

e c o n o T a l k

The latest news from Econotech and friends • Fall 2000 • Volume No. 11

US EPA 1650 Testing for AOX

New Regulations May Affect Your Mill The US EPA (Environmental Protection Agency) now requires AOX testing of final mill effluents from kraft pulp mills in the United States.

What is AOX? AOX is adsorbable organic halogen. Chlorine-based chemicals are commonly used to bleach pulp to a desired brightness. A significant portion of the various chlorinated compounds generated during the bleaching process is discharged into receiving waters.

The measurement of these chlorinated compounds is achieved by the adsorption of the effluent onto activated carbon and the combustion and titration of the adsorbed carbon using a microcoulometric titration instrument.


Econotech is US EPA 1650 Ready! Econotech has been a leader in AOX analysis for 14 years and is proficient in all AOX methodology, including US EPA method 1650.

US EPA 1650 is the method used to test mill effluents in the United States. This method requires all samples to be run in duplicate and a duplicate "spike" of 2,4,6 trichlorophenol to be analyzed on one randomly selected effluent sample per day. These quality control measures ensure your AOX results are accurate and reproducible.

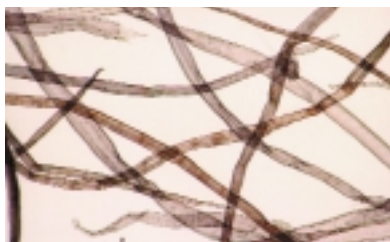
A full service laboratory for the pulp and paper industry for over 28 years, Econotech is accredited by the Canadian Association for Environmental



Analytical Laboratories (CAEAL), Standards Council of Canada (SCC) (ISO Guide 25) and the State of Washington-Department of Ecology for specific tests registered with these associations.

We can help with your mill's AOX testing in an efficient, professional and timely manner - just contact Steve Riche (aox@econotech.com) or Bill Warning (bill@econotech.com) for assistance with sample bottles, shipping and any questions regarding this protocol. 


Microscopic Expansion



The Microscopy department is expanding to serve you better. The addition of Stacey Gosselin to our department will enhance response time for your testing needs. In the space of three months, Stacey has learned many of the tests performed in the microscopy department, and is

well on the way to mastering the more complicated testing of species and asbestos bulk samples. A BCIT grad from the pulp and paper program, she is a quick learner who has already impressed the team with her enthusiasm and dedication to quality. Expect to hear from her soon!

Econotech is also pleased to announce that Heather McLeod has been appointed Group Leader for the Microscopy Department. Heather has

taken on the administrative tasks for the department, and is - as all department members are - happy to assist you with any questions or concerns you may have. 



Stacey Gosselin in our Microscopy department

New Microscope!

With the addition of a new technician to the Microscopy department, another microscope was essential. After careful consideration of quality, functionality and price, we decided on a Nikon ES400 Eclipse compound microscope. This microscope incorporates many of the modern advances in light microscopes over the past ten years. Developments include color balancing, infinity corrected optics and ergonomic design for those long days at the 'scope.

One of the most exciting features of this new setup is digital image capture. We have the latest digital camera from Nikon, the CoolPix 990 at 3.3 Mpixels. Coupled with an Epson Stylus 870 printer, we can easily document [specimens with terrific detail](#). [Photomicrographs can be emailed to you for review](#). Graham Vandegriend will continue in his role as microscopy's photomicrographer extraordinaire. Please call Graham to discuss how photomicrographs of your pulp or contaminants can help you communicate better with your clients. 📧

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Printability Testing

Printability is becoming more and more of an issue in the paper industry. But despite all efforts it is still not possible to describe printability with only one number. There are many other factors besides the paper - printing processes, press conditions, inks, press crews, etc. - that influence the results. However, all other factors being equal, paper characteristics are the deciding elements for the final print quality.

The following paper properties are considered important for all printing processes. This list is not a complete one, but is an attempt to give some idea as to the complexity of predicting printability.

Structural Properties	Surface Properties	Optical Properties
Basis weight	Porosity	Surface topography
Thickness	Compressibility	Roughness/smoothness
Sheet density	Two-sidedness	Surface strength
Moisture	Wire mark	Loose dust/lint
Absorbency	Formation	Dirt
		Brightness
		Color & Opacity
		Scattering coefficient
		Absorption coefficient
		Gloss

The four major printing processes and critical paper properties for each are described below:

Process	Paper Properties Required
Letterpress	Good formation, low roughness, good surface strength, good opacity, no surface dust/lint, high absorbency, uniform, caliper.
Offset	Uniformity is the key property, high surface strength, high brightness, low roughness, good opacity, good dimensional stability, good compressibility, high absorbency.
Gravure	Very flat surface and good compressibility, good formation, very uniform cross-reel profile, good opacity, good ink hold-out (closed surface), resistance to roughening upon drying.
Flexo	Good water absorption characteristics, high surface strength, no surface dust/lint, good formation, low roughness, uniform caliper.

The paper requirements for each process are quite different; however good formation, a smooth and tight surface, high surface strength and good optical properties are desirable for all printing methods.

As we can see, surface roughness is a critical property. This can be measured by the roughness test. Generally speaking the Parker Print-Surf Tester or PPS is used for SC and coated grades. The Sheffield Tester is used for directory and regular newsprint grades. The MBR Print Indicator (invented by MacMillan Bloedel) is also a very good unit to test for ink holdout and two-sidedness for newsprint. The IGT Pick Tester is used for surface strength. 📧

If you have any questions or work involving printability, please contact Sandra Fodor (sandra@econotech.com) or Don McDermid (don@econotech.com) at 800-463-5700.

Love on Christmas

Christmas is coming again soon. Every year it comes on the same day just like the sun never misses the morning. Whenever I think about Christmas, a sad story inevitably comes to my mind.

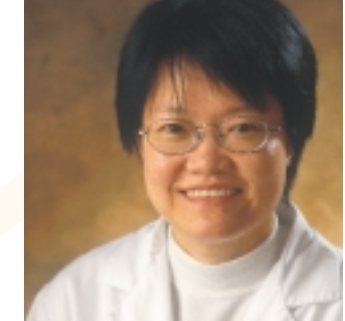
I think it is an illusion to think that everyone in Hong Kong has a good chance to earn money. Lots of people earn shameful amount of incomes, especially the old and handicapped. What is worse is that there is no welfare to help those unlucky ones in Hong Kong. Auntie Lo was one of these unfortunate old ladies.

If you ask me who Auntie Lo is, I would tell you she was the poorest woman I have ever known. She picked up cans around our high school. This was her only source of income. No one had ever paid any attention to her until one day she fainted in front of our school gate.

I still remember, it was the evening of December 20th, just five days before Christmas. No one but Mary and me were around. All the other students had rushed home after our term examination. When I saw Auntie Lo collapse, I screamed for Mary and we quickly carried her up to the office. It took 30 minutes to bring her back to consciousness. Then we heard her story. Only after hearing about her life did we realize how lucky we were.

Auntie Lo lived together with her 15 year old son, Ah Choi. Because her husband died when Ah Choi was only five, Auntie Lo became the only breadwinner of the family. She worked day and night for the family. Unfortunately, because the lack of parental care and attention, Ah Choi became a drug addict at the age of twelve. Later, he ran away and became a drug trafficker to make money to support his habit.

Not long after that, Auntie Lo got laid off from her factory job. Life was so tough for her - she had lost her husband, her son, her job. Her family was totally ruined. At night she prayed to God, hoping one day her son would come back to her. Every day she picked cans in the parks and around our school. After paying the rent, she could only afford one meal a day. She never asked for help and none was offered to her. She continued to pick cans even though she was crippled from bending repeatedly.



Auntie Lo's life became more miserable when her son, Ah Choi returned. He had leukemia and was expected to live only two months. His only hope was to be forgiven by his mother before death. Auntie Lo forgave him just like Jesus Christ does to all of us.

Auntie Lo was happy to have her son back, yet she had great grief because of his incurable disease. She wanted to give her son a wonderful last Christmas and decided she would work even harder to buy a turkey for Christmas Eve.

I think 'love' provided her the energy to work like that. Once Auntie Lo regained consciousness, her first question was to ask where her bag of cans was. Mary and I had tears in our eyes and didn't say much in case we would cry. After that evening, Auntie Lo was never seen again.

To me, love and health seem to be taken for granted and that should not be. Auntie Lo and Ah Choi were not that lucky.

The origin of Christmas is based on love. So love the people you love and be grateful to those who love us. Don't regret! 📧

Annie Fu, Senior Technologist

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Analytical-Pulp & Liquor

Econotech is listening

At the request of our clients, Econotech's Paper Testing department is putting together a training program. The program will include the theoretical and practical knowledge of operating the PFI or valley beater, measuring freeness, preparation of hand sheets and most of the common physical and optical tests associated with pulp testing. This could be performed either at the customers' lab or at Econotech.

For further information please contact Don McDermid (don@econotech.com) at 1-800-463-5700. 📧

RLAs Help Keep Lime Kiln Costs Down!

The cost of energy has risen at a faster rate than the price of pulp over the last year. The cost of oil and natural gas has more than doubled in the past two years. Many kraft mills are examining areas consuming oil or natural gas to reduce energy costs. One area of high energy consumption is the lime kiln. It requires 7 to 10 million BTUs per ton lime production in a typical lime kiln. A general breakdown of the energy requirements for calcining lime mud is given below:

Operation	MMBTU /ton lime	%
Evaporate and heat water	3.0	33.0
Energy in kiln product	0.9	9.9
Enthalpy of calcination	2.7	29.7
Enthalpy consumed from lime, CO ₂ , dust and combustion products	1.3	14.3
Radiation loss	1.2	13.1
Total	9.1	100.0

The energy requirements at your mill will vary from the above example depending on the lime mud moisture content, the presence of lime coolers, type of fuel used, kiln size and loading, and geographic location. From the table above, any program on reducing lime kiln energy usage will include: reducing moisture content of lime mud, use of lime coolers, and minimizing dust loss from kiln. Improvements to lime kiln operation may be dependent on other operations within the causticizing department such as green and white liquor clarification, dregs washing and mud washing efficiency.

The above discussion did not cover the quality of lime produced in a kiln. The amount of energy used in the lime kiln can result in production of under- or over-burned lime. Underburned lime produces less available lime and a dead load of carbonate that results in increased energy consumption per ton of lime produced. Overburned lime (i.e. >99% CaO) is unreactive in the slaker and causticizers leading to over liming and operational upsets in white liquor preparation. Econotech can help you determine and control the quality of lime from your kiln by using a reburned lime analyzer (RLA). The Econotech RLA consists of a reaction vessel and a calibrated gas buret. It measures the amount of carbon dioxide released after the addition of sulfuric acid to a one gram lime sample. Using a supplied calibration chart and the amount of carbon dioxide measured, the residual carbonate on lime can be calculated. A correctly burned lime contains 1 to 2% calcium carbonate. Kiln operators have used our reburned lime analyzers to control production rate and fuel consumption. Approximately 230 Econotech



Ralph Abley with reburned lime analyzer

lime analyzers have been sold to pulp mills around the world over the last 21 years. Some pulp mills have them in both the causticizing department and the main mill laboratory. ☞

We would like to help you solve problems in the causticizing or lime kiln areas. For liquor testing or analysis of residual carbonate in reburned lime, call Thomas Yuen (tomy@econotech.com). For purchasing information on reburned lime analyzers call Ralph Abley (ralph@econotech.com) or Randy Lowe (randy@econotech.com).



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