

# **PEERS Conference 2014**

Tacoma, Washington, USA  
14-17 September 2014

ISBN: 978-1-5108-1506-3

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2014) by the TAPPI Press  
All rights reserved.

Printed by Curran Associates, Inc. (2015)  
For permission requests, please contact the TAPPI Press



at the address below.

TAPPI Press  
15 Technology Parkway South  
Peachtree Corners, Georgia 30092

Phone: (800) 332-8686  
Fax: (770) 446-6947

[memberconnection@tappi.org](mailto:memberconnection@tappi.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>Bleach Plant Optimization at the Resolute Forest Products Coosa Pines Pulp Mill</b> .....	1
<i>Eric Steelreath, Paul Earl, John Vanderheide</i>	
<b>Improved Steady-state Models for Chlorine Dioxide Delignification Sequences That Includes Washer Carryover Effects</b> .....	7
<i>Brian N. Brogdon</i>	
<b>Overview of Water Sustainability Initiatives</b> .....	21
<i>Barry Malmberg</i>	
<b>Catalysis: A White Paper on Alternatives to Kraft Pulping. A Synthesis of the Literature</b> .....	33
<i>Alan Rudie, Peter Hart</i>	
<b>Evaluation of Acetone-Water-Oxygen Delignification of Hot-Water Extracted Sugar Maple: Application of 2<sup>4</sup> Experimental Design</b> .....	47
<i>Chen Gong, Biljana Bujanovic</i>	
<b>Proper Use of Lab, In-line, and On-line Measurements for Fiberline Monitoring and Control</b> .....	59
<i>James Goldman</i>	
<b>Silica Reduction in Bamboo Pulp</b> .....	68
<i>Troy Runge, Scott Paul</i>	
<b>Utilization of Aquatic Species in Paper</b> .....	75
<i>Tom Shannon, Bo Shi</i>	
<b>Production of Dissolving Pulp from Bamboo</b> .....	84
<i>C. M. Jardim, L. A. R. Batalha, F. J. B. Gomes, J. L. Colodette</i>	
<b>SVP-HP ClO<sub>2</sub> Generator Analysis</b> .....	95
<i>Cheryl Sewell</i>	
<b>Single Point Kappa SPK-5500</b> .....	102
<i>N/A</i>	
<b>Advancing Air Separation Technology</b> .....	108
<i>Steve Gibson</i>	
<b>SENECA™ 60 P Alumina Refractory Brick for Lime Kiln Burning Zones</b> .....	113
<i>Chris Macey</i>	
<b>New Applications for the Tornado Pulper</b> .....	120
<i>Robert Hurter</i>	
<b>Dithionite Based Additives</b> .....	128
<i>Dieter Schonhaber</i>	
<b>Dry Sorbent Injection Systems in a Compliance Age</b> .....	137
<i>Mark McCabe</i>	
<b>ZRI Concept for Recovering Fibers from Fine Screen Rejects – A Mill Trial</b> .....	145
<i>Mika Kōrkkö, Liisa Kotanen, Markku Rislakki, Dennis Voss, Elisabeth Wasche, Johannes Haarla, Jouko Niinimäki</i>	
<b>Optimizing OCC System Yields</b> .....	150
<i>Steve Fleming</i>	
<b>High Performance Pulp Washer “Vertical Z”</b> .....	162
<i>Hiroki Nanko</i>	
<b>Brown Stock Washing – A Review of the Literature</b> .....	171
<i>Ricardo Santos, Peter Hart</i>	
<b>Optimization of a Brown Stock Washing Line</b> .....	201
<i>Riku Kopra, Kimmo Koivula, Olli Dahl</i>	
<b>Improving Brown Stock Washing with a Directly Connected Pressure Diffuser, DiConn™</b> .....	210
<i>Anders Hjort, Gord Start, David Annau, Francesca Apruzzese, West Fraser</i>	
<b>Highly Absorbent Fluff Pulp from Refiner Mechanical Pulping of Banana Fiber</b> .....	223
<i>Medwick Byrd, Abenezzer Fanta, Elizabeth Scharpf</i>	
<b>Maintenance Painting of Steel Structures in Pulp &amp; Paper Mills - A Program Approach for Maximum Cost Effectiveness</b> .....	233
<i>David Bennett</i>	
<b>Time to Paint the Wet-end?</b> .....	236
<i>David C. Bennett</i>	
<b>Improved Steam Turbine Efficiency and Reduce Production Cost Through Chemical Foam Cleaning of Turbines</b> .....	242
<i>Danny Foster</i>	

<b>Advanced Condition Diagnostics for Pulp and Paper Mills</b> .....	248
<i>Kari Aura, Steve Crotty</i>	
<b>The Accumulation of Non- Or Slowly Biodegradable Organic Compounds in an Activated Sludge Process Within a Kraft Pulp Mill</b> .....	264
<i>Sakari Toivakainen, Heikki Hannukainen, Timo Laukkanen, Olli Dahl</i>	
<b>Improving Wastewater Treatment with High Purity Oxygen Injection</b> .....	275
<i>Kirk Brown, Steve Gibson</i>	
<b>Implementing Numerical Phosphorus Limits</b> .....	281
<i>Angela James</i>	
<b>Sustainability in Nonwood Pulping - A Perspective from India</b> .....	285
<i>Karthik Raghavan</i>	
<b>APMP Pulping of Whole Kenaf for Value-added Market Pulps</b> .....	302
<i>Eric Chao Xu</i>	
<b>Growing Market Support for Nonwood Based Pulp and Papers</b> .....	317
<i>Neva Murtha</i>	
<b>Chemical, Anatomical and Technology Aspects, for Eucalyptus Benthamii X Eucalyptus Dunnii for Use in Pulp and Paper Mill</b> .....	327
<i>Peter Hart, Gisely Samistraro, Jorge Luis Colodette, Ricardo Paim</i>	
<b>Hardwood Pulping Kinetics of Initial, Bulk and Residual Phases</b> .....	342
<i>Diego Almeida, Hasan Jameel, Ricardo Santos, Peter Hart</i>	
<b>Deinking Considerations with Flexographically Printed Papers: Part I Destabilization of Flexographic Ink Dispersions with Copper Compounds</b> .....	353
<i>Kevin Hodgson, Eric O. Fernandez</i>	
<b>A New Method of Microstickies Agglomeration by Electric Field</b> .....	362
<i>Xiaotang Du, Jeffery S. Hsieh</i>	
<b>Deinking Evaluation Using Near Infrared Digital Image Analysis</b> .....	371
<i>Roland Gong, Paul D. Fleming, Karyn Biasca</i>	
<b>Operating Strategies in the Absence of SSM Exemptions</b> .....	378
<i>Dan Curry</i>	
<b>Developing a Boiler MACT Compliance Strategy</b> .....	393
<i>Aaron Day</i>	
<b>GHG BACT: Current Strategies and Recent Developments</b> .....	400
<i>Maren Seibold</i>	
<b>Brownstock Washing Auditing a Vacuum Washer System</b> .....	415
<i>Jake Townson</i>	
<b>Trialing and Optimization</b> .....	426
<i>Bill Miskimins</i>	
<b>Brownstock Washing Technologies - Brownstock Washing II Panel Discussion</b> .....	446
<i>Bruno Pannese</i>	
<b>Brown Stock Washing Defoamers Defoaming &amp; Drainage</b> .....	468
<i>Bobby Wilson</i>	
<b>New Opportunities For Energy Savings In Larger Diameter Rotary Kilns</b> .....	483
<i>Peter Trane, Niels Ilberg Jacobsen</i>	
<b>Improving Lime Kiln Efficiency: A Mill Study</b> .....	491
<i>Peter Hart, Kenneth Nesselrodt, Stephen Lee, John D. Andrews</i>	
<b>Measurement of Free Lime Content in Lime Mud</b> .....	504
<i>Wei Ren, Xiaosong Mao, Honghi Tran</i>	
<b>Planning, Design, and Execution of an Automation System Replacement During a Scheduled Outage</b> .....	515
<i>Robert Smart</i>	
<b>Advanced Planning - A Tool for Closing Capital Effectiveness Gaps</b> .....	520
<i>Don Sorenson</i>	
<b>Real-time In-line Measurement of Stickies in Recycled Pulp</b> .....	526
<i>Suvajit Das</i>	
<b>Optical Stickies Monitor: a Tool for Macrostickies Characterization for Process Efficiency Improvement</b> .....	531
<i>Sergey Shevchenko, K. Broadus, W. Von Drasek</i>	
<b>Hydrophobization of Inkjet Ink to Improve Deinking Efficiency</b> .....	536
<i>Xiaotang Du, Jeffery S. Hsieh</i>	
<b>Managing Risks Associated with Industrial Impoundments</b> .....	547
<i>R. Kent Nilsson</i>	
<b>Rotary Press Revolutionizes Sludge Compaction</b> .....	554
<i>Ross Elliot</i>	

<b>Anthraquinone – A Review of the Rise and Fall of the Most Recent Pulping Catalyst .....</b>	<b>567</b>
<i>Peter Hart, Alan Rudie</i>	
<b>North American &amp; European Regulatory Issues: 9,10-Anthraquinone (AQ) Use for Alkaline Pulping.....</b>	<b>586</b>
<i>Brian Brogdon</i>	
<b>Anthraquinone – Regulatory Evolution.....</b>	<b>595</b>
<i>Gopal Goyal, Richard Poaps, Dan Burger</i>	
<b>Behavior Of Diatomaceous Insulating Bricks In Large Diameter Rotary Kilns .....</b>	<b>600</b>
<i>Niels Ilberg Jacobsen, Peter Trane</i>	
<b>Design of Refractory Linings for Balanced Energy Efficiency, Uptime, and Capacity in Lime Kilns .....</b>	<b>608</b>
<i>J. Peter Gorog, James G. Hemrick, Harald A. Walter, W. Ray Leary, Murray Ellis</i>	
<b>Computer Modeling as a Tool to Estimate the Impact of Fuel Type on the Performance of Kilns Used to Regenerate Lime in the Kraft Process .....</b>	<b>629</b>
<i>J. Peter Gorog, W. Ray Leary, David Wang, Kevin Davis</i>	
<b>HClear™ Program: A Solution-Based Approach to HCl Abatement.....</b>	<b>652</b>
<i>Kent Schulz, Ian Saratovsky, Christopher R. Smyrniotis, Emelite P. Rivera</i>	
<b>Impact of Availability and Economics on Alloy Selection.....</b>	<b>660</b>
<i>Zachary Schulz, Paul Whitcraft, Devin Wachowiak</i>	
<b>What Goes Around Comes Around .....</b>	<b>670</b>
<i>Jack Porter</i>	
<b>A Practical Approach to Eliminating Rapid Sodium Carbonate – Sodium Sulfate Scaling in Black Liquor Concentrators.....</b>	<b>680</b>
<i>W. J. Frederick, Daniel D. Euhus</i>	
<b>Online Recovery Boiler Reduction Degree - Data Review.....</b>	<b>691</b>
<i>Jeff Butler, Risto Ikaheimo, Antti Kokkonen</i>	
<b>Dimensioning a Recovery Boiler Furnace Using Mathematical Optimization .....</b>	<b>706</b>
<i>Viljami Maakala, Pasi Mikkulainen</i>	
<b>Kraft Recovery Boiler Dust Chemistry – Implications from Operating Boilers .....</b>	<b>720</b>
<i>Keijo Salmenoja</i>	
<b>Guidelines and Considerations for Sootblowing Steam Conversion Projects: A Case Study from Mondi Ruzomberok Mill.....</b>	<b>729</b>
<i>Ati Manay</i>	
<b>Use of MF/RO Filtration Technology for Water Reuse in the Pulp and Paper Industry .....</b>	<b>741</b>
<i>Mrinal Mahapatro</i>	
<b>A Comparison Of Dissolved Oxygen Measurement Methods For Random and Systematic Uncertainty.....</b>	<b>749</b>
<i>Nicholas Giannetti, Peter J. Veverka, Aron Rehm</i>	
<b>Overview of Water Use Reduction in the US Pulp and Paper Sector.....</b>	<b>767</b>
<i>Barry Malmberg</i>	
<b>Bleach Plant and Machine Corrosion from Oxidizers.....</b>	<b>781</b>
<i>Andrew Garner</i>	
<b>Paper Machine Corrosion .....</b>	<b>782</b>
<i>Paul Glogowski</i>	
<b>Reviving Sulfite Pulping for Sugar Production from Woody Biomass .....</b>	<b>793</b>
<i>J. Y. Zhu, M. Subhosh Chandra, Roland Gleisner, William Gilles, Johnway Gao, Gevan Marrs, Dwight Anderson, John Sessions</i>	
<b>Process &amp; Financial Modeling of Lignin Extraction in a Kraft Pulp Mill.....</b>	<b>803</b>
<i>Charles Culbertson, Trevor Treasure, Richard Venditti, Hasan Jameel, Richard Phillips, Ronalds Gonzalez</i>	
<b>Identifying Microbially-Influenced Corrosion on Surfaces Contacted by Mill Waters.....</b>	<b>819</b>
<i>W. B. A. Sharp, Lynda A. Kiefer</i>	
<b>Effect of White Water Constituents on Localized Corrosion of Duplex Stainless Steels .....</b>	<b>837</b>
<i>Preet Singh, Yushu Wang</i>	
<b>Stress Corrosion Cracking of 316L Stainless Steel in High-yield Pulping Environments .....</b>	<b>847</b>
<i>Doug Singbeil, Pat Clarke, Chris Thompson</i>	
<b>Design of Blend Chest Agitators; Guidelines, Data Required and Agitator Sizing.....</b>	<b>862</b>
<i>Steven Drury</i>	
<b>Operational Excellence Through Reliability .....</b>	<b>878</b>
<i>John Yolton</i>	
<b>Effect of Feedstock Moisture Content on Biomass Boiler Operation.....</b>	<b>909</b>
<i>Naz Orang, Honghi Tran</i>	
<b>Combustion Behaviours of Lignin-lean Black Liquor and Lignin .....</b>	<b>922</b>
<i>Liming Zhao, Honghi Tran, Kirsten Maki</i>	

<b>Impact Of Corrosion On Selection Of Structural Materials For Thermochemical Processing Of Biomass</b> .....	933
<i>James R Keiser</i>	
<b>Formic and Sulfuric Acid Reinforced Extraction of Hardwood Chips for Production of a Hydrolysate Containing High Monosugar and Low Lignin Precipitate Concentrations</b> .....	946
<i>Adriaan Van Heiningen, Yusuke Yasukawa, Kefyalew Dido, Raymond Francis</i>	
<b>Recovery of Sodium Acetate from Alkaline Hardwood Extract using Electrodialysis</b> .....	961
<i>R. Patil, C. Truong, J. Genco, H. Pendse</i>	
<b>Author Index</b>	