ASI TODAY

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

From Peter Cai's Desk

Peter Cai, GP & CFO

Dear Customers and Friends,

Greetings from Shanghai. I have spent the better part of this year at our Aurora branch in Shanghai. In the last eight months, we have trained our personnel and implemented "Lean Production" and "One Piece Flow" in our electrode manufacturing process in the areas that made sense. We have overcome several early stumbling blocks. Today we have two cells fully functional with "One Piece Flow" and " Small Batch Flow" processes. Both cells have been in operation for over ten weeks. The results have been very encouraging with productivity increased by 27% and scrap rate decreased by 6%.

There is a saying, "A picture is worth a thousand words", so I have attached several pictures [right] to give you a glimpse of our new Aurora. If you have visited Aurora before you will appreciate our changes.

While I have been working at Aurora to improve our branch here, Brian and his team have been working very hard at ASI to provide each of you with better products and services. Under Brian and his VP's leadership we have achieved outstanding growth in the first eight months of this year compared to the previous years.

I sincerely thank you all for your long time support and praise the Lord for His Great Plan for us.

Peter Cai

Peter Cai

Lean and Mean

Aurora has spent the better part of 2007 working towards a 'lean and mean' goal. The implementation of a one-piece-flow has proven to be an exercise in persistence for Aurora, but the pieces have been moved into place and the results are great. Below is a 'scorecard' used by the cells and managers to monitor the progress of the cell on a daily basis.

The following is one of the two cells in operation at Aurora currently, proving the techniques they have spent the last eight months learning. This cell uses two people to produce hundreds of electrodes each day.

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OEM Temperature

Article 1 *continued from page 1...*

Did you know that ASI offers stand alone temperature sensors (like the colorful examples on this page and in other designs as well) and temperature sensors imbedded in your other electrochemical sensors for automatic temperature compensation (ATC)?

Temperature sensors and elements are a core part of the ASI business - as temperature effects most sensors to some degree.

In pH electrodes there is approximately a 3.4% increase in slope for a 10 °C increase in temperature.

Conductivity electrodes have a large temperature coefficient - as much as 1-4% per 1 °C.

The solubility of oxygen in water is greater at colder temperatures, so temperature compensation in Dissolved Oxygen electrodes is standard.

These previous three examples are just that - examples of the importance of accurate temperature compensation in electrochemical sensors. All electrochemical sensors have some temperature effect - as it is not the sensor that changes, but the solution. Chemicals in solution have many charaterisitics that change with temperature that effect the reading, thus leading to incorrect readings.

It is important to measure (with any sensor without temperature compensation) a standard and sample at the same temperature. If you are not able to heat or cool your standards, then it is highly advisable to incorporate temperature into your product, either as a integral part of the sensor or as an external stand alone sensor.

The question is, which temperature element to choose: Thermistor or RTD?

Thermistor: A thermistor is a resistive device composed of metal oxides formed into a bead and encapsulated in epoxy or glass. A typical thermistor shows a large negative temperature coefficient. Sensitivity is greater than that of RTD's, but useful temperature range is limited.

Advantages

- Basic thermistors are quite inexpensive
- A thermistor may change resistance by tens of Ω's per degree temperature change, versus a fraction of an Ω for RTD's
- A thermistor bead can be made in very small sizes

RTD: A RTD sensing element consists of a wire coil or deposited film of pure metal. The element's resistance increases with temperature in a known and repeatable manner.

Advantages

- Temperature range: -260 to 850 °C
- Platinum and copper RTD's provide a more linear response than thermistors
- The voltage drop across an RTD provides a large output

Here is a list of our common temperature elements:

- 41.4 Ω
- 100 Ω
- 300 Ω
- 348 Ω
- 720 Ω
- 1K Ω
- 2K Ω
- 2.25K Ω
- 3K Ω
- 3K Ω BALCO
- 6K Ω
- 8.5K Ω
- 8.7K Ω
- 10K Ω
- 20K Ω
- 30K Ω
- 36K Ω
- 50K Ω
- 100K Ω
- 110K Ω
- 500K Ω

Contact your ASI sales professional for more information to determine which element would be appropriate for your application.

	RTD	Thermistor
Temperature range	-260 to 850°C	-80 to 150°C (typical)
Sensor Cost	Moderate	Low
System Cost	Moderate	Moderate
Stability	Best	Moderate
Sensitivity	Moderate	Best
Linearity	Best	Poor
Specify for:	General purpose sensing, Highest accuracy, Temperature averaging	Best sensitivity, Narrow ranges, Point sensing

people propHiles

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This quarter ASI is happy to recognize the ASI purchasing and inventory department. These three individuals represent the core of ASI procurement and inventory management team.

Kelvin Wu [left] has been the Purchasing Manager at ASI since November of 2004. Kelvin is married to Grace Wu and they live in Sugar Land. Kelvin enjoys swimming, cooking and reading good books.

Kevin Lee [center] has been an Inventory Control Specialist at ASI since August 2004. Kevin has been married for 20 years and has two children, one about to start college and another still in high school. He enjoys baseball games in his spare time.

Fei Lu [right] has been an Inventory Control Specialist at ASI since February 2004. He lives in Houston with his wife, daughter and son. He enjoys reading good books in his spare time.

This team has received the highest marks for professionalism and ability each year and continually works to serve our customers with the utmost desire to create savings wherever possible while maintaining a high level of material quality.

Chemist Corner

Hello from the lab! In this issue on temperature, I thought I would share some thoughts on the relationship between dissolved oxygen and temperature.

When you use the oxygen probe at low temperatures many different things change the oxygen level.

As the temperature decreases the oxygen in the solution increases, as long as the solution is actively aerated and sufficient time has elapsed to allow for equilibrium between the oxygen in air and solution.

So if you take a solution that is saturated with oxygen and put it in the refrigerator or freezer and lower the temperature of the solution, the oxygen in the solution will take a long time increasing because you are not actively aerating the solution. The oxygen in the air must dissolve into the solution and then diffuse to the whole container. The only place where the oxygen can dissolve from the air is at the surface of the solution if you are not actively aerating the solution.

As the temperature decreases the response of the sensor decreases also. The diffusion rate across the membrane changes greatly with temperature and results in giving a signal that decreases with lower temperatures. This effect is instantaneous and only depends on the temperature of the membrane.

Dr. George Barone III
Senior Research Chemist

The change in the diffusion rate of oxygen through the membrane has a larger effect on the oxygen probe than the increase in oxygen concentration. So when the temperature decreases the measured oxygen decreases as well even though the oxygen in the solution increases.

There is no way to make the probe respond better at lower temperatures. The only thing that can be done is to determine the change in the probe output with the change in temperature and mathematically adjust the reading based on the temperature.

An example is if we know that if the temperature decreases a few degrees from 25°C this will cause the output from the probe to decrease 25%, then the meter must multiply the mV value from the probe by 25% before it converts the mV to oxygen level in mg/L. THIS IS ONLY an example. The real change in output with temperature must be determined by experiments on many probes to get a good average value for the probes.

Warranty Question

Question : What is the shelf life for solutions?

Answer : Solutions are very difficult to give a blanket answer to, here is a guide that may help:

- pH Buffers: appx. 1 year*
- Conductivity Standards: appx. 6 months*
- ISE Standards: appx. 6 months*
- Filling Solutions: appx. 6 months*
- ISA Solutions: appx. 6 months*
- ORP Standards: appx 3 months*
- Cleaning Solutions: appx. 1 year*

*some exceptions exist - contact your sales professional if you have doubts or more specific solution questions

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RETURN SERVICE REQUESTED

From the President's Desk

Brian Williams
President & CEO

Dear Customers & Friends:

I realize some of you might notice that I have shed a few pounds since our last edition. One of the bad things about having your picture in your quarterly newsletter is you become a little vane. That being said, I have shaved a nice 35 pounds off my frame since I looked at the picture of the ASI leaders in the last newsletter and realized I needed improvement in my physical bearing!

That being said, I have been trimming ASI down as well over the last quarter - finding new and inventive ways of reducing costs and improving the quality of our products. Our lead times have finally been brought back under control and our customer service calls are completely up-to-date.

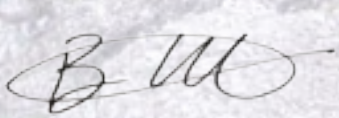
The only areas where I have not been as successful seem to cross industry barriers - fuel/transportation/precious metals and petroleum based products (to name a few) are all on the rise - which is why we have to be vigilant in finding ways to cut costs.

ASI has always prided itself on being able to provide products at the most competitive prices in the market through active negotiation with our supply chains and coordination of production efforts between ASI and ASI-China (Aurora).

It has been my focus over the course of this year to continually work on finding new methods and processes that help in semi-automation, higher volume processing and consolidation of tasks in production. This is where we still find ways of reducing costs, so that other costs that are on the rise have little or no impact. I wish I could say that prices will never change, but I think we all agree that is not realistic.

Like my weight - my determination will not fade in the weeks to come. Customers always come first!

Best wishes this Winter,



Brian Williams