

### **KAWANOE/Valmet tissue machine lineup and the latest technology**

Masamichi Sugi  
Design Dept, KAWANOE ZOKI Co., Ltd.

Kawanoe BestFormer, a household tissue machine for tissue, toilet paper and towels, started to install in Japan as well as Asia since 1974. Now the machines have been installed more than 200 units. There are wide varieties of product lineups such as BF-1000 of the machine speed at 1000m/min, BF-1200TW that can produce both at dry and wet crepe and so on. This time we would like to introduce BestFormer lineups along with the latest energy saving technology that can meet the customer's needs, production volumes and use applications. Also, we offer DCT CrescentFormer under the license agreement with Valmet and ViscoNip, the latest press technology, will also be introduced.

### **How to Improve Tissue Making -Effect and solution of cellulose fiber on coating the shell-**

Ryo Inamatsu  
Application Development Section, Maintech Co., Ltd. Fuji Technology Development Center

Improving production and sheet quality have been one of the top priorities for tissue manufacturers. As press felt deposits due to recycled paper causes sheet web moisture profile uneven and dropped fiber, coating on Yankee dryer tends to be unstable and over hardening, which also leads to sheet spot and chattering mark on the dryer surface. Many kinds of Creping control agents especially polymer based coating agents and release agents have been used to solve the problems, however they have not succeeded in forming stable coating the shell under the recycled furnish condition.

Maintech has developed innovative creping control agents which protect coating the shell from the uneven moisture of the sheet web and over hardening. This report describes the concept and mechanism of new creping control agents and its field testing cases in which new creping control agents has been able to improve productivity and sheet quality.

### **Advanced technical approach to Tissue machine -Visualization of coating chemical on Yankee-**

Takuya Maekawa  
Spectris Japan Co. LTD., BTG Div.

BTG is a technical company who has been innovating and providing a High-Performance Creping blade (Duroblade) to tissue mills in the world, which can improve tissue paper quality and productivity by implementing less blade change and better softness than the conventional steel creping blade. Under BTG policy of "Yankee Safety", BTG have innovated a unique CBC holder system also which can reduce risk of Yankee damage and the frequency of Yankee re-grinding period.

Coating chemical on Yankee is the most important factor making impact on tissue quality and protecting Yankee surface, but there is no way established to measure and check this coating chemical condition on Yankee directly yet. If the coating chemical would be hard or soft, thick or thin, this determination is made through operator's experiences and intuitions which is difficult to be equitized.

The latest BTG system innovated 'Vigilance' can monitor the coating chemical on

Yankee by checking a specific vibration on Yankee blade holder. Vigilance is not just a vibration monitoring system but a system that can analyze a cause of the source for vibration analyzing a filtered vibration band. Applying Vigilance on tissue machine makes coating chemical condition in visualized and lead to optimize tissue machine operation.

### **Latest Technology of Creping Control Agent**

Masashi Sano  
Specialty Chemical Divi. Riken Green Co., Ltd.

Tissue and towel (T&T) paper mills in Japan are required to be more competitive because low-priced paper imported to Japan is increasing and cost of raw materials and fuel are going up. Steel Yankee dryer is installed in many T&T paper machines in overseas to improve production efficiency because heat conductivity of steel is better than that of cast iron. Shoe-press is installed in many T&T paper machines as well and this new technology is started to introduce in Japan. Shoe-press enables to bring less water into Yankee dryer, therefore edge deposit of Yankee surface, which is a common issue of the dryer, occurs more often than before. The edge deposit might cause chatter mark, damage of dryer surface, sheet break or quality loss of paper, and it becomes one of issues of T&T machine with shoe-press. Conventional release and coating products could not fully control the edge deposit, therefore Solenis, who is the leading company of chemical products for paper mills in the world and their products have been distributing in Japan by Rikengreen exclusively, developed new products to solve this problem. The edge deposit issue of Yankee dryer could be improved by using new release and coating products of Solenis, and the interval of doctor blade exchange could be extended and stable high quality paper production could be achieved.

### **CleanLine – The Complete Fabric Cleaning**

Yukio Gyonouchi  
Voith IHI Paper Technology

Maintaining fabric performance is essential in order to achieve targets of productivity, paper quality, cost and safety on the paper machine. However, fabrics in the forming, press and dryer behave like filters to trap and hold contamination. Traditional methods of cleaning fabrics often cause negative side effects such as having to use corrosive and hazardous chemicals, barrier coatings attaching to fabrics and sheet property variations caused by high pressure showers. Also, today's furnish introduces increasing amounts of contaminants while outdated efforts to clean fabrics simply shift the contamination to the next sections, affecting the runnability of the paper machine.

New traversing cleaning systems have been developed in cooperation between paper mills, fabric designers and high pressure water technologists. These solutions are now running successfully on some of the most demanding applications. In forming, the concentration of water jets can greatly reduce the number of wet end breaks, reduce waves in the sheet and minimize spray and mist. Improved cleaning systems for press fabrics can reduce moisture variation and lower the amount and frequency of the use of cleaning chemicals while improving machine runnability. A unique cleaning head can be matched to the surface and structure of dryer fabrics to remove more contamination.

These developments in cleaning technology, using a complete concept throughout the paper machine, bring benefits in servicing, availability of the equipment and the performance of paper machine fabrics.

### **Axial movement compatible type mechanical seal for Refiner**

Takahiro Hayashi  
Engineering Dept. John Crane Japan, Inc.

Application of the mechanical seal has been progressing for sealing system of rotating equipment in the pulp and paper industry. The applications of the mechanical seal were limited to such as pumps and screens for black liquor and coating collar services. In recent years, it is progressed for agitators which has large axial runout and vibration.

However it is remained the gland packings for refiner, because of large shaft movement.

In order to reduce energy consumption and maintenance costs and to provide safety and stability for the daily operation, John Crane would like to introduce the mechanical seal that has capability of large axial shaft movement for refiners.

### **High temperature erosive wear resistance of overlay welding metal in various boiler furnace wall**

Ayumu Sakaguchi ,Yoichi Shiraishi  
Welding Alloys Japan LTD. Engineering Department  
Kazumichi Shimizu  
Muroran Institute of Technology

In the circulating fluidized bed boiler, erosion wear is remarkable as compared with other boilers due to silica sand which is a combustion medium in the furnace. Therefore, in the past, at our company, high temperature blasting test was adopted to evaluate high temperature corrosion abrasion resistance of various overlay welding metals as a countermeasure against erosive wear in CFB boiler under high temperature environment.

In this study, high-temperature blasting tests were conducted on new overlay welding metals of Ni and Fe based, which are not widely adopted in domestic applications other than boiler applications, and high temperature erosive resistance wear characteristics were investigated.

As a result of this test, it was suggested that the overlay welding metals tested this time compared with Inconel 625 has a wear rate of 18 to 27% lower, which is possibly excellent in erosive resistance under high temperature environment.

In the future, in order to simulate a boiler actual machine, in addition to high temperature erosion, we are looking for ways to evaluate the resistance to the environment such as chlorination and sulfurization and think that it is necessary to select the optimum welding metals according to the operating environment of each boiler.

### **Oil Analysis – what it reveals and what it offers -Managing Equipment through Diagnosis of the lubrication oil-**

Kentaro Ootsuka  
JAPAN ANALYST CO.,LTD  
Eiji Suzuki  
JSD Ltd

Many industries, including paper manufacturing, have machinery equipment which use lubrication oil in order to protect the equipment from wear. The lubrication oil, however, can also wear and cause malfunction in the machinery. Lubrication oil acts like blood in the human body system, circulating within the machinery equipment and maintaining it while collecting information that shows the condition of the machinery. Management of the equipment can be hugely enhanced by oil analysis which includes monitoring viscosity, oxidation, water level, and particle number and weight. This analysis allows operators to take necessary measures to protect the equipment, such as fitting it with a high-quality oil filter. In many companies it is the norm to use equipment until it requires partial or whole replacement, but oil analysis can give a clear picture of what is happening to the machinery, and help companies take measures to ensure clean oil, which can prolong the life of their machinery equipment. This will lead to better productivity and overall long-term economic benefit to the company.

## **The History of Paperboard**

### **Part 4: The Current Use of Waste Paper in Paperboard Production and the Summary of the Series**

Kiyoaki Iida

In Japan, by the data of 2017, 67 % of recovered paper was used for paperboard production, and paperboard used recovered paper at the utilization rate of 93.8 %. Even kraft liner, needless to say of jute liner and corrugated medium, is produced with OCC as its main furnish. Wrapping paper, on the other hand, used recovered paper at the rate of less than 10%.

In Europe, by the data of 2015, 68% of recovered paper was used to produce paperboard and its utilization rate of recovered paper was 74%. Its case materials, equivalent to paperboard for corrugated container in Japan, used recovered paper at the rate of 71%. Its trend is similar to that in Japan, though the utilization rate is less than that of Japan.

USA is different from the above two. By the data of 2015, only 45 % of its recovered paper was used for paperboard production, and 40 % was exported to China. The utilization rate in paperboard production was estimated to be 27%, which is quite small compared to Japan and Europe. USA makes most of kraft liner with virgin kraft pulp.

Finally, this series is summarized.

## **Reports on Ozone Bleaching in Vietnam's Pulp and Paper Industry**

Takanori Miyanishi  
JAPAN TAPPI

One of the smaller Asian countries that has done well in recent years is Vietnam. Indeed, the country's paper and paperboard consumption are showing relatively stable increases of over 15% per annum. Since Vietnam is quite dependent on imports at the moment, it will have to invest in to ensure that it has the quality and quantity of domestic paper production required to stop the market from being taken over by overseas producers as its markets develop.

Among the other challenges currently facing Vietnam's pulp and paper industry, the treatment of colored effluent discharged from pulp mills and the shift from conventional bleaching to Elementary Chlorine Free (ECF) bleaching are drawing attention. Ozone has a powerful oxidation potential to react with any type of lignin compounds and can thoroughly replace chlorine gas in bleaching pulps to high brightness. Effluent is non-toxic, colorless and does not cause any environment problems. Approximately 50% of new ozone bleaching equipment installed during the year of 2000-2013 in the world is successfully operated by Japanese paper companies.

Upon the request of Vietnam Pulp and Paper Association (VPPA), I was invited to give a lecture at Hanoi in Vietnam and share my experiences in ozone bleaching with scientists and engineers of pulp and paper companies, university students and lecturers. The technical seminar was fruitful, and many questions were raised from the audience. The following day, we visited An Hoa Pulp and Paper Factory. It is a new paper mill committed to producing and supplying high quality pulp and paper products including calcium carbonate coated paper, printing and writing paper, and photocopy paper.

## **Evaluation of Cellulose Nanofibers by Using Sedimentation Method**

Akio Kumagai, Takashi Endo

Research Institute for Sustainable Chemistry, Department of Materials and Chemistry,

National Institute of Advanced Industrial Science and Technology

Maki Adachi

RENIAS CO., LTD. Development Design Group

The practicality of sedimentation method for evaluating the diameter and morphology of cellulose nanofibers (CNFs) in CNF dispersions was studied using CNFs with different degrees of fibrillation prepared by the mechanical fibrillation of softwood bleached kraft pulp. Evaluations of the CNF dispersions were performed using a stability analyzer and centrifuge particle size analyzer based on the gravitational sedimentation method and differential centrifugal sedimentation (DCS) method, respectively. The sedimentation behavior of CNFs provided by the stability analyzer reflected the fiber morphologies, and good correlation was found between the Stokes' diameter obtained by the DCS method and the fiber diameters estimated from field-emission scanning electron microscopy observations. These results show the possibility of using analysis based on the sedimentation method for evaluating the diameter and morphology of cellulose fibers in CNF dispersions, including the cellulose fibers obtained by fibrillation.