

CONTENTS

Papermaking Technology I

- 1 Report of the 26th Papermaking Technology Seminar
.....Papermaking Technology Committee, JAPAN TAPPI
 - 4 Installation Reference of Energy Saving & Recovery by Dryer Hood and Air System.....Hidenori Tsuzuno, Jean Desharnais and Lawrence Yane
 - 9 Basic Technologies and Latest Trends for Paper Machine
—Dryer to Size Press—.....Toshihiro Katano
 - 15 Modification Example of Dryer and Size Press Part for Grade Conversion
.....Yang Xue
 - 23 Basic Concept of Drainage System and Possibility of Energy Reduction
.....Hitoshi Terashima
 - 28 Basic Technology of Tail Threading Equipment.....Hiroaki Fukasawa
 - 34 SmartPapyrus[®] Approach to Optimizing Operation.....Hitomaru Sakata
-

Topics & Information

- 41 Newly Canvas Cleaner 『ACE Cleaner』Yosuke Sato
-

Pulp and Paper Mills in Japan(99)

- 46 Otake Mill, Nippon Paper Industries Co., Ltd
-

- 50 75th JAPAN TAPPI General Meeting
-

03 Committee report

45 Coffee break

65 Papyrus

73 Industry News (Domestic and International)

78 List of Patents issued and Laid-open Publication

86 Price list of Domestic Logs and Wood Chips by District

87 Other Monthly Statistics

89 News from the Association

Installation Reference of Energy Saving & Recovery by Dryer Hood and Air System

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This is to report on energy saving by Enerquin High Due Pont dryer hood, which is replaced to existing old T&G hood. At the same time existing pocket ventilators are replaced to new Mark II pocket ventilation nozzles. As the result, hood balance is improved and steam saving of paper dryers is evaluated. Also, heat recovery efficiency and Drying Rate efficiency are improved. Power consumption of supply fans and exhaust fans are considerably reduced.

Basic technologies and latest trends for paper machine -dryer to size press-

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In recent trends for carbon neutral, there is a growing demand for energy and raw material savings in the papermaking process through further energy conservation and yield improvement. The most important factor in saving energy in the papermaking process is how to reduce the moisture content of paper, especially before the pressing process.

Although, the dryer part has the largest amount of energy input and is an important part with potential for energy conservation and improvement.

This section first describes the cylinder dryer part and its ancillary equipment and mechanisms, as well as air flotation dryers and IR dryers. In addition, as a recent trend, sizers have been installed between the cylinder dryer parts as coating machines for external coating of paper strength materials and other applications. The functions of sizers and examples of their use will also be reported.

Modification Example of Dryer and Size press part for grade conversion

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With the development of information and communication technology, the digitization of information is progressing, and the market is changing rapidly. While market demand for newspapers and coated paper has declined significantly, Consumption of tissue and containerboards is increasing rapidly due to the after coronavirus "New Normal" and e-commerce.

Demand for paper is declining, while demand for paperboard is expected to increase in the future. Under these circumstances, attention is focused on the shift from the production of paper such as newspaper and coated paper to the production of paperboard such as liners and cores. In such an environment, the paper industry is also undergoing major changes in demand, and it is required to produce products that meet the demand of each production variety. In order to increase the production of a certain paper, there are two methods, rebuilding (grade conversion) of existing machine and new machine. Since it takes time and cost to construct a new machine, many mills select a method of rebuild to products equipment for newspaper that are not expected to be in high demand and allocating them to the production of board that are expected to be in demand, that is grade conversion.

For grade conversion, we will introduce the rebuilding technology and Modification Example of Dryer and Size press part for grade conversion.

Basic Concept of Drainage System and Possibility of energy reduction

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Compared to the original operating conditions for a paper machine, almost all current operating conditions, such as paper weight and speed, have changed.

Saving energy may be possible by investigating and examining whether or not the drainage system has kept up with these changes.

By changing the drainage system to match the paper being made, there should be many cases that can expect improvements in quality and efficiency as well as realizing steam savings.

Here we report on what can be done from now on for the possibility of saving energy considering the drainage system, within recent significant improvements in drying efficiency through sealed hoods, air supply and exhaust, heat recovery system, etc.

Basic technology of Tail threading equipment

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Tail threading systems and equipment has been developed over the years to be able to automatically thread the tail wherever an open draw occurred from one section to the next section of the machine. Some eighty years ago the rope threading system was introduced to thread the dryer section, calender and reel. Approximately sixty years ago the vacuum belt was introduced for threading systems at the dry end. The airfoil application was developed by Crown Zellerbach fifty some years ago.

The core parts of tail threading system introduced here are made in-house by utilizing the process know-how and skills accumulated over many years in the Japanese paper industry. This combination has succeeded in the epoch making improvement of tail threading system for whole parts of paper machine.

SmartPapyrus[®] Approach to Optimizing Operations

Hitomaru Sakata
Technology Development Team
MAINTECH CO., LTD Fuji Technology Development Center

Maintech has been providing paper machines with Dryer Section Passivation technology (chemical application combined with chemical product, equipment, and application methods) for over 30 years to prevent defect/sheet break due to dryer section depositions. As of July 2021, the number of applications being operated over the world has topped 800 units. In recent years, the number of problems caused by machine deposits has been increasing due to the worsening of the raw material of pulp situation. In addition, it is becoming increasingly difficult to respond to machine dirt deposits in a timely and appropriate manner due to the decrease in the working population at production sites and the retirement of experienced employees. To address this issue, we are developing "SmartPapyrus", a system to prevent defects and sheet breaks by visualizing machine dirt deposits using IoT, analyzing it using artificial intelligence, and using machine dirt deposit prevention technology. For this reason, we developed SmartPapyrus[®] 1.0, a system that uses AI to automatically classify images of defects. SmartPapyrus[®] 1.0 makes it possible to determine in real-time when and how many defects have occurred. As a result, the necessity and effectiveness of countermeasures can be quantitatively confirmed. In this report, we will introduce SmartPapyrus[®] 1.0 and discuss some examples of its use.

Newly Canvas Cleaner 『ACE Cleaner』

Yosuke Sato

Design Department / AIKAWA IRON WORKS CO.,LTD.

In recent years, canvas dirt due to deterioration of raw material quality has increased, thereby causing problems such as lower air intake, deterioration of drying efficiency, and unstable moisture profile. At the same time, since the improvement of the product quality is required, the canvas cleaner is required, especially in paperboard and newspaper product machines. Among them, we started selling high-pressure cleaning equipment for machine tools about 20 years ago, and thanks to that, we have delivered more than 100 units of canvas cleaners. Here, 「ACE」 cleaner, which is a dirty objects recovery system by newly developed ejector air, is introduced together with various canvas cleaners of our company.