

ASI TODAY

A newsletter for customers of Analytical Sensors & Instruments Ltd.

Spring 2008

From the GPs Desk



Peter Cai
General Partner & CFO

A couple of weeks ago, we started Day Light Savings Time. While I was adjusting the time on our clocks and watches, it struck me that we were already in Spring! There is a saying, "Time flies when you have fun". I would say, time flies when we are busy. January and February this year, we had solid growth over the same period of last year, for which we highly appreciate all of your support. We could not have done it without your continuous contribution to our business.

While we have been very busy this year, we miss our President and CEO, Brian Williams. He has been deployed since late January this year. This time he will go to Afghanistan to fulfill his duty there. We sincerely respect his dedication to our country and fully support him. Last week, he finished his orientation period for his deployment and participated in our booth duty at PITTCON 2008. We were all excited to see him there. He has lost weight, but looks good and fit. Last Saturday, we had a wonderful party to say goodbye to him where we hugged him with mixed feelings. While we thanked him for his contribution to protect our country and world peace, and expressed our respect to him; we strongly felt that we would

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There's More than Meets the Eye! ASI's Original Equipment Design & Manufacturing Capabilities

By now, many of you have received or downloaded our NEW General Catalog describing our capabilities, services and of course, our products. If you haven't seen a copy, it is available on our website at www.asi-sensors.com. Our catalog represents just the tip of the iceberg in regard to what we have designed, helped design, and manufacture every day at ASI. The vast majority of the products we deliver have been custom-designed for our Original Equipment Manufacturers (OEM's).

ASI has invested a significant amount of time, experience and capital in the development of sensing glass formulas, sensor technologies, glass-blowing techniques, reference electrode technologies, electrochemistry research & development, engineering capabilities and of course manufacturing and assembly capabilities. The design of pH sensing glass, as we discussed in the Winter 2007 Newsletter, is very much a performance and

application oriented process with a "made by hand" methodology. Glass blowing is a highly specialized process and unlike some of our competitors, ASI believes this process should not be automated by machines or mass production processes. Our team of glass blowers and glass workers in both Sugar Land and Shanghai are very experienced craftsmen using glass blowing techniques that have been refined to produce the most consistent and highest quality production. We can help meter manufacturers and other electrode suppliers meet their customers' needs for high quality sensors without investing the tremendous amount of time and money necessary to do this on their own. Talk to your account manager at ASI to discover the many ways to leverage our expertise in this area.

All good technologies find their way to formal drawings and manufacturing documentation. ASI can assist you in the development of electrode designs from conception to product

ASI – your one stop shop for:

- ➔ Drawings and Manufacturing Documentation
- ➔ Research & Development Assistance
- ➔ Engineering services for existing and new products
- ➔ Customer application guidance
- ➔ Electrode design, manufacturing or component supply
- ➔ Low-cost tooling design
- ➔ Low-cost manufacturing of plastic components
- ➔ Machining capabilities
- ➔ Private-labeling and drop shipment capabilities
- ➔ Custom solution bottling

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Dave Ruane, Kimberly Morgan
& John Pham

ASI Sales Team at the 2008
PITTCO Show

There are 5 key members to the ASI Sales Team. The backbone of this Team (pictured right) is Vera Qiu, Customer Service Manager, and Charley Cai, Sales Support.

Many of you communicate with Vera regularly via email or by phone. She answers many questions every day while placing orders in our system and communicating any changes to our manufacturing team, all with a smile on her face! In her free time, she enjoys spending time with her husband Charles of 13 years and her daughter Lang.

Charley is often behind the scenes verifying that shipments are sent correctly (and on time), completing labels for products and most importantly processing invoices. Charley has worked for ASI since 1996 and it often referred to internally as the 'it' guy because of his willingness to help anywhere in the company with any project. Charley and his wife Ming are proud of their son Zubo who will graduate from the University of Texas next year.

Dave Ruane joined as a Sales Engineer for ASI over 1 year ago and has brought over 15 years of electrochemistry and water technologies experience with him to ASI. He shares an office in Ft. Collins, Colorado, with ASI's Vice President of Engineering and spends his spare time outdoors with his family, or riding his motorcycle.

John Pham is the most recent addition to the Sales Team. As an Account Manager he

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miss him in our day-to-day management at ASI. He has done an excellent job at ASI as the President and CEO.

Since Brian is deployed, I have now to come back to manage ASI. I am confident that with all of your support, the efforts from our senior staff, Frank, Steve and Kimberly, and the efforts from all our employees, we will continuously grow.

Thank you all again. I also sincerely thank our Lord for His faithful blessing.

Wish all of you a very best 2008.

Peter Cai

General Partner & CFO



Charley Cai, Vera Qiu
ASI Customer Service Team

manages existing and new accounts. He has quickly learned the industry and electrode technology. John graduated from Texas A&M University with a degree in MIS in 1992.

When he is not working, John enjoys golfing, woodworking, and spending time with his family.

Kimberly Morgan joined ASI in 2006. As the Sales Manager, she is in charge of all aspects of ASI's sales and marketing efforts. She graduated from Texas State University with a BBA in Marketing. On a daily basis she ensures that all customers' needs are being attended to quickly and with all available resources. On the weekends she enjoys various outdoor activities including spending time with her son Marshall at the lake.

The ASI Sales Team is here to help you with all aspects of your business needs – from helping you develop new products to resolving a customer's technical issue. Please contact us anytime!

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improvement and modification. Our team of engineers knows electrochemistry and what works and what might need more joint discussion and development. Before we build test samples we develop drawings. We can use yours or create them ourselves for your review. Leverage our engineering services for the benefit of your design needs!

ASI's engineering and manufacturing capabilities are being tapped by many of our long-standing OEM relationships and we can help you too. In this day of outsourcing and driving towards lower cost manufacturing, ASI is an excellent option for both. With our joint operations in the US and in China, we can deliver on both. Our long-standing, loyal employees in our China operations are also bound by the same confidentiality agreements as our US operations. The US and China facilities are fully owned and operated by Peter and Yuxian Cai.

ASI has been very successful in the past 19 years by delivering quality- high performance electrochemistry solutions that can help you expand your product portfolio without the investment requirements that are typically accrued. These solutions have expanded recently to include not only our dependable and popular pH, ISE, DO and Conductivity electrodes, but also engineering services, plastic parts, tooling, lab accessories, custom enclosures and assembly work. Partner with ASI on your product needs and join the hundreds of satisfied clients that ASI has had long-standing relationships with.

Common Ordering Question

Question: What is the standard lead time of an order?

Answer: The standard lead time for orders to ASI is 10 business days (plus transit time). ASI strives to ship all orders sooner, but large orders require more time (with short shipments if you desire). Orders for products manufactured at our facility in China have a standard lead time of 15 business days (plus transit time), once again depending on the order size.



Dr. George Barone
Senior Research Chemist

In the last newsletter, we discussed glass and glass sensors, however the reference junction is also a critical part of the electrode system. The reference junction is a small but very important part of any combination probe or reference electrode. When the junction is working properly you can hardly notice it is there but when it has a problem it gets a lot of attention. The most common issues with junctions are that they get clogged or they get air bubbles trapped on them. In either case the impedance of the reference electrode increases dramatically and the probe you are testing will drift, take a long time to endpoint, and will arrive at an incorrect potential just to name a few of the issues. In other words an improperly functioning junction makes the whole probe measurement look incorrect!

The primary roles of the reference junction are to keep the reference filling solution separate from the sample and the sample away from the reference system while still maintaining an electrical connection between the two. The purpose of the reference electrode is to supply a constant unchanging potential regardless of the solution you are measuring. The purpose of the junction is to keep the sample from contaminating the reference electrode or the filling solution and changing the reference potential. Ideally the reference filling solution should slowly leak ions into the sample (creating a 'salt bridge'). This is to allow the reference electrode to provide a pathway for the test electrode to "see" the reference and to complete the electrical or potentiometric circuit internally in the solution for the measurement. The potentiostat meter you are using will "see" this connection between the test electrode and the reference and will measure the potential

difference between the two electrodes.

There are many types or styles of reference junctions and they all have many different names or descriptions. They include an open or free flowing junction, a frit (often called a wick or pin), and an annular junction, and they all come in many different shape and design options. The junctions can be made to have a large flow rate or a very small flow rate. The open or free flowing junction has no real physical boundary between the reference electrode filling solution (or gel) and the sample solution. This type of junction can be as simple as a small tube or a trapped, film of electrolyte (filling solution). The key to this junction is that there is a force (usually gravity) to direct the flow of electrolyte into the sample. These types of junctions usually have very low impedances but tend to clog and foul quite easily, requiring more attention to refilling. These also tend to dilute the sample over long periods of time. The frit type of junction can range from a ceramic pin, to a piece of fabric, to a porous plastic pin or a variety of application specific designs. Basically each of these types has small micro-channels for solution or ions to flow out of and can be thought of as a simple barrier to diffusion. These types of junctions can become clogged by sample constituents forming a precipitate or a solid blockage with the reference solution or gel. The annular junction is a junction that is a type of frit (either ceramic or other porous material) that fits completely around a test probe body (like a pH stem).

These junctions can also be combined in multiples to make a double junction (or triple, or ...) and this just makes contaminants in the sample that much harder to get to the reference filling solution. I did not mention that the typical reference filling solution contains ions that can poison the sample and damage what you are measuring. Making a double junction allows a benign filling solution to be placed between the sample and the reference that can be customized to fit your samples.

There are so many different combinations and permutations of the reference junction that the best thing is to call your ASI sales representative and they can fit your application to the correct junction type. My final point about junctions is that they all have different ways to store, care for, and clean them. Please see the information ASI supplied with your probe. Typically the reference junction likes to be wet with a solution that is most like the reference filling solution or is very compatible with the filling solution. There is a competition however between what the junction likes and what the sensing element of a combination probe

likes. If there is an incompatibility however the sensing element should be prioritized. For instance the PVC ISE sensing elements like to be stored dry but the junctions like to be stored wet. In those cases the sensing element is the more critical of the system and we store the probes dry. When you soak the PVC ISE you also soak the junction and the system is ready to measure with.

I hope this has helped you with a short explanation of a very important part of your probes that is usually overlooked. The best way for you to get the best junction for your measurement system is to call ASI and we can discuss the details of your samples and provide you with the best junction possible. I look forward to writing to you in the summer and I wish you a happy springtime.

Warranty Question

Question: I have returned my warranty-review products with an ASI issued RMA number, when will ASI contact me with warranty status information?

Answer: The quality group will inspect and test each electrode that is returned to ASI using the same criteria as final production testing. In certain circumstances, the probes are often analyzed by the ASI Lab. Normally we can provide answers to you within 15-20 business days. At that time we will let you know if the problem is warranted and if so, when your replacement order will be shipped.



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RETURN SERVICE REQUESTED



Brian Williams
President & CEO

Dear Customers & Friends:

It was great to see many of you again during the Pittsburgh Conference (PITTCON) exhibition at the beginning of March in New Orleans. This event is one of my favorite events to see what is happening in the industry and I regret that I will not be able to attend next year's show (ASI's 20th Anniversary) due to my current deployment to Afghanistan.

As you all know, I have been deployed with my unit in the US Army Reserve to Afghanistan. Currently I am writing this article sitting in a large briefing hall hearing a duplicate briefing on mitigating combat stress that I attended about 20 days ago at Fort McCoy, WI. The army is big on duplication to ensure that we absorb as much of the information as possible. While I am not quite out of the US yet - I fully expect that my next article will come directly from Afghanistan with pictures!

I hope you enjoy the photo here of me standing at the fragmentation grenade assault course (and no I did not gain all of my weight back, I am in all of my brand new body armor and pads which adds about 35 pounds of additional weight) waiting for my turn to low crawl through the snow and lob my one practice grenade at the targets - FYI I nailed it!

ASI is doing well and I am staying abreast of all activities and trying my best to provide helpful assistance when possible. If during the coming months you would like to contact me, please do not hesitate to use my ASI email address, bwilliams@asi-sensors.com, as I will continue to check it on a regular basis and respond as soon as I am able. I hope all of you have a wonderful Spring.

CPT Brian D. Williams