

Colorants and Functional Materials Business

Pursuing technologies to achieve colors and functionality, with organic pigments as the starting point

Colorants provide people with richness of mind, and functional materials contribute to resolve social issues. We will enable advanced technologies for both colorants and functional materials to evolve and continue to deploy them in the market, to help improve the sustainability of society and establish our own raison d'être. This is our mission.



Category	Main products	Main applications
Chemicals	Pigments, pigment dispersions	Printing inks, paints for vehicle, plastic colorants, etc.
High functional chemicals	High functional pigments, pastes for color filter	Resist for color filter of flat panel display (FPD), inks for digital printing
Display materials	Color resist	Color filters for FPD, imaging sensors, etc.
Plastic Colorants	Color Masterbatches, Functional Masterbatches, Functional Compounds	Plastic containers, vehicle interior / exterior, OA equipment, electrical appliances, etc.
Developed products and others	Paints for data recording materials, carbon dispersions, inkjet inks*, etc.	Magnetic tape for data storage, lithium ion batteries, Signboards, labels, etc.

*Segment changes: Effective January 2021, inkjet inks are classified as products of the Colorants and Functional Materials Business instead of the Printing and Information Business.

FY2020 results

In commodity-type pigments, sales of products for printing ink applications remained weak throughout the year, and sales of those for automotive coatings also grew at a sluggish pace owing to the slump in automobile sales during the first half.

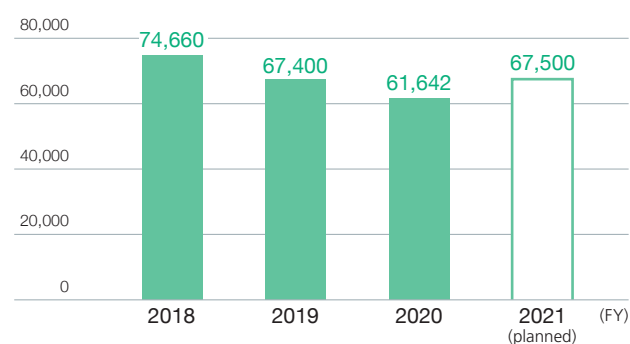
In high functional pigments and materials for FPD color filters, sales of those for use in big screen TVs and smartphones were weak due to U.S.-China trade friction and the COVID-19 pandemic in the first half but recovered in the second half. In addition, sales of products for use in computers and tablets grew. Meanwhile, the market shift towards China led to increased pressure to reduce costs,

putting a squeeze on profits.

In the plastic colorants business, sales of products for container applications related to hygiene grew in Japan, but sales of those for use in beverage bottle caps and cosmetics containers grew at a slow pace as people refrained from going out and the inbound market slumped. In addition, sales of plastic colorants for use in construction materials and solar cells also decreased. Meanwhile, sales of plastic colorants used in office equipment were sluggish in Southeast Asia and sales of those for automotive applications were also lackluster in North America and Europe.

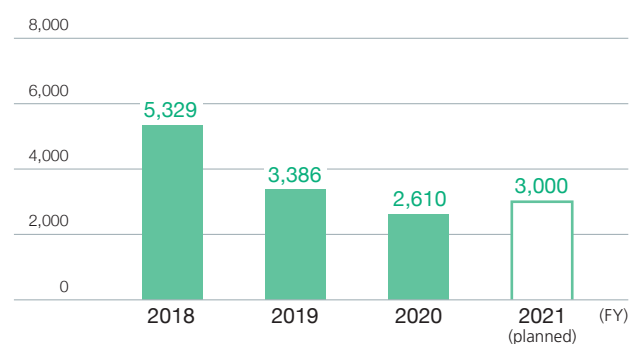
Net sales

(million JPY)



Operating profit

(million JPY)



Business Strategy

Measures to increase earnings during the SIC-II new medium-term management plan (FY2021 to 2023)

Establish the main source of revenue in the growth market

Materials related to electric vehicles (EVs) ... Global expansion of materials for lithium ion batteries

Materials related to digital technologies ... Increase the market share of the resist inks for FPD color filters in China, strengthen the business of resist materials for imaging sensors, and expand inkjet inks globally

Plastic colorants ... Rebuild global bases and expand high value-added products

Priority measures for FY2021

Making an aggressive, strategic move to establish the main source of revenue

In the functional dispersion business, we will increase production capacity by establishing new production bases in the United States and Europe in addition to existing ones in Japan and China, to respond to the rapid growth of demand for lithium ion battery materials reflecting the acceleration of EV development. We will increase sales of colorants for use in FPDs, which is a major application of colorants for color filters, with differentiated products and cost competitiveness by focusing on the expanding Chinese market. Meanwhile, for colorants for use in imaging sensors, we will establish our

own development and quality assurance systems, aiming to reinforce the business foundation and expand sales.

Inkjet inks were transferred from the Printing and Information Business segment in FY2021. We will take this as an opportunity to build an integrated development system covering the process from pigment synthesis to the production of inks and increase their competitiveness. In the plastic colorants business, we will consolidate less profitable bases to improve the earnings structure.

Risks

- A decline in demand for pigments for printing inks attributed to the greater-than-expected acceleration of digitalization
- A decline in demand for plastic products, resulting from growing environmental awareness, including awareness of the plastic waste problem

Opportunities

- Growing demand for lithium ion battery materials reflecting the rapid global shift to EVs
- Increase in needs for sensor materials attributed to growing demand for sensing for multi-camera smartphones, the self-driving of automobiles, security cameras and other applications
- Increase in needs for environmentally friendly products, including colorants for biodegradable plastics

Contribution to the SDGs through business

Electrode materials that contribute to improving the performance of lithium ion batteries

While the shift from gasoline vehicles to EVs is accelerated around the world, lithium ion batteries (LiB) are the key device attracting attention not only for their use in automobiles but also as a linchpin of the electricity infrastructures of a decarbonized society, to be used in, for example, power storage systems for the stable supply of electricity from solar energy and wind energy. We are seeing demand for the increase of the capacity and the reduced weight, safety and durability of LiBs.

The performance of LiBs depends greatly on the conductivity and composition of electrodes. LIOACCUM™, a carbon nanotube (CNT) dispersion for LiB from Toyocolor Co., Ltd., is an electrode material which is high purity CNT made into a dispersion, and is easy to handle. The addition of a tiny amount of this material enables high conductivity and large capacity. It also contributes to higher efficiency and the improvement of the safety of LiB production. The Toyo Ink Group contributes to the ubiquitization of renewable energy and the promotion of the decarbonized society through our global production and supply systems.



Polymers and Coatings Business

Providing value to diverse markets based on polymers with greater functionality

The COVID-19 pandemic has dramatically changed society and the environment surrounding our customers. We will adapt flexibly to these changes and engage in initiatives such as the creation of new business models and the promotion of the “New Polymer Manufacturing Reformation”, to evolve into a company that can contribute to the world through solution models based on manufacturing.



Toshinori Machida

President and
Representative Director
Toyochem Co., Ltd.

Category	Main products	Main applications
Adhesives	Adhesives, pressure sensitive adhesives, laminating adhesives, hot-melt adhesives	Packaging films, flat panel display (FPD), bookbindings, body-wrapping labels for PET bottle, etc.
Coating materials	Adhesive tapes, film materials for electronics, marking films	Double-sided adhesive tapes, electronic products, signboards and interior / exterior decoration, etc.
Paints and resins	Can coatings, resins, hard coating materials	Beverage cans, food cans, drums, architectural paints, functional films, FPDs, etc.
Developed products and others	Medical products, natural extracts	Transdermal patches, foods, feeds, etc.

FY2020 results

In the coating materials business, sales of products for smartphones fell during the first half due to supply chain disruptions and decreased demand, but there was a recovery in the second half. Progress was also made in developing and expanding the sales of electromagnetic wave shielding films for high-speed communication.

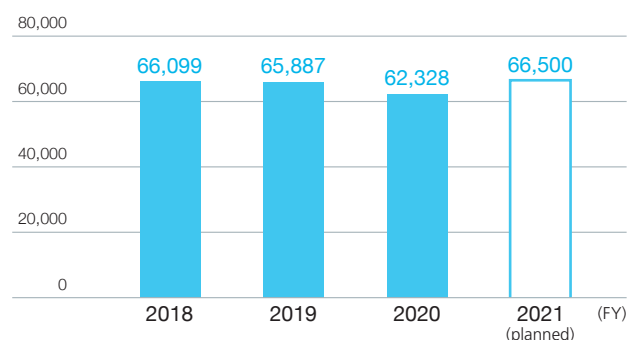
In the adhesives business, sales of adhesives for packaging in Japan remained firm. However, sales of adhesives for use in lithium ion batteries grew sluggishly. In the overseas business, sales in China and Southeast Asia were weak due to the temporary suspension of business activities in response to

COVID-19. In the pressure sensitive adhesive business, sales of products for automotive applications in Japan grew at a slow pace, but sales of adhesives for labels remained strong, and sales of those used for display protection films expanded in Japan and overseas.

In the can coatings business in Japan, sales of products for canned alcoholic beverage applications grew but sales of those for canned coffee and soft beverages sold in vending machines and convenience stores languished because people refrained from going out. Sales of can coatings were also weak in China and North America.

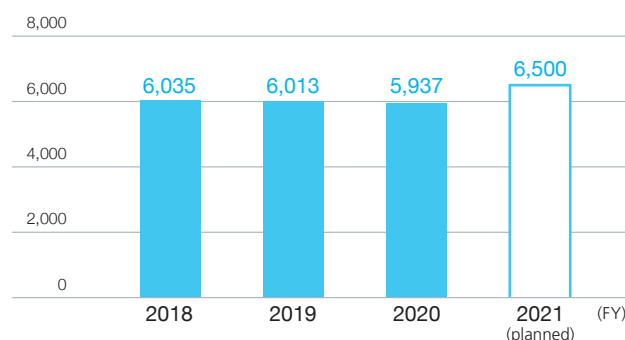
Net sales

(million JPY)



Operating profit

(million JPY)



Business Strategy

Measures to increase earnings during the SIC-II new medium-term management plan (FY2021 to 2023)

Expand the adhesives business overseas and expand business into growth markets with new polymers

- Packaging and industrial materials ... Achieve overseas expansion by increasing production capacity and enhancing environmentally friendly products
- Electronics (5G and IoT) Establish a position in the 5G market and enter the semiconductor market
- Medical and health care Expand and develop related products

Priority measures for FY2021

Expansion of environmentally friendly products and foray into the 5G market

In the adhesive business, we will use the merger of Toyochem Co., Ltd. and Toyo ADL Corp. in January 2021 as an opportunity to integrate the two companies' technologies for environmentally friendly pressure sensitive adhesives and hot-melt adhesives. We will also improve our marketing capabilities through the synergy created by the companies, to advance the development of environmentally friendly products for the packaging materials, electronics, and health care markets and expand the number of the products in these markets. As part of the "New Polymer Manufacturing Reformation", we have established new facilities for develop-

ing technologies for synthesizing new polymer materials in Japan. Overseas, we will accelerate our global expansion by enhancing production equipment in India, the United States, China, and other countries and regions.

In addition, we will develop and expand sales of differentiable products for the rapidly expanding markets of high-speed communications (5G) and semiconductors whose appeals are the solutions they provide to technological issues in these markets, such as the requirements for low dielectricity and high conductivity.

Risks

- Petrochemical raw materials price surges and unstable supply resulting from tougher environmental regulations, the requirements of society, and other factors
- The rejection of materials and fiercer competition resulting from changes in the specifications of smartphones and other electronics products
- Delays, changes, and cancellation of schedules for the development and commercialization of materials for the medical and health care markets

Opportunities

- Growth of demand for environmentally friendly products such as biomass and biodegradable products due to globally increasing environmental awareness
- Growth in demand for electronics-related materials resulting from the expansion of the 5G-related market and the mobile device market
- Increase in demand for medical testing materials and transdermal formulations reflecting measures to control infection and the diversification of approaches to chronic diseases

Contribution to the SDGs through business

Sensor materials that contribute to the safety and security of transportation facilities

Sensor devices are essential technologies for building safe, secure living spaces. Many optical sensors, such as the ones in security cameras and automotive cameras, are used in our living spaces, increasing the convenience in our lives. However, there are complex issues involving these optical sensors, including the violation of privacy, psychological stress caused by the sense of being watched, and the existence of dead angles.

Fichvita™, a non-optical behavior detection system from Toyochem Co., Ltd., detects the presence and movements of people and things with a sensor unit embedded in floors, store fixtures, and other objects. Because it is non-optical, it can be installed in locker rooms, restrooms, and similar spaces. The system ensures simultaneous, high-sensitivity detection over a wide area. It can detect changes in people's postures and centers of gravity and visualize the crowdedness of indoor facilities. At present, we are conducting demonstration experiments, including the collection of passenger information from self-driving buses, toward the full-scale application of the system.



Demonstration experiment in a self-driving bus

Packaging Materials Business

Providing environmentally friendly packaging materials in view of a product's entire lifecycle

We will enhance our presence as a leading company of environmentally friendly packaging materials by steadily and continuously marketing environmentally friendly solutions, such as biomass products, water-based products, and recycling systems, amid the global trends of increasing environmental awareness and stricter regulations.



Category	Main products	Main applications
Liquid inks	Gravure inks, flexographic inks, solvents for gravure printing	Flexible packaging materials, building materials, corrugated cardboard, labels, paper containers, etc.
Gravure printing systems and prepress	Gravure printing systems, gravure and flexographic plate making	Gravure / flexographic printing, precision plate making for electronics

FY2020 results

Sales of mainstay gravure inks for packaging materials in Japan were firm for household foods, such as frozen, chilled, and retort foods, as people refrained from going out, offsetting a slump in inbound demand. They were also firm for hygiene products, notably, sales of biomass inks grew. Meanwhile, demand for gravure inks for publication continued to shrink, sales of gravure inks for construction materials were also weak, and solvent and equipment sales also fell.

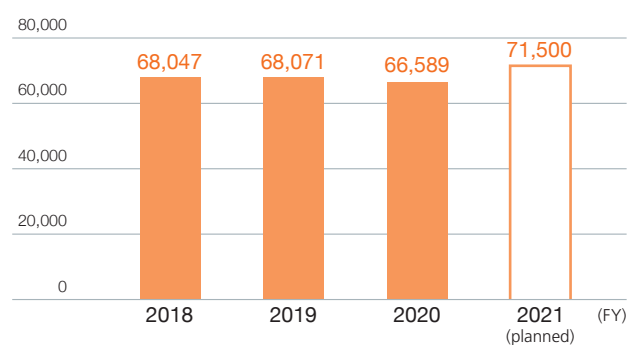
Overseas, client companies and our bases in China,

Southeast Asia, India, and other areas were affected by the shutdown of operations in response to the COVID-19 pandemic. However, we were able to resume operations relatively quickly as we belong to a daily necessities industry. In addition, there was also progress in the expansion of the sales of environmentally friendly products.

In the gravure cylinder platemaking business, sales of products for packaging were sluggish in the second half, but sales of products for precision plate making related to electronics expanded.

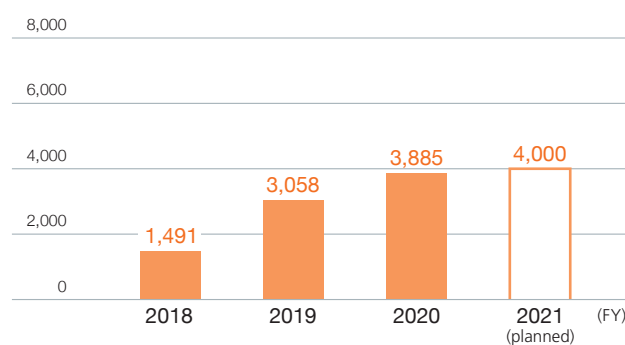
Net sales

(million JPY)



Operating profit

(million JPY)



Business Strategy

Measures to increase earnings during the SIC-II new medium-term management plan (FY2021 to 2023)

Take the lead in eco-friendly initiatives and strive to achieve growth and expansion, particularly in the Asian market

- Promote the commercialization of a system for recycling plastic container packaging materials
- Intensively invest in overseas growth markets, such as China, India, Turkey and Southeast Asia

Priority measures for FY2021

Driving environmentally friendly solutions

We have begun to see words such as the SDGs and ESG in many media reports with increasing frequency. To respond to the growing environmental awareness, we are developing environmentally friendly products, such as biomass, biodegradable, and water-based products. At the same time, we are collaborating with partner companies to build environmentally friendly systems, such as a system for the material recycling of waste plastics. In addition, we continue to work toward the development of antibacterial and antiviral products in response to growing awareness against infectious diseases and the increasing safety and hygiene

needs.

However, in addition to growing environmental awareness, the packaging material markets are expanding in emerging countries, reflecting the growth of the population and the improvement of the standard of living. We will respond to this expansion of demand through measures such as the construction of new plants (in Jiangmen city of China and Turkey) that we will quickly bring on line, and the intensive input of human and technological resources (Southeast Asia and India) to establish supply structures and expand our business.

Risks

- Decrease in demand for consumption of inks for plastic containers and packaging resulting from growing environmental awareness, including awareness of the plastic waste problem
- Petrochemical raw materials price surges and unstable supply resulting from tougher environmental regulations, the requirements of society, and other factors

Opportunities

- Growth of demand for environmentally friendly products such as biomass, biodegradable, and water-based products due to globally increasing environmental awareness
- Growth of demand for food containers for home meal replacements and single-serving foods, which is associated with longer hours spent at home during the COVID-19 pandemic
- Increase in demand for food packaging for long storage intended to reduce food loss and to be used for foods stockpiled for disasters
- Expansion of markets of products related to packaging materials, resulting from population growth and improvement in living standards mainly in emerging countries

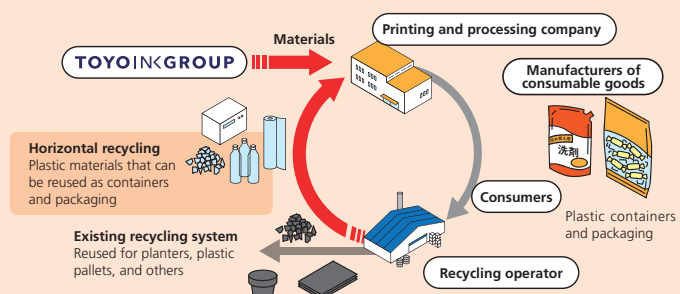
Contribution to the SDGs through business

Material recycling system for plastic containers and packaging

We must address the plastic waste problem to build a recycling-oriented society. Many of the plastic containers and packaging, which account for nearly 50% of general waste, are made of multi-layer films created by bonding together sheets of different materials. Therefore, it is difficult to recycle these materials. While there has been progress in the shift using single-material products, it is still a challenge to maintain the functionality that is required of packaging materials.

At the Toyo Ink Group, we have developed materials that enable the recycling of plastic containers and packaging by removing inks and separating the bonded films. In the recycling system using these products, multi-layer films are separated into the separate materials, permitting the horizontal recycling of packaging materials to packaging materials as transparent, high-quality plastic materials. At present, we are working on a high-quality material recycling business in collaboration with several companies, aiming to start the business in 2022.

Recycling system for containers and packaging that the Toyo Ink Group aims to establish



Printing and Information Business

Deploying products in the high-value added printing market featuring environmentally friendly technologies and technologies that enable superior functionality

We will steadily advance the fundamental reform of our business portfolio by adapting to rapidly accelerating changes in the offset printing market. We will continue to deploy functional ink products that we have differentiated using environmentally friendly technologies and technologies enabling superior functionality to the market in our efforts to secure profit in the high-value added printing market.



Category	Main products	Main applications
Offset inks	Offset inks, newspaper inks, metal decorative inks, UV curing inks	Flyers, books, magazines, newspapers, stickers / labels, paper containers, beverage cans, food cans, etc.
Printing materials and machinery	Offset printing materials, printing inspection equipments	Offset plate making, printing paper surface inspection, etc.
Developed products and others	Screen inks (inkjet inks*), others	Signboards, corrugated cardboard, stickers / labels, packaging, printed electronics materials, etc.

*Segment changes: Effective January 2021, inkjet inks are classified as products of the Colorants and Functional Materials Business instead of the Printing and Information Business.

FY2020 results

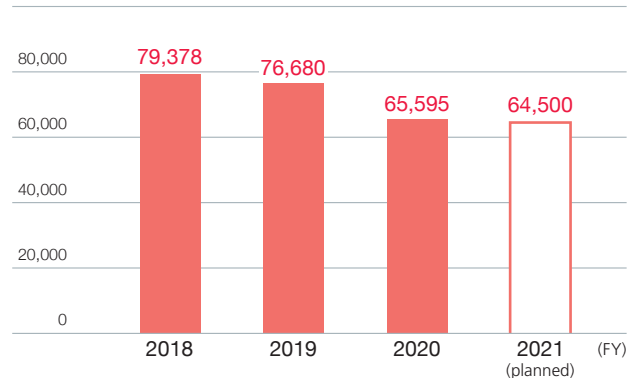
While the information-related printing market continued to shrink due to digitalization, in Japan we strongly promoted the optimization of the scale of business, collaboration and cooperation with other companies in the same business and cost reduction in our efforts to secure profits. Meanwhile, overseas, we sought to expand and enhance our global bases. We worked to develop and expand sales of high-sensitivity UV curing inks and inkjet inks for on-demand printing. Further, we are also advancing price revisions

to partially reflect the increase of raw materials prices due to environmental regulations in sale prices.

However, due to the prolonged COVID-19 pandemic, people are refraining from going out and events have been cancelled in Japan, leading to a significant decline in hand-outs, advertisements, and other printed materials, causing ink demand to weaken. We were also forced to temporarily suspend business activities in some regions such as China and India.

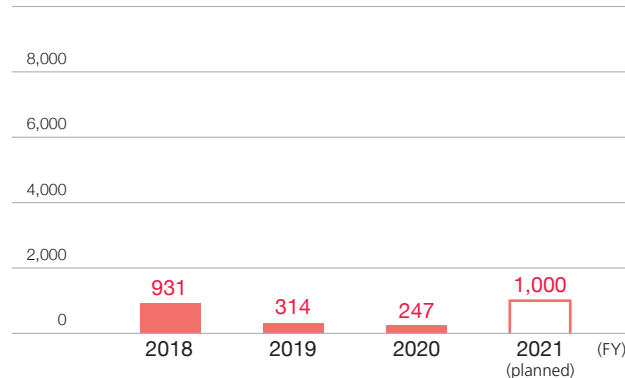
Net sales

(million JPY)



Operating profit

(million JPY)



Business Strategy

Measures to increase earnings during the SIC-II new medium-term management plan (FY2021 to 2023)

Move forward with our evolution into a profitable business structure that adapts to market conditions

- Increase sales of functional inks* for packaging applications such as paper containers and use in the industrial field
- Facilitate the launch of the color communications business

*Functional inks: UV curing inks, metal decorating inks, and screen inks

Priority measures for FY2021

Accelerating changes to make the business profitable

The reduction of demand for printing inks, which is attributed to the digital transformation (DX) of the printing market and the information media market, is expected to continue to accelerate due to the ongoing COVID-19 pandemic. Therefore, we will continue the thorough structural reform of the entire production, logistics, and sales systems. In addition, the prices of raw materials for UV curing inks rose steeply due to the environmental regulations that have

become more strict globally and we will continue to reduce costs and improve the formulas and manufacturing process to reinforce the profit structure.

Meanwhile, in the packaging materials market, including products with growing demand such as stickers, labels, and paper containers, we will shift to high-value added products by globally deploying biomass UV curing inks and other functional inks.

Risks

- A greater-than-expected decline in the demand for printing inks and worsening business conditions surrounding our customers and business partners
- Petrochemical raw materials price surges and unstable supply resulting from tougher environmental regulations, the requirements of society, and other factors

Opportunities

- Growth of demand for environmentally friendly products such as biomass and biodegradable products due to globally increasing environmental awareness
- Expansion of markets of products related to packaging materials, resulting from population growth and improvement in living standards mainly in emerging countries
- Increasing need for functional printed materials with antibacterial and antiviral features triggered by the COVID-19 pandemic

Contribution to the SDGs through business

Biomass inks that contribute to the reduction of CO₂ emissions from package printing

Conventional printing inks use petroleum-derived (fossil-resource derived) raw materials for their constituent resins and solvents. In contrast, Toyo Ink Co., Ltd.'s biomass inks use biomass (renewable, biological materials excluding fossil resources) raw materials. Biomass raw materials are carbon neutral materials that do not increase overall CO₂ emissions even when incinerated because the plants that are the source of these materials absorb CO₂ as they grow.

Our extensive lineup of biomass ink products, including inks for offset printing, screen printing, and package printing, contain 10% to 40% biomass components. They have been certified by the Japan Organics Recycling Association, then, they are used by many printing companies and used for food packaging, convenience store private brand products, and other products.

