# ASI TODAY

*A newsletter for customers of Analytical Sensors & Instruments Ltd.* *Summer 2004*


## From the President's Desk

*Peter Cai, President*

**Dear Customers & Friends:**

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## The magic of ASI manufacturing

Whether they happen across the desk or across the ocean, clear communications between ASI, our customers and our vendors are critical to our mutual success. Over the years we've seen almost every imaginable communication method play a major role in product development and manufacturing at ASI.

The proverbial paper napkin at a lunch table may be at one end of the communication spectrum and at the other end of the spectrum, video/ teleconferencing is used on a regular basis to ensure that the specifications that are produced by our customer's are fully understood and implemented by everyone involved at ASI; whether they are in Sugar Land, Texas or in Shanghai, China.

Let's say that during a visit by ASI VP, Dennis Finch, to a customer located 17 miles west of Castle Rock, South Dakota (the geographical center of the United States) they sketch a design on a napkin for an electrode accessory. This high quality accessory, made of ABS plastic, must be produced in relatively low volumes for a very cost sensitive market. Dennis attaches the sketch to an Engineering Pricing Requisition form, which tracks the product from concept to manufacturing.

After a price quote from manufacturing has been communicated to the customer, ASI Engineering then begins to drive the project. Using SolidWorks, a set of working drawings for the machine shop is created to use in prototyping the design. In her role as facilitator, Amy Zheng puts in a Machine Shop order for the parts and delivers the paper drawings to them.

When Hiep Hong's crew in the Machine Shop has completed the model (in this case using a CNC machining center), Amy assembles and forwards the sample to Dennis for review and shipment to the customer. In the meantime, electronic copies of the working drawings are forwarded to our Shanghai facility, (Aurora) and Aurora has obtained a firm quote from our Molding Shop in Ningbo, China.

After receiving the quote, Dennis verifies that it meets the original requirements. In this case, the customer has decided that the prototype would be improved by the addition of a drilled hole. Dennis redlines the working drawing, returning it to Amy and a Product Release Drawing is produced that incorporates the change. The customer then approves the final design and an order is placed for the first production run of parts.

After the Product Release drawings have been thoroughly reviewed in the US, they are discussed with Aurora's Engineering Staff during a regular video/teleconference meeting. Four people typically attend these meetings, an ASI engineer, Rong Fozeng, General Manager of Aurora, Sun Ouwen, an engineer at Aurora, and translator Liao (fluent in English and in several Chinese Dialects).

This meeting takes place using WebEx, which allows Aurora to see in real time the computer screen of the design engineer in Sugar Land, Texas. Also, through this magic of the Internet, the engineer

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## people profiles

This month's PeopleProfiles will cover Hiep Hong, the ASI machine Shop Supervisor. Hiep is a Vietnam War veteran; he proudly served as an aircraft mechanic for the South Vietnam Air Force for three years during the Vietnam War.

In 1975, following the fall of Saigon, Hiep moved to the United States. In 1976, Hiep married Thu Hong and had four sons over the course of the years, Tuan, Kiet, Quan and Minh. Three of Hiep's sons are currently attending college and one is in high school.

Hiep attended the Arizona Community College in the late 1970's were he trained to become a machinist, mechanical draftsman and then later a CNC programmer.

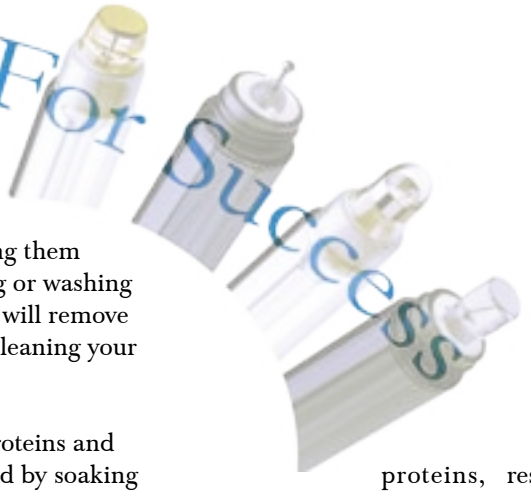
During his 11 years at ASI, Hiep has trained all machine shop employees in his craft, created countless tools and dies, designed fixtures to make production easier, designed and created machine part prototypes and programmed countless designs into the two ASI CNCs.

We are proud to have such an employee at ASI.

*Hiep Hong*
*Machine Shop Supervisor*

## Probing For Success

*Cleaning and caring for pH electrodes*



Cleaning and care of pH electrodes has been written about for decades. There are some points that need to be reviewed.

When new, the pH electrode cells (reference half-cell and sensing half-cell) are clean and free of foulants. After use in even benign samples, the pH electrode performance may deteriorate, become slow and impede performance. At the outset of placing a new pH electrode into service, the user should make note of the Eo and slope of the new pH electrode. These values should be used as benchmarks to determine the condition of your pH electrode.

When a pH electrode gets slow, fouled and coated with contaminants, there are several things that you can do to restore performance. After some period of use, the pH electrode may show signs of slow response, difficulty in calibrating, inaccurate answers or differences in Eo and slope from new performance.

The reason for this is that the sensing glass membrane becomes coated. These coatings range from organics such as oil, grease, proteins to metals ions or other contaminants. Removing them usually requires soaking or washing in some solution which will remove the coating, similar to cleaning your eyeglasses.

Metal ions and some proteins and organics can be removed by soaking the electrode in 0.01 N. HCl for 10-20 minutes. Follow this by soaking in pH electrode storage solution for 1-2 hours. Rinse the electrode in DI water, as usual, and recalibrate.

Next, the reference may become contaminated with various foulants. A single junction style pH electrode may become fouled with silver sulfide. This contamination is difficult to remove. The HCl treatment may help but, often, the best practice is to replace the electrode. If samples contain sulfides or similar silver-complexing agents, a double junction style electrode is recommended.

Proteins can be removed with HCl containing pepsin. Pepsin digests the proteins, restoring the glass surface. Soak the pepsin-cleaned pH electrode in pH electrode storage solution and recalibrate.

Finally, grease and oils can be removed from the measuring elements by washing with warm tap water and dishwashing liquid. Use care if cleaning mechanically... the gas pH bulb is fragile. Electrodes washed in this manner also need to be conditioned by storing in pH electrode storage solution and recalibrated.

When not in use, pH electrodes should be stored in pH electrode storage solution. This insures that the electrode glass remains hydrated, ready to measure accurately and quickly. The storage solution also helps keep the reference

## Chemist Corner

In this issue I want to share a few practical tips in how to get the best results when using a surfactant ISE, which can be used for the determination of both negatively and positively charged surfactants.

The ASI surfactant ISE can be used in the determination of sulfate- and sulfonate-based detergents (such as sodium dodecylsulfate, or SDS), as well as for organic ammonium-containing detergents (such as Hyamine 1622) to name a few. Direct Potentiometry is not practical in the case of determination of Surfactants in real samples, especially in complex matrices such as wastewater. The suggested alternative to determine detergents in such samples is by titration, using the Surfactant ISE as indicator (similar to titrate an acid or base using the pH electrode as indicator).

Hyamine 1622 solutions can be used as titrant in the determination by titration of anionic detergents, with the Surfactant ISE as indicator. The anionic detergent

*Dr. Maria Berrocal*
*Research Chemist*

concentration can be easily calculated from the volume of titrant at the end point. Similarly, the determination by titration of cationic detergents can be done using SDS solutions of known concentration as titrant, with the Surfactant ISE as indicator.

Best results are obtained when the pH of the sample is between 2.5 and 4.5 (diluted HCl or citric acid can be added until the pH falls within the desired range). On the other hand, the polyacrylate content of a sample can be determined if the pH of the sample is raised to 10-11 (by adding 0.01 M NaOH). Diluted Triton X is added to the sample to keep the Surfactant ISE clean at all times.

Other practical recommendations:

- Soak the probe for 10 minutes in a $10^{-4}$ M SDS solution to condition the electrodes daily.
- The electrode life is extended if the sample is diluted to $10^{-5}$ to $10^{-4}$ M (samples with concentrations of 0.01 M and higher should be diluted).
- Stir the sample moderately to avoid excessive foaming (that could lead to erroneous results).
- Use slightly acidic DI water to rinse the electrode (50 mL 0.1 M HCl in 1000 mL DI water).

I hope these tips were useful. Do not hesitate to contact ASI for more information or with your questions about our Surfactant ISE. Have a great summer!

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junction fully charged with KCl. Storing pH electrodes in distilled or deionized water is not recommended.

ASI offers both cleaning solutions and pH electrode storage solution to assist the user in maintaining laboratory style as well as process pH electrodes. Visit WWW.ASI-SENSORS.COM for information on ASI's line of pH electrode maintenance solutions and calibrating buffers.

**If you would like to receive an electronic copy of this newsletter, please email bwilliams@asi-sensors.com, subject line: Spring 2004 Newsletter and a copy will be forwarded.**

**To learn more about ASI products and capabilities, contact Fabian Lozano at extension 121, flozano@asi-sensors.com, or Jeff Gross at extension 125, jgross@asi-sensors.com.**

## Around the Shop

Over the last few months, ASI has been in high gear. In March, ASI attended PITTCON 2004 & NSTA 2004. In May, ASI teamed up with Aurora to exhibit at the AchemaAsia 2004 show in Beijing, China. All of our shows has been a raging success and we appreciate our many customers support and dedication during the last few months.

In addition to traveling the world for tradeshows, ASI has been producing a lot of buzz around our new products. We are currently releasing the all new 61 series industrial probe, formally in a polypropylene body (still available), in a molded PEEK and molded ABS body. This is exciting news for those interested in designing a light industrial sensor with a full range of color options in ABS to customers interested in a heavy duty industrial probe in PEEK.
ASI has also been cooking up a few new ion selective electrodes for the market with surfactant, nitrogen oxide, nitrite, free chlorine and a few others. We recently released the ASI Ion Selective Electrode Brochure, call today to get a free copy mailed out.

Since our last newsletter on the ASI molding and tooling capability, we have designed and tooled over 20 new products, all significantly below customers expect costs for the same product in the US. This is an advantage that we offer to all of our customers interested in saving money on their next mold investment.

Later this month, ASI will publish the 2004-2005 ASI full catalog, call Jeff Gross or Fabian Lozano in the sales office today to reserve a copy. We plan to mail out the new full catalog in early July. Don't delay, they will go fast!

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# Learn more about Surfactant and better cleaning techniques for pH & ORP!

Magic ...
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in Shanghai can operate the computer located in Sugar Land to clarify any questions they may have. After the engineering meetings, final drawings are published to Ningbo, where it takes a few short weeks to fabricate the tooling. Test parts are then produced and shipped via air to Dennis in Sugar Land for approval and shipment to the customer.

After customer approval is obtained on the product, ASI Sales turns on full production. First production parts are then shipped directly to the customer either by air or surface shipment depending on cost and schedule requirements. Any modifications to the product in the future are communicated to ASI from our Castle Rock customer directly to Dennis who then drives and tracks the changes through the Engineering Change Order system. The Castle Rock Accessory is well received by the industry as it is unique, has a price point that makes it almost irresistible, and is truly a well made, quality product.

With this process, ASI is able to keep positive control of all new products. We encourage our customers to communicate all product information to a single contact at ASI. This ensures that we keep our communications clear throughout the product lifecycle.