

Countermeasures for “Hydrangea-like Dirt Spot Defects” of Coated Paperboard

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Coated paperboards are used in packages, for facial tissue and commodities. They have sometimes quality problems caused by waste paper contained in their raw material.

One of the particularly important problems is “Hydrangea-like dirt spot defects”. It is caused by the sublimation transfer sheet contained in the paperboard. Sublimation ink of the waste paper contained in the paperboard migrates from inside to the surface of the paperboard gradually during a few months, then they will appear as spot defects like Hydrangea.

We investigated a method to detect the sublimation dye in the waste paper quickly. We focused on the volatility of the sublimation dye.

As a result, we succeeded in developing the detection system with the FAIMS sensor which can certainly detect the specific volatile components of the sublimation dye in the waste paper rapidly at room temperature.

In the future, we will try to develop an automated system for removing the sublimation transfer sheet from the waste paper in the actual production line.

Introduction and Operating Experience of the No.2 Gas Turbine Plant

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Niigata Mill, HOKUETSU KISHU PAPER CO., LTD.

We run the mill emphasizing the environment, based on the company’s corporate philosophy.

We have improved CO₂ emission intensities with continued activities of saving energy on power plant sections, introductions of large scale Soda Recovery Boiler and Biomass Boiler utilizing construction waste material, fuel source of existing boiler and turbine have been changed to natural gas. We have also experienced violent fluctuations of energy prices around the failure of Lehman Brothers and felt the necessity of diversification of energy source caused by the Great Japan East Earthquake. Against such a background, we planned to introduce the

40MW class Gas Turbine divertible of aircraft engine, as renewing the existing outdated Oil Boiler, 18MW-class Steam Turbine and 17MW-class Gas Turbine.

No.2 Gas Turbine plant has started business operation since March 2014. In this paper, we briefly describe the outline of the equipment and operating experience of No.2 Gas Turbine plant.

Example of Energy Savings in the Press Section of the Paper Machine

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Kasugai Mill, Oji Paper Co., Ltd.

Pulp and paper industry is recently required to reduce energy costs because of sudden fuel cost rise and shutdown of nuclear power plant in Japan.

At Kasugai mill of Oji paper, we are working on energy saving activities with a target to reduce 2.5% of total mill energy consumption and we have focused on the press section as it needs the most power consumption in the paper-making process. We have attempted energy saving measures by shutting off the felt suction boxes of roll press 1P positions near the start of the press section, and 3P shoe press positions and this has mostly never been attempted before on domestic Japanese paper machines.

This article introduces the measures and problems that occurred during these trials.

Operation Experience of MVR Pre-Eva

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Sendai Mill, Chuetsu Pulp & Paper Co., Ltd.

In Chuetsu Pulp, Sendai Mill produces HW pulp with continuous digester line and SW pulp with batch digester line.

The weak black liquor dry solids from the continuous digester to main evaporation plant is around 20 DS % with Pre-Evaporator (Pre-Eva) using the flash steam from the digester extraction as heat source.

On the other hand, around 13DS% SW black liquor directly goes to the main evaporator because of no Pre-Eva in the batch digester line.

Sendai mill has been increased SW pulp production since 2009. Because of the pulp production increase, the main evaporation plant became overloaded.

Pre-Eva with flash steam from continuous digester has been introduced to Japanese mills. In food processing industry, electricity (compressor) has been used to evaporate the product because such steam would not be so available in the food processing mills.

Sendai mill has recently introduced vapor recompression pre-evaporation plant to the black liquor from SW batch digester to decrease steam consumption of the main evaporation plant as cost saving.

There are no references in Japanese pulp and paper industry for vapor recompression evaporator with compressor which has been introduced to the food processing industry. Chuetsu Pulp decided to introduce Andritz Mechanical Vapor Recompression (MVR) Evaporator for Sendai Mill because Andritz MVR has many references for black liquor pre-evaporation plant all over the world.

This paper explains the general description of MVR plant and the operation experience.

Calculation of Greenhouse Gas Emissions Through the Supply Chain

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We have calculated a emission of GHG through the supply chain according to basic guidelines for the GHG emission calculation through the supply chain (Ministry of the Environment / Ministry of Economy, Trade and Industry). The total GHG emissions through our company's supply chain was 1,832,000 t-CO₂. The breakdown is as follow, the scope 1 emission was 663,000 t-CO₂, the scope 2 emission was 152,000 t-CO₂, and the scope 3 emission was 663,000 t-CO₂. It is revealed that the scope 3 emission was more than the company's total scope 1 and 2 emission. Furthermore, emissions of the GHG from a product, the service that we purchased occupied 35% of the emissions through the supply chain, and it became clear to be a main GHG emission source in the supply chain more.

Propagation of Japanese Black Pine (*Pinus thunbergii*) Seedlings for Restoration of Coastal Protection Forest

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Coastal protection forest functions as tsunami damper, prevention of sand erosion and salt damage caused by strong sea wind. Japanese black pine (*Pinus thunbergii*) is considered to be the best choice for these functions. In recent years, to cope with the risk of pine wilt caused by pine wood nematode (*Bursaphelenchus xylophilus*) variety of pine that are resistant against *Bursaphelenchus xylophilus* have been developed. However, pine tree seedlings are produced from seeds because pines are difficult to propagate by cuttings. Therefore nematode-resistant properties cannot always be inherited to progeny. Thereupon, in this research the efficient method to propagate pines by cuttings are investigated.

Needle leaves from 2 year old *Pinus thunbergii* specimen, grown in pots from seed in greenhouse were used as materials for rooting experiments. Cultivation under the environment of high CO₂ concentration (1000ppm) with glutathione, reportedly related to plants' photosynthesis, added to the culture media improved rooting rate to approx. 60%. However, it was unable to produce seedlings because rooted plants transplanted to pot did not sprout. Therefore, needle leaves were treated with N6-benzylaminopurine, known as artificial cytokinin to induce new sprout. Then cutting were conducted with treated leaves. Investigation of rooting rate and subsequent growth showed that even though rooting rate decreased slightly to 40%, new sprout grew afterwards and seedlings were obtained. Feasibility study will be implemented if the technique obtained through this research can be applied to the mass production of *Pinus thunbergii* seedlings for coastal protection forest.

Installing Combisorter™ into Paperboard Product Line and Its Operating Experience

Kenji Ota

Soka Mill, Nippon Paper Industries Co., Ltd.

The Soka Mill is located in the Soka-Yashio Industrial Park which had been developed in Saitama Prefecture for the first time. It is typical urban mill and this site is good place for us so it belongs to the metropolitan area where they consume paper and discharge wastepaper at the most. We have been moving forward recycle business to use wastepaper which is contained 99% in its stock. This helps us contribute to protect environment.

However, recently we are faced with recycled fiber quality issues because of the increase of contaminants and the development of printing technologies. Therefore, the pulp yield has been deteriorated.

We have installed “The Combisorter™ CSM” to solve pulp quality and yield loss problems. Here we report my operating experience.

Introduction Case of TrumpJet System to Paper Machine

Akira Nozaki

MPM OPERATION Co., Ltd.

Hachinohe Mill, Mitsubishi Paper has the capacity of approximately 700,000 ton of papers per year. We have seven paper machines in Hachinohe Mill, and installed Trumpjet System in No.2(2PM) and No.4(4PM) and No.5(5PM) and No.6(6PM) and No.7(7PM) paper machines with the aim of chemical saving.

This report is described about the effect and trouble of Trumpjet System at 5PM.

Effects of Next Generation Lighting on the Flight Behavior of Nuisance Insects

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Masahiko Konishi

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We investigated the number and species composition of insects attracted to LED lamps in the field. The most abundant taxon was Chironomidae in each LED lamp. Except for yellow LED lamp, lack of the effect of UV in attractiveness to some nuisance insects, especially chironomids was suggested.

How to Proceed with 5S Education in Process Industry

— 5S Management for the Plant Manager —

Osamu Haneda

Japan Business Innovation Consulting

5S is a basic in plant operations. However, plant manager worry about the low level of 5S. Therefore, observing the plants 5S level is low, it was considered. As a result, management of the plant manager was important.

Further, it may lead to experts 5S. 5S activated by expert guidance. However, I will stagnate after training of experts. So, I was considered the cause of the stagnation. I introduce you that

we have devised a management of 5S fixation.

Report on the Results of the Fiscal 2014 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

Kazuo Ikeda

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 made a follow-up survey, and published the results every year.

As its Voluntary Action Plan finished in fiscal 2012, JPA started new plan called “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, reduce fossil energy-derived CO₂ emissions by 1.39 million tons in fiscal 2020 from the level of fiscal 2005.

* 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 800 thousand hectares by fiscal 2020.

According to the results of the fiscal 2014 follow-up survey (actual results for fiscal 2013), fossil-energy derived CO₂ emissions in fiscal 2013 was 18.58 million tons, compared to 24.91 million tons in fiscal 2005. Compared to the BAU emissions for fiscal 2013 (21.28 million tons), actual emissions in fiscal 2013 decreased by 2.7 million tons. This is attributed to each manufacturer's active efforts such as energy saving and energy conversion from fossil energy to non-fossil energy like biomass energy.

In addition to the results of the follow-up survey, this report introduces the current energy situation in the Japanese paper industry, and 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 on the industry's measures against global warming.

The History of Technological Developments in Pulp and Paper Industry: From Ts'ai Lun's Invention to the Birth of Modern Pulp and Paper Industry

Part 3: Paper Making in Islamic Lands and Its Transfer to Europe

Kiyoaki Iida

Paper making process invented in China travelled westward. It arrived at the Central Asia in the fifth century and Iraq in the ninth century. Then, it spread to Syria, to Egypt, through the North Africa, and to Spain at the eleventh century. Along the way, it competed with parchment that was durable but costly and papyrus that had a long history as a writing media. As culture there asked that sheet should be written with pen, not with brush, paper was modified to satisfy that need, and increased share. In the fifteenth century, paper supported the fully-matured Islamic culture of which center was Iran. Their paper consisted of well beaten linen rag, and was coated with chalk and starch, to make its surface good for scribing by pen. Then, imported paper from Europe which was cheap prevailed in the market, and the Islamic paper industry became extinct.

Corporate Profile & Products Information (20)

Hakuto Co., Ltd.

Hakuto is a company which trades electronics products and produces speciality chemicals.

For our electronics business, we are on the forefront of technologies and provide excellent technical service on electronic devices, components, and equipment.

For our chemical business, we treat various process chemicals for pulp and paper, petroleum, automobiles, and water treatment industries with our eco-friendly technologies.

Especially, concerning chemicals for pulp and paper, we have started to treat functional chemicals made by BASF. So, we can support the customer from many aspects.

Here, we will introduce the abstract of our company, our product line up for pulp and paper industry, and our new excellent technologies on this paper.

—Peer Reviewed—

Novel Analysis Method for Pulp Furnish Using Tube Flow Fractionator (Part 1)

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Hiroki Ohtake

Hokkaido Mill, Nippon Paper Industries Co., Ltd.

The effects of various chemical agents on the agglomeration and fixation of filler particles in pulp furnish were investigated using a new apparatus, called fractionator, based on a tube flow fractionation. The apparatus separated component of pulp slurry gently by the hydraulic size against for a constant tube flow. The fibers and fines fractions were analyzed with a laser optical sensor and images from a CCD camera. The result from the addition of a cationic dry strength resin to deinked pulp (DIP) revealed that the elution curve of depolarization (D) and scattering (S) signals as indices of fiber and filler, respectively, from the sensor were overlapped while the S-signals of DIP without chemicals was delay from the D-signal. The patterns of those elution curves added various agents such as coagulant and flocculant were different among the agents. The images of those pulp fractions showed that the filler particles in the DIP without chemicals were dispersed. By addition of the chemicals, those particles formed agglomerates by themselves, and flocs with fibers and fines. The morphologies of filler agglomerates was different as well.

In conclusion, the method using fractionator was useful to examine the effect of the various chemical agents in paper making process. This method would contribute to select suitable chemicals and optimize wet end systems.