Industry Business Briefing Session

KONICA MINOLTA 150 YEARS

Business Deployment in the Display Area

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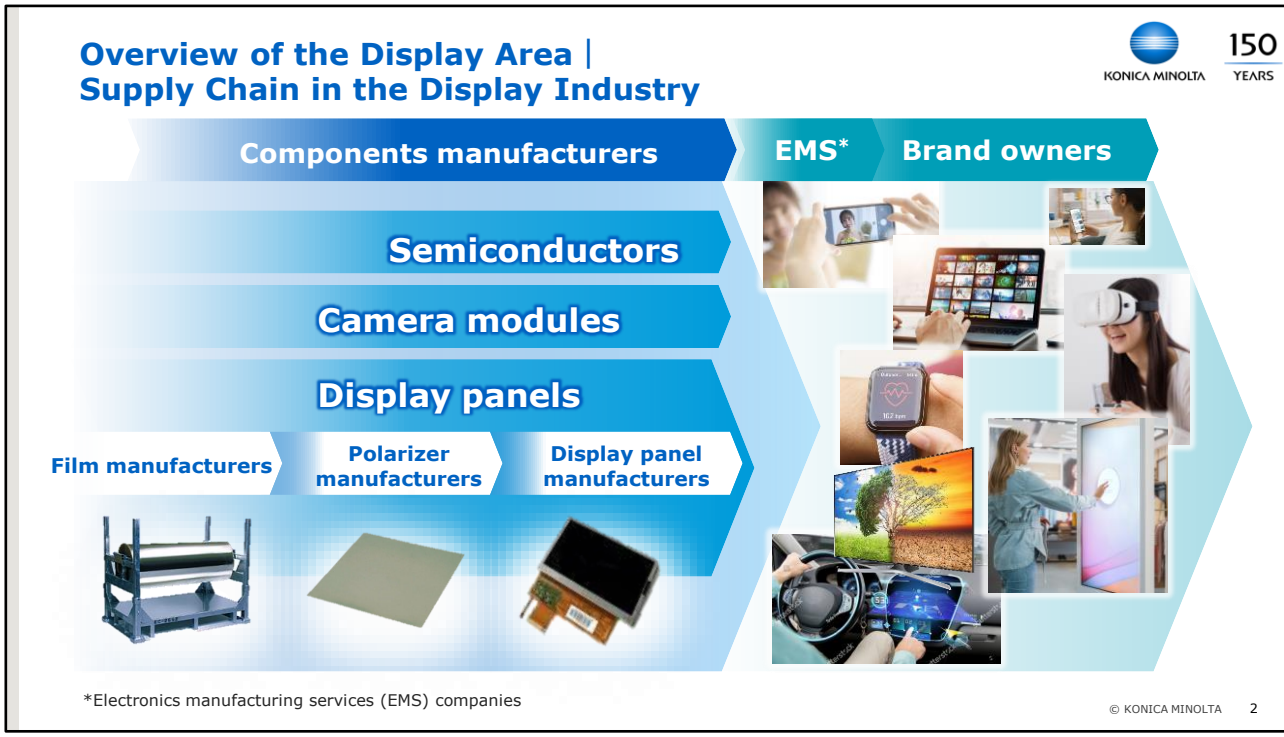
Giving Shape to Ideas

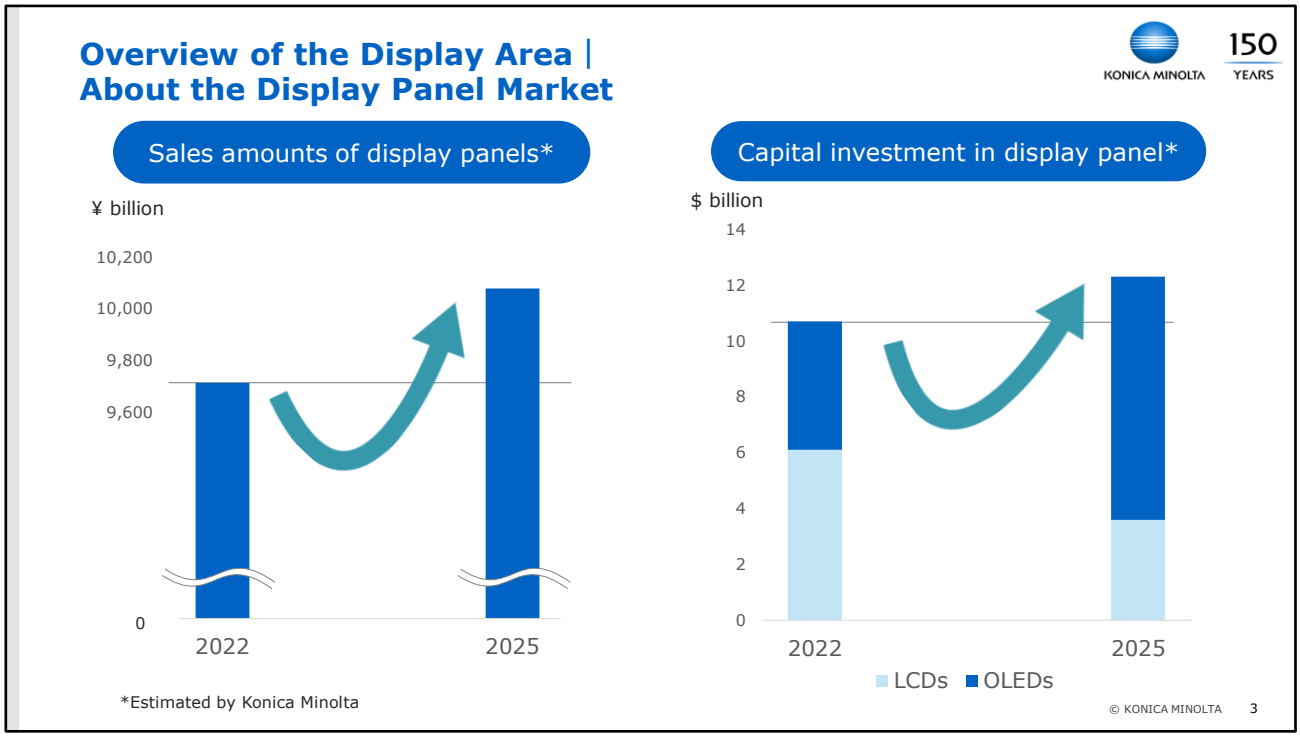
My name is Kenichi Ohkubo and I am the General Manager of the Performance Materials Business Unit. Today I will provide an overview of our business in the display area, including film, within our industry business.



The world now has many display devices that convey information visually and they continue to evolve.
There are various manufacturers in the supply chain that supply components such as semiconductors, camera modules, and display panels that support these devices.

We perform especially in the display panel area, acting as a film manufacturer and additionally providing products to electronics manufacturing services, and to brand owners who are the most downstream set manufacturers.

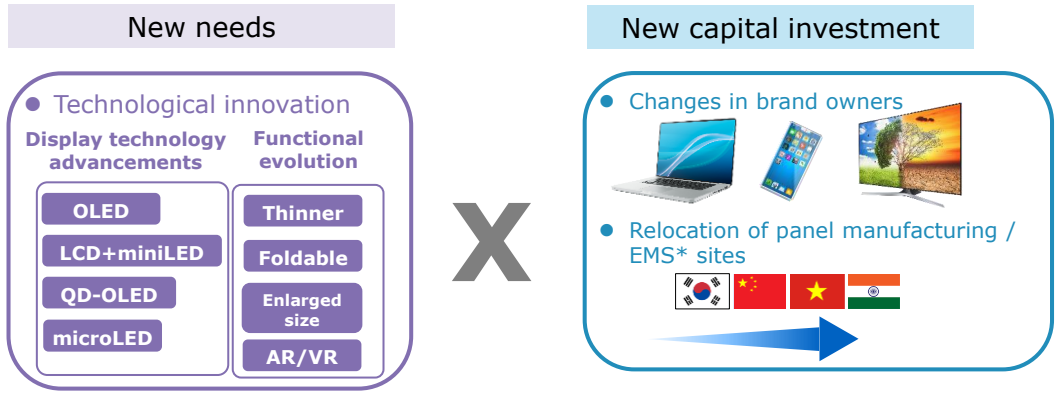
Overview of the Display Area | About the Display Panel Market



As for the display panel market, although there will be a temporary downturn in sales and capital investment from FY2022, it is predicted to recover and show growth again by FY2025.
Even in this recent challenging environment, there are areas that are growing and expanding, our strategy is to find areas where we can increase market share and expect profitability, and target those areas.

Overview of the Display Area | Business Opportunities in the Display Panel Market

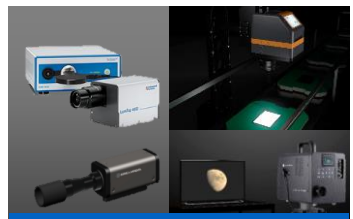
Identify a sign of display technological innovation and swiftly deploy businesses in response to "new needs"



*Electronics manufacturing services (EMS) companies

Technological innovations are being actively pursued in the display industry. With each new device that comes out featuring evolved display technologies and functions, new business opportunities arise for us to develop and supply products accordingly.
In addition, even for the same devices, new business opportunities emerge for us from new brand owners or when new plants are established due to relocation of production sites, requiring new capital investments.

Display-related Business Overview | Customers and Products



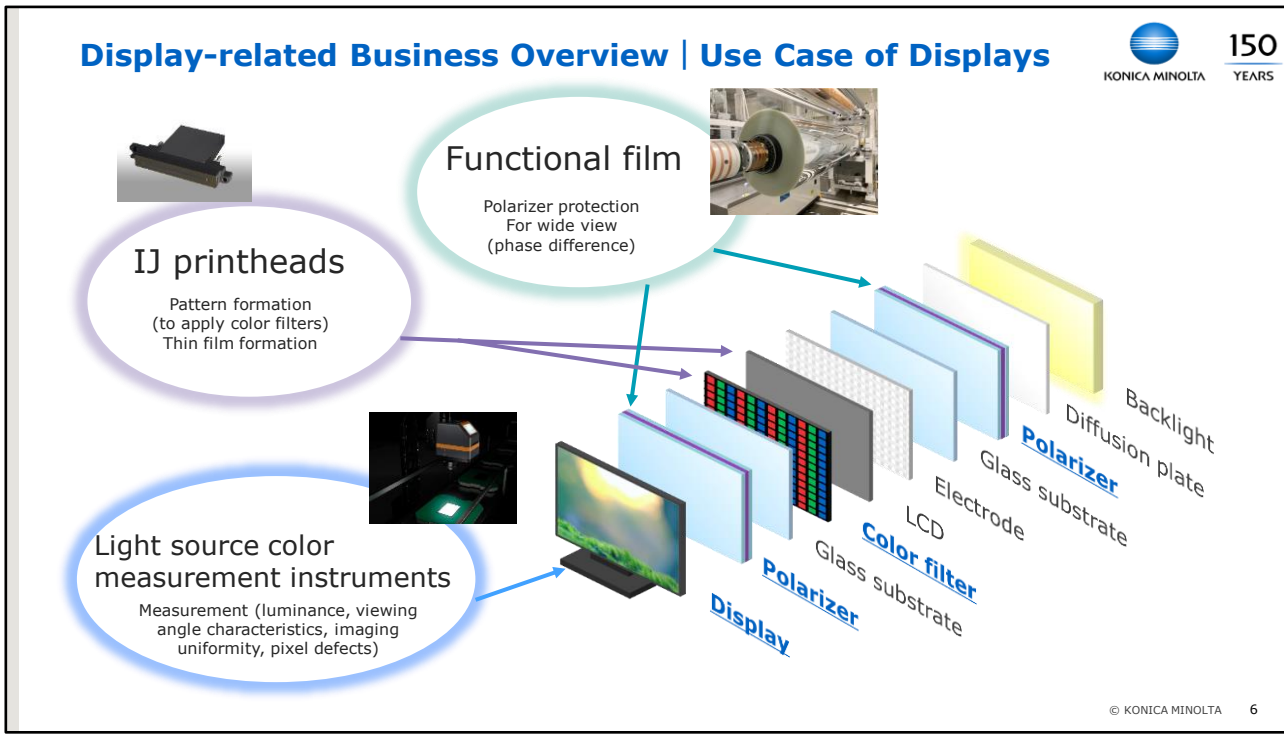
Light source color measurement instruments

Inkjet (IJ) printheads

Functional film

	Light source color measurement instruments	Inkjet (IJ) printheads	Functional film
Target customers	Display panel manufacturers Brand owners Electronics manufacturing services (EMS) companies	Equipment manufacturers	Polarizer manufacturers
Products	Spectroradiometers Display color analyzers Imaging luminance color meters	IJ printheads for pattern formation IJ printheads for thin film formation	Protective film for LCD polarizers Phase difference film

In the display area, our company mainly operates in three areas: light source color measurement instruments, inkjet printheads, and functional film.
Our target customers in these areas are as described here.

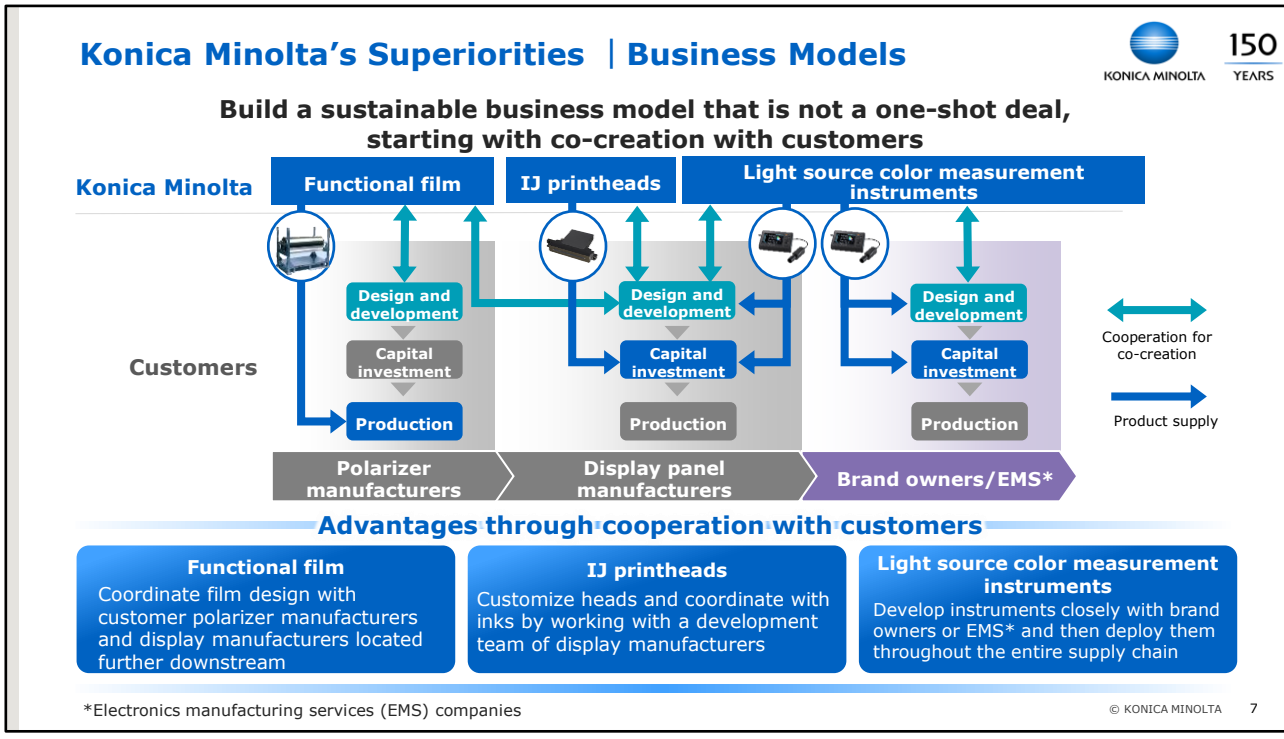


This slide shows a simplified view of where our products are used in displays, using LCDs as an example.

The first is functional film, and this is a material directly used as one of the components in displays. We provide this film as a protective film for a component called a polarizer that controls the path of light. In addition, we provide film that not only protect but also widen view to make the display appear brighter when viewed from the side.

Next, inkjet printheads are used for pattern formation when creating color filters in next-generation displays. Another use is to form a functional thin film by applying a special ink.

Finally, light source color measurement instruments are used for inspecting the performance and quality of displays. We offer a variety of instruments for each of the measurement items stated here.



The diagram above shows where our various products generate business within the display supply chain, as well as within the engineering chain of each supply chain.

The horizontal axis is the supply chain, which shows the flow of goods. It starts with the polarizer manufacturers, moves to the display panel manufacturers, then to brand owners or electronics manufacturing services, eventually becoming the final product.
The vertical axis is the engineering chain, which shows how upstream suppliers and downstream brand owners form each product through design and development, capital investment, and production, in that order, and the blue arrows indicate the process by which our products are used.
The green arrows show we not only sell finished products but also engage with our direct customers and even their downstream customers to discuss the necessary functions and usability of our products at the design and development stage, and this is a common feature of all our business areas.

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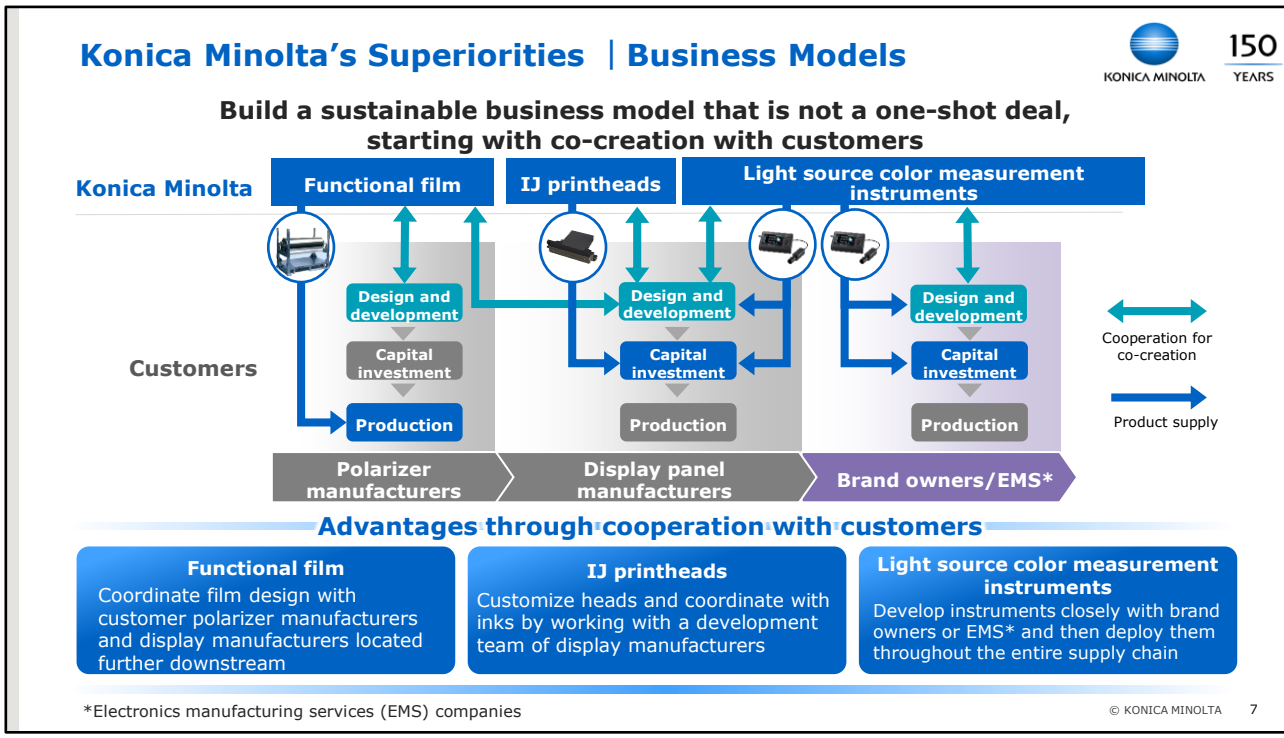
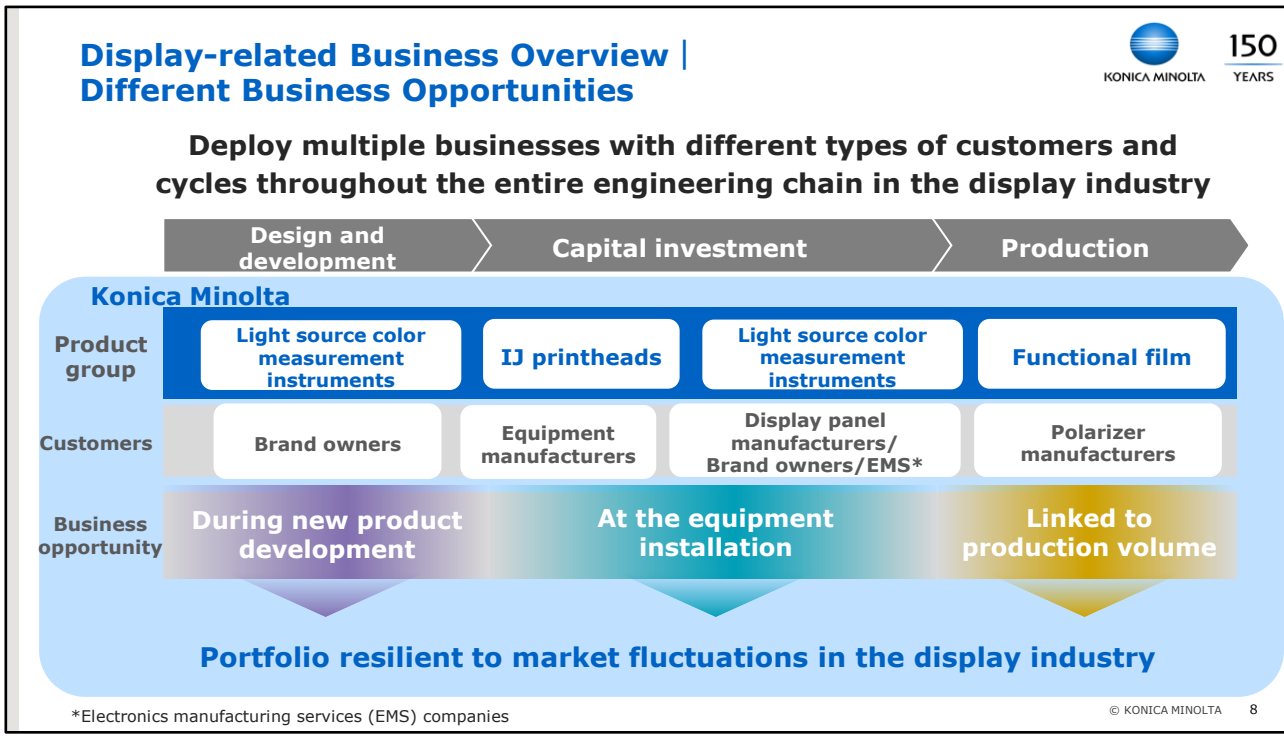


In light source color measurement instruments, we first contact the brand owner during the design and development phase and develop and provide new measuring instruments useful for inspecting the specifications of the device the customer wants to create. There are two business opportunities in this: one for research during the design and development stage and the other to be incorporated into the production line during the capital investment phase for mass production. Furthermore, we will similarly expand our business to upstream display panel manufacturers.

For inkjets, although the blue arrows in the diagram point to the display panel manufacturer, the direct customer is actually the equipment manufacturer that installs this equipment. When a new display device is developed, we work with equipment manufacturers and, together with the design and development departments of the panel manufacturers, proceed with product development by customizing the inkjet printheads and aligning them with the ink.

For functional film, the direct customer is the polarizer manufacturer, but we also coordinate with the downstream panel manufacturer's design and development department to provide film that meet the needs in the customer's production process.

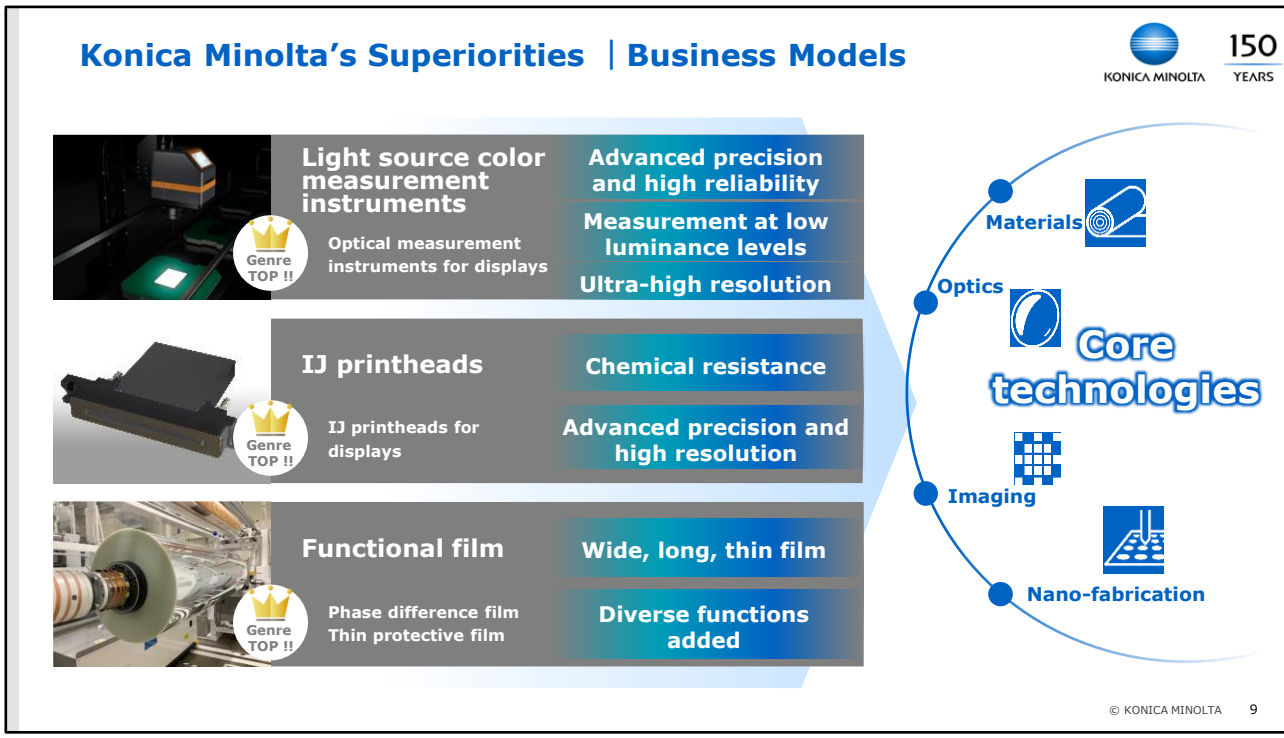
The common point across the three businesses is that we develop and provide our products based on collaborations that extend beyond our direct customers. Furthermore, it can be said that we have built a sustainable business model through equipment operations, new capital investments, and even the next technological innovations by continually reaching out to specific customers and building a business.



As previously explained, while the three areas share a common way of doing business, the timing of business opportunities is different for each.

This diagram shows the vertical axis of the previous slide, made horizontal due to space limitations. Within each customer's engineering chain of design and development, capital investment, and production, light source color measurement instruments have business opportunities during new product development and equipment installation, inkjet printheads at the equipment installation, and functional film linked to production volume.

Although the display industry is a highly volatile business, as each business is operating at different timings within the customer's engineering chain, we can say that our company as a whole has a business portfolio that is highly resilient to market fluctuations.
For example, in the previous fiscal year, the measuring instruments business performed well, seizing opportunities for robust capital investment from customers, amid the market downturn affecting the functional film. By contrast, in the first quarter of the current fiscal year, as the demand for TV-targeted film is recovering, we are prepared for a recovery in the measurement instruments sector, which is in the transitional period of the capital investment cycle. I will explain the medium and long-term strategies within these cyclical market trends later on.



All of the product groups we offer in the display area each hold top shares in specific areas. We refer to this as a genre-top approach, and the source of this is our Group's business model that differentiate us from our competitors.

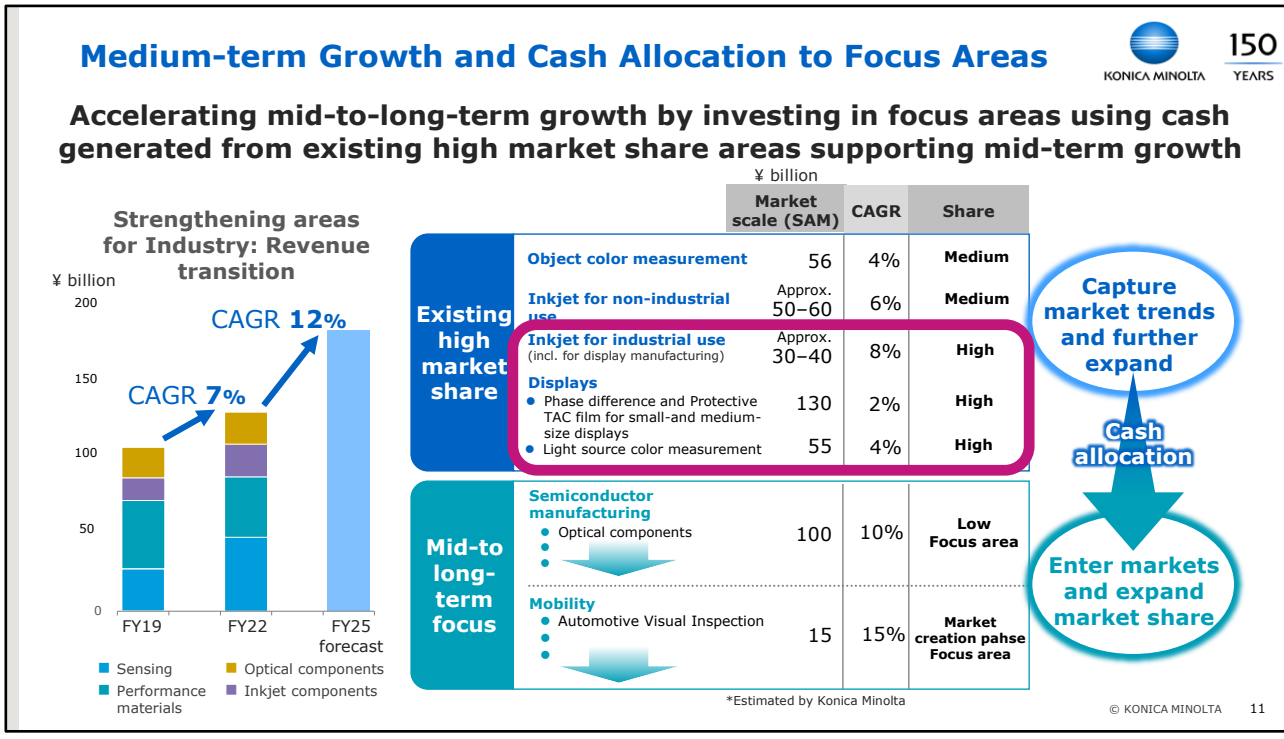
In light source color measurement instruments, advanced precision and high reliability is evaluated by how the error of measurements are as little as possible compared to globally recognized true values. This is an important factor that also affects the trustworthiness of our customers in quality control and assurance.

In inkjet printheads, we have high chemical resistance to solvents often used in industrial applications, and are highly trusted and regarded by the market.

In the area of functional film, our proprietary production technologies and innovations have enabled us to achieve wide, long, and thin film that is unrivaled by other companies. I will describe this in more detail later.

Medium- and Long-term Strategy

I will explain our medium- and long-term strategies from here.



As Kamezawa explained in the presentation "Industry Business Foundation and Toward Growth," the display area is the core area of the existing business and a segment with a high market share. I will explain this in order starting here.

Medium- and Long-term Strategy: Light Source Color Measurement Instruments

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Capture the trends of increase in OLED devices and expand businesses

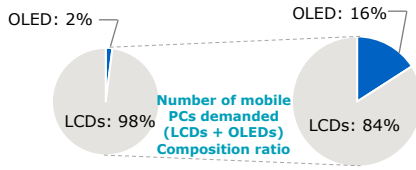
Market forecasts for OLED applications*1
From 2022 to 2025

OLED panel market Capital investment — **CAGR: >20%**

From 2022 to 20230

Number of mobile PC*2 demanded (LCDs + OLEDs) — **CAGR: About 3%**

Of which OLEDs — **CAGR: >30%**



Trends toward OLEDs, such as mobile PCs Increasing applications other than smartphones

Developed instruments that measure at low luminance levels for OLEDs with superior black imaging

Leverage relationships cultivated with our customers to accurately identify the needs

Spectroradiometer
CS-3000HDR

Display color analyzer
CA-410

*1 Estimated by Konica Minolta
*2 Mobile PCs: Tablets, laptops

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First, let me explain about light source color measurement instruments.
In display devices, smartphones are quickly transitioning from LCD to OLED. Going forward, a shift to OLED is expected in various devices such as mobile PCs, leading to projections that the amount invested in OLED panel equipment will grow significantly over the medium term.
We have already developed and launched a measurement system for OLED, which has the feature of excellent “black” expression, utilizing our strength in instruments that measure at low luminance levels. We will continue to grow sales for applications beyond smartphones while responding to trends and needs, leveraging the relationships we have cultivated with our customers.

Medium- and Long-term Strategy: Light Source Color Measurement Instruments

Quickly identify demand and develop through relationships with brand owners to ensure our position in the market

KONICA MINOLTA / Instrument Systems / RADIANT VISION SYSTEMS

Planning
Development
Sales
Konica Minolta Group

Solution proposals

Brand owners

Model designation

Supply chains
- Panel manufacturers
- EMS, etc.

Build close ties with brand owners

Quickly identify demand and develop
Deploy throughout the entire supply chain to expand sales

Measurement instrument for AR/VR

Imaging photometers
ProMetric® Y series
(designed for AR/VR headsets)

Display market forecasts for AR/VR*

From 2022 to 2025

CAGR: 30~40%

Expected to grow beyond 2025

*Estimated by Konica Minolta

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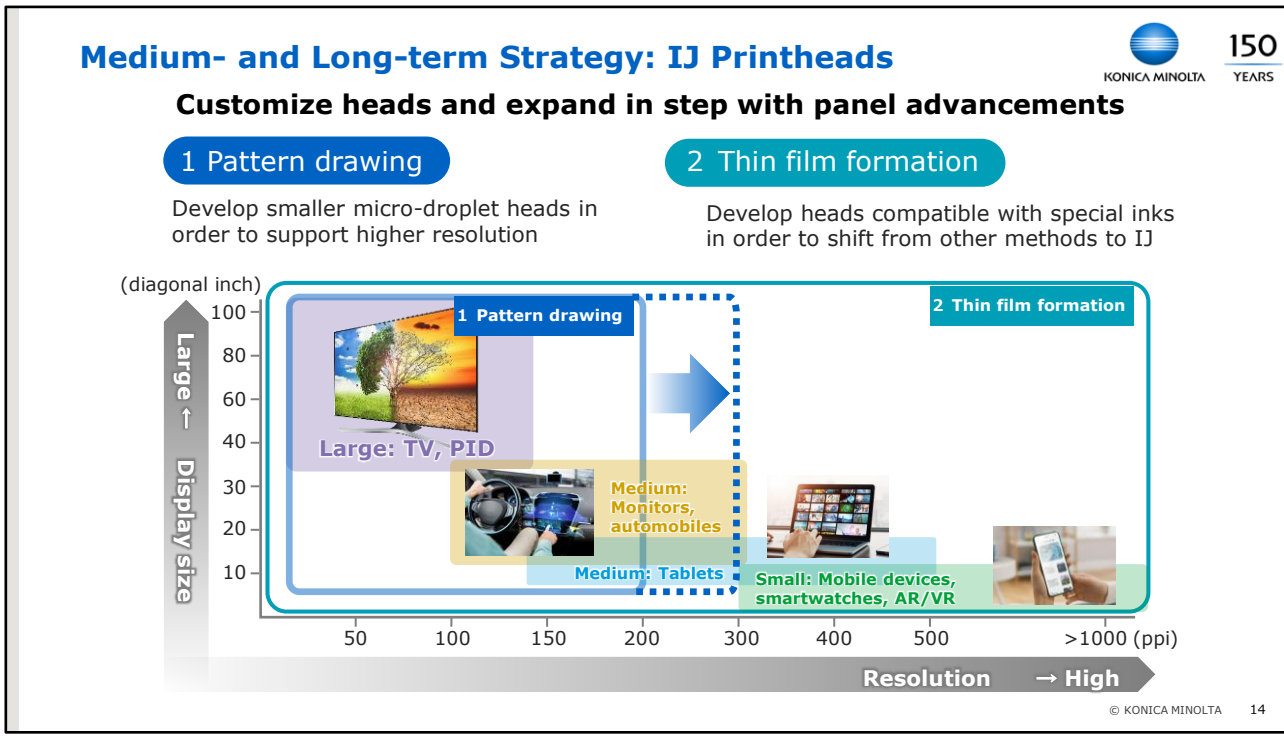
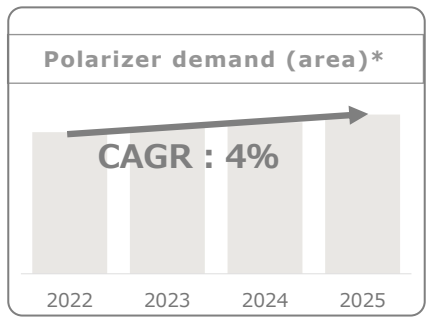
In the long term, we will pursue a strategy of securing a dominant position in the market for new devices constantly by staying in close contact with brand owners who have maintained relationships with us for a long time, quickly identifying demand, and developing and launching appropriate measuring instruments for them at an early stage.
For example, in AR/VR, we have already started offering lenses for AR/VR headsets among the lens variations of our imaging photometers, and will continue to respond to future market growth.

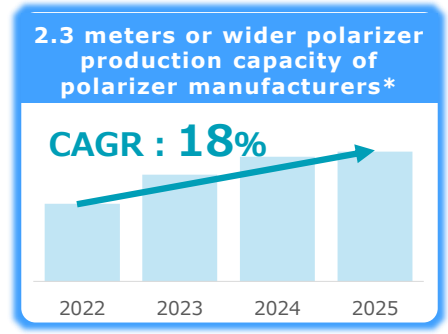


Next, let's look at inkjet printheads.
As shown in the diagram at the beginning of this presentation, inkjet printheads are used to form various components of displays, and are mainly applied in two different processes: pattern drawing and thin film formation.
In pattern drawing, the need for precise ink placement in response to the higher resolution of devices is driving the development of smaller micro-droplet, higher-resolution heads to ensure that business opportunities can be captured.
In thin film formation, we will continue to develop printheads compatible with special inks requested by customers in order to switch from components made by conventional processes such as film coating and bonding to production by inkjet methods that meet the needs for environmental friendliness and effective use of resources.

Medium- and Long-term Strategy: Functional Film

Leading polarizer manufacturers are rapidly adopting wider lines in the large display market.





Reasons for adopting wide lines

A width of 2.5 m allows for efficient production of all 65-inch, 75-inch, and 43-inch products.

Less waste of partially cut-off film

*Estimated by Konica Minolta

Finally, I would like to discuss functional film.
The compound average growth rate from FY2022 to FY2025 for large display panels is approximately 4% in terms of area. On the other hand, for polarizer manufacturers who provide the components, the growth of production capacity in wide lines of 2.3 meters or more has been as high as a compound average growth rate of 18%.
The rapid introduction of wide lines for efficient production by polarizer manufacturers is increasing the demand for wide film. We view supplying these wide film as a major point for growth by contributing to production efficiency by customers.

Medium- and Long-term Strategy: Functional Film

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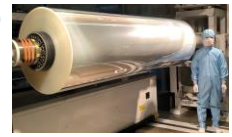
Ensure the opportunity for shifting to accelerated wide film for large displays to expand market share

New materials that allow for wide film

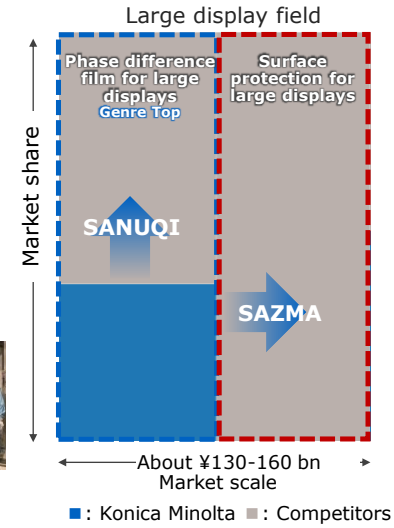
	SANUQI	SAZMA
Material	Cyclo-olefin polymer (COP)	Acrylic
Feature	Well-balanced between phase difference performance and durability	Flexible and high impact resistance

Add a post-stretching line for increased film widths

- ✓ Capture large demand by increasing production capacity
- ✓ Achieve increased film widths with minimal investment



Industry's widest as 2.6 m



*1: Estimated by Konica Minolta for the periods from 2022 to 2025

Our medium-term strategy aims to ensure that we seize the opportunity for shifting to accelerated wide film for large displays to expand market share. As new materials that can accommodate this shift to wide film, we offer two types of film, SANUQI and SAZMA.

SANUQI is mainly for phase difference film for large displays. Currently, we have already gained a large share of the phase difference film market, and with SANUQI, we intend to further expand our share in this market.
SAZMA is an acrylic material that is suitable for surface protection for large displays applications due to its flexibility and high impact resistance. We will enter the area of surface protection for large displays, including the use of SANUQI and SAZMA as a set for polarizer manufacturers, who are our customers.

Furthermore, in terms of facilities, we have added a offline stretching line for increased film widths. This increase in production capacity will capture demand for wide film. In addition, by utilizing the existing film forming line and specializing the offline stretching line only for post-processing, we can reduce capital investment and contribute to improved profitability.

Medium- and Long-term Strategy: Functional Film

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Approach a new market through co-creation with customers and material formulation technology

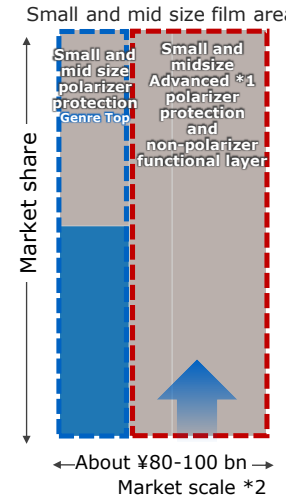
Co-creation with customers

Understand what customers (brand owners) desire to achieve, leading to design and product development that customers are not even aware of

Material formulation technology

Add various functions using material formulation technology

Customize functional film for small and mid size applications including ICT



*1: Components supporting high display functionality (e.g., anti-reflection, flexibility, polarized sunglasses compatible)
*2: Estimated by Konica Minolta

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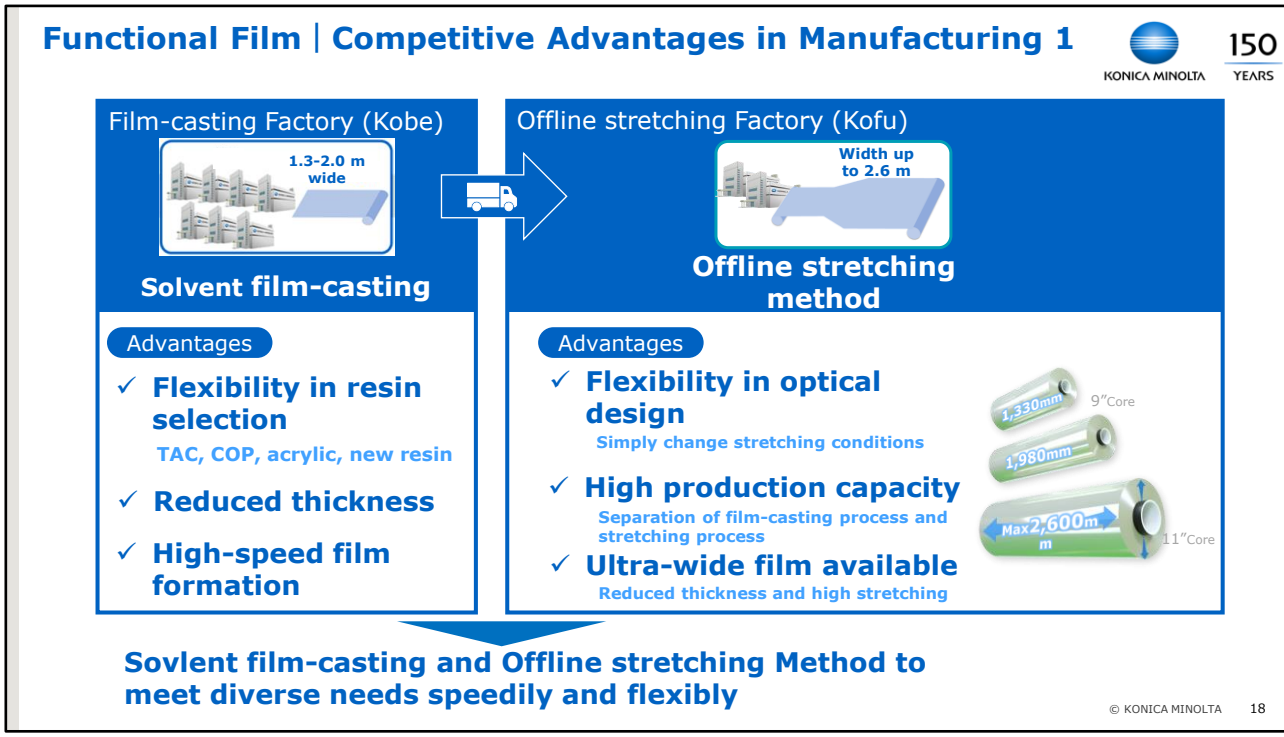
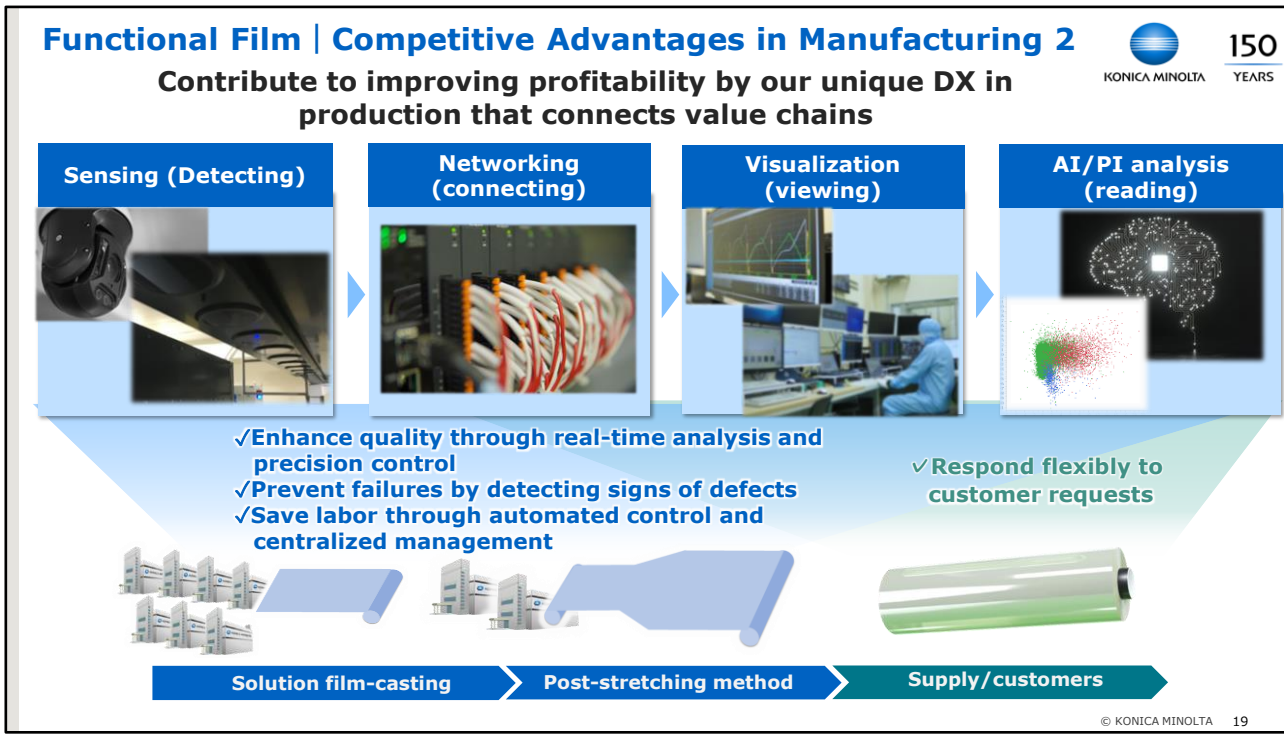
As a longer-term strategy, we aim to develop new functional film in the small and midsized film area where we currently have no share.
To achieve this, the key point is to understand what downstream customers such as set manufacturers and brand owners desire to achieve, and to propose solutions that lead to design and product development that customers are not even aware of.
Our strength in this area is our material formulation technology. Our film can be endowed with various functions by adding a wide variety of functional materials and changing the formulation during the film-making process.
We aim for growth by customizing functional film for small and midsize applications including ICT devices, based on the two pillars of co-creation with customers and material formulation technology.



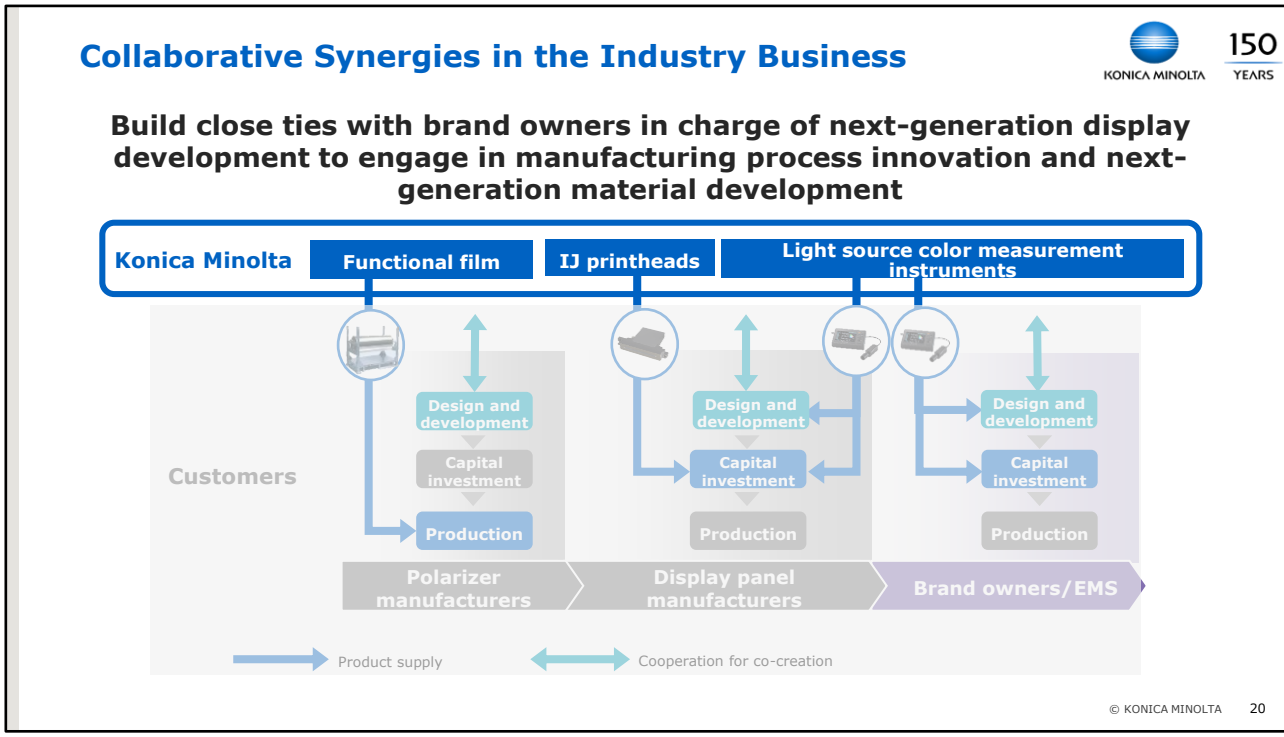
I would also like to talk about the manufacturing features and competitive advantages of functional film.

Our film-casting factory is located in Kobe, where we produce film from raw materials with a width of 1.3–2 meters using a solvent film-casting method. The method is characterized by the flexibility in resin selection, allowing us to make film from various types of resins, including the existing TAC; COP, which is the raw material for SANUQI; acrylic, which is the raw material for SAZMA; and other new resins.

By processing the film made in Kobe at our Kofu offline stretching factory, we produce wide film up to 2.6 meters in width.
By changing the stretching conditions, we can provide optical film that meet the diverse needs of our customers, which allows for a high degree of freedom in optical design and ease of customization.
In addition, by producing film made of the same resin material as much as possible on a film forming lines and separating the post-process to specialize in stretching, we can reduce the time needed to switch different resin material. We have achieved both resin diversification and high production capacity.



We are also actively promoting the digital transformation of production with the aim of contributing to improved profitability in manufacturing.
By bringing the processes of detecting, connecting, viewing, and reading into a film factory that has many analog elements, and digitizing them, we are able to prevent failures by detecting signs of defects and save labor through automatic control and centralized management.



Finally, I would like to explain the future collaborative synergies in the industry business.

As I mentioned earlier, each business has built a close relationship with customers from downstream to upstream in the supply chain.
These relationships will be further leveraged organically to build close ties with brand owners in charge of next-generation display development to engage in manufacturing process innovation and next-generation material development.

For example, our light source color measurement instruments are closely attached to brand owners to quickly identify new device trends and needs, but by horizontally extending that relationship strength to inkjet printheads and functional film, we can lead to advanced proposals and product development.
This could be a significant advantage over the medium to long term as we expand into small and midsized functional film.
Furthermore, by centralizing each customer's point of contact, we can open up connections to new avenues of business that have not existed before.
In addition, because the functional film business has strong connections directly with the top tier of display panel manufacturers, it is also expected that this can be leveraged for business opportunities in inkjet printheads and light source color measurement instruments.

Going forward, we will further accelerate the growth of our business by mutually leveraging the business contact points with customers in the three business areas.

Thank you for listening.