

# ASI TODAY

A newsletter for customers of Analytical Sensors & Instruments Ltd.

Summer 2005

## From the President's Desk



Peter Cai, President

### Dear Customers & Friends:

I am writing this letter to you all from our Shanghai branch, Aurora Scientific Instruments (Shanghai) Co. Ltd. (ASI-Shanghai). I would like to share with you all the excitement of the rapid growth at Aurora.

In the first 6 months of this year, Aurora enjoyed a sales growth of close to 20% over last. More importantly, Aurora has been working with our customers directly to accomplish many projects. In order to face this challenge, Aurora has added more equipment to our molding shop to enhance our molding capability. Aurora also added two EE engineers to our team to get more involvement in manufacturing small electronic devices for our OEM customers. On top of those additions, Aurora has added more employees with English capabilities. Now, our employee team at Aurora has become younger, more professional, and more English capable. Our senior officers at ASI are

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## ENGINEERED SPACE



In previous newsletters, we've mentioned a number of methods that the ASI Engineering Department uses to speed products to market in the most cost effective and technically advanced manner. This time we'd like to focus on what seems to be a recent minor change that we've made that can have a disproportional positive impact on your product development cycle. We're talking about those exciting, all important, defining practices regarding "units".

When a product developed at ASI goes into full production, we have already assembled a set of documents that we call a "drawing package". We have electronic copies that have been developed using our three dimensional SolidWorks CAD software and we also maintain a parallel, two dimensional, copy on paper. These contain all the design details, packaging and QC instructions and also contain a page for future revision control. As ASI and our sister company, Aurora Scientific Instruments in Shanghai share many of these documents, often they contain both English and Chinese language notations.

There are also the "engineering language" hurdles to consider. In the past, we've made attempts to provide documents that are based on both the English units of inches, pounds, and Fahrenheit for temperature and the "SI" units of

millimeters, grams, and Celsius units (some of us still call them "degrees centigrade") and our drawings contained so much information, they were actually a bit difficult to use.

Recently, we've spent a significant number of hours developing a dual unit drawing system so that our customers in Europe or Asia are as comfortable with our design work as are our customers in Moscow, Idaho. We've made every effort to make our documents clear and concise and we believe that our drawing template now gives us an extra step in growing our position as a player in almost every part of the world.

So, whether you speak MPascals or PSI, meters or miles, centimeters per second or furlongs per fortnight, you can be assured that we understand your products and can design and document them in the most favorable way for your success.

Once our "drawing package" has been completed, we use this "alpha" package to produce the first units (first articles) for your company. This way, our R&D department has the opportunity to make red line corrections that may have been missed during the engineering phase of the product development. Some elements of general production are not always evident during the design phase and we use the prototyping as an opportunity to correct and perfect the "drawing package".

Once prototyping has been completed, our customers get the chance to review the product and make any last modifications before the drawing package is finalized for production use. Many times the last element added to our package is the packaging page. While it is often a last thought item, we consider this page to be just as important as every other page in the "drawing package"!



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## people propHiles

This edition of People PropHiles will cover a very important member of our company, JoAnn Tan the QC Team Leader. JoAnn has been working with ASI for almost six years. She started as a tester and over the years has been promoted to the ASI QC leader that makes sure all of the products are properly tested and packaged for delivery. There is a lot to do in our QC department that most take for granted. Each and every electrode we manufacture is individually inspected and then tested to verify proper function. Then each is safely labeled, packed and ready for worldwide delivery. Her hard

work earned her the Employee of the Year Award in 2001. She appreciates the chance to be a contributing member of the ASI family.

JoAnn grew up in Malaysia and when she immigrated to the US ten years ago she was a school teacher. She taught primary school for almost four years before coming to ASI fulltime in November of 1999. In her free time she enjoys time in her garden – she always has fresh flowers in her department throughout the year. When spending time inside, JoAnn enjoys quiet time with a good book then makes noise with her electric organ when given the chance.



Joann Tan  
QA/QC Supervisor

# Probing For Success

**S**ensors and electrodes such as pH, ORP, conductivity, dissolved oxygen and other similar process, on-line sensors require maintenance from time to time.

Just as those of us who wear eyeglasses and must clean them to restore best vision, these sensors must be cleaned as well.

For especially grimy applications, mount sensors so that they can be removed without difficulty. Mounting the sensor by hanging into the tank might be preferred to threading the sensors into a pipe tee or other fitting. Choose fittings and mounting option that protect the sensor and allow convenience when cleaning or servicing.

Sensors applied to most processes eventually need cleaning and recalibration. Cleaning usually involves removing deposits, grease or solids from the sensors housing and measuring elements. With pH, ORP and dissolved oxygen sensors, handle carefully. The pH sensor uses a glass element as the sensing half-cell. Many dissolved oxygen electrodes are fitted with a membrane

which can be damaged if not handled with care. ORP electrode uses a noble metal as the sensing half-cell...more rugged but, do not scratch the metal sensing surface.

Upon removal of the sensor from the process, clean with water...a garden hose can be used to provide a water rinse to aid in removing debris from the sensor wetted end.

Also, pH electrodes can be cleaned with detergent...dishwashing liquid works well. Brushing can be done but, use a soft brush. Warm water can also be used but, use care not to thermally shock the electrode and housing. Follow with a rinse with plenty of clean water. Finally, rinse with distilled or deionized water followed by soaking in pH electrode storage solution. Calibrate before returning to service.

As for dissolved oxygen sensors, plenty of water and some mild brushing to clean the membrane is acceptable. Do not use detergents or wetting agents. Their use will destroy the membrane hydrophilicity and require that the

membrane be changed.

As for conductivity, again, plenty of water to remove loose debris followed by some brushing to clean the cell elements followed by rinsing with distilled water and then, calibration.

Some electrodes will tolerate an acid soak to remove organics and other stubborn debris. Check with the electrode manufacturer before using acid solutions for cleaning or maintenance.



Well, hello again everyone! It is hot and humid summertime

here in Texas and that means vacation time. Speaking of vacations, one of my assistants is on vacation and I have been spending much of my time in the lab covering for her. I have been making the solutions for your products, testing your products, and doing her research projects while she is gone. In this time my other activities are being delayed, so if you notice that it is taking a little longer to receive your warranty return investigation report or a little longer to find me to talk on the phone you now know why.

The approach of summertime also means many different things to many different people. I was noticing the many changes in my drive to work that summertime brings and besides less school traffic and more children playing outside I have seen many pools being used this swimming season. In thinking about the pools I first thought of chlorine and what it is used for in the pools. I thought of chlorine first since chlorine has many pool uses, it is used to clean and disinfect the pool area of molds and other things and it is also used in the pools themselves. This interested me and I investigated the use of chlorine in pools and its chemistry.

When chlorine dissolves in water it undergoes a disproportionation reaction (or auto-oxidation reaction) and it produces hypochlorous acid and chloride ions. The hypochlorous acid will lose a proton based on the pH to form hypochlorous anion. At the usual pH (7.2 to 7.4) of swimming pools an equilibrium of hypochlorous acid and anion exists. This equilibrium is dependent on the pH and on the temperature of the water. The hypochlorous acid is light sensitive and will decompose in sunlight to form chloride ions and oxygen. So in order to properly know the true amount of free chlorine you would have to measure either the hypochlorous acid and anion or measure one of the forms (usually the hypochlorous acid) and know the



Dr. George Barone speaking with Don Miller and TT Han.

pH and the water temperature. Wow, that is a great idea, we make pH probes and temperature probes, all I have to do is make a probe for hypochlorous acid and I will have a complete package that would be a useful product for the swimming pool and spa market. I had better get back into the lab and do some research on the hypochlorous probe soon.

Now, let's see what I will need to make this probe. I will need a membrane that will pass only hypochlorous acid, and then behind this membrane I will need a method to detect the hypochlorous acid. The membrane should be available with a few phone calls or web site visits to the manufacturers of membranes. Now, how to measure the hypochlorous acid? I just cannot use a pH probe as there are other acids that would go through the membrane and change the pH, so I must detect the hypochlorous acid based on another property. Luckily, I have been trained as an electrochemist so I can put an electrode behind my membrane and convert the hypochlorous acid and use the current from this reaction as being proportional to the amount of hypochlorous acid. It can work! Now I really have to get back into lab as I just designed the probe so I have to have it working before this newsletter comes out.

In order to make this story of chlorine complete, the hypochlorous anion is commonly coupled with a sodium ion and called sodium hypochlorite or more commonly known as household bleach. Check out the label and it should say "contains 5% sodium hypochlorite" or something like that! So, my initial thoughts of summertime has lead me

to a research project on a swimming pool and spa total chlorine probe, to the formula for household bleach, and to a powerful anti-mold agent - all of them dealing with the chemistry and properties of chlorine. Wow, I wonder what I will see in the fall and where that will lead me!

Have a safe and happy summer, I look forward to writing to you in the fall.

## From the EVP's Desk



Brian Williams  
Executive Vice President

### Dear Customers & Friends:

Welcome to the summer edition of ASI Today. As you can see we have updated our look a little. As we just released the 2005 ASI General Catalog, I wanted our newsletter to have the same general feel. I am excited to say that everyone should be receiving a complimentary copy in the mail very soon (if not already). If you need more than one copy, please do not hesitate to contact the ASI sales office and we will do our best to support the quantity that you need.

As Peter has spoken mostly about Aurora, I would like to update you on ASI. As you have seen in our

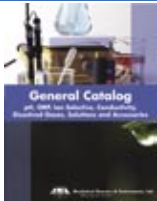
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**From the President's Desk**  
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feeling more at ease working at Aurora without language difficulties. This has greatly aided Aurora in growing to meet Western standards.

At the same time, Aurora has also added several experienced sales people to our sales team. We are launching a new effort to sell ASI/Aurora e-chem sensor products into China market. In doing so, we are interested in carrying a line of good quality meters to sell with our sensors in the Chinese market. These meters and our sensors would compliment each other. If you have the same interest, please contact me

directly at [phcai@aurora-sensors.com](mailto:phcai@aurora-sensors.com) or [phcai@asi-sensors.com](mailto:phcai@asi-sensors.com).

May the Lord bless all of us.

*Peter Cai*

Peter Cai  
President

**From the EVP's Desk**  
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last newsletter, ASI is launching new products as fast as our engineering department can develop them. We have had an overwhelming response to the electrode arm and Universal Microstirrer® during the last three months thanks to you - our customers.

In the second half of 2005, ASI plans to launch our new 3/4" Ryton Model 61

Industrial Sensor (July), the new Twistlock Model BT Sensor (October), Free and Total Chlorine sensors (November) and a pH/ORP element cleaning tool (December).

As I speak with many of you on monthly, weekly and some of you on daily occasions, I can only say that I look forward to helping each of you in development and production of your products. Until next quarter- good luck and happy selling!

Best Regards,

Brian Williams  
Executive Vice President