

Delivering next.

# Implementing Value Creation

—Reform of Our Profit Structure

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**Masatoshi Kamada**

Director and Managing Executive Officer

**Tamotsu Isobe**

Director and Executive Officer

## A dual-director sales structure Further strengthening the growth strategy and human resource development

The new management structure adopted in June 2024 for the sales division puts two directors in charge of sales. The directors discussed what the new structure is intended to accomplish, the key points for strengthening the sales structure, and the steps needed to achieve further business growth.

### The objective of the new system and progress with digital marketing

**Kamada** ● I would like to start by saying that the new sales structure is a manifestation of our determination to build on our superior name recognition and on-site capabilities across a range of industries and to add more precision to how we approach our customers. Another objective is to have a management structure that allows both of us to make full use of our expertise in the Company's business areas. In fiscal 2023, the **ACE 2.0** Medium-Term Management Plan's four quadrants of Foundation, Focus, Development, and Improvement in the business portfolio were reorganized by business function to clarify areas with potential for high growth and high profit. I am in charge of the semiconductor field, and Mr. Isobe is in charge

of the food and life sciences fields. He is also in charge of the biotechnology field, which is the core of the Development quadrant, as well as the overall R&D function. Under this structure, our mission is to set a direction for each business and prepare for the next medium-term management plan by laying the groundwork for growth and developing human resources.

**Isobe** ● We are tasked with directing cash generated by our trading function to the Focus and Development quadrants, which is a key part of the **ACE 2.0** plan to reform the profit structure. In my role overseeing the food, life sciences, and biotechnology fields, I will be particularly involved in coordinating the trading company, manufacturer, and R&D functions to create new value.

**Kamada** ● Lately, an increasing number of clients have been telling us that they look to NAGASE not just to provide products and services, but also to be a strategic partner on the business management level. We have been creating stronger connections across our organization so we can be an even better partner for our clients. The two of us now being in such close contact puts us in a better position to communicate horizontally across the business divisions, which will broaden the scope from which we can develop solutions. The ability to

leverage NAGASE's full range of capabilities vastly enhances our ability to provide solutions to our clients.

**Isobe** ● That is absolutely true. Consolidating and reducing the 11 divisions down to 7 in the fall of 2023 makes it easier to connect not just horizontally but vertically as well.

**Kamada** ● The cloud-based marketing automation (MA) and customer relationship management (CRM) tools introduced to facilitate our inter-organizational collaboration are now also being used at our business sites and to integrate our website platforms. In fiscal 2024, we started training employees and linking the MA and CRM tools so our data assets can be better utilized throughout the organization and our digital marketing can be made even more effective.

### The importance of strengthening on-site capabilities and setting challenges

**Isobe** ● As we have progressed with restructuring the organization and reforming the profit structure, developing our sales personnel has become increasingly important. Online business negotiations became both common and efficient during the roughly three years of the coronavirus pandemic. At the same time, new challenges arose for human resource development.

**Kamada** ● That's true. For example, our clients' final decisions are made by the organization rather than an individual person. When building a relationship of trust with a manager with the authority to make decisions, some things can't be done online. On-site, in-person skills will be crucial when visiting and talking with clients, conducting the necessary examinations and analysis, and presenting to clients what we see as the issues they are facing. We need to develop human resources with the on-site and digital marketing capabilities mentioned earlier and who can then use those skills to match the NAGASE Group's abundant functions to our clients' needs and create new business opportunities.

**Isobe** ● Once when you were my supervisor, you asked me, "Is that issue the real issue?" That made me realize that even if you've identified an issue that the client isn't aware of, searching for a solution for it is a waste of time if it's not part of the real problem. To this day, I keep that question in mind.

**Kamada** ● That question also applies when identifying and choosing issues to address inside the NAGASE Group. He's now an advisor, but when Hiroshi Nagase was the president about 15 years ago, he recognized that the Company had a problem and said, "Our business, which relies on petrochemicals, will eventually become very difficult." That problem was addressed by the decision to add the function of manufacturing naturally-derived materials, which led to adding the current Nagase Viita to the Group in 2012. With decarbonization now a standard part of corporate management, Nagase Viita is leading the Group's sustainability efforts. I think that's an example of identifying the real issue. It's essential to put in the time and work to ensure you have carefully identified and verified the actual issue, whether it's for business with a client or for the Group's transformation. This is also important when developing sales personnel.

### The next medium-term management plan growth strategies

**Isobe** ● Investors have been taking notice of your business growth strategy for the semiconductor field.

**Kamada** ● Our starting point is Nagase ChemteX, which commands top market share in liquid encapsulant materials for semiconductors. We are also investing to expand production capacity, increase our production sites, and develop technologies in anticipation of the growing use of AI. Nagase & Co., Ltd. has been selected as one of the companies that will handle transportation of materials for Rapidus Co., Ltd., which is constructing a factory to manufacture advanced semiconductors in Hokkaido. The supply network will encompass over 100 suppliers, and we plan to continue strengthening that network and leverage it for new investments in the future.

**Isobe** ● In the food and life sciences fields, our priority will be on early implementation of strategies in the Foundation quadrant. We are also continuing our search for a "diamond in the rough" that President Ueshima is so strongly emphasizing because R&D of materials has the potential to produce earnings drivers in the medium and long term. In the Development quadrant, we plan to combine the Nagase Bio-Innovation Center, which is the Group's bio-infrastructure research base, with the Nagase Viita's basic research function beginning in 2027. Combining Group human resources and facilities will generate synergies and enable us to develop new materials into core businesses as we did with the unusual amino acid ergothioneine. We are also currently exploring several investment directions for the food and life sciences sectors.

**Kamada** ● As you execute your strategies and increase profits, is there anything in particular that you are paying attention to?

**Isobe** ● Yes. I want to carry forward the good aspects of NAGASE's history and corporate culture, while actively pursuing new directions.

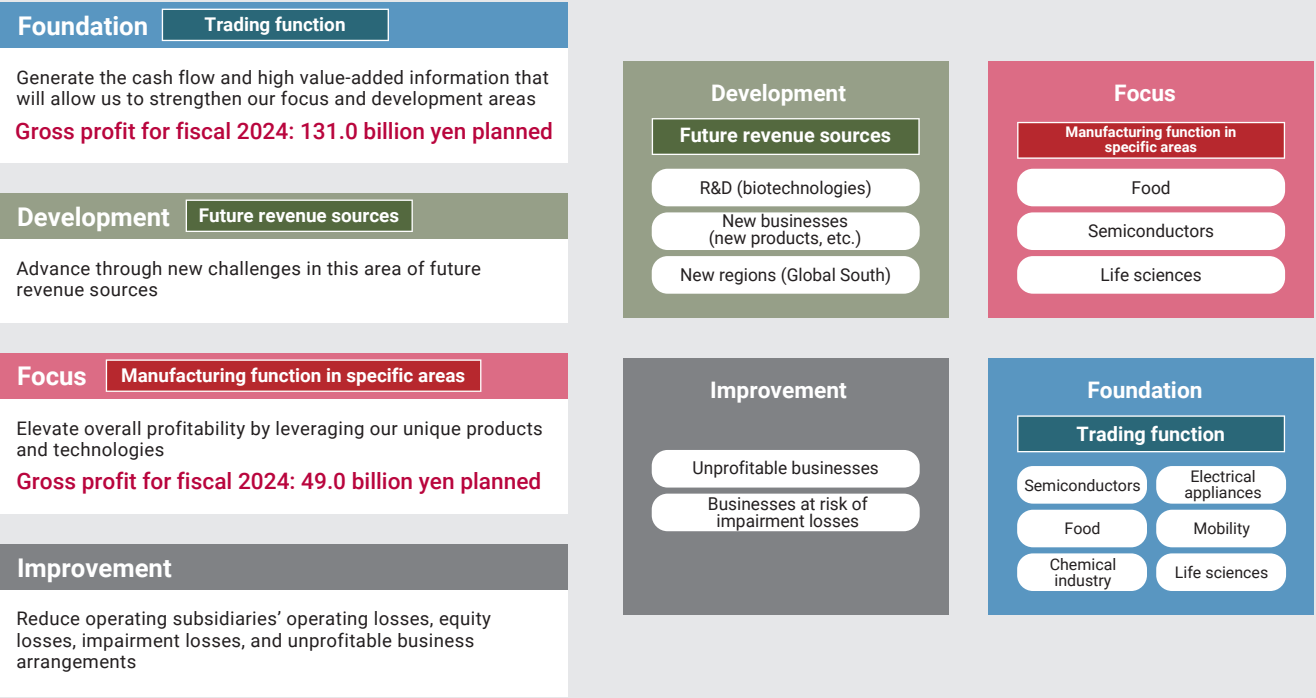
**Kamada** ● I would add being aware of sustainability as we grow our business. Providing solutions for social and environmental issues in a way that only NAGASE can will also increase our ability to make profits. I would also add employee engagement. Inside the company—and we don't say this outside the company very often—we often say that our managers can always count on employees to speak their minds. In a way, this reflects the quality of the engagement in the relationship between the Company and our employees, or the NAGASE style.

**Isobe** ● When I worked with you, whether you thought of me as "reliable" or not, you always believed in me and trusted me. As a director, I want to delegate as much authority as possible to people at the work sites and create a positive environment where everyone is comfortable and confident doing their work. I believe that will lead to the NAGASE Group continuing to earn the trust of society and create employees that are eager to contribute to the Group's success.

# Reform of Our Profit Structure

The key to profit structure reform is to secure and redeploy management resources to maximize efficiency. Specifically, from the standpoint of efficiency and growth potential, we have classified businesses into four quadrants: Improvement, Foundation, Development, and Focus, and are executing strategies according to each area.

## Reorganizing each of our business domains along the lines of our trading, manufacturing, and R&D functions



## List of topics in the “Integrated Report 2024”

Topics			Page	
Foundation	<ul style="list-style-type: none"><li>Roles and strengths of NAGASE's trading businesses</li><li>Issues in FY2023</li><li>Selected as Rapidus Corporation's transportation coordinator</li></ul>		P.32	
	Area	Social issues and needs	Topic examples	Page
	Food (manufacturing function)	<ul style="list-style-type: none"><li>Increasing health consciousness globally</li><li>Awareness of food waste issues</li></ul>	<b>Prinova Group</b> <ul style="list-style-type: none"><li>Strengthening of contract manufacturing function in the nutrition business</li><li>Essential oils distillation company</li></ul>	P.37
	Semiconductors (manufacturing function)	<ul style="list-style-type: none"><li>Growing demand for cutting-edge semiconductors</li><li>Decentralization of manufacturing facilities driven by economic security concerns</li></ul>	<ul style="list-style-type: none"><li>Contributing to sustainability in the semiconductor industry</li><li>Liquid molding compound for cutting-edge semiconductors becoming industry standard</li></ul>	P.33- P.36
Focus	Life sciences (manufacturing function)	<ul style="list-style-type: none"><li>Aging societies and increasing health consciousness</li><li>Increasing awareness of sustainability</li></ul>	<ul style="list-style-type: none"><li>Providing solutions in biopharmaceuticals</li></ul>	P.37
	Area	Topic examples		Page
	R&D (bio-materials) Establishing new businesses Developing businesses in the Global South	<ul style="list-style-type: none"><li>R&amp;D: Ergothioneine contributing to extension of healthy lifespans</li><li>R&amp;D: Development of bio-derived, super-absorbent polymers</li><li>New business: Starting initiatives to discover new businesses (corporate venture capital)</li><li>Global South: Efforts around India, Indonesia, Mexico, and Brazil</li></ul>		P.38- 39
Development	Recent results			Page
	Moved forward by reducing unprofitable businesses and impairment losses	<ul style="list-style-type: none"><li>Progress of our initiatives in FY2023</li><li>Strengthen monitoring points</li><li>Actual past withdrawals</li></ul>		P.40
Improvement				

# Initiatives in the Four Areas of “Foundation,” “Focus,” “Development,” and “Improvement”

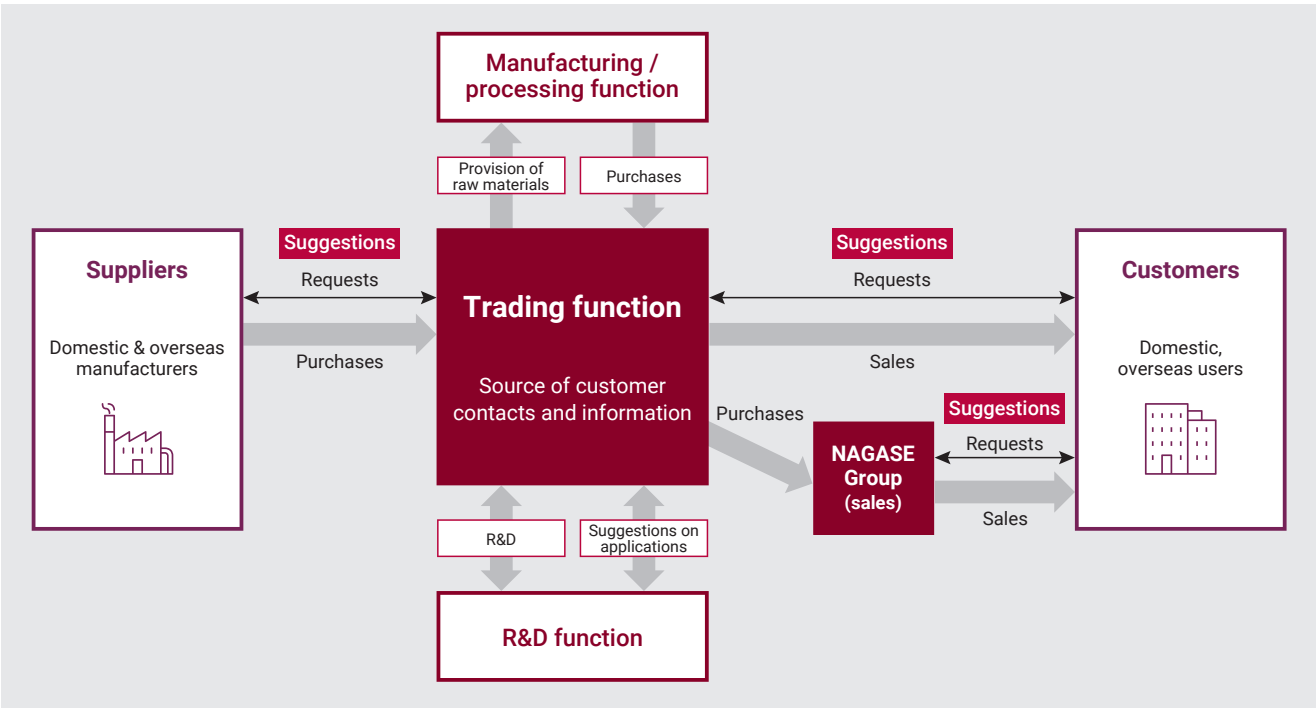


## Roles and strengths of NAGASE's trading businesses

NAGASE is a unique corporation in that it has the functionalities of trading, manufacturing, and R&D. Our trading function, in particular, is positioned as our “Foundation” and is the source of cash, connections with customers, and information. We gather customer feedback and needs, and dig up new business opportunities by providing materials and services in the following five segments: Functional Materials, Advanced Materials & Processing, Electronics & Energy, Mobility, and Life

& Healthcare. This dedication indicates the maximum effect at each worksite, and it creates new value in the Group when all functions are operating at maximum capacity.

Also, in addition to credit and inventory management, we provide a steady supply of materials and contribute to securing the supply chain for business partners' production systems facing diversification due to regulations of chemical products.



## Initiatives leveraging our strengths as a trading company

Nagase & Co., Ltd. was selected as one of the service coordinators organizing transportation of the semiconductor materials to semiconductor plants built in Chitose City, Hokkaido by Rapidus Corporation, who aims for domestic production of cutting-edge semiconductors. We gather the materials received from each supplier at a terminal site, and support centralized transportation from the mainland Honshu to Hokkaido. Our environmentally-friendly transport scheme is well received, including the network we have built as a dedicated chemicals trading company, our expertise in chemicals, and the solutions ensuring safe transportation of dangerous items. (For more details, see P.35.)

## Issues in FY2023

### [Distribution function system]

- Optimization of working capital through proper inventory management
- BCP response for potential supply chain disruption due to heightened geopolitical risks
- Proper response to the “2024 Problem” in the logistics industry

### [Marketing function system]

- Provision of a steady supply chain in the face of reorganization of the domestic petrochemical industry
- Expanded sales of NAGASE Viita products using Prinova's global sales network
- Optimization of marketing reach and sales activities through digitalization



## Manufacturing Function Semiconductors

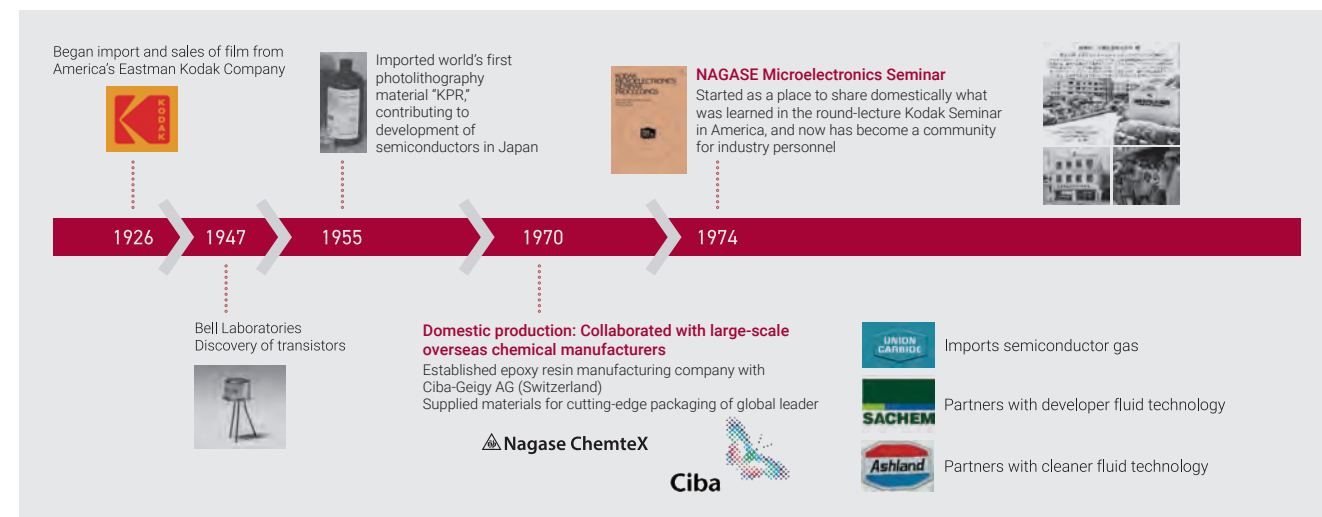
Semiconductors have evolved dramatically as a “digital technology” product that has become central to all industries. Having deep connections to such history, NAGASE is moving toward further advancement and seeking to contribute with novel solutions in the industry as we combine our Group trading function with our manufacturing function.

### NAGASE’s history with Japan’s semiconductor industry

The semiconductor industry in Japan began when NAGASE Group established a joint venture company as a sole agent for America’s Eastman Kodak Company (currently Kodak) and started importing video film that would later be used for semiconductor photolithography technology.

Starting in 1974, NAGASE began holding the “NAGASE

Microelectronics Seminar” for domestic corporations related to semiconductors with the aim of improving semiconductor technology. This study seminar, in which cross-disciplinary efforts are made across industries in order to enhance the whole of the semiconductor industry, was held for the 44th time in FY2023.



### Connections with the full value chain

As a manufacturer and supplier of both materials and equipment, NAGASE expands globally while connected to the full value chain in the semiconductor industry and has carved its unique position. (See chart below.)

It is because the Company has manufacturing

functionality within the Group, that we can solve critical multi-stage problems and rapidly respond to changing customer needs or technological trends. Moving toward our customers’ “next,” we improve the surrounding processes and involve relevant parties when offering suggestions.

#### Silicon Wafer Process – Pre Front End

Ingot	Slicing	Lapping	Etching	Edge Polishing	Polishing	Cleaning	Sorting Packing
Poly Puler Mainte	Wire Coolant	Powder Coolant	Chemical	Tool Tape	Slurry Pad	Machine Cleaner	Tools Clean Bag

#### Semiconductor Device Process – Front End

Water	Mask	Litho	Wet	Etching	CMP Cleaning	Inspection	Sorting Packing
Water Reclaim	Mask Pellicle	PR Gas	Wet Chemical	Tool Chemical	Slurry Brush Cleaner	Machine	Tool Wafer Case

#### Advanced Packaging Process – M&B End

Carrier	Temporary Bonding	Molding	RDL	E-less plating	Bumping	Bonding	Probing	Tools
Glass Carrier	TBA/TBF	LMC ETFE Film	Subcon Service Polyimide	E-less Plating	Solder Ball Placement Electro Plating	LAPLACE-FC	Probe Card Cleaning Sheet	Wafer Handling Tools

Number of business partners as a chemical trading company

Approx.  
**18,000**  
companies

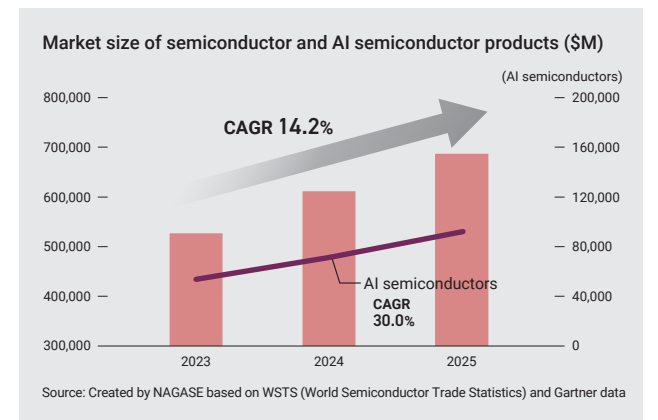
Number of semiconductor-related business partners

Approx.  
**300**  
companies

### Becoming a partner that solves industry issues through “sales” and “technology” capabilities, supporting greater business growth

As the movement in the semiconductor industry greatly impact other industries in our digital society today, the global situation will likely destabilize, and demand for semiconductors, or “international strategic resources” will rise even higher in the future. Amid the industry’s environmental changes, NAGASE has technological capabilities backed by a solid track record, as well as its comprehensive network and sales capabilities typical of a trading company. As we examine growth areas and leverage our Company’s strengths (resources), we create products that become the de facto standard in fields with high competitive advantages.

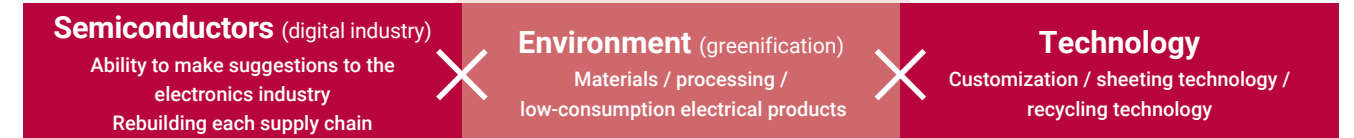
We support the industry with the entire Group, and aim to build a robust, trustworthy relationship as an indispensable partner for business growth.



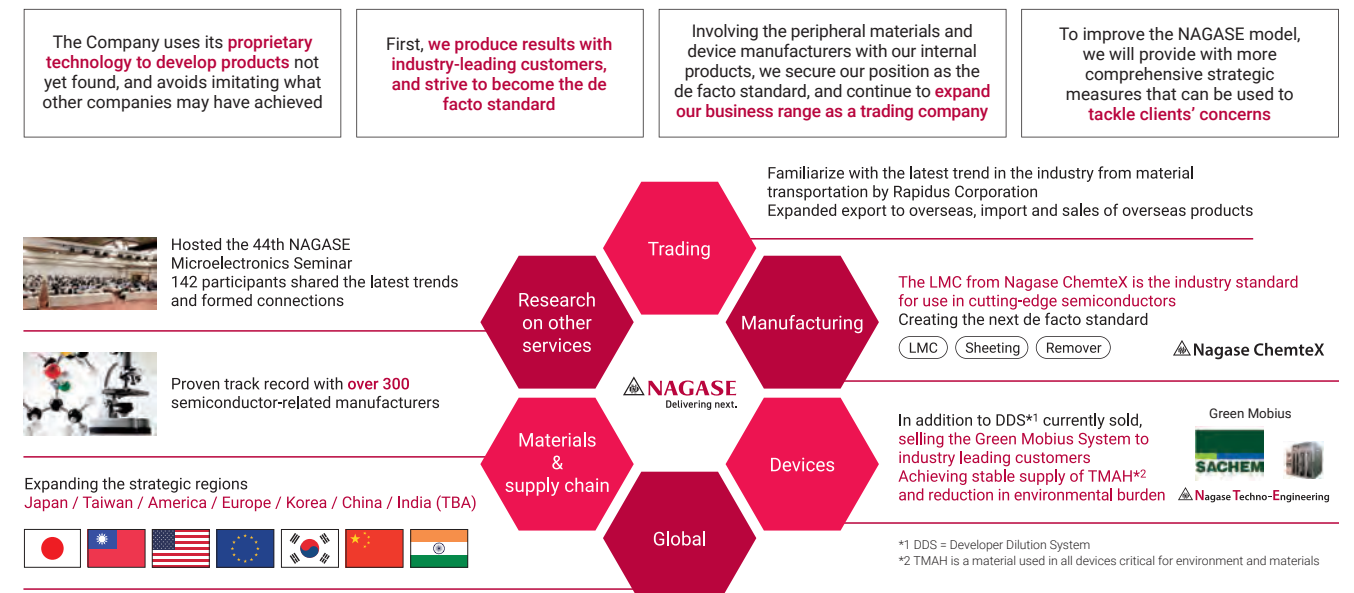
#### Issues in the semiconductor industry

- Growing importance of semiconductors (growth of IoT, advancement in communication technology, etc.)
- Economic security (geopolitical risks ⇒ local production and consumption needs, rebuilding the supply chain)
- Technology trends, such as Chiplets
- Environmental regulations, recycling (changes in products handled)

#### NAGASE’s value provided



#### Strengths (resources) and strategies behind the value offered by NAGASE



Development	Focus
Improvement	Foundation

## Manufacturing Function Semiconductor-related

### Promoting industry development through industry standard technology

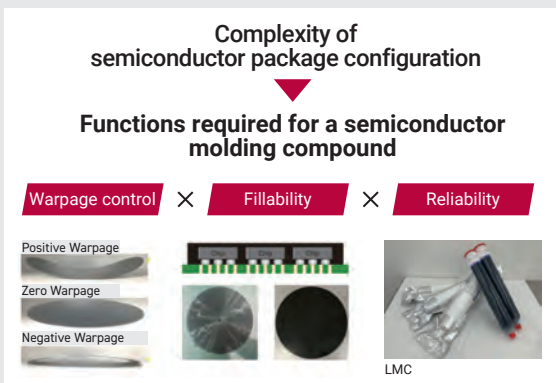
#### Solving problems in packaging for cutting-edge semiconductors Epoxy molding compounds

##### Solving problems in packaging for cutting-edge semiconductors Epoxy molding compounds

In 1980's, Nagase ChemteX (then Nagase-CIBA, Ltd.) introduced the technology for processing epoxy resin into a liquid encapsulant to Japan. Since then, it was applied in a wide variety of forms and uses, such that Nagase ChemteX's liquid molding compound now occupies a large share in cutting-edge semiconductors and has become the de facto standard (industry standard.) In addition to a liquid form, we succeeded in forming a sheet molding compound in the year 2000, achieving a lower manufacturer burden in the form of improved processes and reduced costs, thereby contributing to the development of the semiconductor-electronics industry through advanced manufacturing technology.

#### Now is the time to shine! “Formulation technology” and “reliability”

To handle the increasing complexity of semiconductor packaging such as growing needs for 3D stacking, etc., the better formulation technology for molding compounds (see diagram below) will be in greater demand onwards. NAGASE will continue to provide a diverse array of solutions, based on the reliability and success in creating products that handle various customer issues and become industry standards. In addition to liquid molding compound (LMC), which currently holds a high market share, moving forward, we are going to devote energies to the business of developing a sheet molding compound (a-SMC) as a new concept to solve issues such as uniform molding and larger sizes.

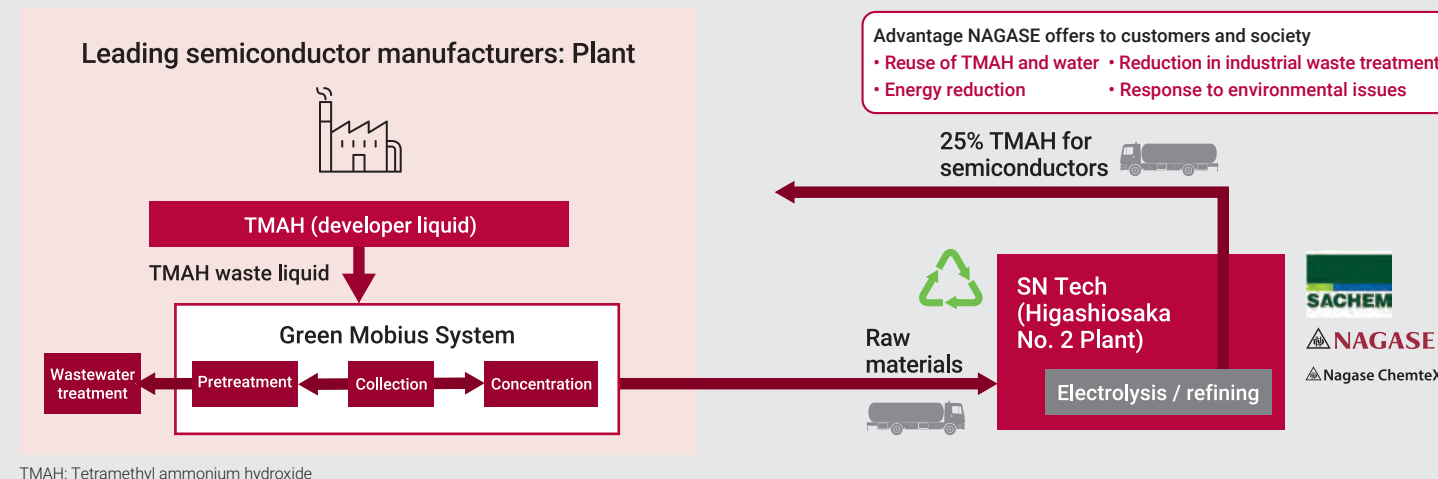


### Contributing to industry sustainability

#### A new environmentally friendly business system

##### Developer liquid recycling (Green Mobius System)

A chemical substance that is essential in the process of manufacturing semiconductors, TMAH is a high-purity developer that is used when forming circuits. Up until now, this developer has conventionally been treated as industrial waste when used for semiconductors, but NAGASE is working to recycle used developer by enhancing developer electrolysis and refining technology originally used for manufacturing LCD panels by SN Tech Corporation, a company formed as a joint venture with Sachem Inc. in America. This business of collecting and recycling semiconductor developer liquid as a product for reuse in



the semiconductor manufacturing industry is the first of its kind in Japan and one of the forerunners globally. Recycling contributes to stable procurement of developer, as well as to improved profitability in terms of cost competitiveness and the realization of an environmentally friendly business.

#### “Catalase” —an enzyme contributing to wastewater treatment at semiconductor plants

In the cleaning stage of semiconductor manufacturing, hydrogen peroxide and other chemicals are used as cleaning solutions. As the semiconductor market has grown in recent years, the amount of wastewater from the cleaning process

has also increased, so more attention is being paid to the enzyme catalase, which breaks down hydrogen peroxide contained in the wastewater. The catalase manufactured as a product by NAGASE's unique biotechnology is also seeing increased demand, as it supports semiconductor manufacturing plants as an enzyme which efficiently treats a great volume of wastewater in comparison to processing by chemical products.

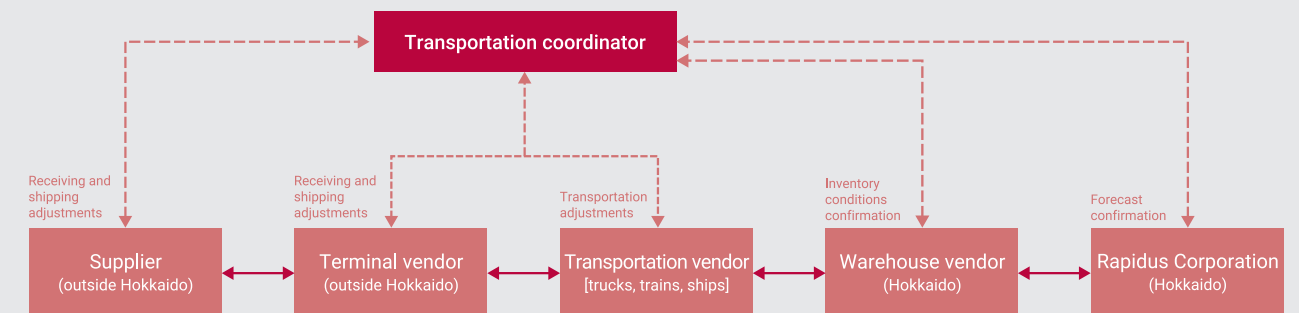
#### “Flux sheet” —daring to create a new industry standard using sheeting technology

Nagase ChemteX is developing the non-epoxy product “flux sheets,” as a new effort utilizing our epoxy sheet technology and production facilities. Flux is an auxiliary material that removes the oxidized layer and allows for easier conjoining when soldering semiconductors or electronic parts to the circuit board. Conventionally, it comes as a paste, but by making it a sheet, it should not only shorten the customer's production process and improve SMT yield, we also expect it to be applicable to small diameter soldering in cutting-edge devices. Also, it can be cleaned with water, so we expect it to decrease the environmental burden when it replaces flux cleaned with solvents. Since flux sheets require suggestions starting from the construction method, this effort to create new value-add is ideally suited to NAGASE, who is thoroughly knowledgeable in devices and processes as a trading company.

#### Business as a transportation coordinator supporting domestic production of semiconductors

##### Supporting the logistics industry through know-how and network as a chemicals trading company

Nagase & Co., Ltd. was selected as one of the service coordinators organizing transportation from the mainland Honshu to Hokkaido for semiconductor materials headed to semiconductor plants (IIM) built by Rapidus Corporation in Chitose City, Hokkaido. Rapidus Corporation is a semiconductor manufacturer who aims for domestic production of cutting-edge semiconductors of size 2 nm, which are critical for next-generation industries such as self-driving and AI. NAGASE, as the coordinator for transportation of main materials necessary for manufacturing semiconductors, gathers the materials received from each supplier at a terminal site, and supports centralized transportation from the mainland Honshu to Hokkaido.



#### Strengths in the logistics industry

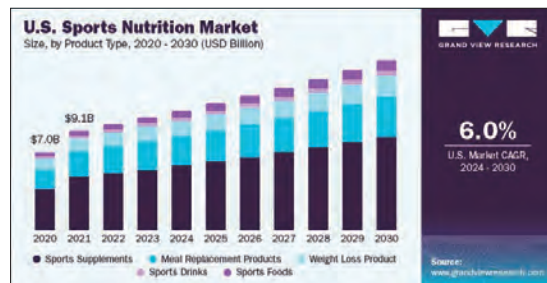
Dangerous flammable chemical substances and high-pressure gases are used in the process of manufacturing semiconductors, and they are forbidden by JR freight terms and conditions to be transported through the Seikan Tunnel connecting Hokkaido and Honshu.

NAGASE collaborates with Senko Nagase Logistics Co., Ltd., a Group company with rich experience in transporting dangerous substances, and other merchant ship operators, as we offer suggestions for more efficient, safer, and more environmentally friendly transportation methods.

## Manufacturing Function Food

### Full operation of contract manufacturing of stick pack products in our nutrition business in America

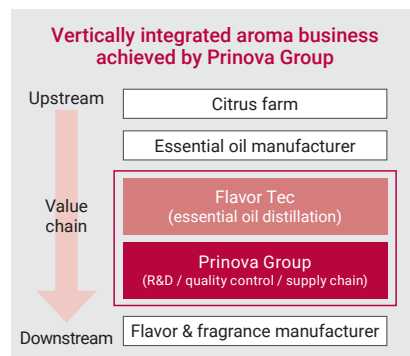
As the market for sports nutrition (sports nutrition-assisting foods) grows globally, Prinova Group is strengthening its contract manufacturing function as a strategic base for its food ingredient business in Europe and America. In particular, as powdered drink, which are highly in demand, stick pack products are gaining attention because the amount for one serving is clear, making measuring unnecessary, and they are easy to carry. So, in July 2024, Prinova Group began full operations of contract manufacturing through Prinova Nutrition, a subsidiary of Prinova Group. Prinova Group will ensure its position in the stick pack product market by aggressively approaching this area in the contract manufacturing field which is expected to grow markedly.



\*Reference: Grand View Research

### Acquisition of an essential oils distillation company to achieve a vertically integrated business in the aroma business

In June 2023, Prinova Group acquired Flavor Tec - Aromas De Frutas Ltda, a Brazilian essential oils distillation company. By acquiring this company involved in high-quality concentration and distillation in the citrus oils field, Prinova Group is realizing a vertically integrated business, from raw material processing to sales, in the aroma business. Also, by strengthening our essential oils processing technology and enhancing quality of procured raw materials, we are strengthening our sales and ability to offer suggestions to customers in the aroma business not only in the Brazilian market, but also globally. By working on distillation in South America, the world's largest citrus producing area, Prinova Group is able to greatly reduce logistics costs and the environment burden of transporting raw materials, and thereby offer sustainable solutions.



## Manufacturing function Life sciences

### Solutions in biopharmaceuticals

#### “SOLBIOTE™”—injectable-grade saccharide pharmaceutical excipient

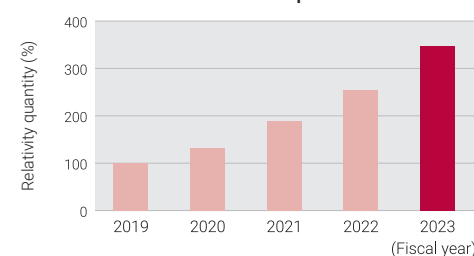
In recent years, pharmaceutical development has shifted the focus of new drug development from traditional small molecules to complex molecules (such as peptides, proteins, and antibodies). Particularly in regards to cancer treatment, there has been global acceleration in the development of biopharmaceuticals based on antibodies. One major problem in this area is maintaining consistent quality when storing these pharmaceuticals. As demand for biopharmaceuticals has grown in recent years, sales of TREHALOSE SG, an injectable-

grade saccharide pharmaceutical excipient developed and manufactured by Nagase Viita, which is a manufacturing subsidiary of the Group, have been on the rise as it can contribute to consistent quality. To strengthen marketing for the biopharmaceutical market, which is expected to grow into the future, we have established the injectable-grade saccharide pharmaceutical excipient brand “SOLBIOTE™” and are devoting efforts to increasing sales of series products TREHALOSE SG and MALTOSYL PH. By contributing to the stabilization of proteins in biopharmaceuticals of anti-cancer drugs and immunoglobulin preparation, etc., these products stabilize the quality of the pharmaceuticals themselves, reducing the impact on quality of storage and transport of the pharmaceuticals, for which strict temperature control is needed. This leads to easier storage and transport and ultimately contributes to the steady provision of pharmaceuticals.

#### Low endotoxin material and endotoxin removal service

Endotoxins are included in the raw materials of the cell cultures of pharmaceuticals, medical equipment and regenerative treatment, but can cause fever and shock reactions when present in the human body. NAGASE not only sells low endotoxin materials, we also offer endotoxin removal services.

#### Trend in amount of sales of focus product “TREHALOSE SG”



## R&D Bio

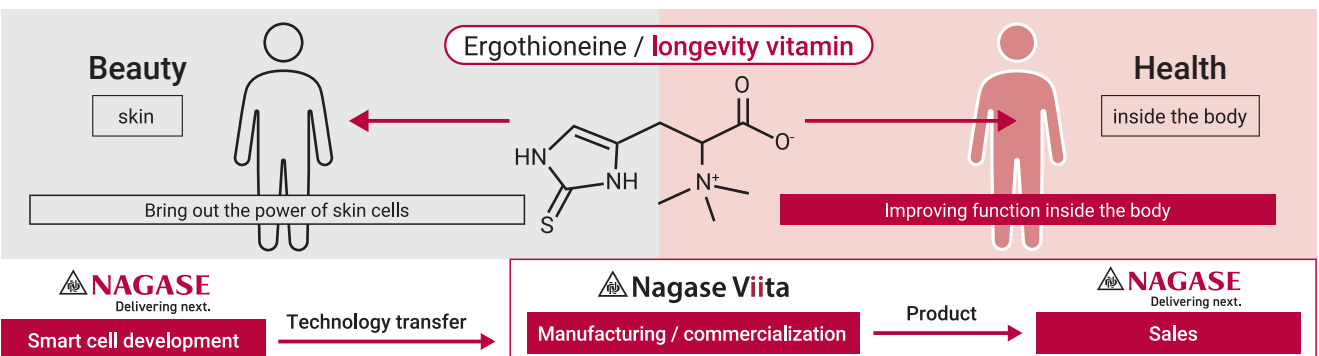
### Commercialization of the longevity vitamin ergothioneine

Present in fungi in small quantities, ergothioneine (EGT) is a rare natural amino acid that improves brain function and has a strong antioxidant effect. As a next-generation functional material, it is expected to have a wide range of applications, including treating the symptoms of neurodegenerative diseases (such as Alzheimer's disease and Parkinson's disease), depression, skin aging (wrinkles and spots) due to UV light, and cataracts, as well as controlling glycation stress. EGT cannot be produced in the human body, and it decreases with age and with stress. EGT is difficult to naturally extract with high purity and leaves a large environmental

footprint when chemically synthesized so there were issues with commercialization.

In 2020, Nagase Bio Innovation Center, which possesses its unique fermentation technology as a NAGASE R&D base, succeeded in raising the production of EGT about 1000x over the conventional method using smart cell technology (biosynthesis technology that artificially maximizes the substance production capability of cells.)

Currently, we are utilizing developed production strains as we work for it to be ready for market in the cosmetics field. Going forward, the NAGASE Group will keep in mind its expansion into the food industry, as we continue to contribute to extending healthy lifespans across the world by utilizing biosynthetic technology to create in an environmentally friendly way.



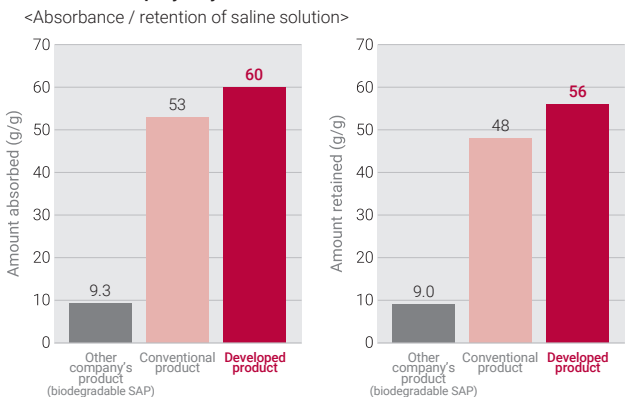
### Initiated joint development to commercialize bio-derived superabsorbent polymers

Superabsorbent polymers (SAP) are polymer materials with high water absorbance that are used in various areas such as sanitary products (mainly disposable diapers and sanitary napkins), as well as agriculture products. However, existing SAP products had the issue of being environmentally unfriendly, because of the petroleum-derived and non-biodegradable materials used. Although efforts were made to develop SAPs using natural raw materials and with improved biodegradability, the creation of commercially viable end products proved difficult as water absorption was insufficient.

In February 2023, through a combination of Nagase Viita Co., Ltd.'s fermentation technology and Nagase ChemteX Corporation's resin manufacturing technology, NAGASE succeeded in developing a SAP with a higher ratio of bio-derived raw materials. Despite starch being the main raw material, this SAP has absorption properties that equal or surpass those of conventional products. Furthermore, in April 2024, a new SAP grade was developed, and testing by a third-party organization confirmed its biodegradability, qualifying it for marine biodegradability certification (over 90% degradation in the ocean in 180 days). The SAP developed at this new grade is expected to reduce fertilizer and save water as a water retention material for use in greenification or agriculture. Also, even if it is washed out to sea by rivers and streams, it will reduce the amount of residual plastic waste.

In May 2024, we began joint development toward commercialization of adult disposable diapers that are environmentally friendly, and we hope to have a product ready starting in 2027. Making environmentally friendly hygiene products that use high bio-mass SAP practical is just the leading case. We are also working to develop a sustainable product for nursing and treatment facilities, as well as drug stores, and ultimately to propose a recycling scheme that enhances the resource recovery efficiency of used disposable diapers.

#### Comparison with biodegradable SAP from other companies and conventional polyacrylic acid SAP



\* Absorption: Absorption (g) of saline solution per 1g of SAP [JIS K 7223-1996 Compliant]  
\* Retention: After the absorbance test, amount of saline retained after 90 seconds of dehydration of absorbing SAP at a centrifugal force of 150G  
\* Conventional product: polyacrylic acid SAP



## New Business Corporate Venture Capital

### Shaping corporate venture capital (CVC) to discover the seeds of new businesses

The Company has begun initiatives with CVC starting from fiscal 2023 in order to elevate our investment in start-up companies who have new business ideas, and to acquire a broad array of knowledge of cutting-edge technology and business models. The Future Co-creation Office, directly under the President, leads up these initiatives and is building a base for development of next-generation business.

In March 2024, using CVC, we formed a capital and business alliance with Piezo Sonic Co., Ltd., a start-up company who is advancing the business of developing, manufacturing, and selling ultrasonic motors and robots. Piezo

Sonic is improving its ability to manufacture ultrasonic motors and autonomous transport robots and strengthening its ability to develop in such fields as ultrasonic motors for vacuum environment in space. Through this investment, NAGASE is gaining knowledge in a field not covered by its existing businesses and deploying that knowledge in the creation of new business.

Furthermore, in July 2024, the Company decided to invest in A1A Inc., who provides data structuring services for quotations handled by the purchasing and procurement departments of corporations, and in Morgenrot Inc., who provides shared platform services and operation efficiency enhancement for HPC servers used in generative AI, etc.



## New Area Global South

In the area of “Development,” we are working to strengthen the next base by accelerating our investment of resources such as human capital in India, Indonesia, Mexico, and Brazil (the Global South), positioned as a new area expected to see continued growth moving forward.

### Latest initiatives in the Global South

India		Expanding the market in the area of electronics (Liquid crystals for cell phones, semiconductors, etc.)
Indonesia		Pioneering markets in the area of food (food materials) as population grows
Mexico		Strengthening on-site procurement in the area of mobility (establishing JVs for manufacturing motorization-related materials)
Brazil		Expansion of business region of aroma business (acquisition of essential oils distillation company) (see picture) in the area of food (food materials)



## Unprofitable Businesses Businesses at Risk of Impairment Loss



### Progress of our initiatives

We are working to ensure that future losses are as close to zero as possible. In the fiscal year 2023, we reduced over losses by approximately 3 billion yen compared to the previous year.

Regarding the assets of unprofitable operating subsidiaries and assets of concern for impairment loss, we have formulated and are implementing a concrete action plan for reducing losses, without eliminating the possibility of withdrawals or sales.

Targets for improvement	Initiatives
<b>1. Operating losses of our operating subsidiaries and equity losses of our affiliates</b> Rapidly formulate and implement improvement plans. Consider withdrawing from operations that seem unlikely to improve	• Withdrawal from color former business in America (liquidation of SOFIX LLC)
<b>2. Assets at risk of impairment loss</b> Strengthen monitoring of assets at risk of impairment loss and minimize that impairment	• Strengthen monitoring before concerns related to impairment loss become apparent
<b>3. Unprofitable business arrangements</b> List and monitor all dealings. Return business rights when improvement seems unlikely	• List individual unprofitable arrangements and improve profitability

### Strengthen monitoring points

For the following targeted businesses and items, the Company utilizes its conference bodies, with the corporate divisions and business divisions collaborating, as the Company aims to strengthen its monitoring.

- Improvement conditions related to deficits and unprofitable arrangements
- List of impairment loss concerns and preemptive countermeasures
- Improvement initiatives with consideration for business improvement settings and timelines

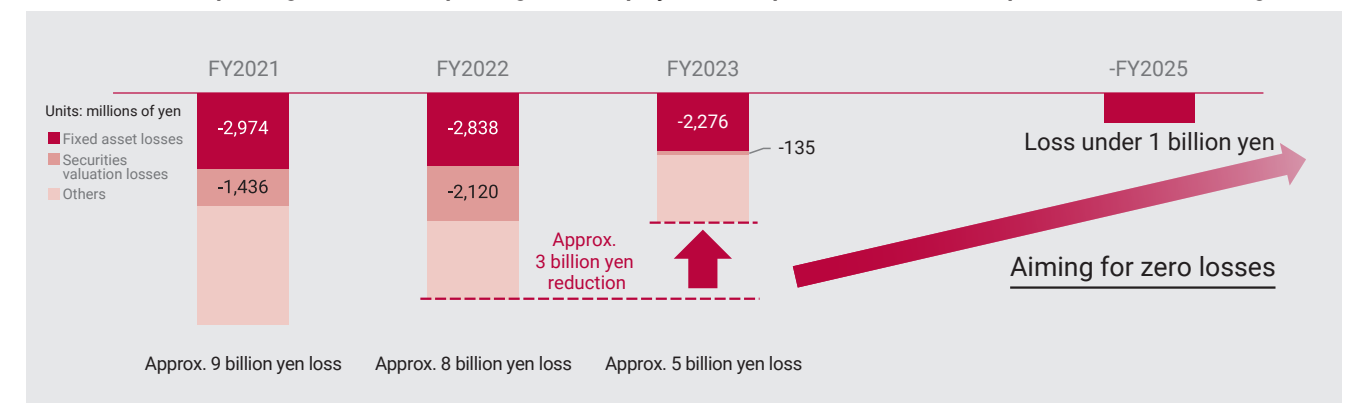
Regarding fixed assets and investment securities at risk of impairment losses, NAGASE clarified the items to be monitored by establishing criteria for listing. Furthermore, the supervising organization formulated countermeasures and plans for those items, and submitted them to the corporate division. By establishing and deploying this kind of monitoring process, we are working to prevent the emergence of losses in advance.

### Actual past withdrawals

In September 2023, NAGASE decided to dissolve the Sun Delta Corporation, an equity affiliate which was formed as a joint venture with the Asahi Kasei Corporation. Since its inception in 2005, Sun Delta Corporation provided business to meet market demands by combining the technology of Asahi Kasei Corporation with the network marketing of Nagase & Co., Ltd. However, as the business environment changed drastically, it became necessary to reevaluate business activities based on our initial goal. As a result, we decided to dissolve the corporation in order to optimize operations and more effectively utilize operating assets.

Additionally, in June 2024, we decided to withdraw from the U.S. color former business, liquidating SOFIX LLC, a consolidated subsidiary of NAGASE which primarily supplied the U.S. market as a color former manufacturing and sales company. Responding to changes in the business environment, such as oversupply across the whole market, NAGASE decided to withdraw based on our judgment that steady profits would be difficult to generate, and it would be better to reorganize our business portfolio given its strategy of growth.

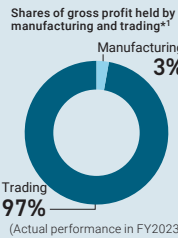
### Financial scale of operating subsidiaries’ operating losses, equity losses, impairment losses, and unprofitable business arrangements



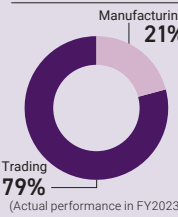
# List of Segments

Business segments

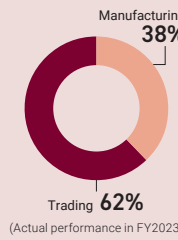
**Functional Materials**  
>P.43-44



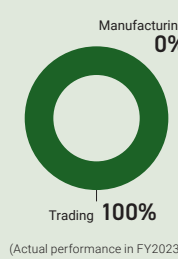
**Advanced Materials & Processing**  
>P.45



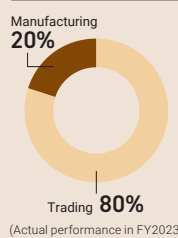
**Electronics & Energy**  
>P.46-48



**Mobility**  
>P.49



**Life & Healthcare**  
>P.51-52



Departmental initiatives

**Performance Chemicals Department**

The Performance Chemicals Department provides high-performance materials for a wide range of industries, including coatings, inks, paints, urethane, toner, textiles, paper-making, and LCD. It is also responding to customers' needs by developing sustainable products, demand for which is rapidly increasing, based on the key words "environment" and "bio," and by effectively utilizing the functions of the NAGASE Group as a whole, including manufacturing, R&D, and processing.

**Specialty Chemicals Department**

The Specialty Chemicals Department provides chemical materials, devices and processing services for the chemical industry, with a focus on semiconductor materials, oils and surfactants, organic synthesis, petrochemicals, polymers, etc. Playing an important role in the chemical industry's supply chain with an extensive network of business partners globally, and the knowhow obtained through handling over 10,000 product items, it is also developing new businesses with unique technologies, thereby helping to solve the issues of customers all over the world.

**Polymer Global Account Department**

With a well-developed sales network and experienced local staff in the Asia Pacific region, the Polymer Global Account Department works with global companies to sell plastic resins for a wide range of industries, including office equipment and the electrical and electronics industries. It is also focusing on eco-friendly businesses and providing environmentally friendly materials and services, such as recycled materials and biomass plastics.

**Electronics Department**

In addition to providing functional materials and their constituent components to the silicon wafer, semiconductor, electronic components and display industries, the Electronics Department is working with partner companies to develop products that align with market and customer needs.

**Advanced Functional Materials Department**

Nagase ChemteX Corporation's modified epoxy resins, developer, re-claiming of stripper, high-performance materials for 3D printing, etc., which are developed based on the company's formulation, compounding, precision cleaning, surface treatment and photosensitive materials design technologies, are sold both in and outside Japan, with key fields including the electrical/electronics industry, mobility, the environment, energy, semiconductors (photolithography and encapsulant materials), 3D printing and displays.

**Mobility Solutions Department**

The Mobility Solutions Department contributes to the realization of a safe, secure and comfortable mobility society by grasping the needs of the mobility industry, including automobiles, agricultural machinery, construction machinery and aircraft, and by offering diverse solutions through pursuing new technological innovations.

**Life & Healthcare Products Department**

In the pharmaceutical, medical, cosmetics, household goods, and food products (processed foods and nutrition) sectors, we provide a wide range of solutions throughout the world through the NAGASE Group's manufacturing, processing, procurement, logistics, research, application development and regulatory-related functions. The Life & Healthcare Products Department is striving to contribute toward the realization of healthy, enriched lifestyles.

Main products and services

**Performance Chemicals Department**

Resin raw materials, resins, solvents, pigments, dyestuffs, coloring matter, dispersion processing materials, various types of additives, urethane materials, release agents, conductive materials, functional sheets, films, adhesives, sanitary materials, and joint distribution matching services

**Specialty Chemicals Department**

Organic chemicals, inorganic chemicals, high-purity chemicals, various types of additives, polymers, bio-products, specialty epoxy resins, specialty acrylic rubber materials, polymer filters, enzymes, water treatment equipment, metal organic framework (MOF), and contract manufacturing matching services.

**Polymer Global Account Department**

Engineering plastics, commodity plastics, packaging materials and other plastics-related products and services

**Electronics Department**

High-precision abrasive materials, optical materials for displays, touch panel components, functional coating, conductive and insulating materials, adhesive and encapsulating materials, high-heat-resistant films, optical lenses, high-frequency devices, low dielectric materials, sensing modules, optical materials for XR, semiconductor and electronic device-related equipment

**Advanced Functional Materials Department**

Formulated epoxy resins and related materials, photolithography materials for flat panel displays and semiconductors, 3D printing-related materials

**Mobility Solutions Department**

Various plastics, functional paints, adhesives, lightweight components, decorative components, HMI components

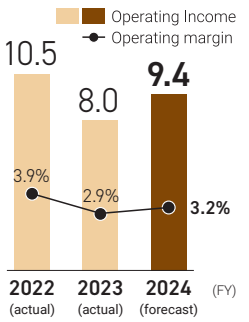
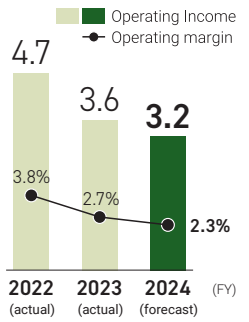
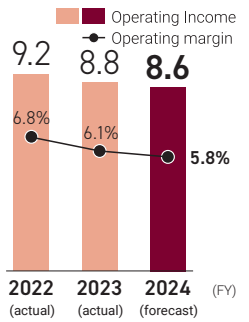
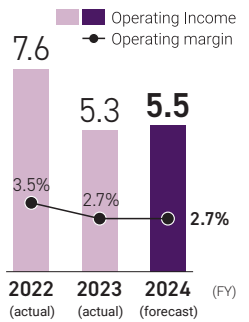
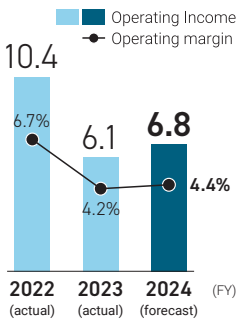
CASE-related:

xEV-related components, heat management components, battery materials, sensors, LiDAR devices, autonomous driving technologies

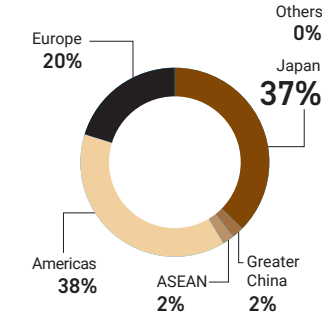
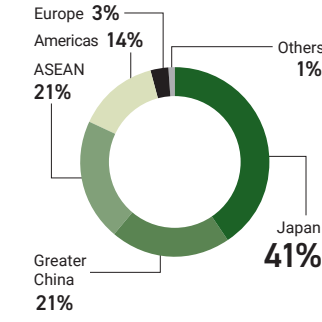
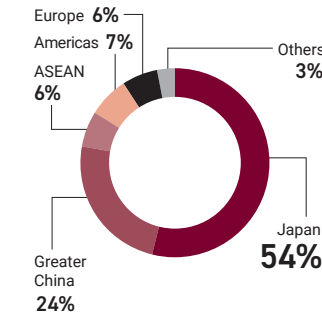
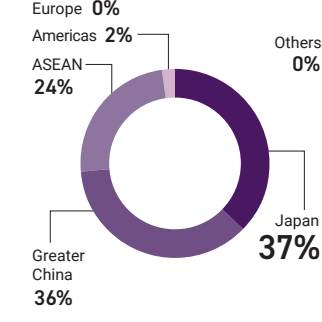
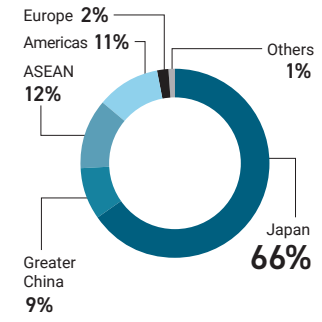
**Life & Healthcare Products Department**

Pharmaceutical products (APIs, additives, intermediates, and other materials), materials for in vitro diagnostics, raw materials for cosmetics and household goods (active ingredients, additives, emulsifiers, and fragrances), food ingredients (nutritional materials, functional saccharides such as TREHA™, glycosides, enzymes, and other processing aids), premix (OEM/ODM), materials for agriculture (including livestock raising) and fisheries, and endotoxin removal services

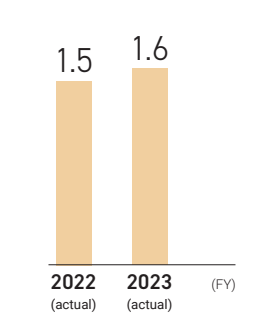
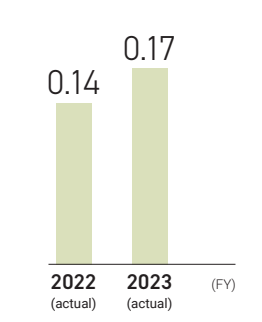
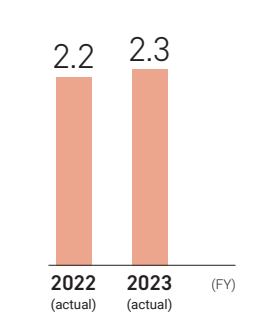
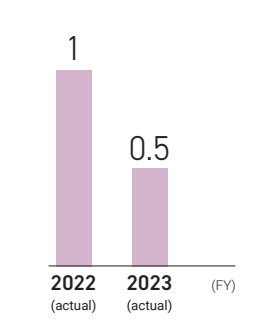
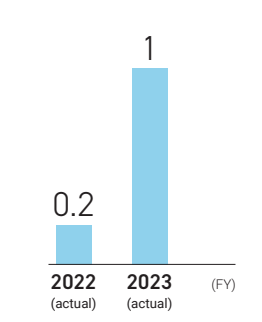
Operating income and operating margin (billions of yen)\*2



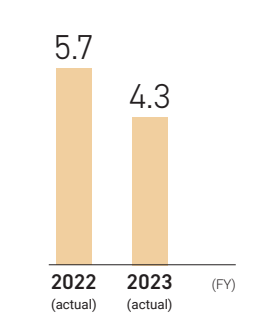
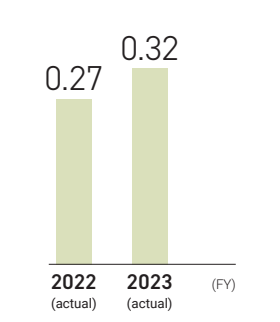
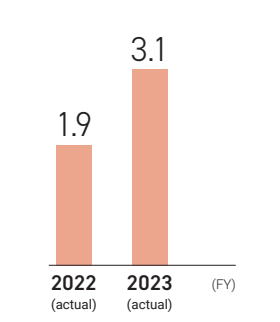
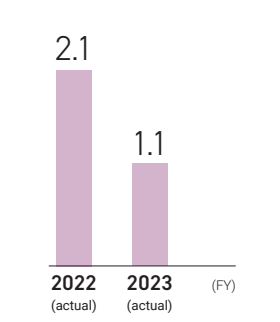
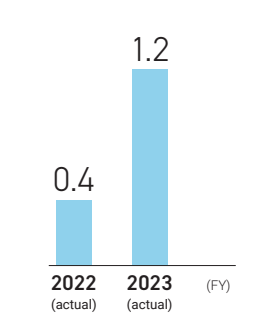
Gross profit by area



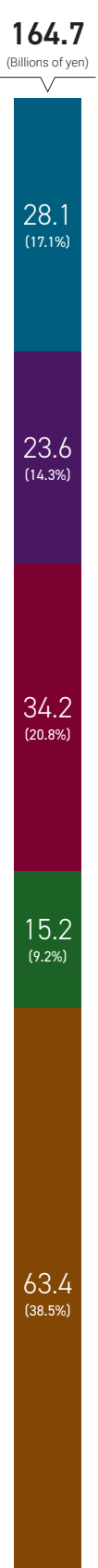
R&D expenses (billions of yen)\*3



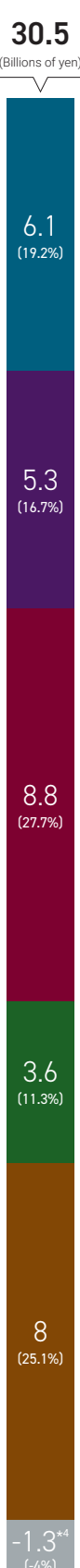
Capital investment (billions of yen)\*3



Gross profit



Operating income



\*1 The trading portion of gross profit includes Other/Corporate, and takes into account the effect of consolidated adjustments.

\*2 In order to realize more appropriate management of the reported segments, starting from the fiscal year ending March 31, 2025, the method used for allocating company-wide common expenditures is being partially adjusted, with part of the company-wide common expenditures that were previously included under "Other" being allocated to individual segments. Data for fiscal 2022 are presented prior to this allocation; data for fiscal 2023 and fiscal 2024 are presented after this allocation.

\*3 These data were calculated based on the business classification adjustment conducted to accompany the business restructuring implemented in October 2023.(This does not apply to the actual performance data for R&D expenditure and capital investment for FY2022.)

\*4 ■Other/Corporate: Includes businesses not included in reported segments and eliminated inter-segment transactions, etc.





# Functional Materials Segment

In this section, we outline the results & challenges faced by each business segment in relation to the QUICK WIN (see P.16) initiatives.

## Performance Chemicals Department



**Masuo Higuchi**  
GM, Performance Chemicals Department

### Business domains

Coatings, inks, adhesives, pigments, urethane, toner, textiles, paper-making, LCDs, etc.

### Recent customer issues

The need to respond to the trend toward sustainable manufacturing, the shrinking of the Japanese domestic market, and intensifying competition in overseas markets

### Products in daily lives

Coating materials used in automotive manufacturing and construction, dyes used in garment manufacturing, materials used in LCD displays, etc.

### NAGASE's added value

A global procurement capability, and providing biotechnology-based, environmentally friendly materials solutions

## Results – Effective utilization of digital technology Meeting the needs of individual customers and industries with our unique technologies

As manufacturing sites become more diversified, customers' needs are growing more complex. Rather than merely offering proposals for raw materials, we are promoting the commercialization of a service model that makes effective use of digital transformation (DX). One example of this is our AI joint logistics matching service for chemical products. By realizing joint logistics for chemical products between multiple companies, and supporting efficient route planning, we are responding to the "2024 Problem" (the imposition of stricter rules on drivers' working hours, due to come into effect in Japan in 2024) affecting the logistics sector in Japan, and contributing toward a reduction in greenhouse gas emissions. Also, with the "Mixing Concierge" service which is scheduled to be launched in 2024, we are focusing on the mixing process which exists in many factories; by providing analytical software that allows the liquid mixing process to be visualized, we are aiming to enhance productivity. Going forward, we will contribute toward the continued development of the chemical industry by providing unique materials and technologies, and services that make effective use of digital technology, to meet customers' needs.



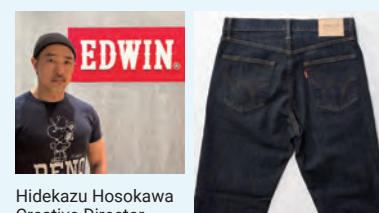
## Challenges – Growth strategy Integrating manufacturing function to improve profitability

With the aim of strengthening chemical manufacturing function relating to the "Foundation," "Focus" and "Development" aspects of our **ACE 2.0** Medium-Term Management Plan, we intend to merge three of our NAGASE Group manufacturing companies – Nagase ChemteX Corporation, the functional dyes (Fujita Plant) business of Nagase Viita Co., Ltd., and Fukui Yamada Chemical Co., Ltd. – within two years from now. This merger will bring about improved profitability through more competitive products. We will also be aiming to enhance production efficiency by strengthening our development capability through technology synergies, promoting business continuity planning (BCP) measures as part of our strategy to develop our network of business locations, and making talent cultivation more efficient by promoting the flow of human talent between business locations.

## NAGASE has solutions! Customer's Voice: EDWIN Co., Ltd.

### Making jeans production more sustainable with a resource-circulating bio-indigo solution

Within the apparel sector, jeans manufacturing is considered to have a particularly large environmental footprint. At EDWIN, we are implementing the CO:RE Project to recycle offcuts and waste product generated by our factories. NAGASE has provided us with a resource-circulating bio-indigo solution that makes use of waste fiber. Although there are still some challenges to address, we and NAGASE have a shared confidence in the value and future potential of this technology, and we are working together to commercialize it. Chemically synthesized indigo, which is currently the mainstream technology, contains aniline (which is harmful to humans), and is also seen as being problematic in terms of the CO<sub>2</sub> emissions generated. Bio-manufacturing, using alternatives to petrochemical-derived materials, has a key role to play in next-generation sustainable fashion, and given NAGASE's ability to develop bio products (as a company whose origins were in dyestuff manufacturing), and its strong organizational capabilities, we anticipate that NAGASE will play an important role in realizing this change.



**Hidekazu Hosokawa**  
Creative Director  
EDWIN Co., Ltd.

## Speciality Chemicals Department



**Kenichi Kurimoto**  
GM, Speciality Chemicals Department

### Business domains

Semiconductor materials; oils, surfactants and organic compounds; petrochemical and plastics

### Recent customer issues

1. Sustainable manufacturing: Reducing CO<sub>2</sub> emissions, responding to hazardous and harmful substances and production processes, etc.
2. New product development through continued technology innovation: Development of high-functionality semiconductors (miniaturization, etc.) and high functionality EV batteries, etc.

### Products in daily lives

Our polymer filters are used in the manufacturing of components for electric vehicle (EV) batteries

### NAGASE's added value

Our polymer filters are used in the manufacturing of separator materials for EV batteries, helping to ensure battery quality

## Results – Organizational restructuring Accelerating DX and new business development

With the newly established Planning and Marketing Office, we have been promoting DX and the development of new businesses. In the DX promotion, in addition to visualization of reports and development themes through CRM, we worked on business creation utilizing digital tools, such as online exhibitions and digital marketing of contract manufacturing matching services. Going forward, besides continuing to develop existing activities, we will also be making operations more efficient through the use of generative AI and to achieve new business creation. We have also started to study the commercialization of new technologies and are focusing on two technologies. The first is flow synthesis technology: we are working to commercialize this technology with the aim of contributing to improved manufacturing productivity, reduced waste emissions, and improved safety and workability. The second is metal-organic structures (MOFs): we are contributing to sustainable manufacturing, including carbon neutrality, by utilizing MOFs' superior CO<sub>2</sub> separation and recovery functions. In parallel, we are also exploring new unique businesses.

## Challenges – Growth strategy Evolution of the business model with NAGASE Group integrated business operation

We will operate our business in greater collaboration than ever with the Group's manufacturing companies, sales companies, and overseas subsidiaries. Five-year growth scenarios for key businesses and major projects have been under development. We will evolve the Group-wide businesses by utilizing our discernment in the growing semiconductor sector, our core manufacturing business, and new projects in India, one of our global south regional strategies.



Flow synthesis technology



Metal organic framework (MOF) technology

## NAGASE has solutions! Employee's voice

### Helping customers with manufacturing issues, from production equipment installation to product launch

When one of our customers was starting up a new business, they had difficulty sourcing the manufacturing equipment they needed to begin volume production, and they asked us to assist them with manufacturing. Based on our accumulated experience, we were able to suggest the optimal outsourcing partners for them (in terms of technology, location, scale of operations, etc.), and they were consequently able to begin volume production very rapidly. I was deeply moved when we celebrated the launch of the new product with everyone after repeated production and delivery adjustments. I also thought that other customers might have similar problems, so I created a system to meet customer needs by utilizing DX, for example, by creating a database of information and know-how of contract companies owned by NAGASE. Looking ahead, we will be accelerating our initiatives to generate new value by growing together with our customers and outsourcing partners.



**Shoichi Uchiyama**  
Osaka Sales Office, Speciality Chemicals Section I  
Speciality Chemicals Department



## Advanced Materials & Processing Segment

### Polymer Global Account Department



**Koji Yoshida**  
GM, Polymer Global Account  
Business Department

#### Business domains

The plastics industry as a whole (including the electrical and electronics industry and the packaging industry)

#### Recent customer issues

Changes in the supply chain (diversification of production locations and of manufacturing technology), the need to reduce CO<sub>2</sub> emissions, and the need to cope with geopolitical risk

#### Products in daily lives

Office automation equipment, laptops, mobile phones, game consoles, cosmetics containers, and food packaging

#### NAGASE's added value

The ability to allocate personnel from different countries to multiple sites in response to the requests from customers to have production locations in multiple different countries

#### Results – ROIC-focused management

#### Thorough implementation of overseas inventory monitoring

One measure being implemented to enhance capital efficiency is thorough efforts to reduce inventory. Particularly in regard to overseas business locations, where in the past there has been significant variation in the quality of inventory management, increasing the frequency and precision of monitoring can lead to an improvement in awareness on the frontline. Going forward, we will continue with related initiatives, working to instill strong awareness of the improvement of capital efficiency management.

In addition, because once inventory starts to pile up it can result in having to sell products off cheap or dispose of them as waste, it is important to minimize the risk that inventory may build up by keeping the size of orders placed with suppliers at a reasonable level. Starting in fiscal 2023, we have introduced new order placement and inventory management systems in certain countries, including Thailand, and have begun trial operation of a new framework for procurement that takes into account changes in suppliers' production status, trends in customers' supply chains, and other variables. Once it has been confirmed that the new framework is producing results, the scope of implementation will gradually be expanded to include other countries.

#### Challenges – Speeding up management

#### Structuring data-driven decision-making and managerial judgement

Given the major global trend toward diversification of manufacturing methods and toward having multiple manufacturing locations in different countries, we believe that this is no longer an era in which NAGASE can survive and thrive based only on the experience of its sales managers. So, we are proceeding with the putting in place of a framework that does not just utilize the integration of historic sales performance data, current customer trends and the outlook for future economic growth for inventory management, but also uses them to realize data-driven decision-making and managerial judgment. As a first step, we have set to work on developing a system for reflecting data analysis in future sales plans; we aim to have this system fully operational by the second half of fiscal 2024. Through this kind of initiative, we aim to be able to formulate high-precision growth strategies for each individual area and market, and set to work on restructuring our businesses (including partner companies that are part of the NAGASE Group), as well as optimizing our global human resources allocation.

#### NAGASE has solutions!

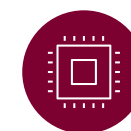
**Customer's voice: Sekisui Kasei Co., Ltd.**

#### Creating synergy through the combination of our company's products and NAGASE's technology to develop new markets

Sekisui Kasei manufactures and sells a variety of different additives in micro-particle form. We received a request from one of the users of our additives asking whether we could supply them with high-concentration masterbatch (MB), partly to realize a further improvement of the additive usage environment, and also because of cost considerations. This particular additive could be manufactured in MB form at normal mixing concentrations, but there were significant challenges to overcome in order to realize high-concentration MB manufacturing for it. While we were exploring possible manufacturing methods, NAGASE proposed the adoption of a semi-wet manufacturing process which would not only save energy but also reduce the carbon footprint, while allowing the production of a highly-concentrated (over 90%) MB. I feel that NAGASE possesses unique strengths, in terms of having expertise in both manufacturing methods on the user side, and evaluation methods. By performing assessment and compiling data based on the actual conditions that would be faced in volume production, we were able to smoothly develop a solution for our customer. Combining our company's products with NAGASE's technology has been the key to developing new markets. Looking ahead, I hope that we and NAGASE will be able to continue working together on the development of new materials, new technologies, and new markets.



**Yasuhiko Soeda**  
Chief,  
Fine Polymers Business Division,  
Fine Polymers Sales Group  
Sekisui Kasei Co., Ltd.



## Electronics & Energy Segment

### Electronics Department



**Kazuyuki Sato**  
GM, Electronics Department

#### Business domains

The semiconductor, display, and smart device sectors

#### Recent customer issues

Low power consumption devices, semiconductors, promotion of recycling, and heat countermeasures

#### Products in daily lives

High-precision abrasive materials for use in the semiconductor industry, and optical materials and functional materials for smart devices

#### NAGASE's added value

- Providing materials to achieve low power consumption for use in power semiconductors, and for use in new types of displays
- Selection and proposal of materials for use in heat countermeasures, heat dissipation, thermal resistance, and insulation

#### Results – Growth strategy

#### Capital investment directed toward development of multilayer semiconductors

PacTech Asia, NAGASE Group member company which manufactures semiconductor packaging equipment is proceeding with capital investment to expand its bumping services, which contribute toward development of multilayer semiconductors; volume production began in fiscal 2024. The last few years have seen the continued evolution of multilayer semiconductors, which help to realize high-functionality, low-power and ultra-thin semiconductors, and it is anticipated that Pac Tech Asia's bumping services, which play an important role in this process, will continue to grow. As these services utilize a chemical reaction method, which uses less electric power than conventional electroplating methods, they also help customers to solve problems in a way that contributes toward the achievement of the UN Sustainable Development Goals (SDGs). In terms of our department's regional strategy, we will be leveraging our network of production locations in Europe, the USA and Southeast Asia and expanding capital investment in line with market trends.

#### Challenges – Effective utilization of digital technology

#### Maximizing customer touch-points and sharing information within the Company

The Electronics Department is focused on providing a trading function, but up until now, we cannot really be said to have been making full use of digital tools in this area. To be able to realize business expansion in a way appropriate for NAGASE that keeps in mind the advantages provided by NAGASE's networks and assets, we are exploring strategies for the effective utilization of digital technologies, both within and outside the Company. As a first step for our external measures, we have utilized marketing automation (MA) tools to build a system for following-up on potential customers after trade shows. The aim of this is to make the best possible use of potential customer contacts made at trade shows, and link this with business development. An internal measure that we are implementing is to realize thorough utilization of customer relationship management (CRM) tools, diffusion of which currently stands at around 60%, to accelerate the development of new business by sharing information between divisions.

#### NAGASE has solutions! **Employee's voice**

#### United in wanting to live up to customers' belief that "If we ask NAGASE, they are sure to be able to come up with a good solution"

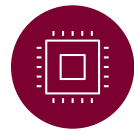
Responding to the rise in environmental consciousness, one of our customers got in touch with us to tell us that they wanted to develop a recycling process for their company's products. They realized that they needed to collaborate with external partners on developing this process, but because the project would be using innovative technology, they were concerned about information disclosure, so it was decided to make use of the Nagase Application Workshop\* laboratory. After setting the conditions and performing process and materials evaluations, we were able to work together with the customer to select partner companies. What enabled us to solve this problem for the customer was not just the unique functions provided by the Nagase Application Workshop laboratory, but also our determination, as a trading company, to do whatever it took to live up to the customer's belief that "We can communicate well with NAGASE" and "If we ask NAGASE about it, they are sure to be able to come up with a good solution."

\* Nagase Application Workshop (NAW)  
NAW provides laboratory functions for the evaluation and analysis of resins and coating materials, application development, and formulation development proposals. (see p. 50)



**Kosuke Baba**  
Business Planning Office  
Electronics Department





# Electronics & Energy Segment

**Nagase ChemteX Corporation**

► <https://group.nagase.com/nagasechemtex/en/>

## Advanced Functional Materials Department



**Ryuhei Tashima**  
GM, Advanced Functional  
Materials Department

### Business domains

Semiconductors, displays, electrical and electronics, structural materials, medical, etc.

### Recent customer issues

Miniaturization, chemical recycling to reduce the burden on the environment, emerging of chiplet, thermal management to deal with complex structural design, reducing the incidence of installed wafer warpage, etc.

### Products in daily lives

Semiconductor encapsulants used with generative AI, etc.

### NAGASE's added value

Recovery and recycling of developing solution from leading semiconductor manufacturers (Green Mobius)

## Results – Growth strategy

### Gaining more trust with new value in product performance and environmental aspects

In fiscal 2023, we engaged in continuous dialogue with our major customers in Taiwan, North America and South Korea, which are the main semiconductor industry markets. Thanks to a series of product proposals that we made together with Nagase ChemteX to address customers' problems, we succeeded in reinforcing the status that our products enjoy as the de facto industry standard for cutting-edge semiconductor packaging materials. Our joint venture company, SN Tech Corporation, is proceeding with the introduction of the Green Mobius System recycling system for developer, the first of its kind in Japan, in collaboration with a leading semiconductor manufacturer. We will contribute to the semiconductor industry not only in terms of product performance and quality, but also in terms of the environment.

In addition, new products that we have launched which make effective use of the photolithography technology that we have cultivated over the years in our display- and semiconductor-related business are also attracting customers in the medical sector and in the metalworking industry. We will be proceeding with efforts to further transform our business portfolio, accelerating growth not only in our core businesses (electrical, electronics and displays) but also in new fields.

## Challenges – Speeding up management execution and cultivating human talent

### Rapid decision-making and human investment in industrial changes

The business environment affecting the semiconductor sector is constantly changing, and we are now at a stage where we need to reconfigure the existing supply chains at a national level. Given the situation, if NAGASE fails to realize speedy managerial decision-making and invest proactively in its businesses and its human capital, then not only we will not be able to grow, we may even have difficulty surviving.

Realizing human talent cultivation that looks ahead several years into the future is a particularly urgent task. The NAGASE Group possesses a manufacturing function with a wealth of experience and an impressive track record, and which also has very strong technological capabilities. Going beyond this, it is vitally important for the personnel who act as contact points for customers to be able to not only find out from customers about issues that have already emerged, but also identify and point out latent problems that have not yet manifested. NAGASE has links to every part of the semiconductor industry value chain, and has access to information that enables us to identify the industry's roadmap and major trends, so we are working to accelerate activities that integrate information and technological capabilities to provide real solutions.

## NAGASE has solutions! Customer's Voice: SACHEM, Inc.

### A partner looking at the future of semiconductors and environmental challenges together

We have known your company for a long time. We started out in the business of reclaiming chemicals used in displays, and now we are working together with major semiconductor manufacturers using our cutting-edge recycling technology "Green Mobius" to take on the challenge of creating a new style in the semiconductor industry.

In order to cope with the fast-paced changes, we sometimes have tough discussions and share difficult challenges, but we communicate closely on a daily basis so that we can make proposals that only SACHEM and Nagase can offer.

In the rapidly changing world of cutting-edge semiconductors, Nagase's strengths lie in your staff's thorough knowledge of the technology, and your quick footwork, using a network that extends not only in Japan but also throughout the world. We hope that Nagase and SACHEM will continue to grow together and that we will continue to be partners in creating the roadmap for the next five to ten years.



**Rosemary Hoffman**  
CEO, SACHEM, Inc.

## Nagase ChemteX Corporation (NCX)

### Business overview

Nagase ChemteX Corporation (NCX) is a core manufacturing company within the NAGASE Group, possessing innovative technologies across a wide range of fields that includes chemicals and electronics.

With core technologies that include innovative organic synthesis, formulation, processing, and evaluation technologies, we create products that have a wide range of applications, from the electronics sector (semiconductors, electrical and electronic components, and displays) through to personal care products and coating materials. Our main business areas are: Functional Resins (formulated epoxy resins, including encapsulants), Precision Processing Materials (photolithography materials, etc.), and Functional Chemicals (special epoxy compounds and conductive coating agents, etc.). With our unique chemical products, which have won plaudits from many customers throughout the world, and the advanced technology that supports the development of these products, we are contributing toward making the world a better place.



**Satoru Fujii**  
Representative Director, President and CEO



**Functional resins**  
Epoxy adhesives, Encapsulants (Sheet/Liquid), Potting materials



**Precision processing materials**  
Photolithography materials, 3D printer resins, and Ag nano ink



**Functional chemicals**  
Special epoxy compounds, transparent conductive coating materials, and low-endotoxin materials

### Company overview

Company name	Nagase ChemteX Corporation (NCX)
Establishment	April 1, 1970
Capital	2.47 billion yen
Net sales	About 25.1 billion yen
Employees	Around 560

## Winning even more trust and achieving continued growth, by responding to society's problems and environmental issues

Besides strengthening our production system for products targeting the semiconductor industry, which is a key growth area, and focusing even more heavily on new product development, we are also developing products that help to reduce the burden on the environment, including: a superabsorbent polymer which is biodegradable; GREEN DENACOL, a bio-based special epoxy compound; and GREEN DENATITE, a resin for structural material use that utilizes GREEN DENACOL. We are also working vigorously to develop new production processes for our existing products that

will use less energy and place less burden on the environment.

We believe that high-functionality chemical products have a vital role to play in helping to solve environmental problems and other issues affecting society. To this end, we are strengthening the R&D capability that enables us to develop unique products needed by the world, and we are also putting in place a stable supply system by strengthening our value chain as a manufacturer, which will enable us to realize sustained growth, and further enhance the value we provide.

### Close-up

## Contributing to the development of the Super Smart Society with semiconductor encapsulant materials

Our semiconductor encapsulating materials contribute to the field of "advanced semiconductors," which are indispensable to the realization of the Japanese government's vision of a Super Smart Society. As advanced semiconductor packaging continues to diversify and become more complex, including 2.xD/3D, WLP\*1, and PLP\*2, we have added liquid molding compound (LMC), which have a high market share, and new-concept of a-SMC sheet-type encapsulant material to our product lineup to further demonstrate our technological strengths. We also focus on providing a place where innovative ideas are generated to solve problems while working together with our customers. We are enhancing our facilities to enable us to determine the direction of development while checking

the suitability of the molding process for devices brought in by our customers, and to fabricate devices for further reliability evaluations.

In response to the growing demand for cutting-edge semiconductors, we are proceeding with measures to strengthen our production system, including the building of a stable supply chain, the strengthening of the quality assurance system, and expanding the equipment in microelectronics production building. We will continue to take on the challenge of providing solutions that can be the de facto industry standard in an as yet unclear future.

\*1 WLP: Wafer Level Package \*2 PLP: Panel Level Package



# Mobility Segment

## Mobility Solutions Department



**Daiji Matsuoka**  
GM, Mobility Solutions Department

### Business domains

The mobility sector as a whole, with a focus on the automotive industry

### Recent customer issues

With the transition toward xEVs (a general term for electric vehicles, including BEVs, HEVs, PHEVs, FCVs, etc.), our customers are having to implement initiatives to strengthen the functionality of electric vehicle components, make vehicles lighter to improve fuel economy, reduce vibration and noise to enhance ride comfort, meet safety requirements, and realize decarbonization.

### NAGASE's added values

We are able to offer design solutions to make the components used in xEVs smaller and lighter, as well as proposals for environmentally friendly materials

### Products in daily lives

Motor vehicles and rail transport rolling stock

## Results – Reorganizing unprofitable businesses Improving customers' manufacturing processes and contributing toward enhanced profitability

In our trading function, besides proposing new materials to joint venture companies and suppliers and striving to improve profitability, we have also contributed toward increasing the value that we provide to customers. In addition, as well as sending Mobility Solutions Department personnel on assignment to the factories of joint venture companies and suppliers to provide support for quality management, including measures to reduce the defect rate in production processes, we have also contributed toward enhancing profitability through improvement proposals that include automation and production line rationalization, making effective use of our network of external experts with their wide-ranging expertise. Going forward, in addition to focusing on environmentally friendly materials proposals and developing new products with our partners, we will also be aiming to achieve further global expansion into new fields.

## Challenges – Effective utilization of digital technology Expanding e-mail newsletter distribution for the mobility business into global markets

Three DX-accelerated initiatives are underway: First, a newsletter and website communication of NAGASE's approach to customer issues, which is aimed at creating new business. Currently, this is only for Japan, but will be launched globally during FY2024. The second is not only to realize smooth communication by expanding the use of CRM, but also to link marketing automation with CRM to enhance sales proposal. The third is to improve the flexibility of work styles by improving order and supply operations through the use of IT, which is currently being expanded by a dedicated organization established in April 2024.

## NAGASE has solutions! Customer's Voice: ATECS Corporation

### Establishing a joint venture in Mexico to jointly take on the challenge of developing global markets by combining our strengths

ATECS has been working to make products for EV components smaller and lighter. However, designing and mass-producing these parts was a challenge because, in addition to features such as pressure resistance for long-distance driving, heat dissipation and cooling functions were also necessary. We developed our own technology, jointly patented it with NAGASE, and overcame the challenge together to bring it to mass production. In November 2024, the two of us established a joint venture in Mexico to realize local procurement of products for the North American market, which is a new stage of our collaboration. NAGASE's unparalleled strengths are their global sales force, their capital and discernment to collaborate with companies that have technological capabilities, and their ability to supply components overseas. We have high expectations for NAGASE in promoting our products in North America and in establishing a supply chain and logistics network in Mexico.



The joint venture factory in Mexico



**Tamanobu Naruoka**  
Representative Director  
and President  
ATECS Corporation

## Nagase Application Workshop

► <https://www.nagase.co.jp/english/enterprise/naw/>

## R&D function: Nagase Application Workshop (NAW)



**Akihiro Taniguchi**  
General Manager

### Supporting Nagase's continued evolution through an open innovation lab for the resin and coating materials sector

The Nagase Application Workshop (NAW) combines technology development, innovation and technical training functions, and has the facilities and specialist technical staff needed to handle everything from coating material and plastics material evaluation, analysis, and application development to formulation development for end products using these materials. Through its technology development function, NAW supports NAGASE's continued evolution by integrating materials and processing technologies for our business partners and NAGASE Group manufacturing companies, and by providing incubation proposals to meet customer and market needs identified by NAGASE's marketing function.

## Solving manufacturing issues with materials

### 1 Linking manufacturers and suppliers through paper materials

With the accelerating trend toward reducing the use of plastic, one of the substitute materials that is attracting a great deal of attention is molded pulp. Made from pulp (the same material that paper is made from) which has been formed and dried, it is mainly used for trays that are utilized in food packaging; however, there have been problems with this material, because it does not cope well with water and oil seepage from food products and does not have strong resistance to abrasions. NAW collaborated with a molded pulp manufacturer that was looking to improve the strength of the material, and with a supplier whose area of expertise is functional coating materials. With the NAW's exploration of which synthetic resins to use and which additives they should be combined with, this collaborative project succeeded in realizing molded pulp that has superior water resistance, oil resistance and powdering resistance, while avoiding the use of coating material that contains potentially harmful Per- and Polyfluoroalkyl Substances (PFAS).



### 2 Invigorating one of a Group company's main products by commercializing a new application in agriculture

NAW is actively engaged in collaboration with NAGASE Group companies. As a new application for trehalose (TREHA®), which is one of Nagase Viita's main products, NAW undertook development of a new formulation that incorporates trehalose into biodegradable multi-film for agricultural use. In this way, when the film returns to the earth after use, it stimulates the growth of bacteria in the soil, creating a virtuous circle of enhanced soil fertility. A joint patent application for this "biostimulant" technology which can promote plant growth without the need to depend on chemical fertilizers was submitted in 2024. NAW will be collaborating with various partners to commercialize and boost sales of this technology.



### 3 Experimenting with different devices and materials to expand the scope of utilization of 3D printers

While it is becoming increasingly common for manufacturing to make use of 3D printers, given the diverse, multi-faceted nature of the manufacturing tasks for which 3D printers are used, our customers require complex knowhow and technology in order to make effective use of 3D printers to meet different needs. NAW has been collaborating with Interfacial Consultants LLC (IFC), a NAGASE Group company which has a high level of expertise in the development of advanced materials and in related manufacturing process solutions. Using IFC's thermoplastic extrusion and stereolithography methods, as well as various other types of 3D printing equipment and specialist 3D data talent, NAW and IFC are able to provide customers with testing and evaluation services for different combinations of printers, resins and filler material. These services are becoming increasingly widely used by customers in the automotive and home appliance sectors, and NAW is also beginning to collaborate with materials manufacturers that have special product development needs.







# Life & Healthcare Segment

**Nagase Viita Co., Ltd.**

► <https://group.nagase.com/viita/en/>

## Life & Healthcare Products Department



**Kenji Okino**  
GM, Life & Healthcare  
Products Department

### Results – Organizational restructuring

#### Realizing stable global procurement by strengthening business infrastructure

In the life sciences sector, supply chain disruptions and quality risk issues are frequent occurrences. Identifying the realization of stable global procurement as a significant market opportunity, starting from last year, we have been strengthening intra-group coordination in our overseas business (which had been noted as a problem) and proceeding with the optimization of organizational design. Our approach to this involves building on the strengths provided by the knowhow and experience that we have accumulated over our businesses in the Japanese domestic market, and building cross-business functional organizations for regulatory affairs, marketing, sourcing, etc., thereby putting in place a global organizational framework that is efficient and effective. Looking ahead, by strengthening the operations of the NAGASE Group as a whole (including our overseas subsidiaries), and by keeping all functions operating at the same level, regardless of whether they are located in or outside Japan, our strategy is to expand both our overseas business and the daily living and healthcare related businesses of our Group manufacturing companies, including Nagase Viita, Nagase ChemteX, and the Prinova Group.

#### Business domains

Life science industries, including food products, pharmaceuticals, and cosmetics

#### Recent customer issues

The need to achieve raw materials traceability and ensure product quality and safety, and procurement risk in the supply chain

#### Products in daily livess

Food products, pharmaceuticals, cosmetics and other consumer products relating to daily living and health

#### NAGASE's added values

Providing support for meeting regulatory requirements, proposals for substitute materials that utilize biotechnology, and stable supply on a global scale

### Challenges – Growth Strategy

#### Accelerating the expansion of our overseas business

One of the ongoing issues addressed by our **ACE 2.0** Medium-Term Management Plan is the question of how to expand our overseas business by effectively utilizing the experience that we have accumulated in our domestic business in Japan. With the pace of change in the global life sciences market environment speeding up, we are working to put in place the organizational foundations needed to accelerate the expansion of overseas transactions that do not involve the participation of the head office in Japan. In April 2024, we established a new Product Management Division, and put in place a sourcing system that enables support to be provided from Japan for customer inquiries and business negotiations throughout the world. In addition, to ensure the secure, reliable supply of materials in all countries and regions, we have adopted a new framework to allow centralized management of regulatory affairs by the Global Regulatory & Pharmaceutical Affairs Office. The effective utilization of these new systems, combined with the customer base and supplier base that we have built up over the years, will generate new business opportunities on a global scale.

### NAGASE has solutions! Topics

#### Combining our strengths as a trading company and as a manufacturer to strengthen the dissemination of sales-related information in overseas markets

We are working to strengthen the dissemination of information (including information about industry trends, new materials, etc.) to potential customers, particularly cosmetics companies in Asia and Europe, and diagnostic agent manufacturers in China by participating in trade shows, seminars, etc. Overseas customers have been particularly impressed by NAGASE's network. The business network that we have built up in the past – including our strong relationships with raw materials suppliers in Japan, and our links with experts in related academic fields and with potential customers at the regional level – can generate new business opportunities in overseas markets. Another of our strengths is that, besides being a trading company, we also manufacture some of our own materials in-house (for more details about Nagase Viita products, see the page on the right). With Nagase Viita handling the development and proposal of raw materials that meet the needs of customers in each country, and Nagase & Co., Ltd. offering marketing proposals based on case studies of effective raw material utilization and on market trends, we are able to provide customers with a wide range of solutions.



## Nagase Viita Co., Ltd.

### Business overview

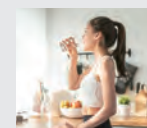
Nagase Viita is a manufacturing subsidiary that plays a key role within the NAGASE Group in the life sciences sector, developing materials for a wide range of applications, including food products, personal care products and pharmaceuticals. Tracing its origins back to a starch syrup manufacturer that was founded in 1883, Nagase Viita develops and supplies materials that contribute toward the realization of an environmentally friendly, sustainable society by combining the power of microorganisms and enzymes with raw materials derived from nature. In April 2023, the company merged with the biochemical (enzyme) business of Nagase ChemteX, another member of the NAGASE Group, to drive the growth of the Group's bio-related businesses by combining the unique technologies that each company had cultivated. The company name was changed from Hayashibara Co., Ltd. to Nagase Viita Co., Ltd. in April 2024, marking a new beginning for the firm. Going forward, Nagase Viita will be creating synergies with other NAGASE Group companies, and providing the world with new products and new value.



**Naoki Yasuba**  
Representative Director



**Food ingredients**  
TREHA™,  
PULLULAN,  
DENABAKE™ EXTRA



**Health food materials**  
CitraPeak®,  
Fibryxa™,  
TetraRing™



**Personal care ingredients**  
AA2G™, MG-60/  
Tornare™, Alpha  
Glucosyl Hesperidin



**Pharmaceutical ingredients**  
Trehalose SG,  
Maltose-PH,  
PULLULAN



**Functional dyes**  
Specific wavelength  
absorbing dyes,  
dichroic dyes,  
fluorescent dyes



**Wellness products**  
LUMIN™-A  
(in tablet form),  
photosensitive dyes

### Company overview

Nagase Viita Co., Ltd.(NVI)	
Establishment	July 10, 1932
Capital	0.5 billion yen
Net sales	34.4 billion yen
Employees	797

### Close-up

#### Taking on the challenge of manufacturing to meet demand for sustainable materials

##### Developing sustainable materials

###### 🕒 Biodegradability – An indicator of a low environmental footprint that is becoming a major focus of attention

Personal care products such as skin care, body care, and hair care products have the potential to cause harm to the natural environment as wastewater from hand washing and bathing. Because these products are used every day, their materials must be functional and environmentally friendly. Biodegradability, the ability to quickly decompose in the environment such as soil, rivers, and oceans, is becoming increasingly important as a criterion for registration and adoption of raw materials by personal care brand owners.

###### 🕒 Nagase Viita's seven biodegradable personal care ingredients

As a result of analysis by an external international testing laboratory, seven personal care ingredients developed and manufactured by Nagase Viita have been confirmed readily biodegradable. Nagase Viita is expanding sales of these ingredients for skin care, makeup, body care, sun care, hair care, and oral care products as ingredients with both unique and distinctive functions and biodegradability.

Name of product	Functions
AA2G™	Brightening, aging care, and antioxidant
Alpha Glucosyl Hesperidin	Enhancing blood circulation, and brightening
Glucosyl Naringin	Restoring skin elasticity
Trehalose (Cosmetic grade)	Preserving skin moisture
PULLULAN (Cosmetic grade)	Adhesion & film-forming properties, and instant lift-up
Lissenare™	Enhancing both stiffness and flexibility to maintain hairstyles, and caring for damaged hair
MG-60/Tornare™	Rich foaming and preventing skin irritation

► For more details, visit the Nagase Viita website:  
[https://group.nagase.com/viita/en/newsroom/press\\_release/article/6927/](https://group.nagase.com/viita/en/newsroom/press_release/article/6927/)

##### Reducing the carbon footprint of manufacturing

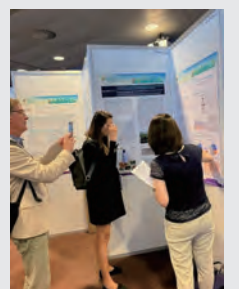
###### 🕒 Announcing new initiatives for carbon footprint reduction at the IFSCC Congress

Sustainability initiatives are presented to leading manufacturers and researchers from various countries at the IFSCC World Congress, the world's largest academic conference where cosmetics scientists present their latest research findings.

**2022:** Introduced the special features of sustainable cosmetic ingredients developed and manufactured by Nagase Viita, and the environmentally friendly methods used to manufacture these ingredients.

**2023:** Introduced initiatives to reduce the carbon footprint (CFP) of the entire business: Attempts to investigate flagship products to quantify the CFP reduction of the entire manufacturing process and summary of research on key materials.

➡ The presentation garnered significant industry recognition as a leading initiative, showcasing the environmental performance of cosmetic ingredients.



Poster presentation at  
the IFSCC Congress