

# e c o n o Talk

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## The Importance of Water Quality on Freeness

Let's review what the various standard procedures call for:

**TAPPI** requires the use of ASTM Type II water, however water with a conductivity of less than 4  $\mu\text{s}/\text{cm}$  is acceptable. **"Tap water is considered unacceptable."**

**CPPA** requires the use of ASTM Type III reagent water. The conductivity must be less than or equal to 1.0  $\mu\text{s}/\text{cm}$  @ 25°C.


**ISO** says simply, "the freeness test is known to be affected by dissolved solids and the pH of water and therefore deionized or distilled water must be used".

What does all this mean? Is it really necessary to follow these procedures

word for word? It has been known for many years now that polyvalent cations seriously affect the freeness of pulps, more so for beaten pulps. Calcium and aluminum salts are likely the worst offenders here in North America. I can't begin to count the number of times I have heard the comment, "Our water is very soft and therefore won't cause a problem." Wrong - it only takes a very small amount of calcium or aluminum in the water to cause significant differences in freeness. If one plots Ca++ ppm versus freeness, the steepest part of the curve is from 0 ppm Ca to 6 ppm Ca; the curve then levels out. This shows us that if the water is very soft the variation in freeness will be great.

The differences that one sees in freeness values between distilled water and tap water become greater the more the pulps are refined.

Revs	Tap water 7 ppm Ca++	Distilled water
3000	679	623
5000	634	566
10000	504	397
15000	349	249

Of course, the chances of mills getting consistent freeness results when their water supply originates from rivers is even less. As the river levels change from season to season the likelihood is that the polyvalent cations will also change. Mills in this situation should check the calcium and aluminum levels of their water on a regular basis. 

*Don McDermid*  
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## From Lab to Links




Lyle Flostrand, well-known bon-vivant and man about Port Alice, will be retiring at the end of June as Laboratory Supervisor at Western Pulp Limited Partnership's sulfite operation on Vancouver Island. The mill produces dissolving sulfite pulp for manufacture of a wide variety of specialty end products ranging from food additives to clothing fabric. The Port Alice mill produces 100% ECF pulp.

Lyle has 'logged' some 33 years at the Port Alice mill and is responsible for maintaining the mill laboratory testing facilities and scheduling personnel. He grades daily pulp production and produces weekly quality and chemical usage reports and also interfaces with outside laboratories to arrange for special tests (that's how so many of us got to know Lyle so well). Our own Thomas Yuen used to work for Lyle many years ago!

Lyle has many hobbies outside the mill that he is more than willing to talk about. His number one passion - beside his wife Maggie, would be golf. He and Maggie have played courses all over the continent. Lyle's other interests include skiing, fishing, hunting and picking wild mushrooms. One of his favorite home hobbies that uses his chemistry background is brewing beer - he claims expert status at this.

After their dual retirements, Lyle and Maggie will fly to England (bet their arms will be sore), then Chunnel to France where they will meet their two sons for a two week celebration in Paris. Following a bungee jump from the Eiffel Tower, Lyle and Maggie will spend a week touring France before taking the Chunnel back to England where they will carry on to Ireland to visit some of Maggie's relatives.

Everyone at Econotech will miss the cheery conversations that Lyle's phone calls bring. We send Lyle and Maggie our very best wishes for a long and hearty retirement, strolling the links of life together. 

*Thanks to Dave Annau at WPLP, Port Alice for his contribution to this story.*

## TOX in Pulp

The measurement of Total Organic Halide (TOX) in pulp and paper has become an important factor in sales of these products to European markets. Strict environmental regulations for TOX levels will affect the value of your product.

Econotech includes routine quality control steps throughout the TOX

procedure. To further ensure your TOX analysis is accurate, an 'in-house' reference pulp is included with each batch of samples. This pulp has been analyzed many times and the TOX result is used by our technicians to monitor method accuracy.

If you would like more information on TOX in pulp, please email or call me.



*Stephen A. Riche*  
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## K No. or Kappa - Which is Better?

Many mills use K No. or kappa numbers to control their cooking or bleaching. Both are acceptable for process control. But does one have an advantage over the other? Let's examine the differences.

K No. is the volume (in milliliters) of 0.1N potassium permanganate solution consumed by one gram of moisture-free pulp under specified condition. TAPPI Useful Method 251 indicates that for pulp with < 20 K No., 25 mL of permanganate solution is used; for < 35 K No., 40 mL of permanganate is used. For higher K Nos., the kappa test procedure should be used, although some mills run 50 and 60 mL K No.

*Randy on Ol' Borax*



tests. In the K No. test, 1 o.d. gram of pulp is oxidized with the required fixed volume of permanganate. The consumed permanganate is determined by back titration with thiosulfate solution.

The K No. procedure is perfectly acceptable to control a digester with a constant K No. target. The K No. determination is not suitable for comparing pulps over a wide range of lignin content or for precisely determining the per cent delignification over an oxygen stage. The change in K No. is not directly proportional to pulp lignin content over the range of the test. In other words, a 15 K No. pulp does not contain half the lignin of a 30 K No. pulp.

Kappa number is linear to lignin content. In running a kappa number the weight of pulp is adjusted to obtain 50% consumption of permanganate. In adjusting the pulp weight, the lignin to permanganate molar ratio is always constant in each kappa determination and the kinetics of the reaction proceeds linearly.

The following equation gives the relationship between lignin content and kappa number:

% lignin on pulp = ~ 0.15 x kappa  
For example, % lignin @ 30 kappa = 0.15 x 30 = 4.5% lignin on pulp

At Econotech, we use either K No. or kappa number for our pulping studies depending on which method is used in the mill. Kappa numbers are normally used in our bleaching studies. A comparison of K No. and kappa numbers is shown below:

Kappa	K No. (40 mL)	K No. (25 mL)
45	27.5	-
40	25.5	-
35	23.0	-
30	20.5	18.3
25	17.3	16.5
20	13.5	14.0
15	11.0	11.0
10	-	7.0

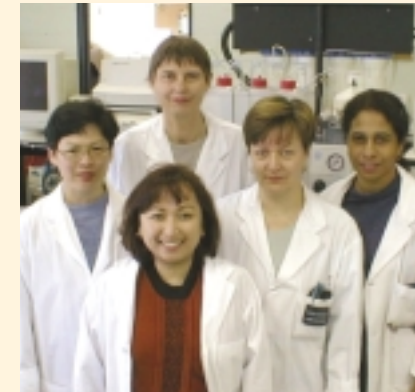
Our analytical department is skilled at using both methods. If you wish to verify the kappa or K No. results for your mill, contact Thomas Yuen (tomy@econotech.com) in our Analytical Department.

*Randy Lowe*  
VP-Pulping & Bleaching Services  
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## The Bigge Auf Wiedersehen

Someone that many of you are familiar with - Ute Bigge, Senior Technologist in our Environmental Department, will be retiring at the end of June this year.

Ute's career at 852 Derwent Way began in 1966 when Columbia Cellulose inhabited the building. In 1972, when her son, Ryan was born, Ute took an extended leave of absence and returned to work at Econotech in 1990. Since her return, Ute has been instrumental in improving the level of efficiency in the Environmental Department. In the last six months, Ute's efforts have been directed towards getting our new Varian GC (gas chromatograph) online and reporting data. She has done an excellent job with this and every task she has set out to accomplish while at Econotech.



*Lien, Rowena, Ute, Igga, Hur*

We offer our best wishes for a happy, relaxing retirement to Ute and husband, Fred. Over the years, Ute has spoiled us with her delicious tortes and coffee cakes, so we hope to see her as a regular coffee-time visitor!

*Bill Warning*  
Analytical Manager  
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## Triple Chocolate Cake



- 1 package chocolate cake mix
- 1 package (4 serving size) chocolate instant pudding and pie filling
- 1 3/4 cups milk
- 2 eggs
- 1 package (12 oz) chocolate chips

Combined cake mix, pudding mix, milk, eggs and chips in a large bowl. Mix by hand until well blended, about 2 minutes. Pour into a greased and floured 10 inch Bundt or tube pan. Bake at 350°F for 50-55 minutes, or until cake springs back when lightly pressed. Do not over bake. Cool 15 minutes in pan, then remove and finish cooling on rack. Sprinkle with confectioners sugar, if desired.

(For high altitude areas, add 1/3 cup all purpose flour, reduce milk to 1/2 cup and add 1 1/2 cups water.)

*Norma Becker*  
Librarian



## BC Institute of Technology

### Pulp & Paper Technology Summer Institute Vancouver, June 5-9, 2000

Here's your opportunity to visit Vancouver (and Econotech) for a little business and a lot of recreation! The 22nd annual Pulp & Paper Technology Summer Institute provides a five-day overview of the process and technology of pulp and paper manufacture, along with current technological innovations in the industry.

Included in this year's program are scheduled tours of Scott Paper, Newstech Recycling, Howe Sound Pulp and Paper and Econotech (you can bet - we'll have the best food!).

This program is a must for anyone involved in the pulp and paper industry. To register or for more information, please contact:

Stephen Berghold  
Berghold Training and Consulting Inc.  
Tel (604) 462.0910  
Fax (604) 462.0920

We're looking forward to meeting with you on the tour!

## New Standards for Lab Certification

The Standards Council of Canada (SCC) Program for Accreditation of Laboratories-Canada (PALCAN) has recently adopted a new International Standard (ISO/IEC 17025) for the basis of their accreditation. It contains all the requirements that testing and calibration laboratories have to meet and replaces the ISO guide 25:1990. Laboratories that comply with this new International Standard meet ISO 9001 or 9002 specifications.

The Analytical Department at Econotech is currently accredited

with CAEAL (Canadian Association for Environmental Analytical Laboratories) and SCC for specific tests to the ISO 25 level and will be moving to the new requirements set out by the SCC.


*Cliff, Donna, Matthew and Rachel Fournier*



New requirements in ISO/IEC 17025 will be reviewed during our CAEAL audit in the summer of 2001.

The benefits of this new program will bring us closer to (but not at) an international accreditation system. This will facilitate international acceptance of our results with countries

where a mutual recognition agreement has been signed for the new standard.

SCC is now formally training up to 100 technical assessors and adding eight more (for a total of 15) Team Leaders. As a result, SCC will become more involved in overseeing and standardizing the CAEAL auditing program. In my opinion, this will result in improvements to the current CAEAL program and increase the value of our work for you. 

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