ASI TODAY

A newsletter for customers of Analytical Sensors & Instruments Ltd. *Winter 2007*

From the GPs Desk

Peter Cai
General Partner & CFO

Dear Customers & Friends:

In 2007, I have spent almost the whole year in Shanghai managing our branch. Now, it is Winter here and the weather is getting cold. But, the team spirit here is high and hot. We have been working so hard day in and day out, so that we would end this year with a growth of more than 25% over last year.

In addition to the sales growth, we have been doing major improvement to our Machine & Plastic Molding Shop. We have added two pieces of major equipment to our shop, so that our mold making capability has been doubled. This year we have made over 40 sets of plastic molds and molded tens of thousands plastic parts. Now, our branch is not only a full-scale sensor manufacturer, but also a plastic mold and plastic part manufacturer. Our mold makers are all high quality employees and they are producing high quality molds and plastic parts.

Since we are solely an OEM manufacturer, we cannot show you all the plastic parts

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Galvanic Dissolved Oxygen

ASI offers a full line of dissolved oxygen (DO) electrodes, including the popular Clark-style Polarographic and Galvanic dissolved oxygen electrodes. We often get questions from customers about the differences, advantages, and disadvantages of these technologies. While similar in construction, materials, and performance, there are some major differences between the mechanics, and chemistry, of the Galvanic and Polarographic DO electrodes.

In very simple terms, the Polarographic electrode must be "powered" by an external potentiostat and it requires 15 minutes to an hour for "warm-up" before measuring. The ASI Polarographic (Clark-style electrode) DO electrode has replaceable internal filling solutions, replaceable membrane caps, and will need to have the Silver anode cleaned periodically to reduce buildup of Silver Chloride or contaminants.

The Galvanic DO electrode on the other hand is essentially always on and ready for measuring. The principle of operation is that the electrode has two metals of dissimilar potentials that spontaneously reduce the oxygen that is measured. The metals must be chosen so their difference in potential is larger than the voltage needed to reduce the oxygen. For the ASI design, we use a Silver cathode and either Lead or Zinc for the anode (zinc allows for RoHS compliance). Most of the ASI designs utilize a sealed system to prevent the accidental release of the Lead oxide that is produced inside the electrodes with a Lead anode. The oxygen diffuses through the membrane and is reduced at the Silver cathode to hydroxide. The Lead (or Zinc) anode is oxidized, forming Lead oxides (or less hazardous Zinc oxides with the Zinc anode system). These oxides flake off of the Lead electrode and fall to the bottom. This electrode does not typically consume or produce water, and the chemistry is less depletive, so it does not require refilling often, allowing it to be placed in long-term deployments of continuous monitoring.

Another major difference between these technologies is that when the Galvanic probe is not in use, it must be "shorted". When it is shorted the

DO Quick Reference Guide of Features and Benefits

	GALVANIC DO Sensor	POLAROGRAPHIC DO Sensor
Polarization	Self-polarizing	Requires an external voltage
Anode	Lead or Zinc	Silver
Cathode	Siver	Gold or Platinum
Electrolyte	Potassium Chloride (KCl)	Potassium Chloride (KCl) (The concentration is different than the KCl for the Galvanic DO)
Membrane	PTFE	PTFE

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Chemist Corner

Dr. George Barone
Senior Research Chemist

Hello again everyone! It is Winter time here in Texas which means colder temperatures and rain. I hope you are enjoying the weather in your area. I would like to review the electrode storage conditions for our products. The storage of an electrode can greatly affect its performance, so choosing the right solution is important. Many electrodes require different storage solutions and conditions so this acticle will only cover the basics.

Electrodes require different storage conditions, depending on how long they will be stored. Of course, the temperature and other conditions are important for the lifetime of your probe as well.

Provided at the top of the page is the storage recommendations for each major electrode type. We have designed a specific storage solution to keep the pH sensing glass, ORP elements and the reference electrode in the optimal environment. The storage solution is buffered at the right pH for the sensing glass and it has a high ionic strength to keep the junction of the reference electrode in proper condition. Conductivity, temperature, and DO probes are all stored dry when not in use. When the probes are being used store them for short periods of time in the test solution or in a dilute standard if available.

Storage Recommendations Chart

	<2 hours	2 hours to 1 day	>1 day
pH	Sample	Sample or storage solution	Storage solution
ORP	Sample	Sample or storage solution	Storage solution
Reference	Sample	Storage solution or filling solution	Storage solution or filling solution
ISE	Lowest Standard Concentration	Lowest Standard Concentration or Dry	Dry
Conductivity	Lowest Standard Concentration	Lowest Standard Concentration or Dry	Dry
Temperature	Sample or Dry	Sample or Dry	Sample or Dry
Dissolved Gas	Sample	Sample	Disassemble & store internal pH half-cell in storage solution
Sodium	Sample	Sample or sodium storage solution	Sodium storage solution

Most of the ISE probes are stored dry. They should be soaked in the most dilute standard for 15 to 60 minutes prior to use. If they are being used within 2 to 4 hours then store them in the most dilute standard. If the probe will be stored longer then 4 hours then store it dry after it has been rinsed.

The sodium probes have a unique soaking solution and it should be used exclusively for the sodium probe and not changed with other probes.

Finally the dissolved gas probes (except oxygen) are shipped with a pH half-cell soaking in pH soaking solution and this pH half-cell probe should be in pH soaking solution when not in use for over 7 days.

The storage temperature should be as close to standard room temperature (25°C or 77°F) as possible. The probes should avoid extremes in temperature at all times but especially during storage. If a probe is stored too cold the internal solutions may precipitate and it could be difficult to get the precipitate to dissolve. This would make the measured potentials change and possibly fail your specifications.

Another storage condition that may damage the probes is sunlight or direct UV light exposure. Sunlight has certain wavelengths of light that will damage the probes. This is especially true for the Silver Chloride contained in many of the reference electrodes. The sunlight or UV light will also damage some of our ISE sensing membranes (especially the Chloride ISE).

Finally it is a very good idea to keep the storage bottle, boot, or container that the probe was shipped to you in. This is a great place to soak probes that need to be soaked and a great way to protect the probes when they are stored.

Warranty Question

Question: What are the correct procedures to return a product?

Answer: The first step is to contact our Customer Service Manager and obtain a Return Material Authorization Number (RMA). This will be given if the product falls within the warranty period (6 months for an Ion Selective Electrode, 1 year for a Laboratory or Industrial Sensor).

Next, the product should be returned to ASI (at the customer's expense) with the RMA number noted on the box. ASI will test the electrode and notify you of the results.

Question: Should I deduct the charges from my payment for the returned product?

Answer: Short-paying an invoice is never the best choice. It is best to wait until ASI provides you with the results of the testing. At this point, we will issue a credit on your account or a replacement.

people propHiles

Limei Han
Accounting Manager

In this edition of the ASI newsletter we would like to introduce our Accounting Manager, Limei Han.

Limei is responsible for account receivables, account payables, ASI payroll, and Human Resources. These roles keep Limei very busy and popular with both ASI customers and employees!

Limei is originally from Shenyang, P.R.China. She joined ASI in 1999. On any given day, you may find Limei in her office organizing documents or focusing on her computer, but also you may see her answering employees' questions throughout the building.

Outside of the office, Limei keeps busy with lots of fun activities. Limei likes playing badminton in her spare time. She also enjoys dancing and attends Chinese traditional dancing practice every week. She is an active member of Guangdong Association and often joins the professional dancing performance.

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potentials of the two metals are the same and the consumption of oxygen. If it is not shorted, the electrode, similiar to a battery, will drain its potential and will no longer be functional. A Polarographic electrode does not require this shorting but does have the "warm-up" requirement. The signal from this electrode is a current that is proportional to the oxygen concentration. The current is usually measured across a resistor, located in the meter, as a millivolt value. The factors that will affect the signal are the amount of oxygen present, temperature, atmospheric pressure, and the salinity of the water you are measuring

There are a few ways to calibrate the DO electrodes. The most common one point calibration method is to hold the electrode in air. Knowing the temperature, elevation, and atmospheric pressure you can calculate the percentage of oxygen in the air and calibrate the electrode. If you want to do a two point calibration you simply put the electrode in a zero oxygen sample and measure the zero point. Two simple zero points are a stream of Nitrogen gas or a saturated solution of Sodium Sulfite which scavenges all available dissolved oxygen.

While your application might call for Dissovled Oxygen Sensor, you do have a choice in method - choose what fits your needs.

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we are producing by picture illustration. I have a few pictures of our shop to show you our capability. We would like to work with you for your plastic part needs. We are capable of designing your plastic parts, making the molds, and casting the plastic parts for you, i.e. we are your full-scale turnkey plastic part manufacturer. Give us a try and we will guarantee your satisfaction.

We are very excited at these improvements and greatly thank you all for your support.

We praise the Lord for our success this year. May the Lord continuously bless all of us in the new year of 2008.

Peter Cai

Peter Cai

General Partner & CFO

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RETURN SERVICE REQUESTED

Brian Williams
President & CEO

Dear Customers & Friends:

The Winter season is upon us in full force here in Sugar Land, Texas. Cold is not in our nature as natives of this area, we are a warm climate bunch!

I am happy to report that ASI has had another strong year of sales with high double digit growth, thanks to all of our customers. We are looking forward to another great year in 2008!

As I am sure many of you have heard directly or indirectly, ASI is about to go through another transition. I will be leaving ASI for about 16 months beginning in February of 2008. The United States Army has seen fit to mobilize and deploy me once again, but at least this time I will get a little different scenery as I will be deploying to Afghanistan. Many of you remember my last deployment in 2003 to Iraq where I was a company commander of a pipeline engineer unit with 170 soldiers. Unfortunately this time I do not have the honor of leading troops in combat. As a Senior Captain [close to Major], I will have a staff position in an engineer brigade unit. My responsibilities will likely involve operating a laptop and working at a desk. While this is not exciting work, it is another job that someone has to complete.

We originally were notified of this mobilization in August of 2007, so ASI has had a lot of time to prepare for this eventuality. Peter and I have had several on going discussions related to the plan of ASI leadership in the US while I am away. The plan for ASI will be for some of my responsibilities to be transferred among the key leaders of the organization (Steve Zelenak in Engineering, Frank Zheng in Operations and Kimberly Morgan in Sales specifically will get some of the responsibilities). In addition, Peter will be returning to ASI for the majority of 2008 and the first half of 2009 to cover the majority of my responsibilities. My expectation is to be back at the helm of ASI in May of 2009.

During my leave from ASI, I will still be able to receive ASI email at *bwilliams@asi-sensors.com* while I am deployed, please feel free to stay in contact. Lastly, I will continue to send in my quarterly article but expect it to not cover ASI business.

Best Wishes to all in the New Year!