

Test and Measurement Equipment for Low Temperature Research Experiments



Michael Swartz
CEO

CEOCFO: *Mr. Swartz, would you tell us about Lake Shore Cryotronics?*

Mr. Swartz: We provide sensors, instruments, and systems that help researchers characterize, or define the properties, of electronic and magnetic materials. These materials may end up in your cell phone, computer, motors, or other electronic devices 5 to 15 years from now. Our primary customers are researchers at universities and national labs around the world. Our company vision is to provide easy to use, high value, and high performance products.

CEOCFO: *Would you give us a few examples of an item that you have available and how it could be used?*

Mr. Swartz: We provide the test and measurement equipment that allows researchers to experiment at very low temperatures, down to almost absolute zero on the Kelvin scale. The physics of materials changes a great deal as you go down in temperature. In fact, many electronic materials are actually more efficient at low temperatures. For example, the charged-coupled device (CCD) in your cell phone that takes photographs was invented long before there was a consumer application. The original CCDs were cooled to low temperatures in order to be effective. Much scientific research was done to make the CCD work at room temperature. Another example is two researchers in Europe who discovered an interesting magnetic sensor that worked at 4 Kelvin (4 degrees above Absolute Zero). They published papers about this interesting material. A researcher from IBM then picked up the research and developed a sensor with similar magnetic sensitivity at room temperature. This new sensor led to the development of hard disk drives with more than an order of magnitude more capacity.

CEOCFO: *How do you decide which project to work on?*

Mr. Swartz: We are constantly working to develop new and improved tools that allow researchers to study the properties of materials. Our goal is to provide everything from the sensors, to instruments, to complete systems that enable researchers to characterize materials in cryogenic and magnetic environments. For example, we are currently developing a system that uses terahertz energy to characterize materials. This system will provide different kinds of information to researchers from what they can get today with existing tools.

CEOCFO: *What is the competitive landscape?*

Mr. Swartz: We sell cryogenic temperature sensors that range in price from a hundred dollars to a couple thousand dollars. We are the world leader in providing calibrated sensors that exhibit a high degree of repeatable precision. We came to dominate this market because of the trust we have built up with researchers around the world. We built upon that trust by then offering instruments to read the sensors, then again for entire systems that provide complete turnkey solutions, which includes sophisticated control software. When surveying the competitive landscape, there are only a couple other companies that make cryogenic temperature sensors. They often serve different niches, but in our niche, they are not as competitive. Instruments are a bit easier to build, so we have a fair number of competitors around the world, but again, they only partially overlap our product line. Since the system products are capital equipment, we have a wide variety of competitors there. In fact, some of our competitors actually buy our products and incorporate them into their systems. There is a wide mix and not many direct competitors for everything we do.

CEOCFO: *When a customer comes to you, do they know what they want or are you helping them with that?*

Mr. Swartz: Our customers are typically people who are either graduate students or professors in physics or material science. They typically know what they want within a broad range because they know the types of materials they are studying and generally how to measure those materials. We help them narrow down their selection by informing them on what is possible with current technology and what their options are. In general, they know what solutions we provide. We help them select and configure the specific tool or system.

CEOCFO: Do customers come to you directly or do you have a network of providers and distributors?

Mr. Swartz: People come to us directly. Domestically in the United States, most of our sales are direct. For overseas, because of logistics issues, language, and timely product support, we have international dealers.

CEOCFO: How is business these days?

Mr. Swartz: Business is steady since we primarily sell to people doing basic research that normally receive their funds through the government, both domestically and internationally. Throughout the financial downturn, we were relatively steady. We have been able to grow internationally as the U.S. has invested less in basic research over the years.

CEOCFO: Do you need to maintain a large inventory?

Mr. Swartz: Because of our wide variety of products, we have a relatively large inventory. We sell products with a wide selection of features and performance levels. Combine this with a small manufacturing capacity, and we end up keeping a fair amount of product at various stages of production so we can meet customer demand.

CEOCFO: What is the key to handling a complex inventory as well as complex distribution?

Mr. Swartz: We use Enterprise Resource Planning (ERP) software to manage our inventory and control workflow. The software tool is incredibly important, but even more important is the need to have good people who understand how to use the tool properly. The people are a critical aspect of any sort of valuable implementation of an ERP solution.

“I think the future belongs to those who collaborate.” - Michael Swartz

CEOCFO: Where do you manufacture?

Mr. Swartz: We manufacture here in Westerville, Ohio. For some aspects of our product, we are kind of a screwdriver factory. For example, we do not actually manufacture the printed circuit boards that go into our instruments. We have those done by a company that specializes in doing printed circuit boards. We bring them in, assemble them in our instruments, and perform the testing and calibration. The ability to calibrate and recalibrate the instruments is one of the key values that we provide.

CEOCFO: Is it difficult to find people to work at Lake Shore or to understand what is needed for your company and industry?

Mr. Swartz: It can be. It is surprising that we have manufacturing entry-level assembly jobs that pay about fifteen dollars an hour, but is often hard to get people to apply for those jobs. It can be a challenge to attract technical people like engineers or scientists to a smaller company. Often those individuals are attracted to the big-name companies. We are often successful by selling the advantages of a small company, and we are fortunate because of our close working relationship with scientists doing leading edge work.

CEOCFO: What surprised you as the company has developed?

Mr. Swartz: What surprised me the most is described in Thomas Freidman's *The World is Flat*. One of the advantages of being in the physics community is that the world is actually a small place. Though we attend conferences, do collaborations, and joint development with scientists in Japan, China, Europe, and in most of the developed world, the actual community is rather small. I think that was one of the interesting things that surprised me.

CEOCFO: Why is Lake Shore Cryotronics a noteworthy company?

Mr. Swartz: Scientist the world over trust our products to provide accurate measurements of cryogenic temperatures, magnetic fields, and to provide noteworthy characterization of electronic and magnetic materials.

CEOCFO: Final thoughts?

Mr. Swartz: I think the future belongs to those who collaborate. We have been collaborating with researchers around the world to help them move science forward. The big discoveries are not coming from one person in the science lab. That is one of the things that has changed since the early days of scientific investigation. Because things have gotten so complex, to make advances, it takes dedicated teams of people collaborating.

Interview conducted by: Lynn Fosse, Senior Editor, CEOCFO Magazine

For more information visit: Lake Shore Cryotronics, Inc. - www.lakeshore.com

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