

# Nitto Group's R&D Strategy as per the Chief Technology Officer



**Yosuke Miki**  
 Director, Executive Vice President, CTO  
 General Manager, Corporate Technology Sector

## The Nitto Group's New Strategy to Successfully Compete in this Time of Change

The rapid spread of information and communication technology (ICT) is bringing with it sweeping changes in our lifestyles and society at large. A pertinent example of this is the advent of the fifth-generation mobile communications system, when we have access to ultrafast, large-capacity, low-latency, and highly reliable cellular networks. This fifth-generation technology standard allows us to gather big data from each IoT (Internet of Things) device, analyze them by industry using AI (artificial intelligence), and create new values in each industrial sector. In response to these emerging trends, we have begun to see collaborations and realignment of businesses beyond conventional industrial frameworks, leading us to believe that digital transformation will only gain speed in our society.

Being tested in this time of major change is what values the Nitto Group can deliver and how. We must keep creating new values for fast-changing, growing fields by moving beyond the traditional boundaries of the market.

To this end, we must deliver tangible values through the combination of our existing technologies and products with new technologies, while at the same time delivering intangible values in the form of intellectual properties, manufacturing technologies, and other intangible assets. Offering both tangible and intangible values - this is what the Nitto Group must deliver going forward.

## Meeting the Expectations of Customers with Innovations for the Future

In 2017, I was appointed Deputy CTO to take care of new business development in the Corporate Technology Sector and took office as CTO in June 2020. For more than two decades since joining the Nitto Group, I have been involved in development, sales, and planning of ICT-related products, working closely with customers to come up with solutions to their everyday difficulties. In this industry where technological breakthroughs are a common occurrence, I have been focused on delivering future-oriented proposals that make customers say, "This is exactly what we wanted!" To this end, it is important to consider the "present," as well as the "future," of each individual customer and think over what values end-users - who buy from our customers - really seek, so that we can keep offering innovations conceived from the customer's point of view.

My role as CTO is to tap into my experiences to provide a

bridge between the Corporate Technology Sector and individual business divisions. One of the first things that I did was to establish a technology incubation center called the New Business Development Division under the Corporate Technology Sector, to accelerate the commercialization of innovative products that we expect will drive the Nitto Group's future, such as plastic optical fibers/cables and neodymium magnets.

In fiscal 2019, to stay keenly alert to the changes and needs of the global society, we set up the Innovation Marketing Center within the Corporate Technology Sector. By maintaining a close connection with our valued customers, helping them to shape their dreams, and sharing the same within the company, we hope to develop new values for our customers and society as a whole.

## Technology and Intellectual Property Directly Benefit Business Growth

I am delighted to note that some of the reforms that we have initiated in recent years, for example, steadfastly bringing technologies from R&D labs to the market and transforming ours into a business model that creates diverse forms of value out of each technology, have begun to bear fruit.

To shorten the time to market, we have reinforced the process engineering function within the Corporate Technology Sector, which has made it possible to further accelerate the move to establish a mass production process from an early stage of research and development. Take plastic optical

fibers/cables, for instance. At the pilot line, we were able to reduce optical attenuation, thus making significant strides toward the early commencement of commercial production.

To transform ours into a business model that creates diverse forms of value, we have reinforced intellectual property management to visualize intellectual property rights. By making a list of what we do and do not have, we were able to exercise rights and sell them to other companies, or, in some cases, relinquish them, as well as generate royalty income, thus boosting operating income.

### Making Intellectual Property Rights Visible



## Nitto Group's R&D Strategy as per the Chief Technology Officer

### "Exits" of Diverse Technologies Made Possible by Intellectual Property Management

Managing intellectual property not only contributes to operating income but also catalyzes the shift to a business model that takes into account diverse "exits" for technologies. Now that all of our intellectual property rights have become visible, we can accurately see the picture of the value of the said rights. What this means is that it is now easier to develop new values by integrating technologies acquired from the outside with the Nitto Group's proprietary technologies.

Furthermore, as members from development and intellectual property teams gather together from the project formulation stage to have in-depth discussions as to what values they should offer and what position they want to reach in the market,

a necessary intellectual property network is formed. It is not a matter of how many intellectual property rights we hold, but rather how they can be used as tools with which to sustain the growth of the Nitto Group.

In marketing, too, we will make the most of our intellectual property information as part of IP landscaping. By conducting integrated analyses of information on patents that have been publicly available, we can gain an overview of where we are in the market now and where we should be in the future - something that a conventional patent map simply cannot do. We will then start offering various inputs to R&D, business, and management strategies.

### Focusing Management Resources into Fast-Changing, Growth Fields

I believe that "information interface," "next-generation mobility," and "life science" are the three growth domains where the Nitto Group's strengths can be maximized. We will concentrate our management resources on these domains, and, should there be a lack of technology for the commercialization of these businesses, pursue collaboration with external parties via open innovation and M&As.

In the "information interface" field, we took advantage of the open innovation scheme to develop plastic optical fibers at the Optical Cable Joint Research Center, which was established jointly with Keio University. Under this framework, we are developing a final module of plastic optical cables (active optical cables) by incorporating our own technologies for optoelectronic hybrid boards and connectors, in an attempt to further enhance the flexibility of plastic optical fibers. We are hoping to make this a reality by promoting collaboration with external organizations, as we do not believe that our technologies alone will be sufficient to develop a final module. (-> See P. 31)

In the "next-generation mobility" field, we have already begun to see results: The Innovation Marketing Center, IP strategy division, and development project team joined forces to increase the possibility of neodymium magnets delivering value

to new markets that have yet to be manifested. (-> See P. 32)

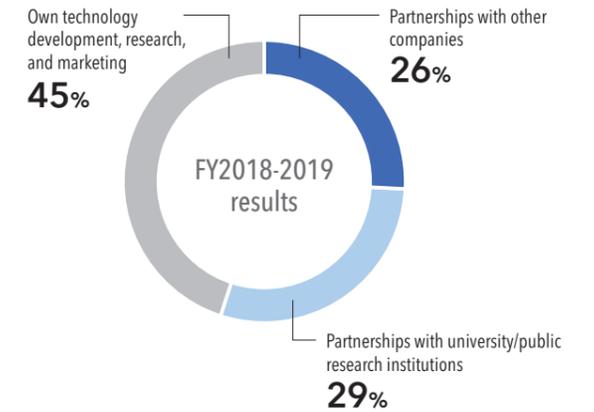
In the "life science" field, we began our efforts in the 1970s by tapping into adhesion technology and drug delivery technology, which delivers drugs to target organs. There were two reasons behind this decision: We wondered if we could use our technologies to extend healthy life expectancy. We also wanted to diversify our business portfolio. Because the Nitto Group does not manufacture pharmaceuticals, we wish to contribute to the creation of new therapeutic drugs by providing customer pharmaceutical manufacturers with our proprietary technologies, such as drug delivery technologies. In April 2019, we established a collaborative research department for the development of oligonucleotide medicines in the laboratories of the Osaka International Cancer Institute. This collaborative research department will integrate the Osaka International Cancer Institute's clinical experience in advanced cancer treatment and drug efficacy evaluation technology using animal models and clinical samples, with Nitto's oligonucleotide medicine and drug delivery technologies to develop revolutionary molecular targeted therapies and immunotherapies for intractable and rare cancers. By combining the outcomes of this effort with the results of the clinical trial of oligonucleotide medicines for KRAS mutant

cancers\* which is conducted in the U.S., we are hoping to enhance the reliability of oligonucleotide medicines.

One bottleneck to such attempts in new fields, however, is the time taken to gain internal approval through the standard decision-making process. To bypass this rather lengthy process and make quick decisions, we have set up a "management fund" system, which uses a different set of criteria for making quick decisions on projects if they are deemed to hold future potential. For up to a certain amount, CTO has the decision-making authority for the fund. I am delighted to say that this unique scheme has helped to accelerate collaborations, as evidenced by the fact that 55% of the projects approved under the management fund system in fiscal 2018 and 2019 involved open innovation.

\* Intractable cancers caused by mutation of KRAS genes, which relay signals for cell multiplication. Mutated KRAS genes are often found in lung cancers, colorectal cancers, and pancreatic cancers.

### Projects Receiving the Management Fund (FY2018 and FY2019)



“ Because we are a B2B manufacturer, it is crucial to stay connected with customers. By not only meeting customers' "present" needs but also more than satisfying their "future" needs, we will work closely with our customers to develop new values in this ever-changing world. ”

# Innovations to Shape the Next Generation

## Plastic Optical Fibers/Cables



As the spread of IoT and the start of 5G have made it imperative to realize next-generation, high-speed, large-capacity communications, the Nitto Group is working toward the early provision of plastic optical fibers/cables (active optical cables) for a diverse range of applications.

### Leveraging Our Strengths for Manufacturing

The Nitto Group is working on the development of cables that combine plastic optical fibers with optoelectronic hybrid boards that transmit both optical and electrical signals.

In October 2017, we started joint research with Keio University, with whom we have maintained technological exchanges for optical materials and other businesses. By combining their photonics polymer technology and their technique to add heat resistance to plastics with Nitto's proprietary technologies, we are working toward commercial production of plastic optical fibers that are thinner, lighter, more flexible, and highly heat-resistant.

We began working on optoelectronic hybrid boards around 2012 for possible applications to electronic and medical equipment, which require high speeds and low noise. Through the integration of Nitto Group's polymer light waveguides and printed circuit boards, we were able to make this innovation a reality.

"We developed two different devices of plastic optical fibers and optoelectronic hybrid boards simultaneously, thus we decided that we could maximize added value if we combined them into a single cable." (Ishimaru)



**Yasuto Ishimaru**  
Optical Communication Business  
Promotion Department, New Business  
Development Division



**Isao Hirose**  
Process Technology Development  
Department 2, Manufacturing &  
Production Engineering Division

### Marketability, Future Prospects

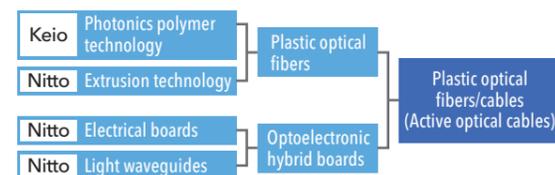
Only the Nitto Group can offer cables that combine heat-resistant plastic optical fibers and optoelectronic hybrid boards. The result is a thinner, more compact, heat-resistant, and flexible cable for broader applications.

To meet the expanding demand for high-speed, large-capacity communications for such markets as housing, medical equipment, aircraft, automobiles, and outer space in the not so distant future, we are working toward the early start of mass-production.

"We managed to improve optical attenuation - the technical bottleneck of plastic optical fibers. I am sure customers will appreciate this advance." (Hirose)

"We have already provided sample optoelectronic hybrid boards to our customers to receive their feedback, and we are currently working on technology for connecting them to plastic optical fibers." (Ishimaru)

#### Convergence for Plastic Optical Fiber Cables



### Competitive Advantages

#### Customer needs

- Next-generation, high-speed, large-capacity communications
- Broad applications from housing and other spaces to automobiles, aircraft, and robots
- Slimmer wiring, simple installation, and increased freedom in cable placement

#### Nitto Group's competitive advantages

- Only the Nitto Group can satisfy customers' demands for components/devices, as well as final modules of integrated cables.

## Neodymium Magnets

Neodymium magnets are powerful permanent magnets that have found a wide variety of applications. Capable of controlling magnetic field orientation, the Nitto Group's neodymium magnets have realized further miniaturization of motors without compromising on high performance, thus contributing to the development of new innovations.

### Leveraging Our Strengths for Manufacturing

Development of neodymium magnets started at Nitto with a customer inquiry about insulating adhesive tape for neodymium magnets around 2007. That casual inquiry led us to discover a potential that went beyond merely commercializing insulating adhesive tape - if we used our technology for sintering organic and inorganic compounds, we could realize neodymium magnets capable of controlling magnetic field orientation, which, by concentrating magnetic force in one direction, would achieve miniaturization, high performance, and energy-saving, when applied to motors. While shipping samples for evaluation from around 2015, we have been working to establish a mass-production process.

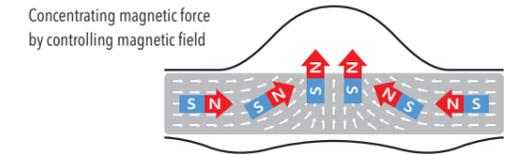
"We successfully made neodymium magnets capable of controlling magnetic field orientation by going out on a limb and doing what no one in the industry thought of; choose an organic substance that does not react with magnet powder and make a green sheet out of it. It was a challenge from the start, and it took us as many as seven years before we could have magnetic properties expressed by using a unique method. We could not have made it without our corporate culture of nurturing technologies and products tenaciously, a platform for organic chemical technology, and talented engineers." (Kume)



**Katsuya Kume**  
Magnet Business Promotion Department,  
New Business Development Division



**Hiroshi Ebe**  
Magnet Business Promotion Department,  
New Business Development Division

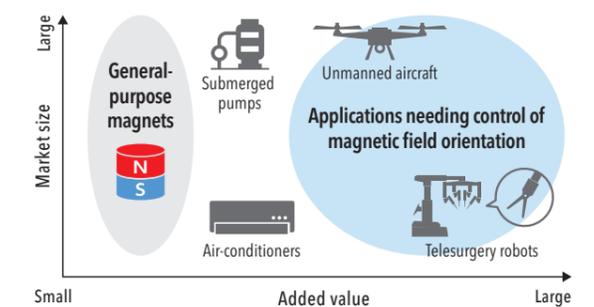


### Marketability, Future Prospects

Under the leadership of the Innovation Marketing Center, which was established in fiscal 2019, we set out to find the fields our neodymium magnets' unique properties and features would contribute the most to. The study confirmed that our neodymium magnets could potentially contribute to miniaturization and performance enhancement in fledgling markets and technologies, the demand for which is increasing in tandem with progress in innovative digital technologies, such as unmanned aircraft, sensors, and high-precision robots.

"Although there is no doubt that this technology is revolutionary, not many people have heard of it, so we are hoping to gain trust from our stakeholders by building on track records one by one." (Ebe)

#### Market where neodymium magnets have a competitive



### Competitive Advantages

#### Customer needs

- Increasing demands for unmanned aircraft, sensors, and high-precision robots, which require lighter-weight, low-vibration motors

#### Nitto Group's competitive advantages

- Using magnetic field orientation control to produce miniaturized, lighter-weight motors
- Protecting intellectual property rights by a patent that quantitatively specifies characteristics of magnetic field orientation control

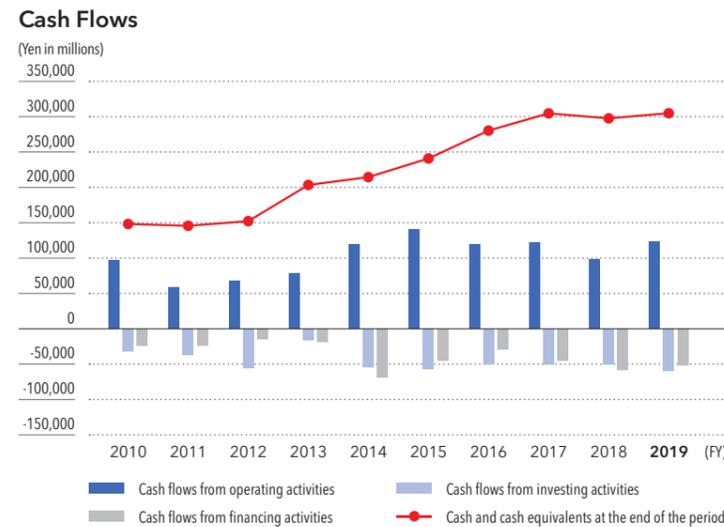
# Financial Policies

## Forging Ahead with the Financial Base

The Nitto Group aims to build a well-balanced, sound financial base that aligns continual enhancement of corporate value with long-term interest of all stakeholders.

Because we are operating in fast-changing and high-risk fields such as optronics and life science, our basic financial policy is to enhance capital adequacy while constantly generating ample cash flows from operating activities through development and sale of competitive products.

Meanwhile, we consider it important to provide returns to shareholders. Accordingly, we maintain a sound financial base while consistently paying dividends and repurchasing our own shares flexibly.

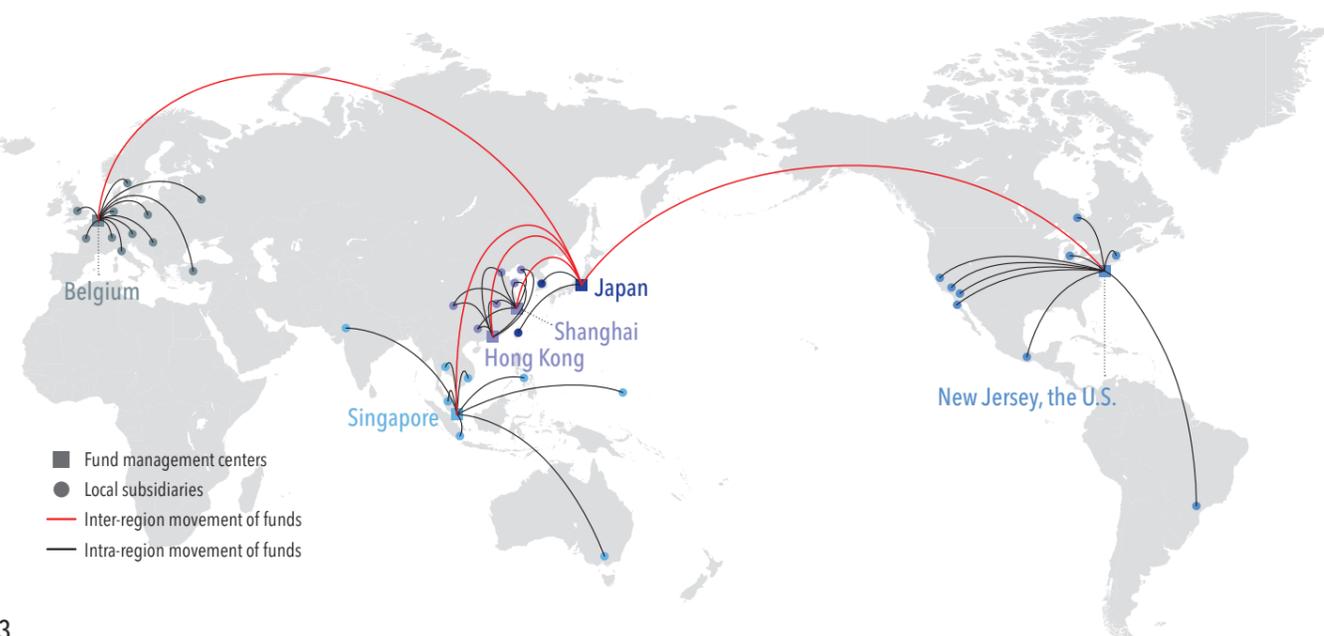


## Cash Management

The Nitto Group uses a treasury management system\* to monitor the movement of funds within the Group both globally and in a timely manner. Capital efficiency is further enhanced by centralizing funds that are distributed across Group companies into a fund management center in each region by way of dividend payments and cash pooling.

We also set up a policy on the handling of funds within the Group, ensuring that it is widely known and implemented to reinforce financial governance, while at the same time preventing outflow of costs associated with forex risk hedging from the Group and reducing consolidated interest-bearing debts.

\* A system that manages financial transactions, such as the promotion of efficient use of funds and currency trading



## Application of Funds and Return to Shareholders

In order to consistently enhance its corporate value amid fast-changing operating environments, the Nitto Group prioritizes its application of funds in the order of: 1. Capital investment, 2. Cash dividends, 3. M&As, and 4. Share buybacks.

### Capital Investment and M&As

The Nitto Group has consistently invested in its facilities and M&A opportunities in a bid to forge ahead with its growth strategies and business foundations.

Whenever we see an opportunity, we make capex decisions by taking into account how soon we can recoup investments and asset efficiency.

Meanwhile, while taking ESG criteria and the magnitude of risks that may occur in the future into account, we also invest in plants and equipment from a long-term perspective. In particular, we are heavily investing in the environmental friendliness, including reducing CO2 and recycling wastewater, and the reinforcement of our fundamental business foundations, such as improving occupational health and the working environment.

Our investment decisions for M&As are made by giving priority to expected returns. In a bid to capitalize on growth potential outside of the Group, we are constantly searching for M&A partners in fields with growth opportunities.

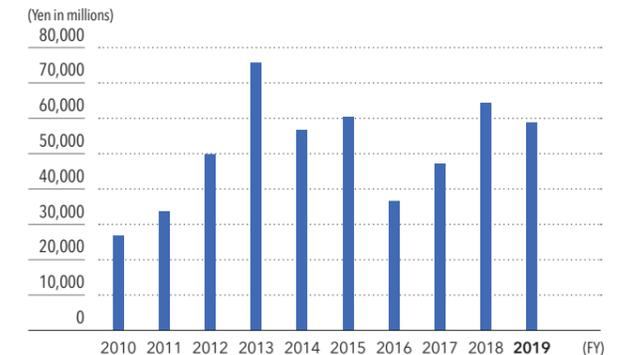
### Return to Shareholders

Providing returns to our shareholders is one of the paramount management issues of the Nitto Group. Our basic policy here is to pay stable dividends to our shareholders.

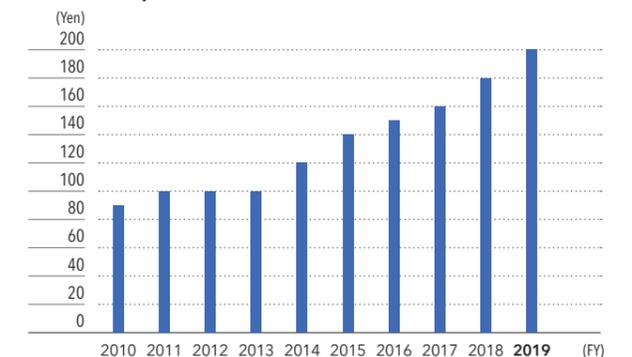
At the same time, it is essential to make proactive upfront investments in research and development and production in order to catch up with rapid technological innovation and meet customer demands in a timely manner. Dividends to shareholders are determined by taking into account various factors, including financial position, profit levels, and payout ratio.

For the purpose of implementing a flexible capital policy in response to changes in the business environment and as part of comprehensive measures to provide returns to our shareholders, we conduct share buybacks. We decided to repurchase 9 million of our shares for up to 50.0 billion yen between February 2020 and July 2020. We also drew up a treasury stock holding policy of cancelling all such shares except those with a specific use, such as compensation to directors.

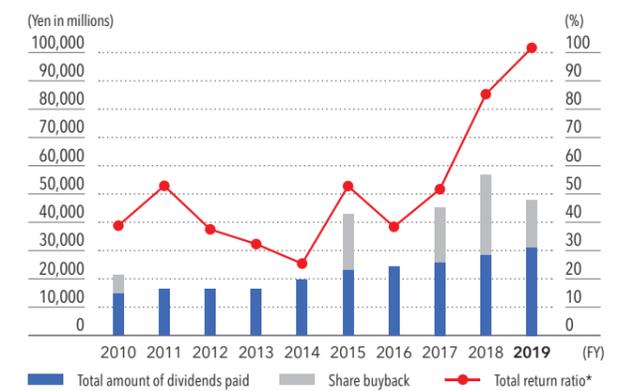
### Capital Investment (completed contract method)



### Dividends per Share



### Shareholder Return



\* (Total amount of dividends paid + Amount of shares repurchased) / Net income attributable to owners of the parent company

# Segment Information

## Summary of Overall Business

During the fiscal year ended March 31, 2020, trade conflicts between the U.S. and China as well as heightened uncertainties over the economic outlook negatively affected the world economy as a whole. The GDP growth rate slowed down in the Americas. Demand remained weak due to Brexit issues in Europe. China saw a drop in import and export from and to the U.S. and weaker business sentiment in the manufacturing industry. Out of the Group's key markets, the auto market recorded a significant decline in production volume. Although the production volume of smartphones did not grow as well, there has been a new change in displays. As the novel coronavirus infectious disease (COVID-19) spread toward the end of the term, the effects of outing restrictions and stalled logistics in each area and region worldwide on the real economy deepened. In response to these circumstances, the Group promotes

telework in the best interest of its employees' safety and handles this situation responding to requests from governments. Although the Group temporarily suspended operations in China region, it gradually resumed production after the Chinese New Year. Meanwhile, some local subsidiaries in the Americas, EMEA (Europe, the Middle East, and Africa) regions, and Asia remained out of operation. The impact of COVID-19 on business results was limited in this fiscal year.

As a result of the above, revenue decreased by 8.1% from the previous fiscal year (changes hereafter are given in comparison with the previous fiscal term) to 741,018 million yen. Operating income dropped 24.8% to 69,733 million yen, and net income attributable to owners of the parent company fell 29.2% to 47,156 million yen.

### Consolidated operating results

(Yen in millions)

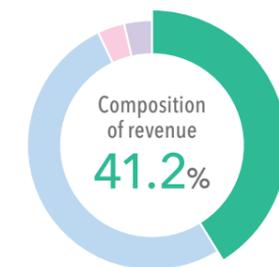
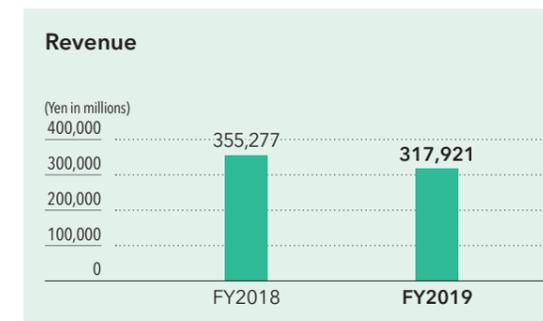
		Revenue	Operating income	Income before income taxes	Net income
1H/FY2018	Results	403,678	51,365	50,178	35,191
2H/FY2018		402,817	41,412	41,732	31,425
FY2018		806,495	92,777	91,910	66,616
1H/FY2019	Results	378,285	41,102	41,016	29,162
2H/FY2019		362,732	28,631	27,996	18,061
FY2019		741,018	69,733	69,013	47,224

## Summary of Results by Segment

### Industrial Tape

Main products: Functional base products (bonding and joining products, protection products, process materials, etc.) and automotive products

#### Operating Results



For functional base products, due to the sluggish electronics market, demand for products for smartphones and process materials for electronic components did not grow. Meanwhile, despite the weak semiconductor market, related process materials remained firm. In addition, in response to sales expansion into new areas, the Group enhanced the production system of diaper materials manufactured and developed at a Group company in Turkey. We expect to expand the market area of these materials and develop applications for adults. Further, demand for organic solvent-free double-coated adhesive tapes was steady. The Group will continue contributing to the environment in manufacturing.

The transportation business including automotive products saw a drop in production volume and weak demand in world's major auto markets such as Europe, the Americas, and China. In addition, the business was affected by COVID-19, with the Group's factories in Europe, the Americas, and Asia forced to suspend operations toward the end of the term.

As a result of the above, revenue decreased by 10.5% to 317,921 million yen and operating income declined 33.2% to 20,752 million yen.

#### Issues to be addressed

For functional base products, the Group will review optimal production system and carry out productivity reform of existing businesses, and thereby enhance its competitiveness. Further, the Group will create new products in fields where the demand for electronics materials, semiconductor process materials, and electronics process materials is expected to grow, driven by the dissemination of 5G and the data center market. It should be noted that the inventory levels of customers of this business may fluctuate sharply due to COVID-19.

For the transportation business including automotive products, with a long-term slump in production volume assumed on account of COVID-19, the Group will enhance the competitiveness and improve profitability of existing products by reviewing and thoroughly streamlining the global supply structure, and integrating and abolishing current products or other efforts. The Group will also push ahead with creation of new products related to car-electronics in response to changes such as car automation, automatic driving, connected and sharing, and the mobility fields other than automobile such as aircraft, and thereby aims to achieve further business growth.

# Segment Information

## Research and development activities

At the adhesive tape manufacturing process, efforts are being made to reduce organic solvents and promote the use of biomass materials. Nitto received the Excellence Award at the 46th (FY2019) Environment Award (co-organized by the National Institute for Environmental Studies and The Nikkan Kogyo Shimbun, Ltd. and sponsored by the Ministry of the Environment) for its environment-friendly product, organic solvent-free double-coated adhesive tape.

We will remain focused on the development of sustainable and environmentally friendly products while paying close attention to ESG and the SDGs.

In the semiconductor field, we developed process tape that smoothes out uneven wafer surfaces. Since properties of process tape must evolve in tandem with advancements in the semiconductor fabrication processes, we will continue developing new products in this field.

As part of the ongoing effort to explore applications of products that use fluorine functional materials, we will

dedicate our resources to the development of products with novel functions in the fields of semiconductors, electronic components, and mobile devices.

In the transportation field, we are forging ahead with the development of products that help to enhance the performance of transport vehicles, including automobiles, railroad cars, and aircraft. In anticipation of a rapid expansion of the electric vehicle market and an increase in the number of electric/electronic components in vehicles, we now have expanded product lines for insulating materials for motors and vent filters for electric/electronic components. Also, in preparation for the full-scale arrival of the self-driving market, efforts are underway to roll out radio wave absorbing materials for radars. Furthermore, in an attempt to develop new businesses for the CASE (Connected, Autonomous, Shared, and Electric) market, we have embarked on new value development through convergence with the Next Generation Mobility Center.

previous fiscal year, but new revenue is forecast to be recognized from the next fiscal year onward.

With regard to flexible printed circuit boards, production volume of high-capacity hard disk drives (HDDs) remained low in personal computers application and others. However, demand continued to recover in line with realization of high capacity for data center application. In applications other than HDDs, production of materials for hearing instruments in the wireless recharging system started. Going forward, the Group will continue to cultivate new applications of high precision substrates.

The impact of COVID-19 on the segment was limited despite a temporary halt of production in China.

As a result of the above, revenue decreased by 7.2% to 398,942 million yen and operating income slid 7.9% to 57,067 million yen.

communication environment, which in turn will create a higher demand for our flexible printed circuit boards. We will seize the opportunity that such changes present promptly and without fail.

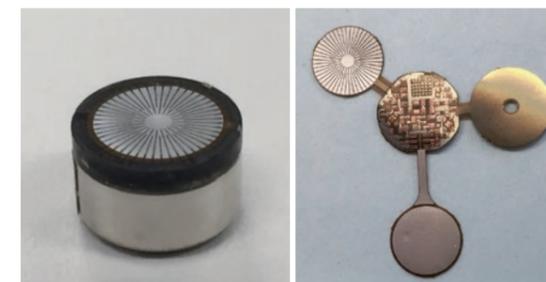
## Research and development activities

For flat panel display applications, we are catering to the growing demand for large-sized liquid crystal displays (LCDs), including public information displays (PIDs), monitors, notebook computers, and tablets, as well as OLED-TVs and other organic light emitting displays (OLEDs), while developing products that meet specific requirements of different devices. For mobile display applications, on the other hand, we are being requested to enhance the visual quality of OLEDs and make them thinner and more flexible. In response, we are working on polarizing films that offer higher optical performance while being thin and bendable.

In the auto industry, with the progress in self-driving technology, it is expected that we will see an increasing in both the number and size of in-vehicle displays. Because polarizing films for use in a car are required to have higher heat resistance and lower contraction, we are developing products that meet these requirements. At the same time, we are intent on the development of products that offer the performance needed for polarizing film products used with curved and shaped displays, which enhance freedom in the interior design of high-end automobiles.

For optical materials for display peripherals other than polarizing films, we are also pushing ahead with the development of interlayer filling adhesive for displays and materials for the OLED process, in a bid to offer value to customers manufacturing displays and equipment with a built-in display.

For flexible printed circuit boards, we are marketing high-precision circuits made possible by circuit formation technology using photosensitive polyimide and the semi-additive process to new markets other than that of HDDs. In the current fiscal year, high-precision circuits were adopted for wireless charging systems for hearing aids and components for smartphones to start contributing to our sales. We will continue with development efforts to meet demands as they arise.



Battery pack for a wireless charging system for hearing aids (left) and Nitto's high precision substrates for wireless power transfer (right)

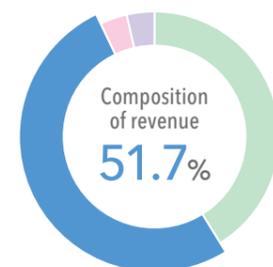
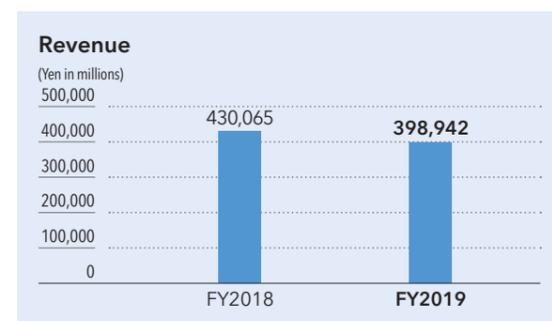
## Issues to be addressed

For information fine materials, the display market has been bipolarized between the commodity market and the high-end market. Amid this trend, the Group will, by honing its industry-leading technological prowess, respond to the changes taking place to displays. The Group also aims to strengthen its business foundations and expand highly profitable businesses by strengthening and streamlining its product lifecycle management. With regard to flexible printed circuit boards, the Group aims to enhance profitability by boosting the market share of its HDD application and streamlining the business. The Group will increase its efforts to make this another core business by using the high-accuracy circuit formation technologies it has cultivated for smartphones and other new applications whose demand is growing, while expanding relevant production facilities. Due to the increasing impact of COVID-19 and other factors, it is expected that more people will be working remotely in the advanced

## Optronics

Main products: Information fine materials and flexible printed circuit boards

## Operating Results



Production volume of information fine materials for smartphones did not grow. The Group, however, responded to irregularly shaping of optical films to accommodate to large-sized displays. As a result, this application performed strong compared to the previous year. In the TV market, the

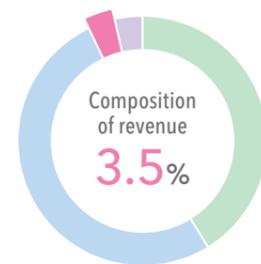
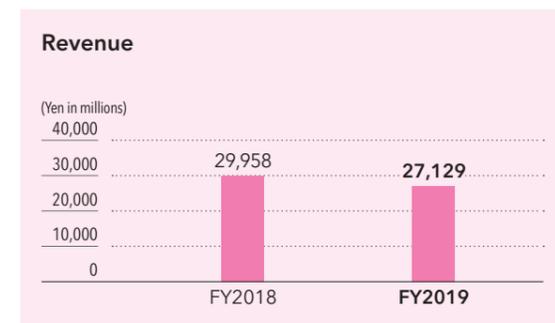
supply and demand balance has greatly changed as panel manufacturers' supply capability expanded. In such an environment, the Group focused on the high-value-added domain in such application. Royalty income from technology licensing of general polarizing films was partly posted in the

# Segment Information

## Life Science

Main products: Medical-related products

### Operating Results



The life science business posted final revenue from a customer's suspension of new drug development in the nucleic acid medicine contract manufacturing in the previous fiscal year. Due to this, the result for the year under review did not reach that of the previous year. Revenue, however, is on a recovery trend to cater to the needs of the steadily growing nucleic acid medicine market. In addition, as for transdermal absorption tape formulations, atypical antipsychotic agent LONASEN® Tape, which the Group jointly developed with Sumitomo Dainippon Pharma Co., Ltd., contributed to this trend.

As for nucleic acid drug discovery, the Group is continuously working on a clinical trial of a drug for pulmonary fibrosis and intractable cancer.

As a result of the above, revenue dipped 9.4% to 27,129 million yen and operating loss amounted to 2,546 million yen (operating income of 1,920 million yen was reported in the previous fiscal year).

#### Issues to be addressed

In the life science business, the nucleic acid medicine market is expected to expand in the future, backed by an increase in themes for late-phase clinical trials and approval of new drugs. In this context, the Group will expand its share in

the contract manufacturing market by strengthening its manufacturing and technology development capabilities. For the drug discovery business, the Group will forge ahead with research and development as well as clinical trials of drugs in fields such as pulmonary fibrosis and intractable cancer in an attempt to develop them into new core businesses. The Group will also work with Sumitomo Dainippon Pharma Co., Ltd. to expand sales channels and ensure a stable supply of atypical antipsychotic agent LONASEN® Tape, which was launched in September 2019. Please note that these clinical trials may be postponed should the impact of COVID-19 spread further.

#### Research and development activities

For pharmaceutical products, an atypical antipsychotic was approved by the regulatory authority in June 2019.

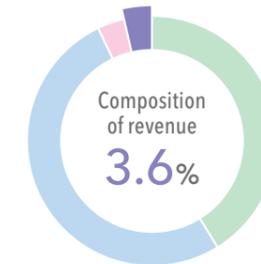
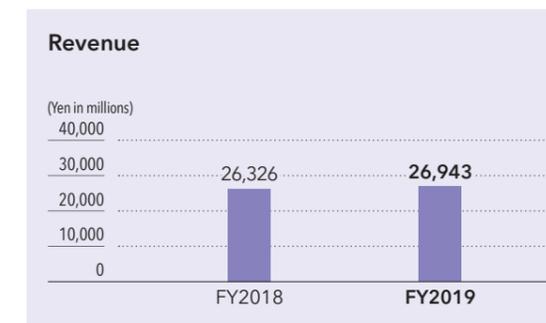
Commercial production was subsequently started and the product was launched in the Japanese market by Sumitomo Dainippon Pharma Co., Ltd. in September.

For medical and hygiene materials, we have promoted the development of business in new domains and the expansion into new markets and regions by strengthening the framework for external partnerships over and above existing partnerships with other business sectors/divisions within the Group.

## Others

Main products: Membrane products, other products

### Operating Results



For membrane products (polymer separation membranes), demand for industrial applications for seawater desalination and environmental measures was steady. Also, in the field of energy, demand for new nanofiltration membrane for water injection used in oil drilling grew.

Please note that this segment includes new businesses that have yet to generate sufficient levels of revenue.

As a result of the above, revenue increased by 2.3% to 26,943 million yen and operating loss amounted to 2,782 million yen (operating loss of 1,970 million yen was reported in the previous fiscal year).

#### Issues to be addressed

For membrane products, the Group will streamline its operations, which include automation of its production processes, while strengthening its business foundations. Aiming to grow new businesses in the fields of energy and environment, the Group will work to increase profitability. For new businesses, the Group will aim to bring products currently under development, including plastic optical cables, to the market as soon as possible.

#### Research and development activities

A treatment process designed to remove all the effluent and wastewater, zero liquid discharge (ZLD), is bringing about a change in the global water environment. At the Shiga Plant, where we manufacture reverse osmosis (RO) membranes, we verified technology for recycling effluent and wastewater and launched a set of products for recycling purposes in fiscal 2019. We will utilize our separation technology to promote recycling of water resources, while at the same time coming up with new products that are meant to meet social needs.