## 🖗 Fuji Seal International

ENVIRONMENTAL REPORT Vol. 30

Fuji Seal Group Environmental Initiatives toward Horizontal Recycling of Shrink Sleeve Labels "Label-to-Label"

The Fuji Seal Group is working to build a recycling-based society to contribute to a sustainable society and achieve long-term corporate growth. We are working to implement recycling not only in design, but also in practical recycling processes so that labels and packages that have been consumed can be reborn as resources. This report features the latest developments in our resource recycling initiative for shrink labels in Japan, "Label-to-Label".

#### "Label-to-Label" Overview

"Label-to-Label" is a technology that contributes to resource recycling by peeling off printed labels regenerating them into new labels. (Horizontal recycling)

Since 2021, We have been collaborating with our partner companies to collect and recycle shrink sleeve labels through horizontal recycling. With the support of brand owners, retailers, and local governments who share this vision, we have been advancing efforts to collect shrink sleeve labels from the market and reuse them to produce new shrink sleeve starting in 2022.



Feasibility Study ①

Feasibility Study 2

Feasibility Study ③

### New Technology for The Social Implementation of Shrink Sleeve Labels Recycling "Label-to-Label"

Through our "Label-to-Label" collection demonstration experiment, we have identified issues that need to be addressed. We will introduce new technologies that will enable more efficient recycling.

# 🖗 Fuji Seal International

ENVIRONMENTAL REPORT Vol. 30 Fuji Seal Group Environmental Initiatives toward Horizontal Recycling of Shrink Sleeve Labels "Label-to-Label"

### 1 To reduce restrictions on recyclable labels

Previously, special printing was required to remove ink from the printed layer, but we have developed a technology that enables ink removal even from labels without special ink. This innovation allows recycling regardless of whether special ink is used, leading to improved recycling rates. Additionally, the reduced risk of labels with ink residue being mixed in is expected to enhance product quality.



	New Process	※ Same as the general structure
•	Surface Design	
	Eliminated	
	Film	

### 2 To reuse shrink sleeve labels by material type

Labels for PET bottles distributed in Japan are made of multiple material types. Once these can be sorted automatically, it will be possible to prevent the mixing of different materials when pelletizing after market collection, leading to improved quality. In addition, it will enable the joint implementation of various collection experiments, which are currently conducted separately by product, and will serve as a steppingstone toward the utilization of various types of shrink sleeve labels that are currently collected and discarded in the PET bottle recycling process, according to their material type.

As part of GSHIP's efforts, preliminary verification using an optical sorting machine conducted jointly with Mitsubishi Chemical Corporation confirmed that shrink sleeve labels of each material could be sorted achieving over 90% purity, confirming the feasibility of automatic sorting.

#### **③** To reduce waste generated during recycling process

In our "Label-to-Label" initiative, we have been working to promote the reuse of film by removing ink from labels, while also exploring ways to reuse the removed ink. With the support of Dainichiseika Color & Chemicals Mfg. Co., Ltd., we have successfully produced recycled ink from removed ink. Its performance has been verified in printing machines, and it is now being used in limited-edition labels.

# 🕻 Fuji Seal International

**ENVIRONMENTAL** REPORT Vol. 30

Fuji Seal Group **Environmental Initiatives toward** Horizontal Recycling of Shrink Sleeve Labels "Label-to-Label"

#### $\diamond$ Deployment of New Technology

Fuji Seal, Inc. (hereinafter to as "the Company") has been participating in the "Demonstration experiment for building a resource recycling model toward horizontal recycling of beverage labels", which was selected for the Marine Plastic Measures and Leading Project Support Program for FY2024 (focused on plastic reduction and related efforts) publicly offered by Hiroshima Prefecture for the past three years. In FY2024, the Company conducted demonstration

experiments on the project to confirm their effectiveness.



< Separation of Target Materials and De-Inking Using an Optical Sorting Machine for Post-Consumer Labels>



# 🖗 Fuji Seal International

ENVIRONMENTAL REPORT Vol. 30 Fuji Seal Group Environmental Initiatives toward Horizontal Recycling of Shrink Sleeve Labels "Label-to-Label"

### To Raise Awareness of "Label-to-Label", "Label-to-Label" Mark Certified by the Ministry of the Environment

The "Label-to-Label" mark, which was created to raise awareness of an initiative and has been used on the labels of customers who have adopted the initiatives, was certified as an environmental label by the Ministry of the Environment in October 2023. This initiative is based on the idea of providing consumers with clear and relevant environmental information. By making it easier to understand the meaning of the "Label-to-Label" mark and the initiatives behind it, the Company aims to encourage consumers to consider ease of recycling and environmental impact when making purchasing decisions. In addition to our website, an overview of the "Label-to-Label" mark can also be found in the database on the Ministry of the Environment's website. Please refer to this resource for more detailed information.

The Ministry of Environment Data Base: "Label-to-Label" Japanese only

#### ◇"Label-to-Label" Mark Usage Guidelines



- Pre-consumer materials from shrink sleeve labels and/or postconsumer materials from shrink sleeve labels as recovered materials
- A shrink sleeve label made using recycled shrink sleeve material, which is produced by removing printed designs from collected labels and processing them into recycled pellets

### Toward Establishing a Horizontal Recycling System for Shrink Sleeve Labels in Japan

While continuing to develop the new technology introduced here, We will continue to promote "Label-to-Label" deployment as we have done in the past.

Furthermore, we plan to implement a pilot program for the collection and recycling of shrink sleeve labels, in partnership with supportive companies and local governments, with the goal of achieving full-scale societal implementation by 2030.