

## CONTENTS

### Deplasticization

- 1 Development of Coated Paper Products for Packaging, “barricote<sup>®</sup>” and “barrisherpa<sup>®</sup>”……Masanori Nagoshi
- 6 Cellophane or Paper Packaging as Alternative for Plastic Packaging  
……Taro Yotsumoto, Susumu Sakata, Yoshihito Fujimoto and Keiko Imai
- 10 New Concept Paper Container “SPOPS” to Replace Plastic Refill Pouch  
……Takaharu Noda
- 14 Effort for Deplasticization and Plastic Reduction by Utilizing wood Pulp Material  
……Kenta Arishima
- 20 Development of Moisture Resistant Coating agents Derived from Biodegradable Biomass Material……Teruyuki Matsushima
- 24 Water Based Coating Agent to Impart Barrier Layer, for Paper and Paperboard  
……Wakako Masuda and Shunsuke Hayashi

### Topics & Information

- 30 Revision of JIS P 8116  
Paper-Determination of tearing resistance-Elmendorf tearing tester method  
……JAPAN TAPPI, Pulp and Paper Test Standards Committee
- 34 Research Projects of Universities and Government Research Institutes  
……Wood Science Committee, JAPAN TAPPI

### Pulp and Paper Mills in Japan (95)

- 44 Kumagaya Plant, LINTEC Corporation

- 03 Committee report
- 43 Coffee break
- 50 Papyrus
- 56 Industry News (Domestic and International)
- 63 List of Patents issued and Laid-open Publication
- 70 Price list of Domestic Logs and Wood Chips by District
- 71 Other Monthly Statistics
- 73 News from the Association

### **Development of coated paper products for packaging, "barricote®" and "barrisherpa®"**

Masanori Nagoshi  
Mitsubishi Paper Mills Limited

The realization of a sustainable society has become an issue in terms of countermeasures against marine plastic waste and global warming caused by the rapidly increasing consumption of plastics for containers and packaging worldwide.

In response to this challenge, Mitsubishi Paper Mills Limited (MPM) Group's subsidiary in Germany, Mitsubishi HiTec Paper Europe GmbH, has quickly commercialized "barricote®", a paper-based coated paper for food packaging, as an alternative material that can contribute to reducing waste plastic. The products have been highly evaluated and adopted by major European food manufacturers since spring 2019. In order to meet a wide range of packaging needs in the Asian market, including Japan, MPM is currently developing and marketing "barricote®" and "barrisherpa®", coated paper products for packaging, in Japan. In this presentation, we will introduce the products developed in Japan.

### **Cellophane or Paper Packaging as Alternative for Plastic Packaging**

Taro Yotsumoto, Susumu Sakata, Yoshihito Fujimoto and Keiko Imai  
Central Laboratory, Rengo co., Ltd.

Recently, environmental pollution by marine plastics and micro plastics has been popularized as a global problem. In addition, social demands for plastic reduction are becoming more and more full-scale, such as strengthening the regulations on disposable plastics, promoting the use of biomass-based materials, and changing the behavior of companies related to SDGs. In Japan, the Resource Circulation Strategy for Plastics has been formulated, and some efforts toward "3R+Renewable" have been strengthened. Brand owners also have great interest in it, and the adoption of new technologies is becoming active.

To meet these plastic-free needs, our company has also developed an eco-friendly packaging, "REBIOS" that combines biodegradable materials based on cellophane and paper. In this study, we suggest "cellophane-based packaging" and "paper-based packaging" as alternative for plastic packaging. For example, we developed heat-sealable, moisture-proof, and oxygen-barrier packaging material made of cellophane coating a PVDC (oxygen permeability 5 [cc/m<sup>2</sup> · day · atm] at 23°C/65%RH condition). Other hand, we also developed paper-packaging which can be recycled as paper, heat sealable, and with good printed surface.

We will continue the efforts to expand our series and contribute to creating a better and sustainable social environment through the creation of high-quality, high-value-added packages while effectively utilizing resources and reducing the impact on the global environment.

### **New Concept Paper Container "SPOPS" to Replace Plastic Refill Pouch.**

Takaharu Noda  
Paper-Pak Sales Division, Nippon Paper Industries Co., Ltd

In the Japanese market, refill pouches are widely used in toiletry products, because it can reduce the amount of plastic waste compared to using plastic bottles as disposables. According to the consumer interview, the most of them have some kind of frustrations with refill pouches about the usability. In addition, single use plastic reduction has become a global important issue due to the ocean plastic problem. Under these circumstances, Nippon Paper developed new paper container "SPOPS®". Compare to refill pouches, it can improve usability and reduce single use plastic amount. Recently, 'SPOPS Hygiene' with specifications compatible with sanitizer has been developed to meet the growing need for sanitizer containers due to COVID-19.

## **Effort for deplasticization and plastic reduction by utilizing wood pulp material**

Kenta Arishima

Marketing & Development Dept. Sales Div. Oji F-Tex Co.,Ltd

Japanese government has set a target to reduce the emission of one-way plastics and declared its intention to achieve zero emission of greenhouse gas, in other words, carbon neutral society by 2050.

Under these social situations, paper and cellulose materials made from carbon-neutral woody biomass are attracting a great deal of attention, and manufacturers are considering replacing plastic materials with paper materials.

Paper products, such as paper cups and paper plates, have been used for a long time, but film-based materials have been the mainstream packaging material for barrier and heat-sealing properties.

Therefore, we have developed a new packaging material "SILBIO series" based on paper material that can be used as an alternative to film-based packaging materials. The lineup of "SILBIO series" is paper-based barrier material "SILBIO BARRIER," a filmless packaging paper with heat-sealing property "SILBIO EZ SEAL," a transparent paper-based barrier material "SILBIO CLEAR," and an aluminum-vapored paper-based barrier material "SILBIO ALBA".

These products meet various needs by combining properties such as transparency, concealability, esthetics, and texture like paper.

We believe that we can contribute to a carbon-neutral society by expanding sales of SILBIO series.

## **Development of moisture resistant coating agents derived from biodegradable biomass material**

Teruyuki Matsushima

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In the global trend of reduction of plastic products that originated due to the Marine plastic debris problem, the movement to replace plastic material with paper material is spreading all over the world. Paper is a biomass material made from wood. Due to biodegradable and recyclable nature, it is attracting attention as an ecofriendly material that has a less environmental impact. In order to use paper as a substitute for plastic, functionality equivalent to that of plastic is required. In response to this problem, studies have been made to impart various functions to paper by coating it with aqueous resin. In this paper, I will introduce moisture resistant coating agents "SEIKOAT® T-EF102 and T-EF103" that have biodegradability, as coating agents that have a less environmental impact, mainly using biomass materials.

"SEIKOAT® T-EF102 and T-EF103" have four characteristics below:

- The percentage of biomass material in the solid content is more than 85%
- Biodegradation degree (relative value) of more than 75%
- Conform to FDA21CFR § 176.170, § 176.180
- Moisture permeability: under 80 g/m<sup>2</sup> with a coating volume of more than 12 g/m<sup>2</sup>

By applying these coating agents to paper, I believe that plastic substitution by paper material that has a less environmental impact will be possible.

## **Water based coating agent to impart barrier layer, for paper and paperboard**

Wakako Masuda and Shunsuke Hayashi

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

In recent years, the plastic waste problem has become global concern. In addition to recycling plastic materials, the solution to this problem is to reduce usage. Also, using paper as an alternative to plastic is one of the solutions to this problem. Paper is mainly produced from pulp, which is a biomass material obtained from wood, and has little impact on the environment. However, because paper has many voids, it is often laminated with a plastic such as polyethylene (PE).

Paper materials that have been given various functions by laminating are also used in food packaging containers such as paper cups and food packaging boxes. On the other hand, PE-laminated paper has problems such as low recyclability such that the paper and PE film are required to be peeled off, and low degradability of the film used in the natural world.

We developed new water-based coating agent, "HICOAT BC series", which can add various functions to paper to replace PE laminate. The products can be applied to food packaging grade and reduce plastic usage. In this paper, regulations on food packaging in various countries as well as technology of HICOAT BC series are reported. In addition, we report new product using high ratio of biomass raw materials, which is under development.

## **Revision of JIS P 8116**

### **Paper -Determination of tearing resistance- Elmendorf tearing tester method**

JAPAN TAPPI, Testing Standards Committee

JIS P 8116: 2022 Paper -- Determination of tearing resistance -- Elmendorf tearing tester method was published in February 2022 after being consistent with the corresponding international standard ISO 1974: 2012.

The main revisions from the old standard (JIS P 8116: 2000) are as follows.

a) Clarified in the scope that it is not suitable for determining the cross-direction tearing resistance of highly directional paper (or board).

b) Described the specifications of the Elmendorf type tearing tester in the main body of the standard.

c) Specified the depth of the clamp as  $15 \text{ mm} \pm 1 \text{ mm}$ .

d) Added a calculation method for digital read-type devices when obtaining measured values as tearing resistance.

e) Added an annex about precision.

In addition, the issues and results under discussion regarding the number of test pieces, the width of the test pieces, and how to round the numerical values are reported.