time and increased productivity





*Our global reach includes a direct sales team along
with an extensive distribution,
channel partner and OEM network.*

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, channel partner and OEM network. Today, we have more than 18,000 systems installed in over 50 countries.



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