



ASI TODAY

A newsletter for customers of Analytical Sensors & Instruments Ltd.

Summer 2008

From the GP's Desk



Peter Cai, GP & CFO

Dear Customers and Friends:

Over the past 19 years, in an effort to maintain low prices for our customers, ASI has never implemented a general price increase. It still remains our goal not to have regular price increases or adjust prices each time our material cost has an increase. We have been successful in offsetting material cost increases by improving our production efficiencies and other cost cutting measures. Unfortunately, we have now reached to a point where these material cost increases have exceeded our cost cutting measures, especially the drastically sharp rising costs of precious metals.

Now, we must announce a general price increase for all ASI products, especially for our products with precious metals. This price increase will take in effect on July 15, 2008. We fully understand that this increase may cause inconvenience to your business. However, we sincerely hope that you would also realize that only a financially healthy ASI could continuously be a strong support to your business. We would also promise you that we would not implement another general price increase in near future.

In order to keep our promise, while continuously maintain healthy financial status at ASI, we are taking the following measures.

First, we continue to lean our production and improve our management to lower the product cost.

Secondly, we have been diversifying our product offering, such as injected plastic parts and OEM specific small electronic components, and developing new sensors to suite different customer needs, so that we could guarantee continuous sales growth and dilute the cost per capita.

In this way, ASI could remain strong and provide you all with the most economical sensors with the best quality and best service as always.

Thank you again for your continued loyalty. We are especially grateful to our Lord for his blessing in this critical time.

Best regards,

Peter Cai

Peter Cai

ENGINEERED SPACE



PLASTIC RESINS, INJECTION MOLDING TOOLING AND PRODUCTS

It wasn't so long ago really, that the advent of synthetic plastics was the base for a radical change in product design and manufacturing. The first commercial synthetic plastic, "Bakelite", was developed over the years 1907 to 1909. Of course, a lot has happened in the field over the past one hundred years!

Molded plastics found their way into consumer products from the beginning (cases or enclosures for radios, automobile components etc.). Decreasing costs and ever improving technologies to form these plastic resins into unique shapes with a variety of mechanical, electrical and chemical characteristics has given generations of designers the ability to turn what otherwise would only be fanciful dreams of performance, style and shape into products the consumers have come to expect.

True statements, probably, but what do they mean for folks in the "industrial" leaning world of electrochemistry? For manufacturers, such as ASI and our OEM customers, consumer expectations and points of view make a product with a unique style or shape, material, or color more appealing than those taking the shape of a pipe with a sensor in one end and a cable glued into the other.

Many of us that have been attending the major trade shows of our industry over the past two decades have seen the progression of products from those of simple form and function to those that industrial design and engineering have taken to new heights of performance and style - even for some of the most basic of products. These changes would not have happened if the end user didn't desire them and would either reject the old, or pay a premium for the "next best thing".

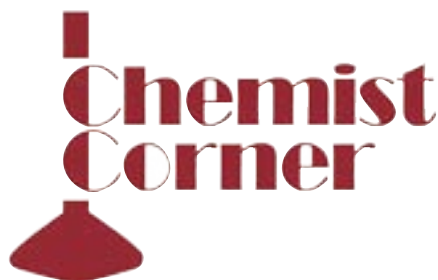
For many of us, these customer expectations create a challenge. If annual demand for a product that you want to be attractive, unique and easily identifiable as your own is in the low thousands, it can be difficult to justify the resources (including dollars, of course) to apply the magic of plastic injection molded parts. 'Low cost' and low demand often are contradictions in terms and typically the costs of part and tool design, along with fabrication, are insurmountable barriers- even before the piece-part cost is considered. Analytical Sensors has faced the same hurdles and in finding ways to overcome them. We have developed a tool box of answers for our own internal use and to share with our valued customers.

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Hello everyone, it is summer here in Texas and that means heat! I hope you are able to keep cool and you are enjoying your summer.

I would like to give you some additional perspective on one of ASI's largest selling probes - the pH probe. I want to focus on the most frequent questions I am asked - how do you determine if an electrode is good and (if bad) whether the problem is the probe or the meter? How do you qualify the pH probe?

Let us assume that you have taken a pH reading and it does not seem correct, what do you do to determine if the probe is working or not?

The simplest way to determine if your probe is good is a visual inspection.

Does it look dirty or cracked?

Is the pH sensing glass bulb intact?

Any other visual observations?

If the probe looks good or you have cleaned it and it appears to be just like when it was received then your next step is to measure two standards. The ASI Lab consistently starts with pH 4 and 7 buffers. Record the millivolt (mV) values and compare them to the original values you got when the probe was new (it is always a good idea to log initial values for your electrode). Typically the pH 4 buffer should read 177 ± 20 mV and the pH 7 buffer should read 0 ± 20 mV. The difference between the two mV readings should be above a minimum threshold value (that is usually set by a QC group at your company). For instance, if your minimum requirement is 93% or greater value (a common minimum) then the mV

difference should be above 165 mV (this is a slope of 55 mV/pH unit) at 25°C.

If your meter does not display mV values for your calibration points, you may need to check them outside of the calibration procedure, or to run a calibration and review the slope. A typical pH electrode slope is 59mV/decade and computed internally by the meter. Generally accepted good slopes are 55-63 mV/decade for pH electrodes.

If your mV values or slope is out of spec, you still need to determine whether the problem is with the probe or the meter? There are two ways to answer this question.

The first way is to change the meter with a known good meter and see if the slope gets better. If the slope varies significantly from meter to meter, then the meter is likely suspect. It is not unusual for a meter to develop an "offset" that could change the reference point of your calibration. Check your meter operation manual to see if there is a procedure for your specific meter to check this offset.

The second way to find out which is having the issue is to use the ASI DuoChek pH & ORP Tester. The DuoChek is a simple pH meter and mV supply meter in one. You can plug the pH electrode into the DuoChek and read the mV values from the electrode. Then, you can plug the DuoChek into the pH meter and send 177, 0, or -177 mV to the meter and see if you get close to pH 4, 7, or 10 from your meter. The DuoChek is a very good tool to isolate the meter or electrode in your troubleshooting resolution.

Another popular question is - how do you qualify your pH probes and set up a valid test for your application? Each company had specific needs and requirements, but I can give you some general guidelines. It will first be important to determine what level of accuracy and precision you need from your pH measurement. I suggest that you use at least three buffers to calibrate your pH probe (4, 7, and 10 for example) and one or two standards near your expected test values to verify that the calibration works for your samples.

For example, if you are measuring the pH of beer or wine you would want to verify that the probe works with a

carbonated sample and/or a sample with high ethanol content (this would be very different if you were measuring the pH of cheese).

As an alternative example, if you were measuring samples that were always between pH 0 and 2 you would want to calibrate the probe in this pH region and verify that the probe will measure standard samples that you are testing. Buffers outside of the standard 4, 7, 10 range are available from specialty reagent and chemical manufacturers.

It is essential that I point out that the pH probe, standards, and slope all have temperature dependencies. Please make sure that your meter is able to accommodate the temperature variations in your samples as well. The theoretical slope for a pH electrode is 59.16 mV / pH unit at 25°C. As the temperature changes from 25°C the slope value changes and most meters will automatically take this into account. The other important thing about temperature is that the standard buffers that are used to calibrate the pH probe and meter also have temperature dependencies. The standard pH value changes with temperature variances. If you cannot control the temperature to 25°C, check with the buffer manufacturer to see if they have a chart on temperature effects..

Most of this has been addressed by the various instrument manufacturers. As long as you standardize your meter and probe according to the directions from the manufacturer and you test representative samples before you measure your real samples, you should measure the correct pH value.

I hope you see that this simple issue of standardizing your pH meter and probe, determining if they are working properly, and qualifying your calibrations can be a bit challenging without the necessary information. This is why I have focused on this information in several issues of ASI Newsletter. As always, if you have any questions please call your ASI Account Manager and he/she will get an answer to you as quickly as possible.



David Jin
Mechanical Engineer

At the corporate home of Analytical Sensors, in Sugar Land, Texas, a large number of the key engineering functions are done for the entire company. We are proud of the skills and dedication of our people in that group.

David Jin, a Mechanical Engineer at ASI, is celebrating his 10th anniversary with the company this year. Early on David spent most of his time in the drafting of product designs that came from others but with his education and years of product knowledge, he now applies his engineering creativity to personally designing a number of ASI's new products.

As a Beijing native and basketball fan, David is looking forward to the Olympic Games being held in his hometown. David loves to watch NBA games and is a loyal Rockets fan. And of course, he is also a fan of another tall Chinese native, Yao Ming. Away from work, he spends his time with his wife and son.

Amy Zheng is another one of ASI's long time pillars, having been with the company since 1993. As our Research and Development Engineer, almost any new product will be built and tested by her before it is approved and sent to mass production on the manufacturing floor.

Amy is the wife of our VP of Operations, Frank Zheng. Their daughter will be graduating in May with a Master's degree before moving to Atlanta to become a teacher. Congratulations to Frank, Amy and Jenny! Amy loves to spend her spare time working in her

backyard tending to her fruit trees and flowers. She also loves sewing and crocheting.

Alice Wong joined ASI in October 2006 and now shares her time between helping in the Engineering Group and "front office" activities. Born in Taiwan, Alice moved to the United States when she was 14. Before joining ASI, Alice held various management positions in the food and beverage industry.

Alice loves gourmet food and wine and spends her leisure time sampling new foods and collecting cookbooks. Alice also loves to travel and is looking forward to visiting Japan later this year. She has traveled to over 15 countries all over the world and the number is still increasing. Alice will be getting married this fall to her fiancé whom she has dated for 9 years.

Although he spends enough time in the Sugar Land office to keep a full supply of clothing and household goods there, ASI's V.P. of Engineering, Steve Zelenak, actually works from our satellite office in Fort Collins, Colorado. He has overall responsibility for Engineering in Texas and Shanghai, China (where he visits frequently). He joined ASI in 2001 after nine years as a Mechanical Engineer for a major electrochemical company, first as a Manufacturing Engineer and then as a General Manager for a Medical device company.

This August, Steve and his wife Amy will celebrate their 25th wedding anniversary. Their son Andy is a junior in college double majoring in Mechanical and Electrical Engineering at Colorado School of Mines. Their daughter Georgianna is a high school junior. A large amount of their free time is spent enjoying the great Colorado outdoors.



The ASI R&D Office



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Plastic continued from page 1...

For a number of years, ASI has been offering extremely cost competitive plastic injection molded part design, tool design and fabrication, and of course, the products made from these tools. These can include electrode bodies providing truly customized electrochemical products or cases for anything from a small, hand held solid state sensor or transducer, to a large enclosure for a system controller. An integral capability we have also developed is the over-molding of custom strain relief features for cables and connectors.

Part of the ASI niche in this market is in providing design services for customers that may have limited or no in-house technical staff versed in molded products coupled with the ability to provide low cost, short run, quality plastic parts.

Of course, many of our customers have substantial engineering and design capabilities of their own. Our experience and investment in this area means their bottom line benefits from plastics tooling and molding in low cost regions (Shanghai and Ningbo, China) without many of the usual difficulties of working across boundaries of culture and distance.

As with even our basic electrochemical products, our customers for these products work directly with the knowledgeable Sales and Engineering Staff in Sugar Land, Texas. ASI then applies all the tools that having very long standing direct ties, multicultural backgrounds and a wealth of technical experience can provide to make sure the projects are completed on time, within budget, and of consistent quality.

If you have a new product in mind, even at the "concept on a napkin" stage, your ASI Account Manager is available to begin the process of our helping you turn it into reality.



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RETURN SERVICE REQUESTED

From the President's Desk



Brian Williams
President & CEO

Dear Customers & Friends,

By the time you read this I will have been in Afghanistan for a couple of months. Afghanistan is a very interesting country, full of interesting people and culture. I

don't know if this is exactly what I was expecting before I arrived, in fact I know it is not what I had expected. My expectations were more in line with my Iraq experiences, but what I find is a fairly calm country (yes there is still activity, bombings, mines, etc) where the people seem truly happy that we are here helping rebuild their nation.

As I was deciding what to write about this quarter, I ran across a quote that when put into perspective with the movie "Charlie Wilson's War" seemed to describe Afghanistan quite correctly. (For those of you who have not seen the movie, I will not spoil anything and let you draw your own conclusions.)

All parts should go together without forcing. You must remember that the parts you are reassembling were disassembled by you. Therefore, if you can't get them together again, there must be a reason. By all means, do not use a hammer. - IBM maintenance manual, 1925

I must tell you that the work we are doing here, rebuilding a war torn nation, is great work that makes me proud to be an American Soldier.

Now on to the really important topics, how is ASI doing. Right now we are in the middle of hiring a new account manager, new engineer and a few other folks to help round out the ASI staff in Sugar Land. From my corner of the world, it seems that ASI is taking care of each and every one of you. Never hesitate to contact me at my ASI email address (bwilliams@asi-sensors.com) as I have civilian internet access. Even if you don't have a problem, I would enjoy the opportunity to correspond with any of you.

I hope you all have a pleasant Summer, talk to you in the Fall!

Sincerely,

Brian Williams
CPT, EN
Bagram Airfield, Afghanistan