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Location:

Headquartered in East Hartford in an historic mill building on the Hockanum River and in cyberspace at www.AFRinc.com

Business:

AFR has successfully developed innovative analytical instruments, R&D services, and software products, and has been internationally recognized as a leader in advanced Fourier transform infrared (FT-IR) spectroscopy. AFR conducts R&D in a broad range of technical areas, including gas turbine instrumentation, fuel cell components, carbon materials, biomass pyrolysis, mercury control, and epitaxial growth of thin films.
For more than 20 years, AFR has served a number of government, academic, and commercial clients, including DOE, DOD, NSF, NASA, DOC, USDA, MIT, BYU, Oregon State, Arizona State, Dow Chemical, ABB, Factory Mutual Research Corp, 3M, and Pratt & Whitney.

History:

Advanced Fuel Research, Inc. (AFR) was founded in 1980 by Dr. Peter Solomon, Dr. David Hamblen and Ms. Sally Solomon. The initial focus was to use advanced Fourier Transform Infrared (FT-IR) spectroscopy methods to understand the starting

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composition of coal, and to follow its behavior during thermal degradation reactions (pyrolysis). AFR was founded to pursue the development of clean fuels in response to the energy crises of the 1970's. However, with the collapse of oil prices in the early 1980's, interest in alternative fuels began to wane. The FT-IR diagnostic techniques that were initially developed for studying the reactions of coal and related materials were subsequently extended to a wide range of applications to measure gas compositions and temperatures, particle size distributions, number densities and temperatures, and the thickness, temperature, optical properties, and composition of thin films. Through this research, the AFR scientists and engineers became pioneers in FT-IR instrumentation and its applications, producing numerous patents and publications.
In 1991, a number of key AFR patents were transferred to a spin-off company partially owned by AFR shareholders. This spin-off firm, On-Line Technologies, Inc. (OLT), manufactures and markets gas-state sensors, wafer-state sensors (for the semiconductor manufacturing industry), process control software, and thin film monitors. OLT is now a part of MKS Instruments Corporation. An additional spin-off company was created in 2001, Real-Time Analyzers, Inc. (RTA) (continuous, real-time, trace chemical detection based upon Raman spectroscopy). TurboSense is a potential future AFR spin-off company, focused upon combustion diagnostics. Today, AFR has 14 full-time employees and 17,000 sq. ft. of office and laboratory space, while the OLT and RTA spin-offs have 35 and 4 employees, respectively.

Key People:

Peter Solomon, Chairman and Founder
James Markham, CEO and head of TurboSense Group
Michael Serio, President
David Hamblen, Chief Financial Officer
Marek Wójtowicz, Manager, Hydrocarbons Group
Joseph Cosgrove, Manager, Electronic Materials & Devices Group
Susan White, Company Treasurer and Secretary
Kenneth Wexler, Director of Business Development
Karin Dutton, Manager of Contracts & Proposals

Awards:

R&D 100 Award – four time winner
Small Business Administration's (SBA) 2000 Tibbetts Award
Associations:
Founding Member, Connecticut Technology Council
Founding Member, Small Business Technology

Coalition
Numerous technical associations

Most Difficult Assignment:

As discussed above, in 1991 AFR formed On-Line Technologies, Inc. (OLT) as a separate company to focus on commercializing AFR's innovative FT-IR spectroscopy technology. For a decade, AFR and OLT executives had a continuous challenge in working together, swapping key employees, sharing laboratory space, keeping two companies collaborative yet working for different clients, and reacting to changing market needs. OLT started off with a primary interest in environmental monitoring and developed over time into a world-class leader in semiconductor metrology and process monitoring instruments. On March 16th, 2001, AFR announced that OLT was acquired by MKS Instruments, Inc. (NASDAQ: MKSI) in an agreement worth more than $20 million.

Funny Story:

AFR has a wide range of research interests, from developing next-generation carbons for ultracapacitor electrodes to measuring the temperature of high temperature aircraft turbine blades (while they are spinning!). One of the more unusual areas that we have delved into is the area of chicken manure (more formally "biomass"). There are more chickens (~9 billion) than people in the United States, and the desire to make something from.... $%?#! is a real technical challenge. AFR has studied the practical uses of chicken manure as a source of fuel gases for remote off-grid power generation, but we still take a ribbing from our staff and others about this line of work (particularly when some of the manure experiments are underway).