

2016 April JAPAN TAPPI JOURNAL

Vol.70, No.4 Abstracts

Introduction to Oji Papéis Especiais Ltda. in Brazil

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Oji Papéis Especiais Ltda. (hereinafter called OPE) Piracicaba Mill was established in 1953, to produce paper by using the sugar cane bagasse pulp, and was acquired by Oji group in 2011, which had had the technology tie-up with OPE for 25 years and counting.

OPE is located in Piracicaba city in Brazil and has two paper machines and three coating machines. The company has supplied high quality coated paper in Brazil, and its capacity is 120,000 t/y. OPE has big share in Brazil, about 80% with thermal and carbonless paper.

In recent days, having been demand increase in Latin America, The mill is expecting to make the capacity investment.

Study about Recycling for UV Cured Prints

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In recent years, various kinds of ink and/or printing system have been developed to reduce energy consumption and the time for delivery as well as to get higher print quality. Several kinds of printing materials from recovered papers were chosen to evaluate their recyclability by using high density pulping and/or PFI mill treatment as a mimic of a mill kneader alternative. The dirt speckles of the de-inked pulp from UV cured, UV vanish over coated, and polystyrene over coated prints were much higher than those of conventional prints. Although high reactive UV cured prints brought fewer dirt counts than the conventional UV prints, they were also affected by printing conditions, especially the intensity of total irradiation of UV lamp for curing. The surfaces of print sample were investigated by using attenuated total reflection infrared spectroscopy (ATR-IR) method. As a result, the ATR-IR methods brought more precise classification for each sample in terms of their recyclability compared with conventional solvent detection method. Consequently, the ATR-IR method will be able to contribute more efficiently

to sort out recovered papers with poor recyclability in order to enhance quality control of de-inked pulp production in a mill. It is very important to collaborate with companies related to printing industries to facilitate recycling of recovered papers including UV cured prints.

Reduction Electricity Cost by Enhancing the Capacity of TMP Plant

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For remarkable rise of crude oil price, Chuetsu Pulp & Paper Futatsuka mill stopped an expensive dust coal boiler of the generation unit price in June 2010, and shifted to running only by a biomass boiler. As a result, the self-generation of electricity of Futatsuka mill is used up with facilities except thermomechanical pulp (TMP) plant. Thus, it was necessary to use purchase electricity for the operation of TMP plant which needed much electricity. For ability of storage and production capacity, Futatsuka mill couldn't but operate TMP plant in daytime since the unit price of purchase electricity was higher on weekdays.

In this report, we would like to introduce the case study that could increase the capacity of production as well as energy and cost saving significantly have achieved with making use of the equipment that has so far remained unused.

Energy Saving by Introduction of Thermocompressor to the Container Board Machine

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Rengo Yashio mill has been engaged in saving energy with all of mill employees and this approach has gained a high reputation from many associations. This report describes approach and effect for installation of thermo compressor, surplus steam recovery system, as one of the energy conservation activities. Even though it was the first study and experience of thermo compressor operation with a paperboard machine of Rengo, we found a means to utilize it by making up the control system with minimum required equipment. Moreover, this system has been operated without any problems in manufacturing process and any additional energy consumption. Although this trial is not finished yet, the steam recovery system with thermo compressor can be very beneficial if the process condition is fitted to the system.

Energy Saving Performed by Remodeling Drainage System of No.4 Paper Machine

Hajime Endo

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Our No.4 paper machine operated at Hachinohe mill of Mitsubishi Paper Mills LTD was not really outstanding at steam saving as compared with other paper machines.

A factor is difference of the steam consumption at the dryer part. And problems are lower efficiency of the steam equipment and differences of the operational condition, the mechanical drainage flow, and the drainage balance. We modified the drainage system as a solution of these problems in December 2013 and achieved big steam saving.

This report is described about the past problems, the modifying of drainage system, and the result of steam saving.

Efforts for the Practical Use of Cellulose Nanofibers

—The Development of Functional Additives—

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As a comprehensive biomass industry, Nippon Paper Industries Co., Ltd. tries to develop various new business areas making the most of woody biomass. As one of the new use of cellulose, we focus on production and development of various applications of cellulose nanofibers (CNF). We examine the use of CNF not only for functioned nanocomposite (with resin or rubber etc.) utilizing its high fiber strength and low thermal expansion, also for an optical film utilizing its high transparency and for a catalyst carrier or the absorbent utilizing its high surface area. Among those uses, because the use of CNF as functional additives such as thickener or dispersant is a similar use as existing carboxymethyl cellulose (CMC), early commercialization is expected. In this report, as the example of the effort for commercialization we present the development of CNF as functional additives. And the production method of CNF, the solidification technology for practical use and CNF's various characteristics as additives are reported.

Review of Biorefinery Work Based on the Production of Dissolving Pulp

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As a part of biorefinery business of OJI group, we started commercial production of hardwood dissolving kraft pulp at Yonago mill since May 2014. At the same time, we also initiated verification tests for furfural production. In this report, the review of our biorefinery process and operating experiences are presented.

Preventive Measures against Insect Invasion by Improvement of Supply Air Balance at PM8

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Otake Mill, Nippon Paper Industries Co., Ltd.

The No.8 machine in Nippon Paper's Otake Mill produces paper of food use, so the presence of any insects in the paper can be directly linked to customers' complaints, and cause serious problems leading to the loss of customer trust. In recent years, various measures have been implemented to prevent insects invading the paper-machine room. This has reduced the number of complaints concerning insects being found in paper, but has not eliminated them entirely. Therefore, new measures were taken to improve of supply air balance, intended to prevent insects entering from outside. As a result, a significant reduction in insect defects was achieved.

This presentation will report the contents of the investigation that was carried out, and the results that were achieved.

Report on the Results of the Fiscal 2015 Follow-up Survey on "JPA's Action Plan for Low-Carbon Society" and Related Information on Measures against Global Warming in the Japanese Paper Industry

Yasuharu Sakina

Japan Paper Association

The Japan Paper Association (JPA) established its "Voluntary Action Plan on Environment" in 1997, in response to Nippon Keidanren's call to the Japanese business community to organize "Keidanren's Voluntary Action Plan on Environment". Since then, JPA has carried out a

follow-up survey and published the results every year.

As the Voluntary Action Plan finished in fiscal 2012, JPA newly started “JPA's Action Plan for Low-Carbon Society” and has been actively addressing global warming prevention in order to achieve the following targets set in the plan:

*Compared to BAU scenario(based on specific CO₂ emission rate of 2005), reduce fossil energy-derived CO₂ emissions by 1.39 million tons by fiscal 2020 .

*In view of securing forest resources and increasing forest carbon sink, expand forest plantation areas owned or managed by the paper industry at home and abroad to 700 thousand hectares by fiscal 2020.

According to the results of the fiscal 2015 follow-up survey (actual results for fiscal 2014), fossil-energy derived CO₂ emissions in fiscal 2014 was 18.05 million tons, a 27.6% reduction compared to the fiscal 2005(24.91 million tons).This is attributed to each manufacturer's active efforts including energy saving and energy conversion from fossil energy to non-fossil energy such as biomass energy.

In addition to the results of the follow-up survey, this report introduces the current energy situation in the Japanese paper industry, outline of the next phase of JPA's Action Plan for Low-Carbon Society spanning the ten-year period from fiscal 2021 through 2030 and the latest information of countermeasures against global warming.

Nano-Cellulose Seminar Hosted by the Embassy of Canada in Japan

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Nano-Cellulose Seminar hosted by the Embassy of Canada in Japan on January 26, 2016 attracted 100 participants and active discussion was made. A professor of University of British Columbia (UBC) and project managers of Alberta Innovates – Technology Futures (AITF) were invited from Canada to present Canada’s role in nano-cellulose materials from basic science to commercialization. An excerpt of the seminar was reported in this paper.

Upgrading Paper Machines with Virtual Technology

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Managing Director CF Procsim GmbH
Erik Bargfrieder

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The majority of all paper machines are rebuilt several times in order to increase production capacity. The "less important" parts such as recuperation, ventilation equilibrium, exhaust heat and sometimes steam and condensate system are not given particular preference. The original concept of energy efficiency has changed dramatically. Because of the complexity of relationships between efficiency, quality and production the energy optimization of a paper machine is not possible without profound analysis of the drying process! The mathematical description in the form of a virtual machine is the shortest and most efficient route to the destination in such tasks. Simulation is the only means by which planned capital investments to boost the drying performance of paper machines (to save energy or increase capacity) can be effectively proven in the pre-project phase. The technical design of planned upgrades is optimized and fine-tuned before the project start to rule out any unpleasant surprises later. The effectiveness of new equipment can be observed in the virtual paper machine using supplier guaranteed parameters. This brings massive and efficient support for all technical issues and reduces project risks significantly. Virtual technology brings higher project profits through lower project costs, optimized solutions and shorter start-up periods.

A Report on Tokyo Paper 2015, a Joint Conference of the 9th International Paper and Coating Chemistry Symposium & International Paper Physics Conference

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Many scientists and engineers from overseas joined us for Tokyo Paper 2015, a joint conference of the 9th International Paper and Coating Chemistry Symposium and the International Paper Physics Conference, which took place in the University of Tokyo during October 29 to November 1 in 2015. The conference set the stage for their communication and discussion focusing on paper and coating chemistry, paper physics, the latest developments in bio-composites and nanocellulose materials, new papermaking technologies including stratified forming and foam forming, and computer process simulation. The conference provided an opportunity for future collaboration between the members in an in-depth investigation that could continue to transform the pulp and paper industries to stay viable and profitable.

The History of Technological Developments of the Paper Industry in Japan Part 6: The Struggle of Washi Industry and Environmental Concern

Kiyoaki Iida

How was the washi industry in the Edo period? Based on old historical method, they used kozo (mulberry) and mitsumata (paper bush) as raw fiber, prepared pulp and made sheet by hand. Many domains (han) encouraged papermaking as it was an important business to their revenue. With substantial supply of paper, wood block printing flourished in everyday life.

As the Meiji era started, letter press printing and paper carton were introduced as a new way of life, and paper that fit to them, called yoshi, was imported. Washi unfortunately lost its printing-paper market. Then, washi countered the trend. In free spirit relieved from restriction of old domains, new developments, which Genta Yoshii was famous for as one of pioneers, were taken in like use of cylinder machine, new product exploitation and open cooperation. Washi maintained its output that was larger in money than yoshi until 1915, 40 years since the start of yoshi production in Japan. Typical new products were typewriter paper and Tengujo (very thin and uniform paper), and were exported abroad. The volume exported was 350 tons in 1913.

The output, however, decreased drastically after 1920. It was not competitive in price to yoshi, which was produced in a big machine with wood pulp. The washi industry is now producing products of highly functional quality.

—Peer Reviewed—

Current Situation of the Japanese Pulp and Paper Industry

—Special Lecture of Tokyo Paper 2015—

Takanori Miyanishi

JAPAN TAPPI

The manufacture of pulp and paper is one of the world's oldest industries. The significance of paper and paper products is obvious to everyone; no manufactured products play a more meaningful role in every area of human activities. The industry has developed through many technological innovations for centuries. Japan is an energy efficient country and the emission per GDP is very low among advanced economies. The carbon dioxide emission per unit of paper and paperboard production has been reduced significantly due to industries' numerous efforts including energy saving, conversion from fossil fuel to biomass residues and installation of energy efficient equipment. We aim to realize a green recyclable economy and nurture "urban forest." It is a part of the program to reduce fossil fuel consumption and carbon dioxide

emission in preventing global warming. By applying biotechnology to forest science, Suzano in Brazil will start commercial scale field tests of gene transformed Eucalyptus trees that grow fast or hold the traits of salt, frost or drought stress tolerances. In advanced economies, printing and publishing on-demand is the future of the industry and is one of the most important strategies that publishers need to embrace to grow in today's digital marketplace. In the United States, TAPPI Agenda 2020 Technology Alliance encourages the development of advanced manufacturing technologies that promise transformational impact on the paper and forest-based industries. In Europe, deep eutectic solvent was selected as the winning concept to lower carbon dioxide emissions. By dissolving wood and selectively extracting lignin, it could replace both chemical pulping and mechanical pulping. In Japan, the Nano Cellulose Forum was established for its rapid commercialization. It is all-Japan based consortium, for sharing information and enhancing cooperation among academies, industries and governments. Dr. Isogai et al. received Marx Warenberi Award for their research on TEMPO mediated cellulose nanofibers. By their method, the energy need can be reduced significantly and the cellulose produced this way can disperse homogeneously. It is a discovery that paves the way for nanocellulose being one key product of the future forest industry.