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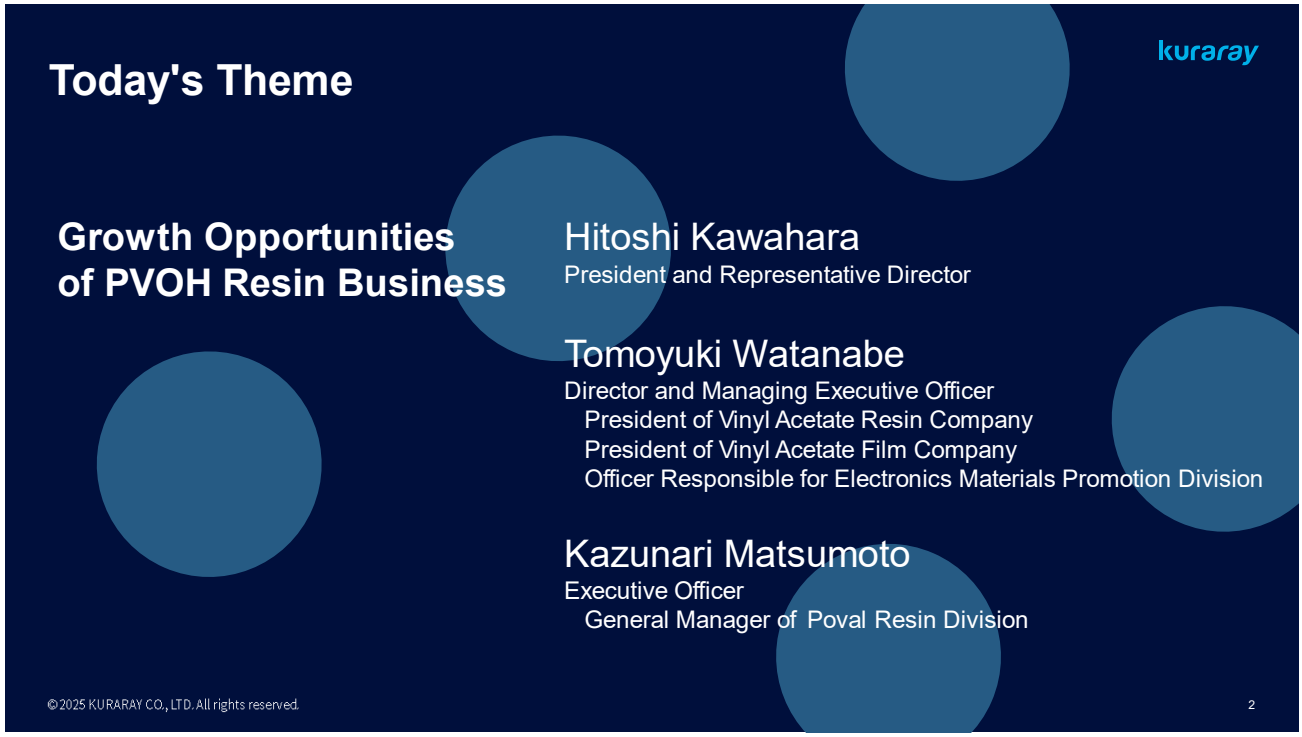
Management Briefing

Growth Opportunities of PVOH Resin Business

Presenters:

Hitoshi Kawahara	President and Representative Director
Tomoyuki Watanabe	Director and Managing Executive Officer President of Vinyl Acetate Resin Company President of Vinyl Acetate Film Company Officer Responsible for Electronics Materials Promotion Division
Kazunari Matsumoto	Executive Officer General Manager of Poval Resin Division

June 19, 2025



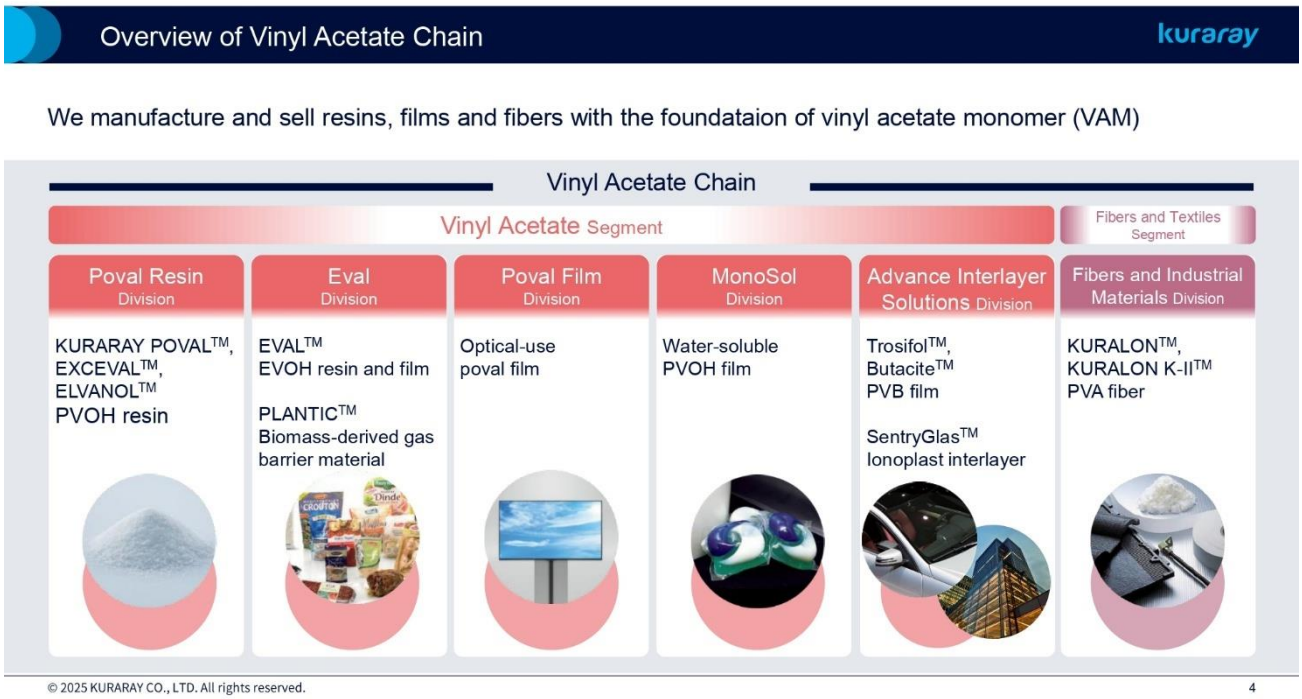
I am President Kawahara.

Today, I would like to highlight PVOH resin in the vinyl acetate segment, which is one of the core businesses of the Kuraray Group.

PVOH resin is the core business of our vinyl acetate business, and during today's presentation, I would like to discuss its high-value-added strategies, as well as its prospects, including peripheral businesses.

First, Mr. Watanabe, President of the Vinyl Acetate Resin Company, who is standing next to me, will give an overview of the vinyl acetate segment and the value chain of the vinyl acetate business, and then Mr. Matsumoto, General Manager of the Poval Resin Division, will give a detailed report on the PVOH resin business.

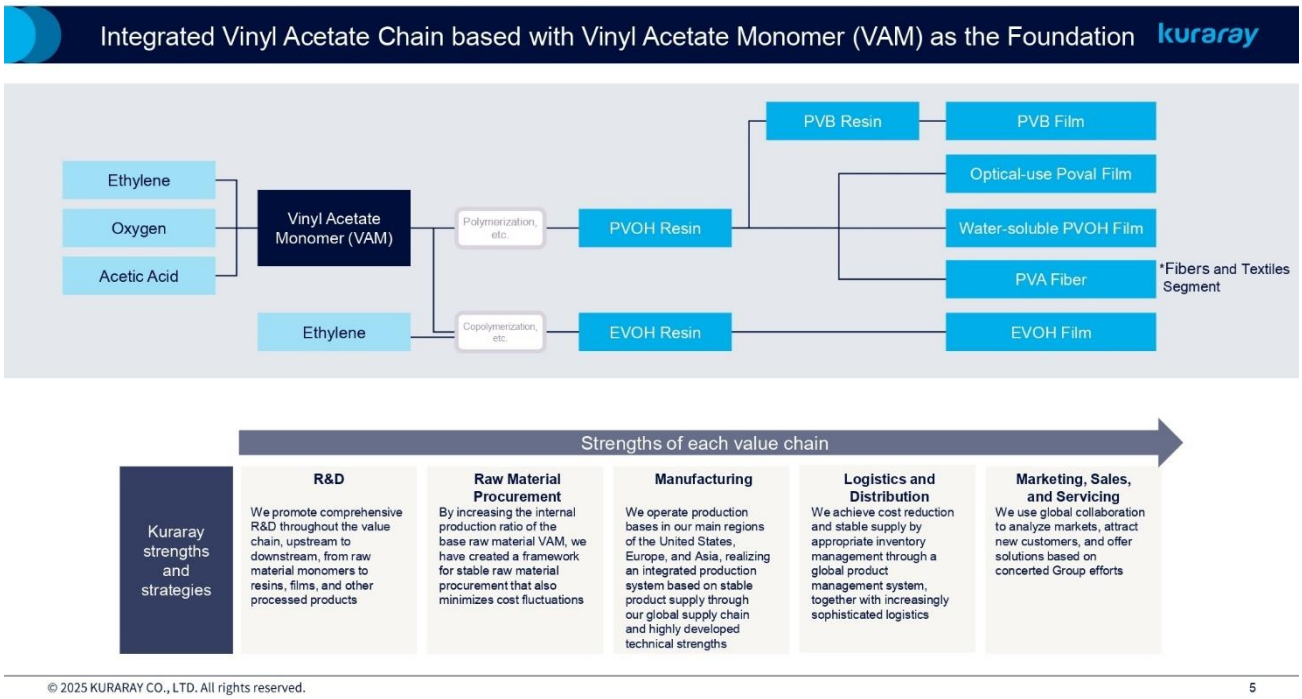
Finally, I would like to talk about our efforts to develop new solutions utilizing PVOH resin and related technologies, as well as our future initiatives.



I am Watanabe, President of Vinyl Acetate Resin Company. Let me begin by giving you an overview of our vinyl acetate chain.

The vinyl acetate segment has five divisions, as you can see on this slide. Regarding the Poval Resin Division and the Eval Division, which will be the topic of today's discussion, we mainly manufacture and sell resins. In contrast, the Poval Film Division, MonoSol Division, and Advanced Interlayer Solutions Division mainly manufacture and sell films. The business units that handle these films receive raw materials mainly from the Poval Resin Division, which is located upstream, and manufacture the films.

Regarding the Fibers and Textiles Segment, a picture of the product is shown on the right. These are PVA fiber products named KURALON™.



One of our strengths is that we have built a strong value chain based on vinyl acetate monomer.

PVOH resin is the raw material for films and fibers. We can design or modify the structure of PVOH resin at the microscopic scale to create specialized versions of the resin that are better suited for the final goods or components. This special PVOH resin supports the quality and functionality of downstream products.

We also produce vinyl acetate monomer in-house, the raw material for PVOH resin. This enables us to achieve high-cost competitiveness and supply stability, leading to high customer appreciation and high profitability.

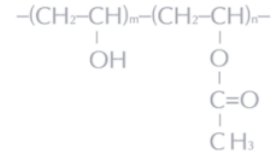
This concludes my presentation. Next, Mr. Matsumoto will provide the details.

What is PVOH Resin?

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- Abbreviation of polyvinyl alcohol, a water-soluble polymer. Kuraray was the first in the world to successfully industrialize it in 1950
- Among water-soluble polymers, it has the highest level of film strength and is biodegradable in its aqueous state

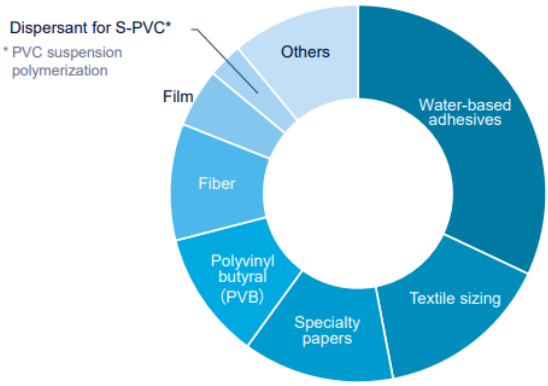
[Chemical Structure]





- Through structural control, properties such as solubility, strength, barrier performance, and surface activity are well-balanced, leading to widespread use in essential everyday applications such as water-based adhesives, water-based coatings for specialty papers, and soluble unit dose systems for detergent

Global Demand Quantity for PVOH Resin
(Based on in-house research)



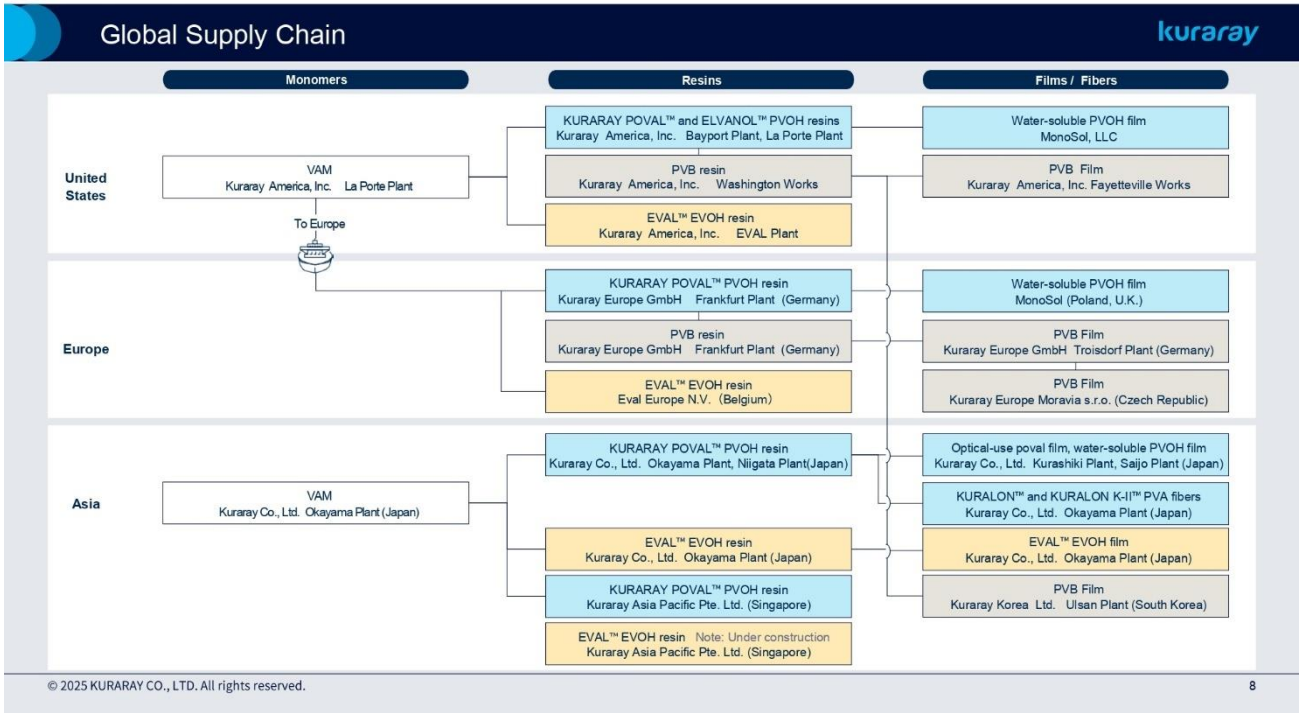
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I am Matsumoto, General Manager of Poval Resin Division. From here, I would like to discuss the growth opportunities for the PVOH resin business.

PVOH resin is the generic name for polyvinyl alcohol, a water-soluble polymer material. Kuraray was the first in the world to successfully industrialize this material in 1950. During the postwar reconstruction era, our company's leader was determined to revive the industry using technology developed in Japan, and their vision led to the creation of this material. Since then, Kuraray has continued to lead the industry as a pioneer in PVOH resin technology.

One of the characteristics of PVOH resin is that it can form a resilient and flexible film than other water-soluble materials such as starch and cellulose. Also, as Mr. Watanabe mentioned earlier, by controlling the molecular structure, it is possible to bring out a desired balance of properties such as solubility, strength, barrier properties, and surface activity.

As you can see from the graph on the right, it is used in many products around us.

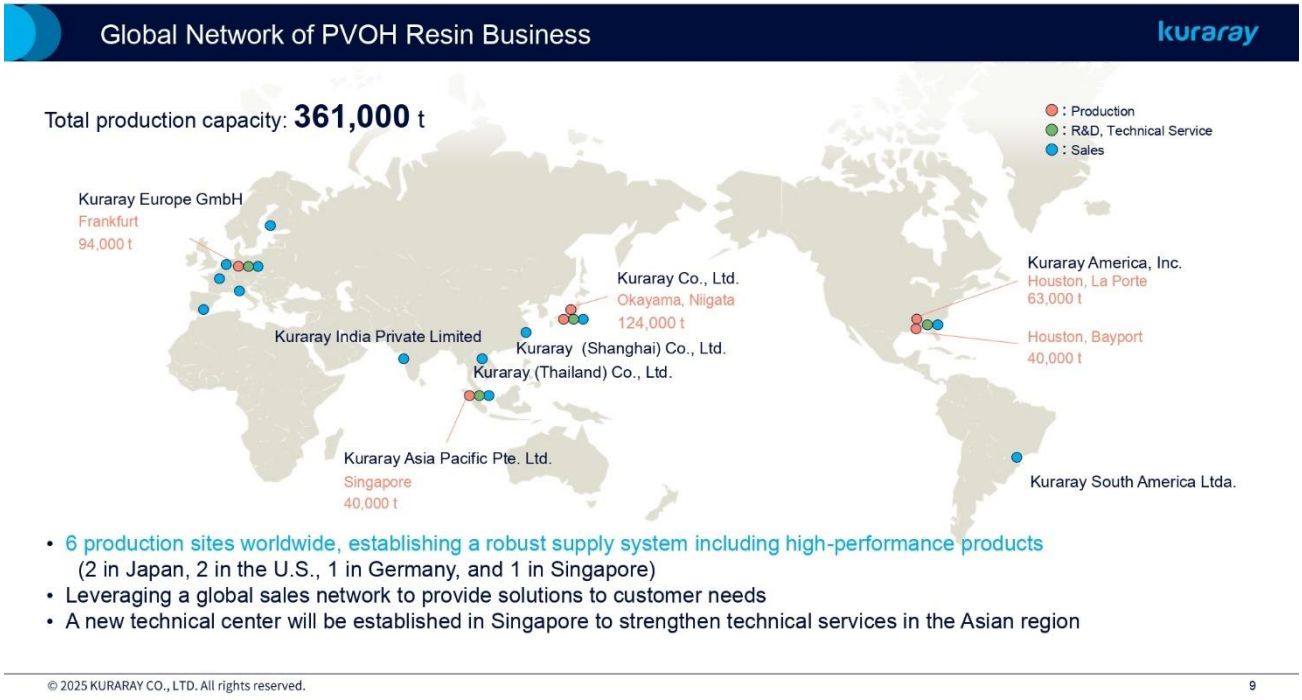


One of the unique characteristics of our company is its global value chain, founded mainly for vinyl acetate monomer, which produces multiple strengths.

The vinyl acetate chain encompasses PVOH resin, EVAL™ EVOH resin, film and fiber made from them, and PVB. The chain leads to the following strengths.

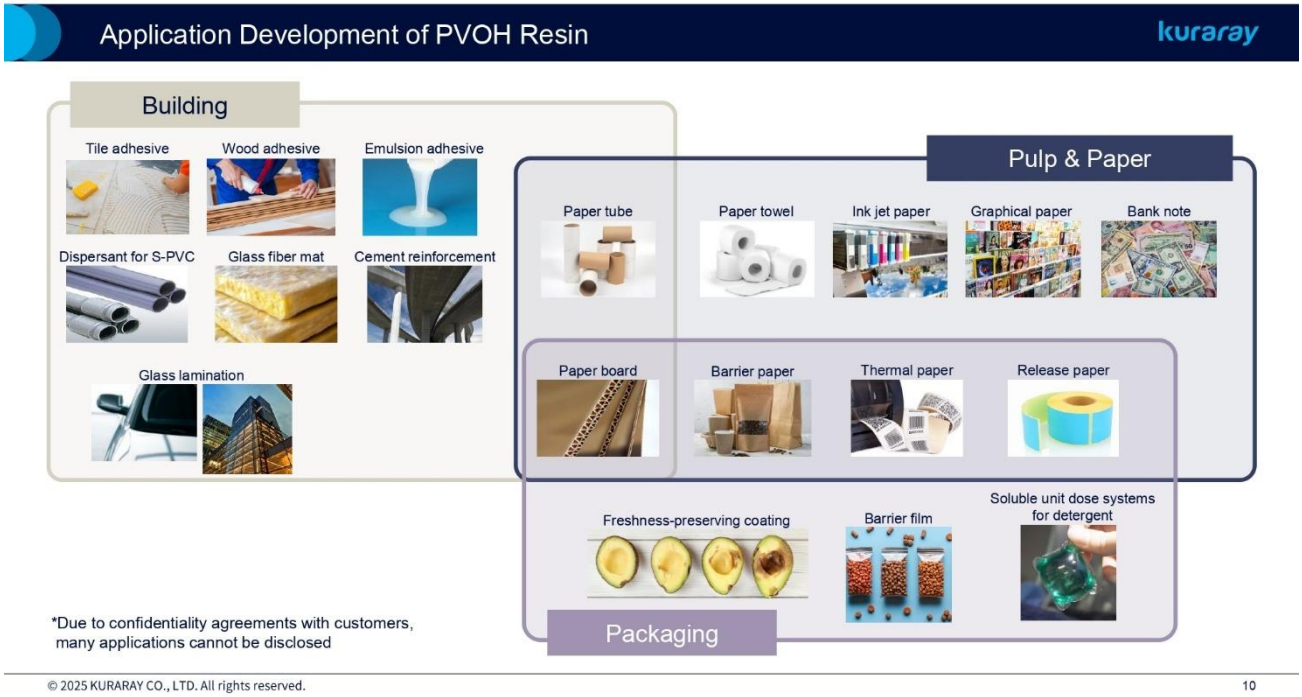
- Product differentiation through chain-wide R&D
- Cost advantage and stability in raw material procurement by increasing the in-house manufacturing rate of vinyl acetate monomer
- A stable product supply network, supported by the production sites in the major regions like the US, Europe, and Asia
- Integrated production of resins, films, and fibers leveraging high technological capabilities
- Cost reductions through improving supply chain efficiency
- Group-wide solutions through the coordination of the marketing activities of multiple business segments

This value chain was first established in the Japanese market and is accelerating its globalization in the 21st century. We have expanded first to Europe, primarily Germany, and then to the US, primarily the Houston area, and are currently expanding in Asia, primarily Singapore.



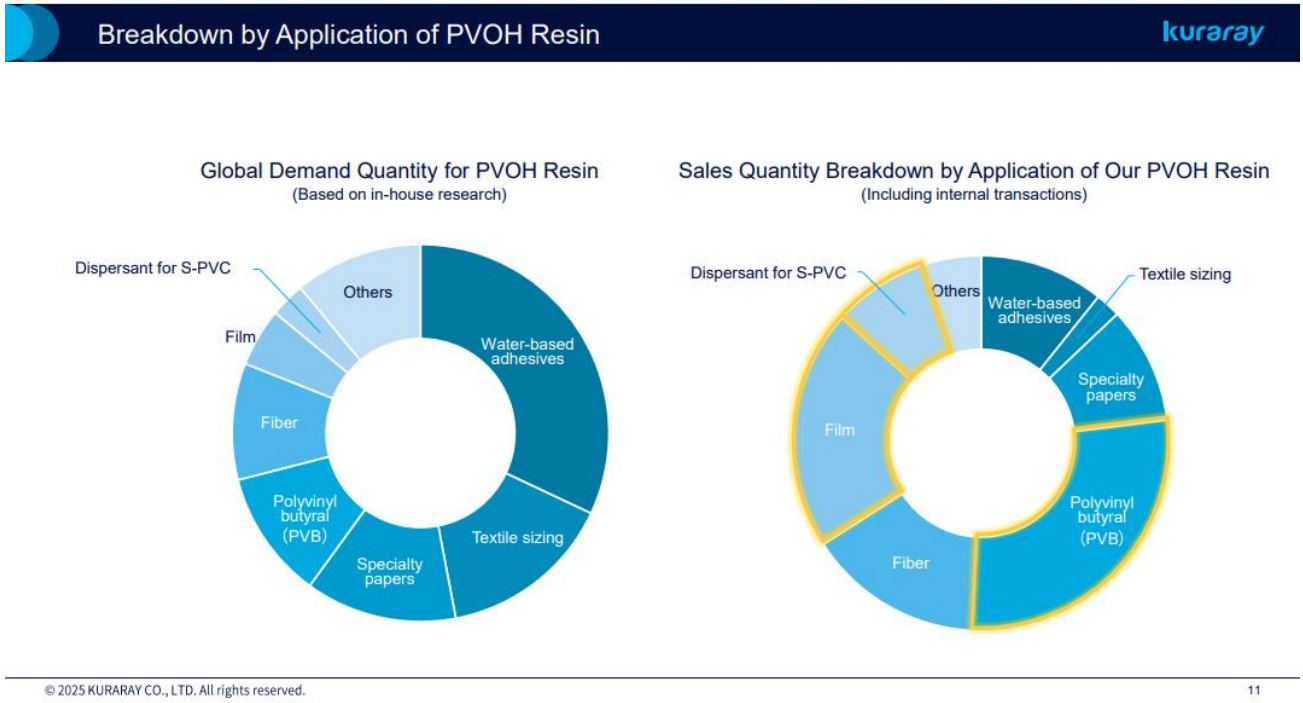
We have established a production system for PVOH resin at a total of six production sites around the world: two in Japan, two in the US and two in Germany and Singapore. In addition, we have been producing high performance products, which used to be manufactured only in Japan, overseas since 2010, and our strong supply system, including high performance products, is a major strength of our company.

In addition, our customers appreciate our ability to respond quickly and flexibly to their needs through our global sales and technical support system. In September this year, we will further strengthen this structure by opening a technical center in Singapore, where we already have a PVOH resin plant and are currently constructing an plant for EVAL™.



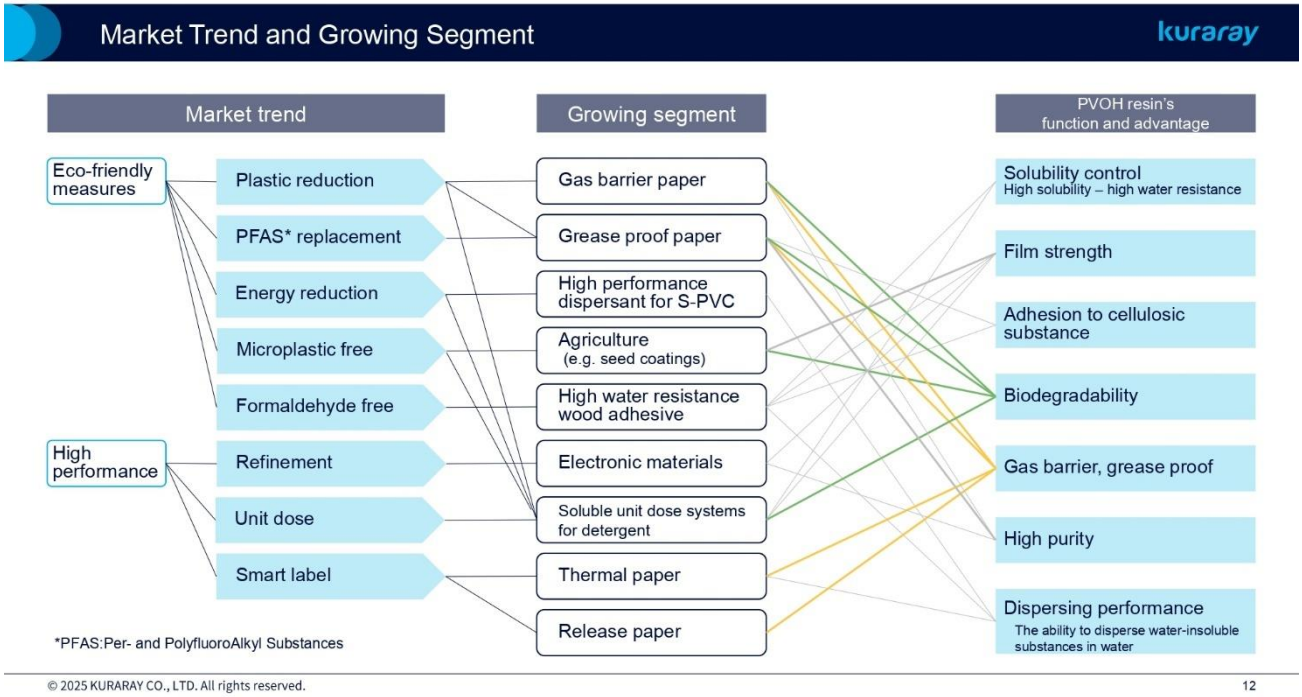
From here, I will discuss the development of PVOH resin's applications and priority fields.

As shown in the figure here, PVOH resin is used in various fields closely related to our daily lives, such as construction materials, pulp and paper, and packaging materials, as I mentioned earlier. The material has a 75-year history. New applications are still being developed, and the possibilities continue to expand.



This graph on the left explains global demand of PVOH resin, including competitors, which we introduced at the beginning of this report. The pie chart on the right shows a comparison of our PVOH resin application development status here.

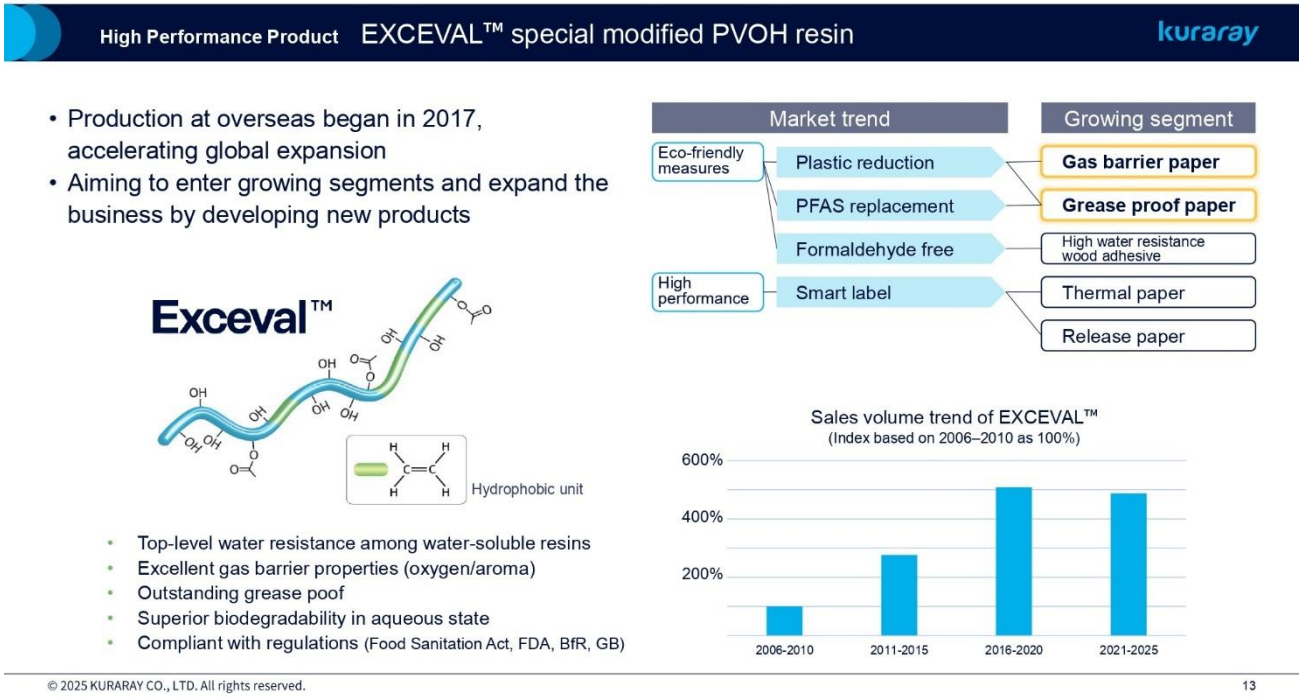
We have withdrawn from some traditional applications, such as fiber sizing agents, which are difficult to differentiate ourselves from competitors. Instead, we are focusing on high-value-added products. Specifically, please see the yellow portion of the graph on the right. Dispersants for vinyl chloride polymerization, films, and PVB represent a high ratio.



We believe that the future growth of the PVOH resin business is possible, and we will continue to develop our business in conjunction with the market trends shown here.

First, environmental response themes include plastic reduction, PFAS substitution, and microplastic measures. We are also developing the use of PVOH resin's functions and the superiority of our products in the field of packaging materials, such as barrier paper, for example.

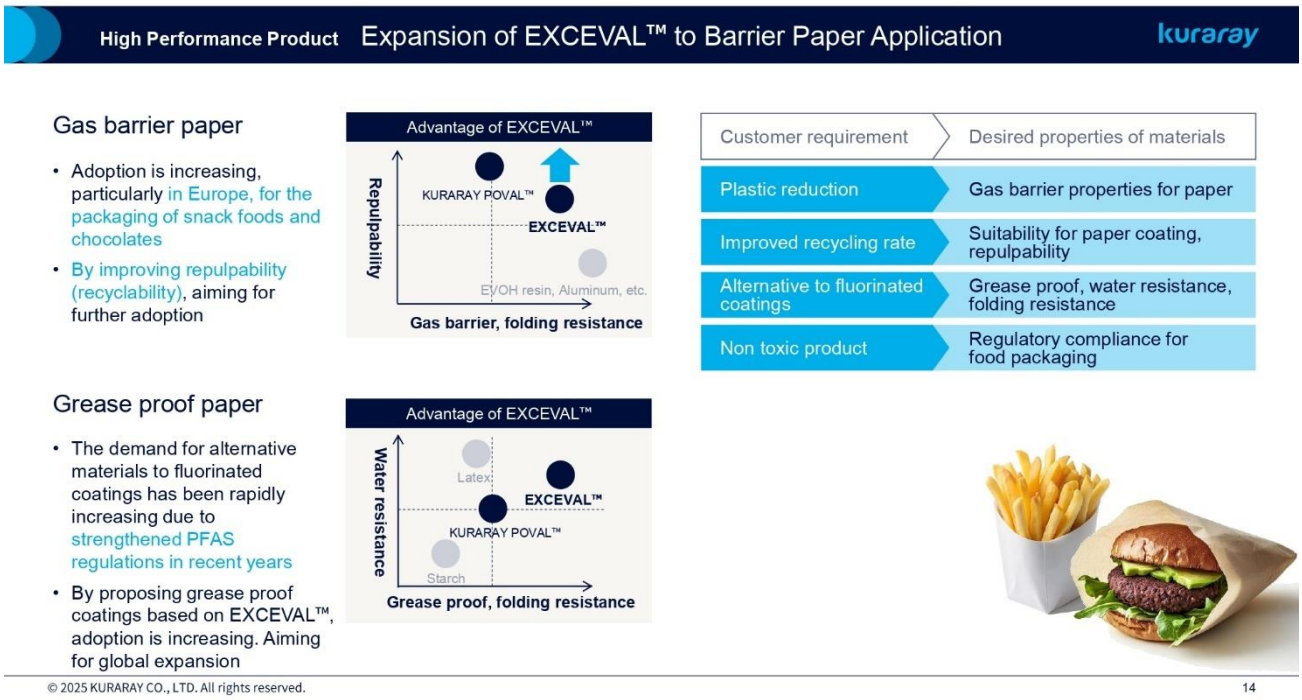
In the market trend toward higher functionality, there is a need for miniaturization and individual packaging. In line with this trend, we are aggressively developing markets for electronic materials and soluble unit dose systems for detergent to achieve sustained growth.



From here, I would like to share details of several markets that are expected to grow in the future.

First of all, let me discuss our trademarks, EXCEVAL™ special modified PVOH resin, which we industrialized in 2000. EXCEVAL™ has superior water resistance and excellent barrier properties over PVOH resin, and in recent years has also been found to be biodegradable. These characteristics have earned it a high reputation for highly water-resistant wood adhesives, thermal paper, release paper, and other products, and since its industrialization, it has grown at an annual rate of more than 10%.

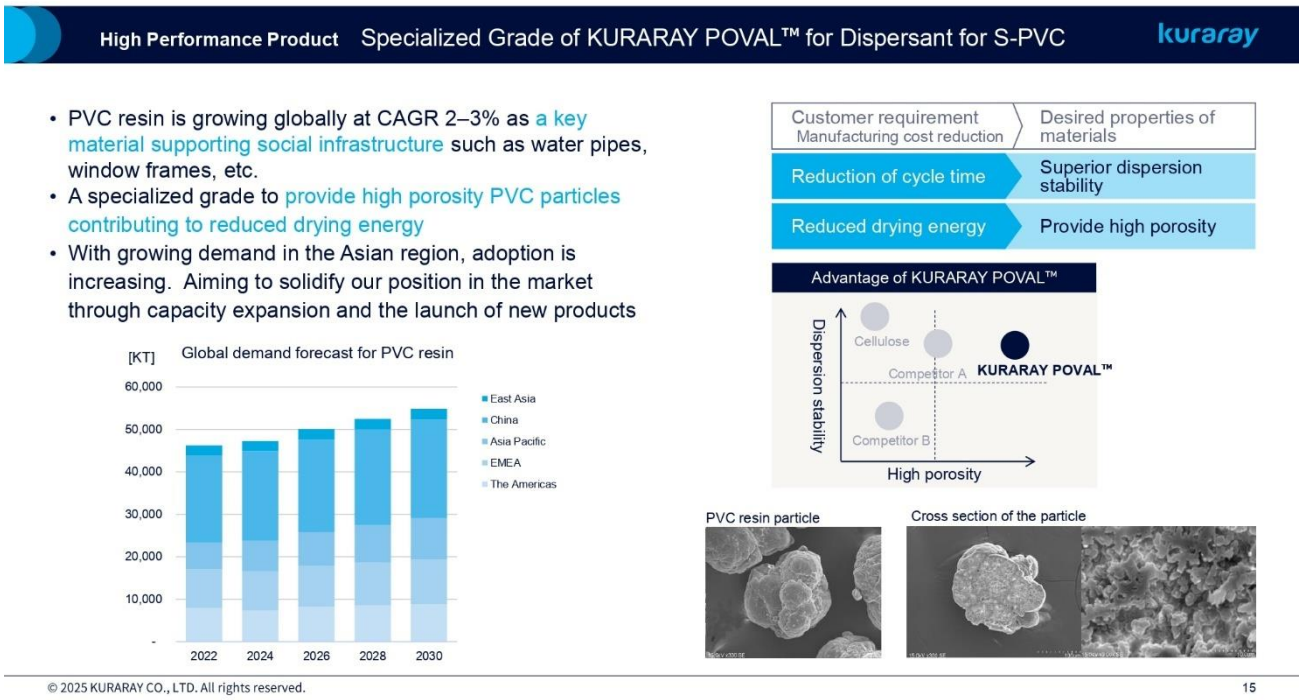
Although demand temporarily slowed down slightly after the COVID-19 crisis, business opportunities are expanding for new environmentally friendly applications such as barrier paper and grease proof paper, and we are currently developing new products.



One application where EXCEVAL™ is expected to expand its market is the gas barrier paper. There is a global trend to replace plastic packaging with paper, and in Europe in particular, practical application has already started in packaging for snacks and chocolates.

For barrier material, our product EVAL™ is the number one in the world. In the paper industry, there is a demand for barrier materials that can be easily removed during the recycling process, and our water-soluble EXCEVAL™ is attracting a great deal of attention.

In addition, demand for non-fluorine oil-resistant coatings is growing rapidly against the backdrop of stricter PFAS regulations, and the adoption of oil-resistant agents based on EXCEVAL™ is progressing. We have a track record of use in packaging materials for a global coffee chain, and we are aiming to further expand applications to include fast food chains and pet food packaging.



Next, we will introduce stabilizers for PVC polymerization.

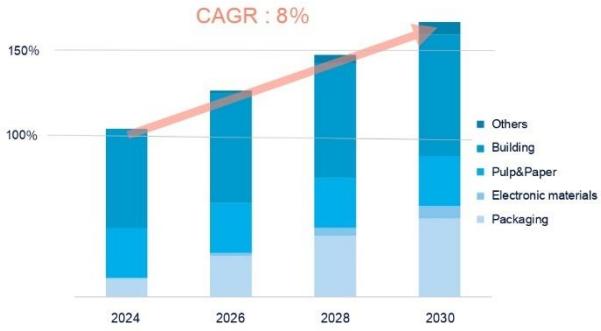
PVOH resin plays a role in the suspension polymerization of vinyl chloride, controlling the size, shape, and porosity of the PVC particles. Porosity refers to the ratio of gaps or spaces per unit of material. In order for vinyl chloride manufacturers to reduce production time, it is important to highly disperse and stabilize vinyl chloride particles in water, and the higher their porosity, the lower the load during drying, which leads to reduced energy use.

Our overwhelming technological superiority in this field has made us number one in the world. The PVC resin market is expected to grow 2-3% per year for infrastructure applications such as water pipes, and we are investing in facilities and launching new products to keep pace with our customers' increased production.

Future Growth Opportunities of High Performance Products

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Growth outlook for high performance* products
(Image of sales expansion based on 2024 as 100%)



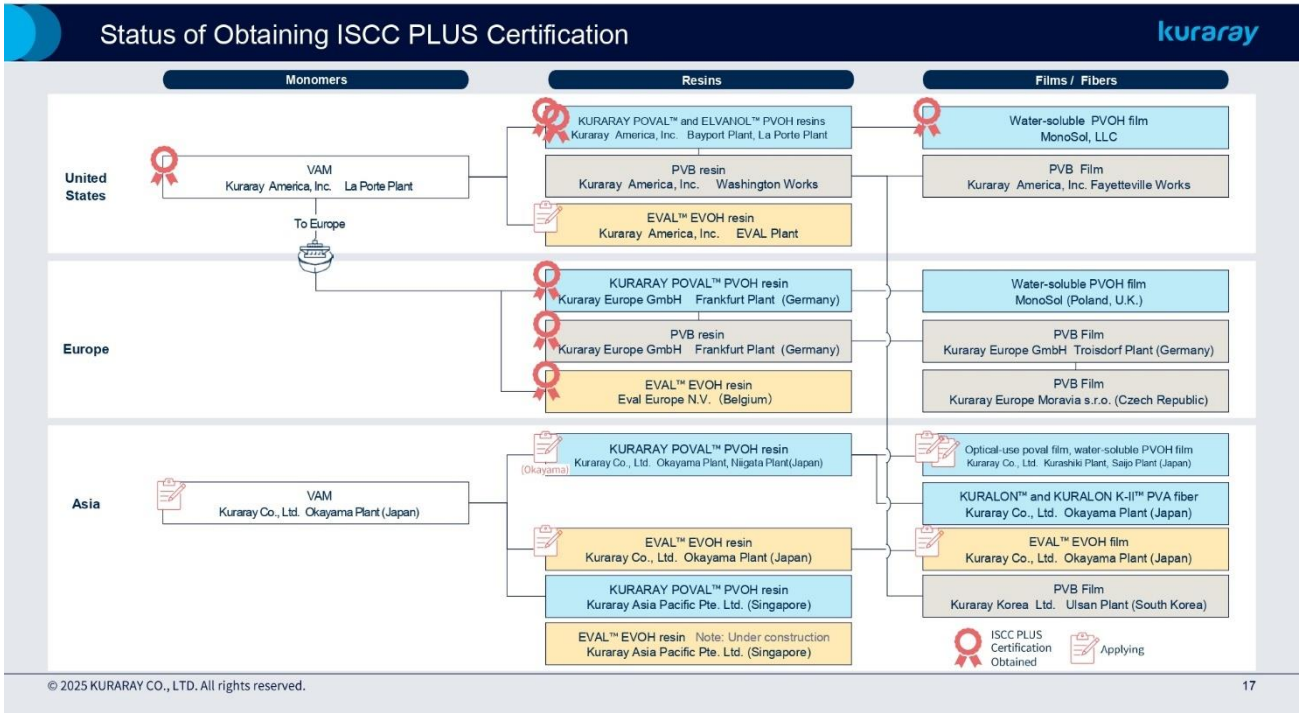
*High performance products: Product grades achieved through Kuraray's advanced technological capabilities, offering high capability and high quality

An compound annual growth rate (CAGR) of 8% is projected for 2024 to 2030

- Steady capture of the growing demand for PVC resin in the Asia region
- Expansion of formaldehyde free and high water resistance wood adhesive
- Expansion of adoption in gas barrier paper and grease proof paper
- Launch of differentiated products for soluble unit dose systems for detergent with improved solubility
- Launch of high performance and high quality products for electronic materials
- Expansion of microplastic free coatings for agricultural use (e.g., seed coatings)

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As we have discussed, we continue to add value to our products and grow with our customers. Today, we discussed barrier paper, grease proof paper, and PVC applications. We are also actively working on other growth markets shown here. For these high performance products, we expect an annual growth rate of 8%.



To conclude the PVOH resin part of the presentation, I would like to discuss our commitment to sustainability.

In addition to reducing the amount of steam and other materials used at our manufacturing sites, we are also promoting the use of bio-based and recycled raw materials. We are currently in the process of obtaining ISCC PLUS certification for the entire chain, as shown here. Most of our plants in the US and Europe have already acquired certification, and we are currently in the process of acquiring certification in the Asian region.

The use of bio-recycled raw materials is expected to reduce the carbon footprint of our products by 20% to 30%. In addition, we are developing innovative vinyl acetate production processes and are strengthening our efforts to reduce CO2 emissions.

This is the report on Kuraray's initiatives and future prospects in the PVOH resin business.

Next, Mr. Kawahara will explain about our approach to new solutions.



This is Kawahara, and I will introduce some of the new solutions and new business initiatives that make use of PVOH resin, its peripheral technologies, and basic technologies.

Some of the major trends that are expected to increase urgency in the future around the world include the reduction of greenhouse gas emissions and the food crisis. Among these, PVOH resins are being developed for use in agricultural applications, taking advantage of their biodegradability and gas barrier properties, as well as the bio-derivation of raw materials.

In the healthcare field, we are also developing new products in response to trends in pharmaceuticals and regenerative medicine.

Today, I would like to introduce a product that contributes to pharmaceuticals or regenerative medicine as an example of one of these products.



As shown here, the paradigm shift is taking place in the fields of medicine and food.

In the field of medicine, the development of cell-based therapies, such as biopharmaceuticals and regenerative medicine, is advancing at an extremely rapid pace, replacing conventional small molecule drugs. In the field of food, from the viewpoint of stable food procurement, research on the production of food by increasing cells, such as cultured meat, is being conducted in many parts of the world.

Thus, the era of mass culture of cells is coming, and this market is expected to grow at a high rate.



Under these circumstances, we have developed microcarriers derived from PVOH resin, which is polyvinyl alcohol, suitable for cell culture for regenerative medicine. The product name is SCAPOVA™. We have developed SCAPOVA™ and began experimental sales in the last fiscal year.

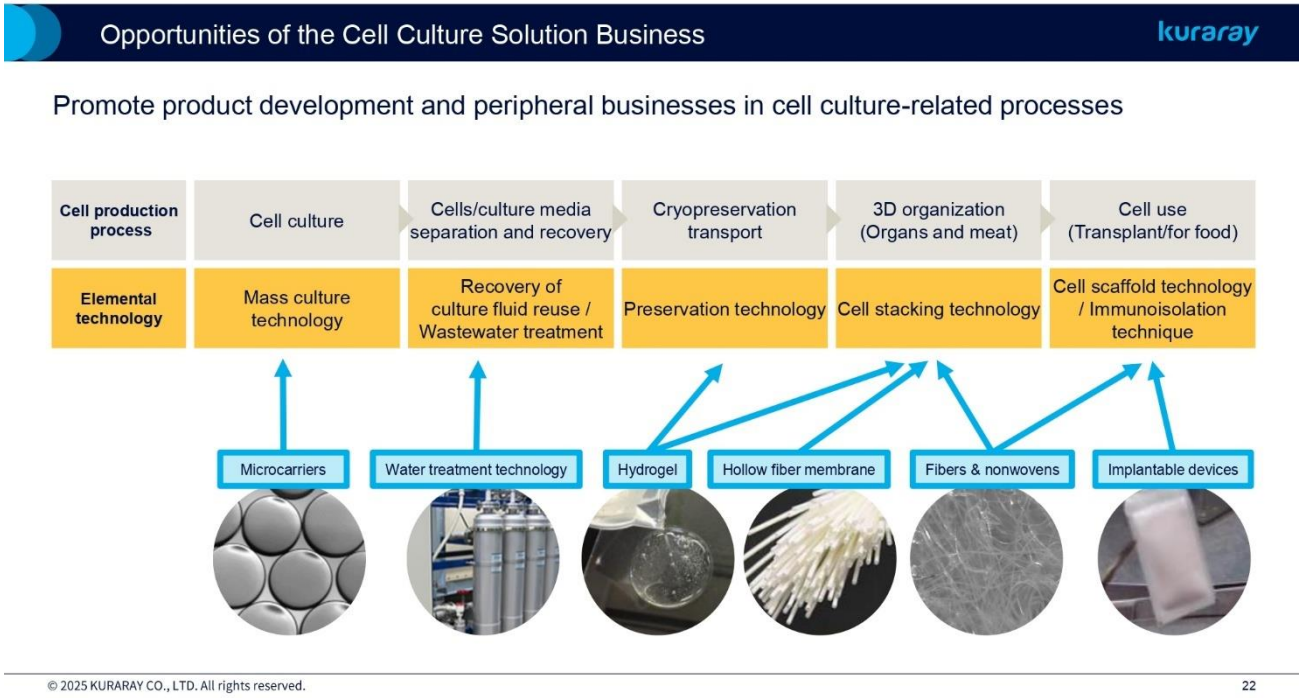
There are three features of our products, as described here. Three typical examples are: high cultivation efficiency, high safety, and easy handling.

As for the first point, culture efficiency, it depends on the type of cells to be made, but we have confirmed that the growth rate is two to three times higher than that of other products. We also have experience in bioreactors at the 100-liter level, which means we can scale up. In addition, the cultured cells can be easily detached, making the collection easy.

Regarding safety, PVOH resin itself has excellent elasticity, and its moderate elasticity prevents the microcarriers from being broken by impact when stirred, resulting in an extremely low incidence of microfractures, which can be a problem. In addition, product safety is assured through strict quality control at the medical level.

The third and final point is the handling capability, which is described as "Ready to Use.” The process of sterilizing or cleaning before use is not necessary, and the microcarriers can be used immediately after immersing it in the culture medium for a few minutes. Another major advantage of using PVOH resin microcarriers is that they are transparent in color, making it very easy to observe the cells.

Since its launch last year, the product has received numerous inquiries, leads, and sample offers as it can efficiently and safely culture a large number of cells. Currently, we ship mainly to research institutions in Japan. In H2 of this fiscal year, we will begin shipments to overseas research institutions to give momentum to the expansion of our business.



In the series of cell culture-related processes that flow from left to right, SCAPOVA™ is used in the cell culture process on the left side.

The entire process involves a series of cell cultures using these microcarriers, followed by separation and recovery, transport, and organization and their eventual use for medical transplantation or even food. In each process, we believe there are products that we can contribute to by utilizing our membrane, fiber, and other technologies.

Thus, we intend to expand our business not only in cell culture itself but also in its peripheral areas by providing various solutions in the growing field of cell culture, starting from SCAPOVA™, utilizing the technologies of our group.

This concludes my presentation.