

Customizable Chemical Agent Detection System



Bret Bader - CEO

About Owlstone Inc.

The Owlstone detector is a revolutionary dime-sized device that can be programmed to detect a wide range of chemical agents that may be present in extremely small quantities. Using leading-edge micro- and nano- fabrication techniques, Owlstone has created a complete chemical detection system that combines the features of low manufacture cost and small size with the highest level of performance. There are numerous applications, across industries from security and defense to automotive and healthcare, that depend on the rapid, accurate detection and measurement of chemical compounds.

Owlstone works with market leaders within these applications to integrate its detector into next generation chemical sensing products and solutions. Owlstone's technology offers a unique combination of benefits, including: small size, low manufacturing costs, minimal power consumption, reduced false-positives, and a customizable platform.

At the heart of this platform is a ground-breaking solid state sensor whose operational parameters can be fine-tuned to detect a wide range of airborne or dissolved chemical agents in extremely small quantities. Originally developed by the company's founders at the University of Cambridge, these pioneering technologies have already won Owlstone widespread commercial and academic recognition.

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

CEOCFO: Mr. Bader, your website indicates next generation detection. What have you figured out at Owlstone?

Mr. Bader: For the past 4 decades, designers and manufactures of detection solutions have been trying to manage the same challenge. How do you deliver a high performance chemical detector, in a form factor that is handheld, easy to operate and cost effective. Generally, the market is divided into two categories. You have laboratory-based spectrometers that offer strong analytical capability, but are not mobile, can be cost prohibitive and in many cases require a specialist operator. On the other end of the spectrum, there are many mobile and cost effective chemical detection products, but they come with a dramatic reduction in performance. At Owlstone, we believe we are revolutionizing the space of chemical detection by combining all of these features into a single offering. We provide the analytical power of a laboratory-based spectrometer, in an easy to operate, cost effective devise that will fit in the palm of your hand.

CEOCFO: How are you able to do it?

Mr. Bader: We have developed a detection technology that takes the form of a microchip. Our sensor is an extremely sensitive, highly selective, reprogrammable spectrometer that will eventually integrate into a cell phone. When considering the features of size, cost and performance, a microchip-based sensor can deliver the ultimate desire for size and cost with little challenge. The more critical feature was high performance. This is where Owlstone truly separates itself. Our technology is not only suitable for miniaturization, it benefits from it. Our sensor looks at the behavior of an ion as it passes through a rapidly varying electric field. When the sample passes through the electric field, it has a path which is unique to that chemical and allows it to be classified. The parameter that drives performance of this technology is field strength, therefore, the stronger the electric field, the better the performance. We utilize state of the art micro fabrication techniques to deep etch extremely narrow gaps on a microchip, allowing incredible field strengths to be achieved, without requiring a tremendous input voltage. In essence, our technology is a perfect storm, where the features of miniaturization and cost optimization naturally exist with performance.

CEOCFO: Where are you in the process?

Mr. Bader: We are a platform technology with a core package that sits as the heart of all of our products and have commercialized the technology into our first series of systems. The future of Owlstone is a sensor that will integrate into a cell phone, however, our initial strategy was to get to market quickly with products that already meet or exceed the standards for size and cost, while offering dramatically improved performance. With initial funding by the US DOD, we offer solutions in military and defense, as well as industrial process control products and scientific instruments. Our

technology is also deployed in medical research where we have demonstrated the ability to identify markers that indicate the onset of disease, including cancer.

CEOCFO: *You clearly have potential and solutions in many different industries. How have you decided what to work on first, what to develop now and as you go forward how will these decisions be made?*

Mr. Bader: The potential for the technology is broad, and one of our great challenges was trying to figure out where to go first. The market that was obvious to us was military and defense, and we have been pursuing this from the onset. This was a good fit for a number of reasons. The first, being that the US military saw the potential and provided a significant amount of funding to help develop the technology. The second is that the requirements are well defined. We know the standards for detection and we know our competitors and where they have limitations. It is a very clear and well-defined landscape. We believed that we could be a game changing technology in this space. Lastly, it is a very large marketplace. In addition to military, we wanted to pursue other opportunities. We did so by forming commercial partnerships. Because our technology is a platform technology, whether you are detecting chemical warfare agents on the battlefield or acetone in someone's breath, the core technology remains the same. What enables the application is primarily software. We went out looking for industry leaders; in spaces, we believed our technology could provide a powerful offering and created collaborations that would not only develop solutions for these markets, but also fund the development. That led us to where we are now--serving four separate markets and in my opinion building four businesses each with great value creation potential.

“Protecting soldiers and government infrastructure is critical for all of us. But Owlstone is going to be so much more than that. The power of Owlstone’s technology is not just going to have implications for the men and women who serve in our military or work in government. It has the potential to affect everyone, everywhere, every day.” - Bret Bader

CEOCFO: *How do you handle the challenges of developing four separate businesses? How do you as CEO give everything its proper weight and proper consideration?*

Mr. Bader: You have heard this before but it is always true. The number one goal of a CEO is to surround yourself with people who are hopefully a lot smarter than you are. I am fortunate to have been able to do that at Owlstone. In addition to great people, we also made certain that we had the appropriate information to make the best decisions. This became even more critical as we were looking to develop our technology and fund this business during the worst economic conditions of our lives. As a result, we had many challenges with managing cash flow. Making sure that we had the right partners to help drive the development we could not fund internally what was critical for us. We first evaluate the size of the potential market and the likely technical risks. We also look at the cost of developing the solution, the source of funding and the time to monetize. How we weight these areas however, is dependent on where the business is from a capital perspective. For example, back in 2008 and 2009, when things were more difficult from a cash flow perspective, we would put more weight on external funding, or collaborating with organizations willing to pay for the development. We also put more weight on the time to market, or how quickly we could generate revenue. Those criteria were more important back in 2008 and 2009 because of the external environment being managed. Ultimately, we now try to create a mix. As a young business, generating revenue is important not only from a cash flow perspective, but also to demonstrate the ability to transform from a company that is developing technology to a company that is selling products. We recognize that it is ultimately about creating value and in some cases neither value nor revenue is perfectly aligned. We try to get a mix of satisfying the needs of the business from the cash flow perspective with applications that we know are low technical risk, quick to market and have funding, with longer term and potentially more risky ventures, that will support tremendous growth and value.

CEOCFO: *Owlstone has received a number of cash awards and recognition. Often it is not just the value of the product, but it is how it is presented. What do you understand about that process and how have you been able to achieve success in this arena?*

Mr. Bader: First, you are right. How you present your business means everything. There are wonderful technologies that if not presented properly will not get traction. We do have an advantage as the story really speaks for itself. We are able to go and make claims and then back them up. When we say that we have a microchip-based sensor that provides the analytical data of a much more expensive, laboratory based spectrometer; we have the data to back it up. Certainly as the CEO, I need to promote the business and I do so as someone who is completely convinced that what we are delivering is revolutionary. We have made our share of mistakes, have a great deal of humility and are fortunate to be in the position that we are.

CEOCFO: *What is next for Owlstone?*

Mr. Bader: We are on the verge of some critical milestones. Major contracts are being awarded within the US DOD, which projected to receive. We are also waiting on results from strategic initiatives in our other markets. For the remainder

of this year, we are going to continue to execute on our strategy and drive significant growth with our current commercial products. We will also look for the right strategic partnerships to pursue future development. In addition to cell phones, our vision is to evolve into a sensor that can integrate anywhere. Homes, rail cars, buses, shipping containers and fence lines will all have the ability to monitor chemicals in the air. That is the future of Owlstone.

CEOCFO: *Put it all together for our readers. Why pay attention to Owlstone right now?*

Mr. Bader: Owlstone is a technology that is going to be able to do far more than standard chemical detectors. When people think of chemical detection, they usually think of military and homeland defense and rightfully so. Protecting soldiers and government infrastructure is critical for all of us. But Owlstone is going to be so much more than that. The power of Owlstone's technology is not just going to have implications for the men and women who serve in our military or work in government. It has the potential to affect everyone, everywhere, every day. Our technology will be able to analyze body chemicals to monitor your wellness and diagnose diseases at the very earliest stages. Imagine being able to manage treatment continuously and remotely from your cellphone as opposed to having to go the doctor. Having sensors in your home will also become a reality. Where in addition to monitoring the quality of the air we breathe and the food we eat, we will be generating data that can create services and applications that will potentially change how we live our lives. In fact, I do not think we can fully define how deeply Owlstone can potentially affect the future. We do know that the miniature, cost effective and powerful platform that Owlstone delivers, enables it.

CEOCFO: *Your enthusiasm is clear.*

Mr. Bader: I love this company and I believe in what we are doing. The team we have assembled is second to none, as far as I am concerned, and I feel privileged and proud to be part of it. We have a bright future.

BIO: Over the past 20 years Mr Bader has held several senior management positions with leading manufacturers of security screening equipment and sensor technologies, including EG&G Astrophysics, Heimann Systems and Smiths Detection. Prior to his appointment as CEO of Owlstone Inc. he served as General Manager and Vice President of Smiths Detection, The Americas. Mr Bader joined Owlstone in April 2006.



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