



# CENTRAL PULP & PAPER RESEARCH INSTITUTE

केन्द्रीय लुग्दी एवं कागज़ अनुसंधान संस्थान

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## MANAGEMENT NEWS

### Meeting of Development Council for Pulp, Paper and Allied Industries (DCPPAI)

A meeting of DCPPAI was held under Chairmanship of **Shri Harsh Pati Singhania, CMD, JK Paper Ltd.** on April 5, 2013, at Scope Building, Bhabha Hall, CGO Complex, New Delhi. While initiating the proceedings of the meeting the agenda of meeting was presented by Dr. R. M. Mathur, Member Secretary & Director CPPRI, covering various issues like a **viability of degraded forest land for plantation , improving recovery of waste paper, technology modernization assistance program (TMAP), PAT scheme, promotion to agro forestry, skill development, dumping of newsprint.**

The progress of various Cess projects was also reviewed. The dignitaries who participated in meeting as members and special invitees were Shri N. Gopalaratnam, Shri R.R. Vederah, Shri R. C. Rastogi, Shri Anil Kumar, Shri P. S. Patwari, Shri Pramod Agarwal, Smt. Sunita Yadav, Director, DIPP and Shri P.L.N. Murthy, Under Secretary DIPP, in addition to the member officials from **Indian Paper Manufacturers Association (IPMA), Indian Agro and Recycled Paper Mill Association (IARPM), Indian Newsprint Manufacturers Association (INMA), JK Paper Ltd.,**



*Meeting of DCPPAI under Progress*

**International Paper, All India Federation of Master Printers (AIFMP) and CPPRI.**

## RESEARCH AND DEVELOPMENT ACTIVITIES

### RAC Projects

#### Raw Material and Product Development

#### Utilization of Rice Straw and other Non-Conventional Raw Materials for Production of Various Grades of Pulp

Detailed literature survey in the areas cited below was carried out for planning of the project activities:

- ❖ Availability of rice straw for Indian Paper Industry
- ❖ Storage and handling of rice straw
- ❖ Pulping practices for rice straw
- ❖ Bleaching practices for pulps obtained from rice straw.

Further studies will focus on-

- ❖ Collection of rice straw from various climatic zones of the nation having highest production of rice straw like West Bengal, Chhattisgarh & Assam etc.
- ❖ Each sample collected will be subjected to Proximate Chemical analysis and efforts will be aimed to remove silica from the raw material. Various pulping processes will be employed to produce different grades of paper by blending the rice straw pulp with long fibre indigenous raw material pulps.

#### New Approaches in Processing and Paper Making of Recycled Fibre to Improve the Quality of End Product

R & D work is in progress to evaluate the efficacy of Dry Strength Resin (DSR) of different charge density to improve the strength properties of Deinked pulp (DIP) of ONP/ OMG furnish. Simultaneously studies were initiated to study the effect on Bio co-polymers on improving the Water Retention Value (WRV) and fiber-fiber bonding potential of OCC furnish.

## Energy Conservation and Environmental Management

### Implementation of Enzyme Application in Pulp & Paper Industry

The project aims to implement the biotechnological applications in pulp & paper industry to pursue the clean & green technology to address the issues related to energy conservation, quality up gradation and environmental improvement in following areas:

- ❖ **Bioethanol production from lignocellulosic biomass, bagasse pith and rice straw**

Collection of identified lignocellulosic biomass viz. bagasse pith and Rice straw for Bioethanol production. Proximate analysis of raw material was initiated for different parameters like Klason lignin, Pentosan, Holocellulose etc.

Studies were continued with optimization of pretreatment conditions viz. acid concentration, retention time and temperature etc.

- ❖ **Development of indigenous capabilities for production of various enzymes and their application in Indian paper industry**

Studies on isolation of microorganisms from different sources were initiated. Primary screening of microorganism were initiated conducted by activity zone method for production of desired enzymes viz. cellulase/Xylanase/ amylase etc.

- ❖ **Bioremediation of Paper mill effluent:**

Isolation and screening of microorganism are under progress in order to find the more effective strains for paper mill effluent treatment. Primary screening of isolated microorganisms is mainly targeted on the growth of microorganisms on lignin and other phenolic compounds supplemented media. Acclimatization studies were continued with screened bacterial strains by increase effluent concentration.

### Incremental Capacity Enhancement and Improved Efficiency of Conventional Chemical Recovery System in Wood and Non wood based Paper Mills

Studies were initiated on black liquor collected from a non-wood based mill. Characterization of collected black liquor completed and further studies on separation of lignin, characterization and its processing is under progress.

### Water Conservation through Application of Kidney Technologies in Pulp and Paper Industry

The project activities were initiated with identification and selection of mills for adoption as case study. Questionnaire were prepared and sent to the mills for collection of information and data related to water consumption, reuse and recycling practices adopted by the mills etc. A study has been initiated at a RCF based mill claiming Zero Liquid Discharge (ZLD) where regular collection and analysis of back water and treated water is being carried out to study the build-up of TDS and other pollution load and its impact on product quality and overall impact on mill operations.

## Infrastructure Development and Capacity Building Activities

### Strengthening of Training and HRD Infrastructure in Pulp, Paper and Allied Industry

#### Biotechnology

- ❖ Training was imparted to three M.Sc. students in the area of biotechnological applications in pulp and paper industry.

#### Pulp & Papermaking

- ❖ Forty Four student trainees from Dr. Y. S. Parmar University of Horticulture and Forestry Nauni, Solan (Himachal Pradesh) were trained in the area of Pulp & Papermaking in two batches.



*Dr. Vimlesh Bist Sc. F & Dr. Priti S.Lal Sc. E-I with student trainees from Dr. Y.S. Parmar University of Horticulture and Forestry Nauni, Solan (H. P.) on April 05, 2013*

- ❖ One month training was imparted to two students from Sant Longowal Institute of Engineering & Technology (Haryana) and Dr. B. R. Ambedkar University, Agra (U.P.).

#### **Chemical Recovery**

- ❖ Five month training was imparted to one student from D.C.R.U.S.T, Murthal Sonipat.

#### **Environment Management**

- ❖ Two month training was imparted to one student from CCS University, Meerut (U.P.).
- ❖ Three month training was imparted to one student from Kurukshetra University (Haryana).

### **Cess Funded Projects**

#### **Studies on Ozone Treatment of Indigenous Raw Material Pulp for better Bleachability**

##### **Objective**

Ozone treatment studies were continued on indigenous raw material pulp with the objective to improve bleached pulp quality & liquid discharges.

- ❖ Bagasse unbleached pulp having 12 Kappa No. was bleached employing following total chlorine free (TCF) bleaching sequences.
- ❖ Z(EP)QP
- ❖ AZ(EP)QP
- ❖ OAZ(EP)QP

Final bleached pulp obtained after each bleaching sequence was characterized for physical strength as well as optical properties & results revealed that

- ❖ Incorporation of A and OA stages in case of bagasse pulp helped in reduction of kappa number from 10 for Z(EP)QP sequence to 8 for AZ(EP)QP sequence & 4.3 for OAZ(EP)QP sequence.
- ❖ TCF bleached Bagasse pulp employing Z(EP)QP , AZ(EP)QP and OAZ(EP)QP showed final bleached pulp brightness of 77.9%, 80.2% and 83.4 % (ISO) respectively and CED viscosity of 726, 693 and 601 cc/gm. respectively .
- ❖ Final bleached pulp strength properties for Z(EP)QP ,AZ(EP)QP and OAZ(EP)QP TCF bleaching sequences at 300 ml CSF level indicated burst index 2.61, 3.80 and 2.54 Kpam<sup>2</sup>/gm. and tensile index 48.4, 62.14 and 44.0 Nm/g and tear index 5.38, 6.05 and 6.16 mNm<sup>2</sup>/g respectively.

#### **An Integrated Approach for Utilization of Bagasse Pith for Production of Bio-ethanol and Value Added Lignin Products (CPPRI/IIP, Dehradun)**

The objective of the project aims efficient utilization of bagasse pith through development of a process for production of bio-ethanol and value added chemicals. The project was completed successfully and the final report of the project has been submitted to cess committee.

#### **Development of Environmentally Safe Biological Process to Bleach the Bamboo & Wood Pulp using Potential Bacteria (CPPRI/IGIB, New Delhi)**

The aim of the project was to develop the environmental friendly bleaching process for bio-bleaching of wood pulps using ligninolytic bacteria for the reduction in the demand of chlorinated bleaching chemicals and improvement in pulp quality. The project was completed successfully and the final report of the project has been submitted to cess committee.

## Sponsored Projects

**Enzymatic Refining of Cotton Comber and Linter Pulps** - Sponsored by M/s Security Paper Mill, Hoshangabad. M.P.

The objective of the project is to explore enzymatic refining process for cotton comber to improve the pulp quality, drainability and to reduce energy during refining. Enzymatic treatment of cotton comber followed by beating showed encouraging results and indicated the potential to reduce the energy (15-20%) consumed during refining of enzymatically treated pulps, with improved drainability and strength properties.

Further, refining studies are continued with the objective for selection of enzyme for mill trial study. Refining study was continued with different refining enzymes. Refining enzymes procured from different enzyme manufacturing company were used for the study. Preparation of final report is under progress.

Also, the planning of mill trial is under progress.

**Evaluation of DSR's (3 nos.) to Improve Physical Strength Properties of Different Grades of Paper** - Sponsored by M/s ION Exchange (India) Ltd., Hyderabad

Evaluation of three samples of Dry Strength Resin (DSR) were carried on different Recycled fiber furnish to study the effect on improving the mechanical strength properties of Kraft, Newsprint, Writing/ Printing and Duplex grade paper.

**Improved Energy Efficiency through Utilization of Lignin Based Biomass from Agro Based Paper Mills** - Sponsored by Petroleum Conservation & Research Association, New Delhi

Lignosulphonate was prepared from Rice Straw lignin on pilot plant scale and the applications of product were tested in concrete and plywood industry. Results were highly encouraging.

**Indexing, Digital Abstracting and Digitisation of IPPTA Articles/ Publications** - Sponsored by IPPTA, Saharanpur

E-library portal has been designed and developed for IPPTA. Database of 20 years of Research articles/ publications of IPPTA (since 1992 - 2012) have been created and remaining database of research articles / publications of IPPTA Journals (1964 to 1992) are under progress to upload in the data base. Scanning of the articles of last 20 years (i.e. 1992 - 2012) have been completed.

**Production of High Alpha Cellulose Pulps** - Sponsored by M/s Godavari Biorefineries Ltd., Mumbai

The project aims to fractionation of bagasse into its major constituents that is hemicellulose, high purity cellulose and lignin. Studies on prehydrolysis of depithed bagasse were conducted using steam and dilute acid. Prehydrolysate was analysed for reducing sugars and xylose sugars and pretreated raw material was subjected to analysis of parameters of interest like holocellulose, ash, silica, lignin etc. Experiments on soda cooking of the pretreated bagasse are continued within objective to produce high purity cellulose and separation and recovery of lignin with zero discharge

**Review and Validation of the Baseline Energy Audit (BEA) Reports for all Designated Consumers Belonging to Pulp and Paper Sector - Rendering Services as an Energy Professional Under PAT Scheme** - Sponsored by EESL, New Delhi

A project has been awarded to CPPRI by Energy Efficiency Services Limited (EESL), Ministry of Power, Govt. of India.

- ❖ Received 41 reports of BEA conducted in designated consumers of Pulp and Paper Sector in accordance with the requirement of EESL.
- ❖ Checked each report for completeness of technical data and sufficiency of other essential information

as desired in accordance with the sector specific format

- ❖ A consolidated sector specific report has been prepared and submitted to EESL.

**Technological Improvement of a Process of Biological Reduction of AOX, Colour, COD and BOD of Waste Water Emanated from Large Pulp & Paper Industries. (CPPRI/IGIB, Star Paper Mills Ltd.) - Sponsored by Department of Biotechnology, New Delhi**

The project aims to develop tailor made microbial consortia for treatment of paper mill effluent to reduce color, COD and AOX. The activities were taken up a pilot and commercial scale and results were encouraging. Final report of the project has been submitted to Department of Biotechnology, New Delhi.

## TECHNICAL/CONSULTANCY SERVICES

Following technical/consultancy services were provided to various Pulp, Paper and Allied Industries for the period April - June, 2013 by the Institute. Details are as under:-

- 1) Technical services were rendered to 14 Paper Mills, 1 Chemical Industry, 1 Thermal Power Plant and 2 Others by analysing their effluents, ground water and solid waste samples or carrying out air monitoring studies for various pollution parameters.
- 2) 770 Nos. of paper sample are evaluated for different paper properties like Brightness, Opacity, Tensile Index, Tear Index, Fold Endurance, Burst Index, Fiber Characteristics and Furnish Analysis.
- 3) 12 Nos. samples of black liquor, pulp, scale, lignin & lignosulphonate were analysed for various Physico-Chemical & Thermal properties.
- 4) 17 Nos. samples of black liquor, pulp, bagasse pith, musturd straw, lignin were analysed for various Elemental properties viz. Fe, K, Ca, Na, Mg, Hg, ni,

Al, Zn, Ti, lignin purity and C, H, N, S.

- 5) 40 Nos. samples of raw material were analysed for moisture content, proximate chemical analysis.
- 6) 2 Nos. of non-fibrous raw material samples were analysed for White liquor analysis.
- 7) 2 Nos. of pulp samples were analysed for MCC Pulp.
- 8) Evaluation of chemicals (Wet strength resins & Dry strength resin carried out for M/s Ezochem Organics (India) Pvt. Ltd., Meerut (U. P.).
- 9) Studies on the determination of charge density in the pulp from different locations were carried out at mill site, K. R. Paper Mill, Shajahanpur on the request of M/s Flourish Paper & Chemicals Ltd; Mohali (Punjab).
- 10) Analysis of talc sample for abrasion value carried out for M/s Kumaon Geosource Pvt. Ltd., Haldwani and M/s BlueRock Soap ston, Haldwani (U. K.).
- 11) Feasibility of Jute (Core) for pulp and paper production carried out for Jute Corporation of India, Kolkatta (West Bengal)
- 12) Identify reasons for low productivity & suggest measures for improved productivity of Nagaon Paper Mill of HPC Ltd. Carried out for Cachar Paper mill (HPC Ltd.) Distt. Hailakandi (Assam) and Nagaon Paper Mill (HPC Ltd.) Jagi Road (Assam)

## WORKSHOP/SEMINAR/MEETINGS

CPPRI Scientists visited different organisations to participate in the following meetings:-

1. NPC, New Delhi for discussion to conduct joint Energy management activities by CPPRI and NPC.
2. Uttar Pradesh Prathmik Shiksha Vibhag Lucknow (U.P.).
3. Botany & Pathology Division ICFRE Dehradun (U.K.) in connection with facilities for identification of raw material.

4. NEPA Ltd., Neapanagar, (M.P.) as a member to attend the PMC bid evaluation committee for modernization and development of mill.
5. BEE, Ministry of Power, New Delhi in connection with revised proposal submitted by CPPRI to USAID for "Study on normalization of energy consumption in Pulp & Paper sector" and for reviewing the base line energy audit report of HNL.
6. M/s Godawari Biorefineries Ltd., Mumbai and Advance Enzymes, Mumabi under a sponsored project.
7. Bhabha Atomic Research Centre, Trombay (Mumabi) for final review meeting and presentation of progress of the DBT sponsored project titled "Technological improvement of a process - pulp & paper industry".
8. 11th meeting of Scientific Panel on labelling & claims/advertisement at FSSAI, FDA Bhawan, New Delhi.

## REPORTS AND PUBLICATIONS

### Reports

1. Project report on "Pulping and Bleaching Evaluation of Coconut fibres" was submitted to the sponsoring agency Indian Institute of Carpet Technology Bhadohi (U.P.).
2. Complaine Reports under CPCB Charter for Water Recycling and Pollution Prevention in Pulp and Paper Industries of Ganga River Basin :
  - ❖ Century Pulp and Paper, Lalkuan , Uttarakhand.
  - ❖ Khatema Fibers Ltd, Khatima, Uttarakhand.
  - ❖ PN Pulp & Paper Industries, Kiccha, Uttarakhand.
3. Adequacy of existing effluent treatment plant at Genus Paper Products Ltd, Aghwanpur,U.P. for treatment of mill effluent with respect to compliance of discharge norms under CPCB charter for water recycling & pollution prevention

in pulp & paper industries of river Ganga basin.

4. Adequacy of existing effluent treatment plant for treatment of mill effluent generated from proposed capacity expansion at Aroma Craft & Tissues (P) Ltd., Roorkee and Uttranchal Pulp & Paper Mills (P) Ltd, Roorkee, Uttarakhand.
5. Reuse of excess back water from Unit -II based on waste paper and agro based Unit-I manufacturing writing & printing paper at Shree Shyam Pulp & Board Mills Ltd., Kashipur, Uttarakhand.

### Publications

- ❖ Priti S. Lal, Arvind Sharma and Vimlesh Bist "**Pine needle - An Evaluation of Pulp and Paper making Potential**" published in Journal of Forest Product & Industries, 2013, 2(3), 42-47.
- ❖ R. K. Jain, Chetna Gupta, Dhermendra Kumar, Vasanta V Thakur, R.M.Mathur "**Improved Papermaking of Recycled fibres through fibre through Fibre Modification with enzymes**", Inpaper India, 2013, 16(3).

## INTERACTION WITH INDUSTRY

- ❖ M/s Godawari biorefineries ltd., for enzymatic prebleaching.
- ❖ M/s Security Paper Mill, Hoshangabad, M.P. for enzymatic refining of cotton comber.
- ❖ M/s Value addition Pvt. Ltd. Delhi, M/s Exun Biotech Pvt. Ltd., Delhi, M/s Natuzyme, M/s Advance Biochem, Mumbai for procurement of enzymes for various enzyme applications in Pulp & Paper making.

### Visits to Mill and Other Organisations

Director and CPPRI scientists visited following mills and other organisations:-

- ❖ Director and Senior scientist along with the Expert Group on Green Chemistry Initiatives, Govt. of India visited Hindustan Newsprint Ltd. Kerala and

ITC Bhadrachalam Andhra Pradesh for discussions to explore the possibilities of implementation of green chemistry applications in Indian Paper Industry.

- ❖ Senior Scientist along with the scientific delegation from Department of Science & Technology, Govt. of India visited M/s Ballarpur Industries Limited (Unit: Shree Gopal), Yamunanagar and ITC Bhadrachalam for discussions with technical personnel of the mill to explore the opportunities for green chemistry applications in pulp & paper industry.
- ❖ M/s Advance Enzymes Technologies Limited, Mumbai for discussions regarding the biofuel enzyme samples to be used for production of bioethanol under the Cess funded CPPRI-IIP joint project.
- ❖ Institute of Genomics & Integrative Biology, Government of India, New Delhi in connection with the sponsored project.
- ❖ Indian Institute of Petroleum (IIP), Dehradun for delivering of the samples of hydrolyzate for conducting the HPLC experiments.
- ❖ Khadi & Village Industries Commission (KVIC), Regional Office, Ambala for collection of technical data under the sponsored project.
- ❖ M/s Value Addition Papers Pvt. Ltd., New Delhi for pilot plant trials on utilization of lignin as lignosulphonate under the PCRA sponsored project titled "Improved Energy Efficiency through Utilization of Lignin based Biomass from Agro Based Paper Mills.
- ❖ Forest Research Institute (Deemed) University, Dehradun for discuss the activities pertaining to 2nd batch (2012-14) of the M.Sc. (Cellulose & Paper Technology).
- ❖ Shreyans Paper Mill Ltd. (Punjab) to collect the Pulp sample.
- ❖ 15 Pulp and Paper mills in Muzaffarnagar Cluster for review of progress of implementation of CPCB Charter.
- ❖ DCRTTP, Yamuna Nagar , Haryana for Environmental Monitoring on weekly basis.
- ❖ M/s Mysore Paper Mills Ltd. Bhadravati, Karnataka for Preliminary visit to discuss the scope of work for carrying out comprehensive environment monitoring.
- ❖ Century Pulp and Paper Ltd. , Lalkuan for ETP Adequacy Assessment and Review of progress and status of CPCB Charter Compliance.
- ❖ Review of progress and status of CPCB Charter Compliance in following mills:
  1. Uday Paper Mills Ltd., Kashipur, Uttarakhand
  2. Shakumbhari Paper Mill , Moradabad , U.P.
  3. Genus Paper Mills, Moradabad , U.P.
  4. Sidharth Papers Ltd., Kashipur, Uttarakhand
  5. Cheema Papers Ltd., Kashipur, Uttarakhand
  6. Khatema fibres Ltd, Khatima
  7. Shree Ram Chandra Straw Products, Moradabad, U.P.
- ❖ Environmental Monitoring
  1. M/s Shreyans Industries Ltd , Punjab
  2. Exide Industries Ltd , Rewari Haryana
  3. ITC Specialty Paper and Boards Ltd., Bhadrachalam, A. P.
  4. Bilt, Yamuna Nagar
- ❖ M/s Gangotri Paper Mill Roorkee for RAC project.
- ❖ Udyog Bhawan, New Delhi To attend meeting of sub-committee constituted by monitoring committee for revival of Ashok Paper Mill, Darbhanga.
- ❖ ETP Adequacy & Hazardous Waste Audit
  1. Shree Shyam Pulp & Board Mills Ltd., Kashipur, Uttarakhand



2. Sidharth Papers Ltd., Kashipur, Uttarakhand.
  3. Visvakarma Paper & Board Ltd., Kashipur, Uttarakhand
- ❖ M/s Ashok Paper Mill, Darbhanga, Bihar for Identification of Scrap and redundant material as per list prepared by sub-committee constituted by monitoring committee for revival of the mill under implementation of scheme approved by Hon'ble Supreme Court of India.
  - ❖ Ambala College of Engineering and Applied Research, Ambala for Practical Examiner of BE student.

project entitled "An integrated approach for utilisation of bagasse pith for bioethanol production and value added lignin products" sponsored by Cess Committee on April 11, 2013.

- ❖ Shri. Sanjay Jindal & Shri. Rakesh Chandra Dutt visited CPPRI for discussions in connection with the DBT sponsored project on April 22, 2013.
- ❖ Dr. S. P. Singh from Forest Research Institute, Dehradun & Dr. Dharam Dutt, Prof. IIT Roorkee, Saharanpur campus visited CPPRI to participate in the meeting on Revision of course contents of M.Sc (Cellulose & Paper Technology) course being run jointly by FRI & CPPRI on April 26, 2013.
- ❖ A delegation from Department of Science & Technology, Govt. of India headed by Principal Scientific Advisor visited CPPRI for discussion on promotion and implementation of the applications of Green Chemistry in pulp & paper industry on April 29, 2013.

## VISITORS

### International

- ❖ Mr. Houssam Dawood from DIS Industrial, Deutschland visited CPPRI for discussions in connection with the sponsored project for installation of commercial desilication plant in a 100 TPD rice straw based paper mill in Egypt and signed MoU for transfer of desilication technology on April 2013.



*Dr. R. M. Mathur, Director, CPPRI & Mr. Houssam Dawood, Owner, DIS Industrial, Egypt signing the MoU for transfer of technology on Desilication of silica rich black liquor*

### National

- ❖ Dr. D. K. Adhikari, Dr. D. Ghosh, Ms. Deepti from Indian Institute of Petroleum (IIP), Dehradun and Shri. A. Siddiqui from M/s Angel Instruments, Saharanpur visited CPPRI for discussions on pilot plant to be fabricated for production of bioethanol and witness the trials under the CPPRI-IIP joint



*Visit of delegation from Department of Science & Technology, Govt. of India*

- ❖ Dr. Dietmar Laudert, R&D Manager from DSM India Innovation Center, Gurgaon (INDIA) visited CPPRI along with his two colleagues Mr. Rajiv Agarwal & Mr. Santosh Vyas for discussions on rice straw lignin and its utilization.
- ❖ Shri S.K. Agarwal and Shri Naresh Kumar, Century Pulp and Paper, Lalkuan
- ❖ Dr N.K. Bhardwaj and Dr. Sanjeev Gupta, TCIRD, Yamunanagar

- ❖ Shri D.K. Singhal, Chandpur Enterprises Ltd., Chandpur, U.P.
- ❖ Abhinav Srivastava, Purlieus Inc., Noida, U.P.
- ❖ Shri Rajesh Jain, Aroma Craft & Tissues (P) Ltd, Roorkee, Uttrakhand.
- ❖ Shri D.K. Tyagi, Uttranchal Pulp & Paper Mills (P) Ltd, Roorkee, Uttarakhand.
- ❖ Shri Kapil Gautam and Shri Sushil Sharma, Katyani Paper Mills Ltd., Kashipur, Uttarakhand.

### CPPRI INSTITUTE MEMBERSHIP

CPPRI welcomes the new members, D. P. Paper Pvt. Ltd., Lucknow (Individual Membership) and Metso Power India Pvt. Ltd., Chennai becoming the part of our membership brigade.

### WORKSHOP

In order to create awareness among the school children regarding conservation of environment through recycling of waste paper, PCPB Division of the Institute organized a workshop on "Handmade Paper Making" at CPPRI Saharanpur (U.P.) during May 13 - 17, 2013. Nineteen students from Saharanpur Public School attended the workshop. Principal of Saharanpur Public School also visited CPPRI. The Student also visited CPPRI Museum.



*Dr. Vimlesh Bist Sc. F., distributing the Certificate to the students on May 17, 2013*

### WORLD ENVIRONMENT DAY

World Environment Day was observed by CPPRI on June 05, 2013. To mark the occasion, a programme was held in CPPRI auditorium wherein Dr R.M. Mathur, Director, CPPRI addressed the staff highlighting the significance and objective of observing World Environment Day every year. A presentation was made by Dr Nitin Endlay on the theme of the World Environment Day 2013 i.e. - **Think, Eat and Save**. The presentation highlighted need to reduce food loss along the entire chain of food production and consumption and specifically in context of food wasted by consumers, retailers and the hospitality industry and the environmental and economic impact due to food wastage.



*World Environment Day Celebrations at CPPRI*

## STAFF NEWS

### Retirement

**Name:** Shri D. N. Gupta  
**Designation:** Administrative officer  
**Date of Retirement:** 30/06/2013

### Papermaking

Vahey, David W.; Considine, John M. and Macgregor, Michael A. **Influence of Forming Conditions on Fiber Tilt.** *Tappi Journal Vol. 12(4), 2013. Pg. 33 - 40.*

**Abstract:** Fiber tilt describes the projection of fiber length in the thickness direction of paper. The projection is described by the tilt angle of fibers with respect to the plane of the sheet. A simple model for fiber tilt is based on jet-to-wire velocity differential in combination with cross-flows on the wire. The tilt angle of a fiber is found to vary as the sine of its in-plane orientation angle. The phase of variation is a large multiple of the fiber-misalignment angle associated with the cross flow. The multiple can decrease from 40 to 8 as the cross-flow angle increases from 1° to 10°, showing a high degree of nonlinearity. Application of the model was demonstrated by characterizing previously published tape-peels conducted at 45° intervals on both sides of a lightweight-coated base sheet. Degree of fiber pullout, a surrogate for fiber tilt, was indicated by measuring the mean gray value of images of the tape surface against a dark background. On tape peels from each side of the sheet, gray value versus angle was well described by a sine wave, but the phase of the wave was different on each side. By comparing the phases of the sine waves with those of the model, top and bottom fiber misalignment angles were calculated. The model is most sensitive to variations in misalignment angles less than 2.5°.

### Bleaching

Hietanen, Tomi; Tamper, Juha and Backfolk, Kaj. **Environmental Benefits of Magnesium Hydroxide - Based Peroxide Bleaching of Mechanical Pulp – Mill Results.** *Tappi Journal Vol. 12(6), 2013. Pg. 9 - 15.*

**Abstract:** The use of a new, technical, high-purity magnesium hydroxide-based peroxide bleaching additive was evaluated in full mill-scale trial runs on two target brightness levels. Trial runs were conducted at a Finnish paper mill using Norwegian spruce (*Picea abies*) as the raw material in a conventional pressurized groundwood process, which includes a high-consistency peroxide bleaching stage. On high brightness grades, the use of sodium-based additives cause high environmental load from the peroxide bleaching stage. One proposed solution to this is to replace all or part of the sodium hydroxide with a weaker alkali, such as magnesium hydroxide. The replacement of traditional bleaching additives was carried out stepwise, ranging from 0% to 100%. Sodium silicate was dosed in proportion to sodium hydroxide, but with a minimum dose of 0.5% by weight on dry pulp. The environmental effluent load from bleaching of both low and high brightness pulps was significantly reduced. We observed a 35% to 48% reduction in total organic carbon (TOC), 37% to 40% reduction in chemical oxygen demand (COD), and 34% to 60% reduction in biological oxygen demand (BOD<sub>7</sub>) in the bleaching effluent. At the same time, the target brightness was attained with all replacement ratios. No interference from transition metal ions in the process was observed. The paper quality and paper machine runnability remained good during the trial. These benefits, in addition to the possibility of increasing production capacity, encourage the implementation of the magnesium hydroxide-based bleaching concept.

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*We welcome suggestions & comments  
for further improvement of this News Bulletin.*

