

ASI TODAY

A newsletter for customers of Analytical Sensors & Instruments Ltd.

Fall 2006

From the President's Desk



Peter Cai, President

Dear Customers and Friends,

Greetings from Aurora in Shanghai. I have spent most of my time this year in Shanghai managing Aurora. Though, I miss ASI and my family in Sugar Land terribly, I have been overwhelmed by the excitement of Aurora's growth. I would like to report two major aspects of the growth to you all.

First, we are expanding our plastic tooling and molding capabilities. We recently leased a 4,000 sq ft space close to Aurora, invested in new equipment, hired additional capable employees to produce more quality molds and molded products. With this development, we could serve our customers with higher quality plastic parts and decrease delivery times.

Secondly, we just completed the Aurora Website in Chinese. We are promoting ASI and Aurora with more efforts in the China market. Aurora's Website in English will be completed by the time you are reading this newsletter. The web address is www.aurora-sensors.com. I sincerely welcome you to visit Aurora's Website.

We are continuously working to improve Aurora and developing her to meet world standards, so that we could serve you all better.

May the Lord bless all of us generously in this exciting 2006.

Peter Cai

Original Equipment Manufacturer (OEM)

Being an OEM of electrochemical products, ASI is exposed to many types and styles of products. From standard electrochemical products (pH, ORP, conductivity, DO, and ISE's) to custom products, ASI has the experience in designing and manufacturing products for the laboratory and process industries. We utilize the newest technologies and techniques and follow international design standards (ASTM, DIN, SPI, IEEE, ACS, etc.).

After the Sales Department receives the customer requirements, samples, and/or drawings, the design process starts in the Engineering department. Using basic mechanical, electrochemical, electrical, and electronic design principals, we analyze the product required and set specifications for all the different parts and assemblies. Depending on the electrode type and application, there are many design factors and criteria including but not limited to glass type, body material, internal fill solutions, SJ/DJ, temperature element, anode/cathode materials, non-refillable/refillable, membrane material, connector type, cable type and length, and packaging type just to name a few. From body material, o-rings, threading types, to adhesives and manufacturability, all aspects of the product are defined. We use 3-D CAD software for all our designs which allows form and fitment to be first analyzed in virtual space which in turn

OEM continued on page 3...



Hello again everyone, I hope you are having a great Fall. We are writing about our ammonia electrode in this issue and I thought I would share the "secrets" on how it works.

This probe is in a class of electrodes known as gas sensing electrodes (our three types of GSE probes measure carbon dioxide, nitrogen oxides, and ammonia). This class of probes has been traditionally listed with ion selective electrodes (ISE) in most producers catalogues.

The basic theory of operation is that ammonia in solution will diffuse across a selective membrane and will change the pH of the solution behind the membrane. The pH electrode in the probe will detect this change in the pH. The calibration of the sensor correlates the amount of ammonia in solution (it is easier to make ammonium solutions and convert with a base) to the change in the mV output of the pH probe. That is the basic theory of this probe. I will now provide more details on each part of the probe that is not a "trade secret".

One of the main keys of this probe is the pH electrode inside. The important, crucial feature of this probe is that the pH sensing glass of this electrode must be smooth and flat. Fortunately, the glassblowers here at ASI are very talented and they make extremely smooth and flat pH sensing glass for this type of application. I still am impressed with the ability of our glassblowers to make these probes so flat and smooth repeatedly. The internal filling solution (IFS) is designed

Corner continued on page 2...



Analytical Sensors
& Instruments Ltd.

Measuring Your Success™

Ammonia Gas Sensing Why?

Ammonia, known as NH_3 , is a colorless gas with a pungent odor and is both toxic and corrosive. It is used in everything from fertilizers to explosives and is also found in many household cleaning products.

Ammonia is classified as being environmentally dangerous because it is highly toxic to aquatic life and is one of the biggest killers of aquarium fish. It is essential to test aquariums and aquatic areas to ensure that the ammonia is at a safe level. Ammonia toxicity is linked directly to pH, so it is critical to test both. Humans and mammals having specific mechanisms to prevent any buildup in the bloodstream, but fish do not possess this and continually excrete metabolic ammonia in the water. In lakes and rivers these levels are normally diluted by nature, but a confined space such as an aquarium, pond, or fish farm requires monitoring.

For health and safety reasons, wastewater treatment plants monitor ammonia levels before wastewater re-enters a body of water, land, or is reused in any manner.

Ammonia is often used as an ingredient in fertilizers and as a fertilizer itself. By forming a solution with irrigation water ammonia can be used for fertilizing without additional chemical processing. In this process it is essential to have the right quantities of ammonia present. Measuring the soil pH at this time is also essential.

ASI offers an ammonia gas sensing electrode (GSE) that can measure the level of ammonia in a solution. This potential is then measured against a stable reference.

Since this electrode has a removable membrane, it is easy to clean. If not in use for several hours, it can be stored dry, otherwise in a low concentration solution.

Corner continued from page 1...

so that the pH will change predictably when the ammonia diffuses into the probe. The only interferences listed by manufacturers for this probe are volatile acids that can diffuse across the membrane and lower the pH of the internal. Personally however, I would be concerned with any small volatile base that could diffuse across the membrane as well. The membrane is the other main key part of the probe. This is a membrane that only allows small neutral molecules, like ammonia, to pass through and block any ions or larger molecules. This membrane is stretched tight across the pH sensing glass surface and a small layer of the IFS is trapped between the glass and membrane. The ammonia from the sample diffuses into this small layer and changes the pH of the solution in proportion to the ammonia concentration outside of the probe.

The interesting part about the calibration



George Barone, Ph.D.
Research Chemist

of this probe is that the standards are all ammonium ion standards and when the ionic strength adjustor is added it contains a base that converts the ammonium to ammonia. Our ionic strength adjuster (ISA) contains an acid / base indicator that is a blue color in base and clear in acid. So, if you are ever measuring with your ammonia probe and the solution becomes clear, that indicates that there is a lot of ammonium or other acids and they have used up the entire base in the ISA. You should add a base to the solution until the solution is blue again (and keep track of the dilution effect) or take

another sample, dilute it, and measure it again (also keeping track of that dilution factor).

If you have any questions about our ammonia probe or you would like to discuss your application, please either email or call me and we will get an answer to you promptly.

gbarone@asi-sensors.com

From the EVP's Desk



Brian Williams
Executive Vice President

Dear Customers & Friends:

Just a quick note, as this issue is full of important information, versus my quartely musings. ASI is a having another extraordinary year - many thanks to all of our customers!

During the last 20 plus months of leading ASI, I have contemplated our direction as a company and the future that is unfolding before us. I see a bright future for ASI, as we have an inventive group of people at all levels creating new and exciting products. We have a dedicated team that works with every customer, small or large, in the same manner: we search out and find the answers to your questions.

With that in mind, please never hesitate to contact anyone at ASI, including myself, anytime about your products. Our first mission is customer satisfaction.

Enjoy the Fall Season!



OEM continued from page 1...

shortens development times. For many products we use our standard parts and supplies and can complete designs promptly. For more custom products, we utilize our onsite machine shop with multiple CNC equipment and custom glass shop to build prototypes. All our designs are fully tested and all processes are fully documented and controlled. In addition to the electrode itself, any packaging and labeling specifications are also incorporated into the drawing package as well as QC specifications. Concurrent with the design of a product, any fixtures and jigs required for assembly are also designed and built.

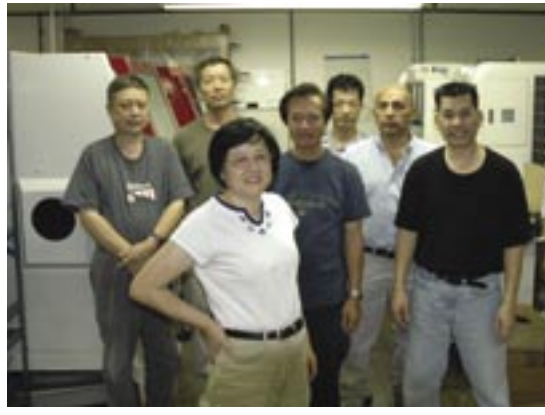
After preliminary design and drawings are completed and tested, samples are built and sent to the customer for evaluation. Any required changes are documented and implemented through our ECO process. Once an order is placed, a final drawing set is generated and distributed to our Production Department for manufacturing. The Production, Engineering, and Sales departments work closely together during and after a product is manufactured and provide support throughout its lifecycle.

In addition to electrodes, we also design and incorporate all accessories and related tools used with an electrode. From adapters, extension cables, basic electronics, installation tools, stirrers, to mounting stands and solutions, ASI can design and package these items together.

For higher volume products that demand tooling and injection molding, we work with suppliers and our sister company in Shanghai, China, to provide solutions to our customers needs and to keep costs down. Working with our sister company also expands our engineering and design capabilities. Typical communications involve daily email, teleconferencing, and web-based conferencing to discuss design specifications and resolve manufacturing issues.

Whether in large or small quantities, we deliver quality results to our customers!

people propHiles



**(Right to Left) Hiep Hong, Carlos Contreras, Bangwen Tao, Shue Chuan Lee, Bao Lihna, John Li Xu, Hunzhong Huang
ASI Machine Shop**

In this edition of the ASI Newsletter we would like to introduce you to some of ASI's Machine Shop employees. These individuals are responsible for the machining and preparation of the housings and internal parts used in your products. Everyday they are working hard to build your products to the highest standards.

Hiep Hong has been the machine shop supervisor since May 1993. A Vietnam Air Force Veteran, Hiep brought his family to the US in the Mid-1970's. Hiep is married with five boys, two of which are currently in college. Hiep enjoys reading and watching the Animal Planet Channel on cable TV.

Carlos Contreras is our CNC Lathe Operator. Carlos joined ASI in 1996. He is married with three sons. Carlos enjoys playing soccer, working out, and

shopping with his family.

Bangwen Tao is a CNC Mill operator. Bangwen joined ASI in 2004. He is married with one daughter. He enjoys cooking and computers.

Shu Chuan Lee is a Manual Lathe Operator. Shu joined ASI in 2001. He is married with a son and daughter. He enjoys cooking and gardening.

Bao Lihna is a Manual Lathe Operator and Machine Shop

coordinator that assists Hiep with inventory control and work order processing. Bao joined ASI in 1998. She is married with one son. She enjoys watching TV, reading, and working in her garden.

John Li Xu is a Manual Lathe Operator. He joined ASI in 2002. He is married with one daughter. John enjoys playing soccer on the weekends.

Hunzhong Huang is a CNC Mill operator. Hunzhong joined ASI in 2004. He is married with a daughter and son. He enjoys fishing and cooking on the weekends.

We at ASI would like to thank these employees for their many years of faithful service to the organization and are proud to bring them to your attention.





Analytical Sensors & Instruments Ltd.
Measuring Your Success™

12800 PARK ONE DRIVE
SUGAR LAND, TX 77478
TEL: 281.565.8818

RETURN SERVICE REQUESTED

Beverly Rock Update

Over the last several months, many of our customers and friends have continued to inquire about the status of Beverly Rock's recovery from her stroke earlier this year.

A few weeks back she stopped by the ASI offices with her husband George Rock. We are happy to report that she is doing remarkably well. While she still has some issues with word choice, she has regained her full mental and physical capacity and is very close to a full recovery.

We are excited about the prospect of Beverly re-joining the ASI family very soon. We hope that by the next issue, Beverly will have started back to work in a limited capacity, as her presence at ASI is dearly missed.



Annual Tradeshow Attendance

Want to meet up with ASI, but never see our booth at your tradeshow? There is a reason behind our lack of displaying a booth at most tradeshows; we want time with our customers - OEM's.

Since most of you are also displaying booths in tradeshows, it makes more sense for ASI to only attend, and not exhibit - that way we keep our costs down and provide that to you in aggressive product pricing.

Call your sales representative today to schedule a meeting during your next major tradeshow.

Current tradeshows attended by ASI:

PITTCON - Exhibit Annually
WEFTEC
ISA
NSPI
NSTA
ACHEMA