History

Steve Skewes and Dale Wilcox, former employees of Ameritherm, a world leader in the development, manufacture and application of RF induction heating power supplies and ready-to-use systems for protective atmosphere heating, founded Induction Atmospheres in Rochester, New York in September, 2002. Induction Atmospheres is exclusively dedicated to designing and building atmospheric induction systems aimed at lean and continuous flow manufacturing. Induction Atmospheres and Ameritherm remain strategic business partners; all Induction Atmospheres systems will incorporate Ameritherm's advanced solid state RF power supplies . Induction Atmospheres will manufacture, sell and service the Protective Atmosphere Heating Systems formerly built and sold by Ameritherm.

Background

The engineers at Induction Atmospheres have designed, built and marketed a core of four products that have gained wide acceptance in the aerospace, automotive and medical industries. These products include High Vacuum systems, Atmospheric Glove Boxes, Bell Jar Systems and Induction Furnaces. To complement these products, they have developed strong working relationships with *Fortune* 500 customers in the aerospace, automotive and medical industries.

Induction heating is a method of providing fast, consistent, economical heat for manufacturing applications which involve joining, or changing the properties of metals or other electrically conductive materials. The process relies on electrical currents within the material to produce heat. Although the basic principles of induction are well known, modern advances in solid state technology have made induction heating a remarkably simple, cost-effective heating method for applications which involve joining, heat treating, general heating and materials testing.

The basic components of an induction heating system are an AC power supply, induction coil, workpiece (material to be heated or treated), and tooling. The power supply sends alternating current through the coil, generating a magnetic field. When the workpiece is placed in the coil and enters the magnetic field, eddy currents are induced within the workpiece, generating precise amounts of clean, localized heat without any physical contact between the coil and the workpiece.

There is a relationship between the frequency of the alternating current and the depth to which it penetrates in the workpiece; low frequencies are effective for thicker materials requiring deep heat penetration, while higher frequencies are effective for smaller parts or shallow penetration. Power levels and heating times are closely related to the characteristics of the workpiece and the design of the induction coil. Coils are normally made of copper with appropriate water cooling and vary considerably in shape according to the application.

Induction Atmospheres is located at the Rochester Tech Park in Rochester, N.Y. The unique facility provides all the electric power, compressed air, chilled water, and environmental control necessary. Induction Atmospheres is also able to tap into the knowledge-based workforce in the Rochester area, for instance, hiring people from the Rochester Institute of Technology's (RIT) who

can provide a required skill set. In terms of entrepreneurship, Rochester offers programs through the University of Rochester's Simon School, Digital Rochester, and High Tech of Rochester that can help companies such as Induction Atmospheres thrive.

Situation Analysis

Induction Atmosphere's new Protective Atmosphere Heating Systems combine modern solid state induction technology with the recognized advantages of heating in a controlled environment. Designed for the brazing, welding, hardening and general purpose heating of conductive materials, these new systems deliver fast, precise, non-contact induction heat and eliminate the time-consuming, costly post-processing and cleaning required after normal atmospheric heating.

Heating in a normal atmosphere causes oxidation, scaling and carbon build-up on the parts. To clean the parts, applications of joint-weakening flux and expensive acid cleaning baths have traditionally been required. Batch vacuum and atmospheric furnaces solve these problems, but have significant limitations of their own because of their large size, poor efficiency and lack of quality control.

When compared to old-fashioned furnaces or flame heating techniques, Induction Atmospheres' new approach offers rugged reliability with 100% solid state design, maximum process repeatability with microprocessor control, and continuous flow / cellular manufacturing capability with speed and small footprints. Induction Atmospheres systems are highly selective, quickly heating only the joint or selected work area. This reduces cooling times, improves part quality, simplifies fixture design and maximizes fixture life. Individual parts can now be processed with speed, accuracy and consistency.

Induction Atmospheres offers complete system solutions for a wide variety of heating applications including brazing, heat treating, and pre-heating for welding. Each system is built around a solid state radio frequency induction heating power supply matched to deliver optimum results for each application.

Conclusion

As firms drive toward lean and continuous flow manufacturing, the need to drive out batch-oriented processes greatly increases. Induction Atmospheres' products and services eliminate many batch heating processes. The company is positioned to be the market leader in providing solutions to complex industrial heating applications in industries such as turbine engine repair automotive component and medical instrumentation manufacture.