

Mechanisms of Improved Viscosity of Coating Color with Application of Core-Shell (Polyvinyl Chloride-Cationic Styrene Methacrylic Ester Copolymer) Emulsion

Yui Takagi, Kazuhiro Kumeda and Shiro Umeuchi

Paper Chemical Business Division, Seiko PMC, Co., Ltd.

In recent years, as demands of high definition full color printing on demand have been increased, there is an increased need for inkjet recording paper in commercial use. Conventional inkjet recording paper on which is coated a coating color mainly containing porous silica, inkjet ink fixing agent and polyvinyl alcohol (PVA), enables to high definition full color printing. But because inkjet recording paper is expensive and has poor layer strength, currently, it isn't popular in commercial use, while popular in home use. In order to resolve these situations, we had started developing the new high-performance binder for inkjet recording paper, to achieve lower viscosity and better layer strength of coating color.

In a present study, we found that "core-shell (polyvinyl chloride-cationic styrene methacrylic ester copolymer) emulsion" has two useful effects for coated inkjet recording paper. One is the reducing viscosity of coating color and the other is the enhancing layer strength on coated inkjet recording paper. Reduction in coating color viscosity leads to lower production costs of inkjet coating paper as a result of the reducing drying load.

In this presentation, we show the above new binder's effects and mechanisms of improved viscosity of coating color with inkjet printability to paper.

Automatic Correction Method of Soft-Sensor Function that Employs Linear Multiple Regression Model for Pulp Bleaching Process

— Ordinary Method and Kalman Filter Algorithm —

Mori Yoshitatsu

Pulp and Paper innovation Center, Oji Holdings Corporation

When we adopt "Soft Sensors" to pulp plants, "Linear multiple regression equation model" is used well. And at that time, the coefficient values of the regression model are determined by using statistical analysis in general.

However, in many cases, the once decided coefficient values are drift with age, because of the gradual deterioration from actual processes. To prevent this problem, the method to correct and adjust automatically by the “constant parameter value” of the regression model using the ordinaly "smoothing method" is known well.

In this case, the “constant parameter” value is modified based on the actual measurement results which were obtained by periodic “hand analysis datas” . Furthermore, this paper describes about the advanced method applying "Kalman filter algorithm” that correct all coefficients’ values of the multiple regression model by using iteration procedure. Here, those predicted results’ performance were compared with using ECF pulp bleaching process data.

The System for Assessing the Flush Ability of Disposable Products (Tosa Method)

—Clearance Test of Disposable Products in Toilet and Drainage Lines—

Jun Morisawa

Kochi Prefectural Paper Technology Center

“The System for Assessing The Flush ability of Disposable Products (Tosa Method)” is composed of two tests, “Clearance Test of Disposable Products in Toilet and Drainage Lines” and “Disintegration Test of Disposable Products in water”

In “Clearance Test” , the probability that Disposable Products clog the pipe or drained by wash water is obtained, by using a large-sized apparatus that combines the drain pipe and toilet. And as the DC value (%), we were calculated ratio of “Drained or Clogged” of Disposable Products per unit weight.

DC value (%) indicates the probability that Disposable Products of a certain weight clog in the drainage Lines. And DC50 value (g) indicates the dry weight (g) expected that Disposable Products clog with the establishment of 50%.

By using the DC value of each product, we can compare the clearance of various Disposable Products.

Novel Chemical Solution for Increasing Ash in Paper

Hiromichi Hatakenaka

Paper Chemicals Development, R&D Center, R&D Company, Harima Chemicals, Inc.

Recently, the domestic demand for paper and paperboard has remained almost the same. Although the society is shifting to paperless, printing and communication paper still plays an important role as information media. Usually, inorganic particles called fillers such as talc,

calcium carbonate, and etc. are added to printing and communication paper to improve printability and optical properties. Especially, calcium carbonate is widely used, and its dosage to paper gradually increases due to its excellent performance and cost effectiveness in papermaking industry.

A lot of paper mills take great advantages of using calcium carbonate. However, the problem of strength loss would become serious as the dosage of calcium carbonate increases. To provide solutions for such problem, we have developed “surface-treatment agent for calcium carbonate”. It is a novel wet-end chemical that was created by combining new materials with our polymerization technology. It is applied to the slurry of calcium carbonate, and can improve the strength loss of paper caused by calcium carbonate.

When calcium carbonate was used with our “surface-treatment agent for calcium carbonate”, the strength loss was reduced compared to untreated calcium carbonate. Moreover, it was found that it can enhance the performance of wet-end chemicals such as dry strength agents. It is expected that it enables paper mills to increase calcium carbonate further.

We introduce our “surface-treatment agent for calcium carbonate” and how to use it along with the trial results.

A New Pitch Control Agent “Spanplus500 series” —Paper Quality and Operational Improvement—

Satoshi Wada, Yoshihiro Ozawa and Chigusa Taguchi
Kurita Water Industries Ltd.

The domestic paper manufacture industry uses wastepaper as raw materials from the perspective of resource utilization, energy saving and environmental conservation. The rate of utilization of wastepaper is numerical value approximately near the limit. With increase of the rate of utilization of wastepaper, pitch included in the wastepaper increases in paper process of manufacture. The pitch causes quality drop and operation efficiency aggravation such as defect and paper break. Therefore the further improvement of the pitch control technology is expected to use wastepaper.

We developed the pitch control agent "Spanplus500 series" based on a concept "to fix on fiber and to make non-adhesion".

This paper introduce feature “Spanplus500 series" and case of paper quality and operation improvement by using it for machine having pitch trouble cause wastepaper.

The Latest Trends of Chemicals for Household Paper Products

Koji Yoshitani

Paper Chemical Business Division, SEIKO PMC Corporation

In this report, we introduce novel cationic emulsion type softener. Comparing with conventional softeners, features of new softener are as bellow.

1) Better softness with keeping better dry strength, 2) high-bulk (high specific volume), and 3) less foaming.

Additionally, we also introduce new creping adhesive. Comparing with conventional adhesives, the new creping adhesive provides soft coating on Yankee dryer with good adhesion and good water resistance. The new creping adhesive is suitable for Yankee dryer with thermally-sprayed coatings.

Advances in Biolatex® Binding Systems

Julien Mesnager, Vahid Noeei, Omkar Chandorkar, Steven Bloembergen and Doug Ireland

EcoSynthetix Inc., Burlington, ON, Canada.

Masato Katayama

FIMATEC, LTD.

EcoSynthetix introduced Ecosphere® biobased latex binder to the paper industry in 2006. These binders demonstrated not only their performance with excellent binding strength but also their unique rheological & coating performance, enhanced coating structure, and optical properties to both wet and dry paper coatings. A mechanism for their unique behavior was proposed based on the understanding that these biolatex binders consist of deformable, water-swollen and internally crosslinked biopolymer nanoparticles.

The biobased nanoparticle latex is a technically competitive alternative binder system to petrochemical-based binders, such as XSB and SA latex binders. The characteristics of the biolatex binders and their successful application in paper and paperboard have been extensively discussed. When added to the paper coating color formulation, these products typically replace 25% to 50% of XSB and SA latex binders used in coating processes on a one-for-one parts-per-hundred basis.

This article will provide an overview of the EcoSynthetix product development capabilities and by way of example, review a case study of a new product innovation that involves a biolatex binder composition with novel functionality and improved performance. This new approach opens up the opportunity to go to higher petro-latex substitution rates in base and top coat formulations, especially in off-set applications. Performance and cost savings are to be expected in addition to a higher bio-content.

EVERLOY Spray Nozzles for Paper Mills

Shunsuke Makino

Everloy Shoji Co., Ltd.

Kyoritsu Gokin Co., Ltd. which is one of the leading manufactures of spray nozzles was founded in 1938 in Japan. The company brand : Everloy is well known especially in Japan. The more paper machines are large and speed is fast, the more demands for spray nozzle is increase. With such continuous demands, spray nozzles became indispensable high precision parts nowadays. EVERLOY will introduce Straight Jet and Flat Fan pattern nozzles for paper mills.

Wetting and Dispersing of Pigments with Regard to Curtain Coating Application

Sönke Hübner

Special Project Paper Coatings, BYK GmbH

Takashi Miyazawa

BYK Japan KK

Wetting and Dispersing Additives are important for all pigmented coating colors. With a right Wetting and Dispersing Additive you can achieve higher pigment load and lower viscosity of the coating color and at the same time you can get better substrate wetting. Especially when using Wetting and Dispersing Additive the stability and the elasticity of the curtain will be also improved.

Installation of “Defect Positional Information System” for Off-machine Coaters and Slitters

Nobuyuki Sugiura

Nakoso Mill, Nippon Paper Industries Co., Ltd.

It is highly important for quality assurance to accurately take care of splicing on poor paper quality resulting from coating defects. The accuracy of defects positional information was low so that we had to check over a wide area. When defects were not found, the roll was unfortunately treated as a reject roll. These issues caused productivity and yield decrease on the finishing process. Then we introduced “Defect Positional Information System” to solve these issues.

Various Safety Devices for Machinery Safety Applications

Keiji Otake and Yuji Yamada

Azbil Trading Co., Ltd.

The amendments of laws and guidelines have promoted the safety awareness of users and makers recently. However, due to the complicated standards and regulations as well as various safety devices available now as a result of technology advancement, we scarcely observe appropriate safety protections supported by correct understanding of standards requirements, the real danger at site and the most suitable protection measures with the economical point of view. Especially in the Paper and Pulp market, operators often need to approach to machines while roller parts are moving, and they try to manage avoiding machine stoppage as much as possible, for it is laborious to restart the machine. Therefore, machine designers and safety persons at site are facing dilemma over to what extent they should enforce safety measures to their machines.

In this paper, we are going to explain the concept of 'isolation and stop' and 'safety confirming systems', which constitute the bedrock of machinery safety, using actual application examples, including tips on how to choose safety devices.

Corporate Profile & Products Information (16)

Earth Environmental Service Co., Ltd. (ESCO)

Our company is established in 1978 as a pest control company and has grown up to be a company providing a total hygiene managing service for many kinds of clients such as food factory, pharmaceutical factory, packaging factory, *etc.* Service includes environmental monitoring and validation, inspection and examination, microbial control, education and consulting related to hygiene management, support service for certification, besides pest control operation. In this paper, we introduced our original current technology contributing to total hygiene management.

—Peer Reviewed—

Characteristics of Peroxymonosulfuric Acid Bleaching and the Mill Application

Iori Tomoda

Pulp and Paper Innovation Center, Oji Holdings Corporation

Peroxymonosulfuric acid has been examined as bleaching agent which has ability of delignification, not as degradation agent of hexenuronic acid.

We revealed, in this study first the reaction mechanism of peroxymonosulfuric acid which has some characteristics during pulp bleaching. It was found that lignin degradation proceeded at almost the same rate in the range of pH 1.5 to 5.0. The most effective pH for degradation of hexenuronic acid (HexA) was 3.0. The peroxymonosulfuric acid treatment at low pH resulted in the decrease of fiber qualities. A treatment for more than 60 minutes was required for the sufficient degradation of lignin and HexA. It became apparent that the condition of peroxymonosulfuric acid (Px) stage was similar to another bleaching stage.

We confirmed that the effect of converting a common bleaching stage into Px stage in a laboratory test In a trial an acid-washing stage was converted into Px stage in Z-ECF, and in the second trial acidic peroxide stage, which was introduced as the first stage in D-ECF, was converted into Px stage. It was confirmed that the beneficial effects of conversion were mainly decrements of hexenuronic acid and of chlorine dioxide consumption in both cases. These effects also confirmed in mill scale, and therefore we installed peroxymonosulfuric acid bleaching stage in June 2007 at Tomioka mill and January 2012 at Kasugai mill.