

Possibility of Chemistry

Our work introduces new value for the future.

It makes tomorrow brighter for people and the planet.

Since our founding in 1915, we have challenged ourselves to improve society and the world, leveraging Denka's unique strengths unmatched by any other.

We combine 110 years of expertise with cutting-edge technology, pioneering new possibilities in chemistry.

We anticipate the needs of the future and create new forms of prosperity.

Through efforts such as developing advanced materials for the environmental and energy fields and achieving breakthroughs in life science, we continue to respond to ever-diversifying challenges. Every employee shapes their own story so that we continue to contribute to people, society, and the world.

Denka

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The Denka Way

Autumn
2025 Vol.24

Publisher: Corporate Communications Dept., Denka Co., Ltd.
Nihonbashi Mitsui Tower, 2-1-1 Nihonbashi-muromachi, Chuo-ku, Tokyo 103-8338
Editor-in-chief: Hiroyuki Yamamoto / Published: October 1, 2025



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Denka

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Autumn 2025 Vol.24

Overcome the limits of communication technology.

Contents

02 Story of SNECTON
Special Feature: A New Material Contributing to the Development of a High-Speed Communication Society

08 History of Challenges:
The Story of Denka's 110-Year History

12 Cross Baton: Calcium Cyanamide

14 Denka TOPICS

Story of SNECTON

Special Feature

A New Material Contributing to the Development of a High-Speed Communication Society

Denka officially launched SNECTON, a low dielectric organic insulating resin, in 2025. This product, developed using Denka's coordination polymerization technology, is gathering attention as a key material in realizing a future high-speed communication society. Below, we dive into the product's overview, origin, and future potential.

Part

1 A future realized through high-speed communication

Telecommunication systems serve as the fundamental technology for the PCs, smartphones, and other devices essential to our daily lives. High-speed communication technologies, such as 5G and beyond, are expected to be at the core of all industry and social activities from 2030 onward.

2030: the year communication will further advance companies and society

Next-generation communication is expected to bring significant innovation to all of society due to its ultra-high speed, capacity for multiple simultaneous connections, and low latency.

For example, in agriculture, it will realize smart farming that enables efficient and large-scale production with even a small number of people. This includes drones for spreading pesticides and fertilizer, self-driving tractors, and the real-time collection and analysis of crop-growth data. In manufacturing sites, automation is accelerating due to manufacturing DX, and collaboration with robots is becoming standard. Through this, workers are being spared from danger and hard labor, and work environments are becoming safer and more comfortable. Furthermore, supply chain management, including demand forecasting and inventory control, will be highly optimized, simultaneously reducing

costs and environmental burden.

On top of those examples, the range of benefits from communication technology in our daily lives is expanding—e.g. the evolution of mobility through autonomous driving and the growing accessibility of healthcare services from the standardization of telemedicine and sharing of medical information.

Functionality of printed circuit boards is key

Generative AI servers, data centers, and base stations play important roles behind-the-scenes of these diverse services and applications, and their expansion and enhancement is progressing. In line with these developments, there is a strong demand for greater capacity and faster speeds in data communication.

The key to realizing this demand is improving the heart of electronics, which is responsible for transmitting data: the printed circuit board.



New technology realized with next-generation high-speed communication technology

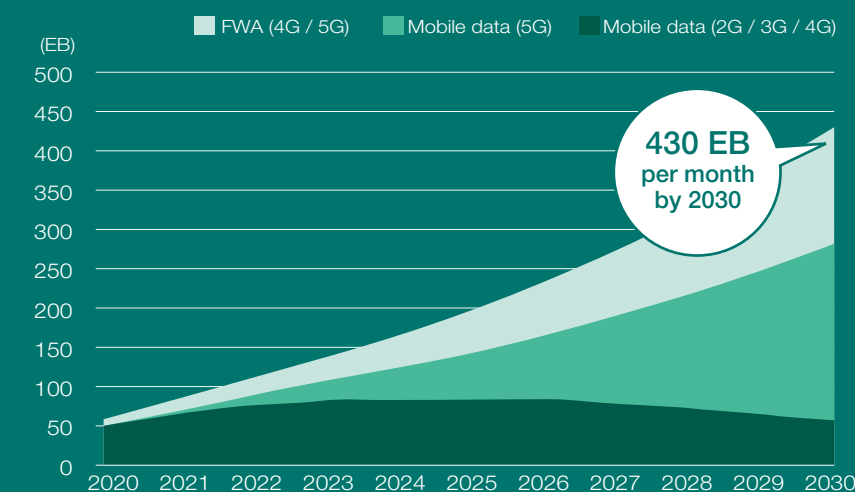
Data transmission capacity to grow up to 2.6 times by 2030

The capacity of data transmission is predicted to grow exponentially. According to a report by Ericsson, a Swedish communications equipment manufacturer, global mobile data traffic, including fixed wireless access (FWA),^{*1} will grow to 2.6 times what it was at the end of 2024, by 2030, or 430 EBs a month (1 EB (exabyte) is 1 billion times the size of 1 GB). Additionally, the share of 5G in mobile data traffic grew from 26% at the end of 2023 to 35% by the end of 2024, and it is forecasted to reach 80% by 2030.^{*2}

^{*1} Wireless network used in fixed locations, such as at home or in the office. On the other hand, "mobile data" refers to networks for mobile devices such as smartphones.

^{*2} SNECTON's applications also include wired connections.

Global mobile network data traffic (EB per month)



Source: Ericsson Mobility Report June 2025, page 9

Part

2 SNECTON contributes to the advancement of the digital society

Transmission loss is one of the hurdles preventing realizing a new society with ICT. The key material that will resolve this is Denka's SNECTON. Below, we introduce the product's specifications and origin.



The barrier blocking high-speed communication —The difficult challenge of transmission loss

Computers, smartphones, automobiles, household electronics, communication servers, etc.—at the core of the many electronics like these are printed circuit boards. In order to improve the functionality and data capacity of these circuit boards, what kinds of hurdles need to be overcome?

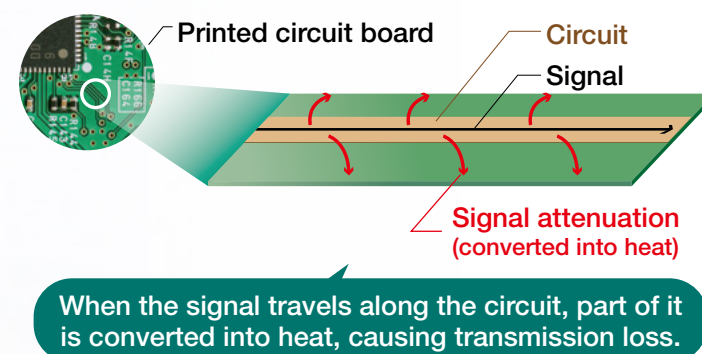
Kume "The biggest challenge is when electrical signals turn into heat, inside the circuit board, as a result of accelerated transmission, causing data to be lost in a phenomenon known as 'transmission loss.' The question of how to prevent transmission loss in the circuit board's insulation layer was causing a bottleneck in improving

transmission speed and data transmission capacity, requiring a new insulation material."

Supporting various high-speed communication substrates

The insulation layer of a circuit board is made by combining a piece of glass cloth^{*1} with a mixture of additives such as soft and rigid resins and filler, letting it dry, and then cutting it. After copper foil is attached to both sides of the insulation layer, it is called a "copper-clad laminate (CCL)." Then, multiple etched^{*2} CCLs are layered on top of each other and bonded together to create a multi-layer circuit board. Advanced circuit boards used in AI servers and other electronics have 32 or 48 layers and require not only insulation but also stability and heat-resistance for preventing thermal expansion.

Mechanism of transmission loss



^{*1} Glass cloth: A fabric made of warp and weft glass fiber thread.

^{*2} Etching: A method for creating circuit patterns by using chemicals or other substances to melt and remove part of the material's surface.

SNECTON changes the norms of substrate materials

Denka's SNECTON is a resin material equipped with electrical properties including a low dielectric constant and low dielectric loss tangent, allowing it to reduce transmission loss. The material's low dissipation factor is at least as excellent as that of PTFE (polytetrafluoroethylene), the highest performing product currently available. The material can also be laminated, granting it excellent heat resistance and affinity with copper foil.

Nakagawa "SNECTON is gaining a lot of attention from CCL manufacturers and downstream PCB manufacturers. Customers are particularly impressed by its low dissipation factor. I truly feel I am involved with a one-of-a-kind material!"

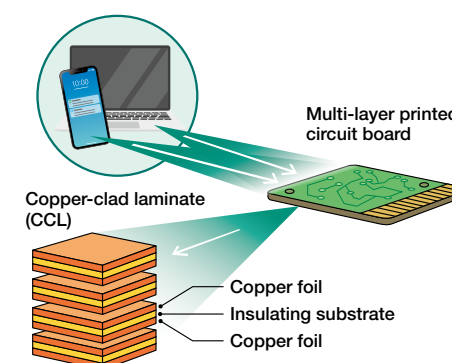
Leveraging SNECTON's strengths for data centers

SNECTON is expected to be mainly applied in the motherboards^{*3} of advancing data centers, cell phone base stations, AI servers, etc., and it is currently being tested in CCLs, flexible CCLs (FCCL), and various interlayer insulation materials.^{*4}

Of these applications, Denka is focusing on data centers as targets for a new market, which are facing the previously mentioned issue of transmission loss, in addition to the major issue of heat dissipation. The heightened performance and miniaturization of servers has increased their density and quantity of heat exhaust. This has led to high electricity costs for the required cooling, and risks, such as malfunctions and server failures, cannot be ignored. In that regard, compared to other materials, SNECTON can reduce the dielectric loss of CCLs by 30 to 50%, in turn reducing transmission loss and ultimately contributing to the resolution of heat dissipation and electricity cost issues for entire data centers.

Hasegawa "The motherboards currently in use will be replaced with next-generation models over the next few years. Envisioning SNECTON's application in future generations and beyond, we are now proceeding with customer sample evaluations."

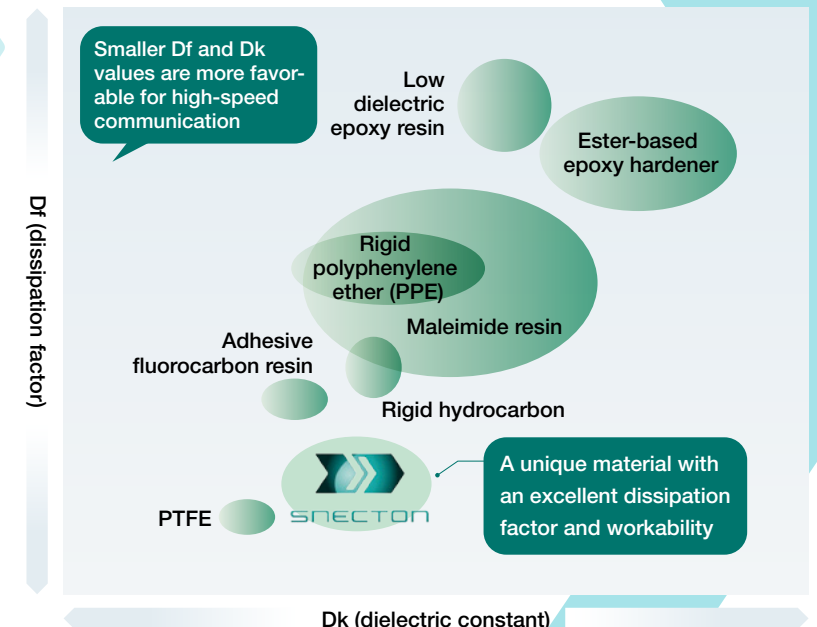
Structure of multi-layer printed circuit boards



^{*3} Motherboard: A kind of circuit board. A key component that functions as a command tower, exchanging data between connected parts, such as CPUs, memory, and storage components.

^{*4} Interlayer insulation material: Material for electrically insulating between wiring layers of semiconductors and other components.

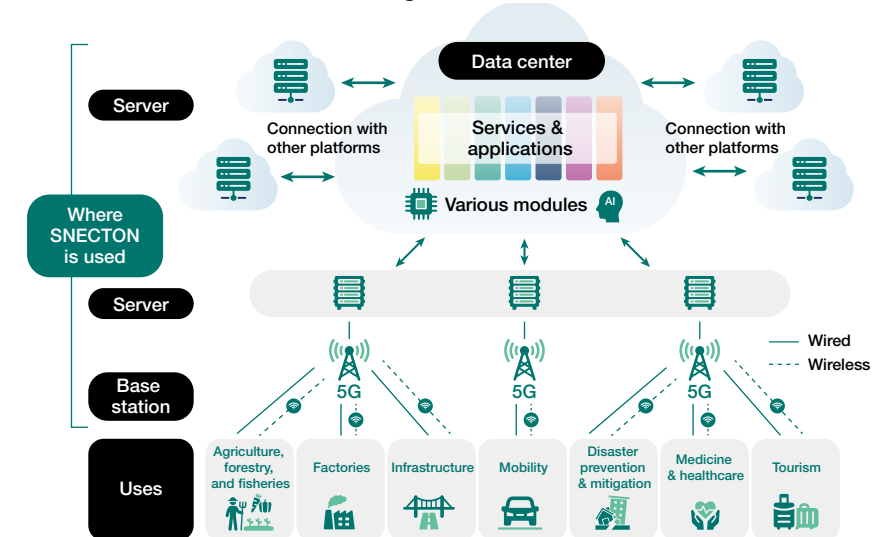
Comparing electrical characteristics with other companies' materials



Explanation! Dielectric constant and dissipation factor

A dielectric constant (Dk) is a value that represents how much an electric signal polarizes (unevenly distributes) as it travels along a circuit. The lower the value for a material, the faster and more accurate it can transmit signals. A dissipation factor (Df) shows how easily electric energy is lost when it travels through a material. The lower the value, the harder it is for the material to absorb electricity and the further and more efficiently it can transmit signals. In regard to their use in reference to motherboards for large circuit boards, the dissipation factor is valued for being highly effective in reducing attenuation.

A communication network diagram and real-life uses



(Source: Ministry of Internal Affairs and Communications, 2020 Beyond 5G Promotion Strategy documents and WHITE PAPER 2023: Information and Communications in Japan)

Explanation! What even is a printed circuit board?

Printed circuit boards are an indispensable component for electronics, such as smartphones, computers, and automobiles, and electrically connect electronics to transmit signals and electricity. They work as circuits by forming metal wiring (circuit patterns) on an insulator board and attaching electronic components such as resistors and integrated circuits (IC).

History,

Part

3 The history of SNECTON

There were numerous difficulties faced before SNECTON was developed successfully. Let's look back at the history of SNECTON and hear from some of the people who were involved.

1995

Development of polymerization technology that would be the base of SNECTON starts

2006

Styrene-based resin SE Polymer is developed at the Central Research Institute in Machida

- Characteristics: Scratch resistance, softness
- Applications: Automotive interiors, medical materials

2009

Proposals of low dielectric insulation material derived from SE Polymer suspended due to insufficient demand

2016

SE Polymer pilot plant constructed within Chiba Plant

2020

Noticed low dielectric properties of developed resin could reduce transmission loss resulting from the increase of data transmission and started full-swing development of SNECTON

2021

Continued prototype development and sample work for potential customers

2025

SNECTON LDM-03 (S700) launches



Daisuke Inoue

Deputy General Manager, Advanced Specialty Materials Dept., Electronics & Innovative Products

Toru Arai

Business Promoting Dept., Electronics & Innovative Products

The “future material” waiting in the refrigerator for its time to shine

As a matter of fact, SNECTON had been stored at Denka for many years. Arai, the parent of SNECTON, explains, “We started technical development in 1995 and successfully developed SE Polymer, a styrene-based resin for automotive interiors, in 2006. SNECTON was developed as its derivative material.”

Despite building a pilot plant within Chiba

Plant, this material and technology, whose commercialization was postponed, did not see the light of day again until 2020. Arai said, “I had heard people in the company were searching for a low dielectric resin material, and it occurred to me the prototype had shown low dielectric properties.” The low dielectric properties of the sample that had been carefully stored in the research institute's refrigerator were astonishing, and Arai was convinced it had to be released to the public as a product.

However, the road to commercialization was not an easy one. Until this time, Denka had no experience working with organic resin as an electronic material, so members involved in its development scrambled to persuade and coordinate within the company. Additionally, after the first prototype was evaluated by a CCL manufacturer, it was discovered the viscosity was too high, rendering it unusable. Inoue reflected on that difficult moment, “We had to rethink the material design from step one.”

Inoue went on, saying, “We worked with the customer who evaluated the sample to brainstorm how to use the material in the manufacturing process for CCLs.” The high expectations and level of cooperation from the customer helped drive its commercialization forward.

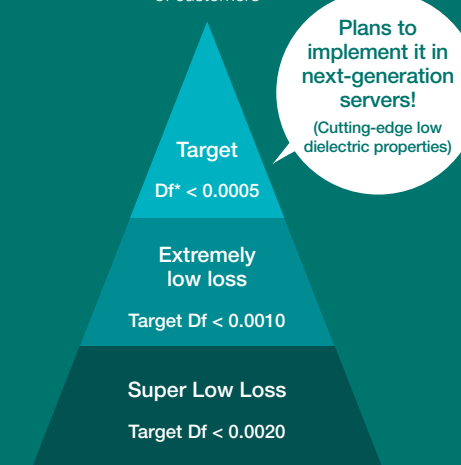
Finally hitting the market in 2025

Finally, in February 2025, Denka launched SNECTON. Going forward, Denka will level up its lineup by offering products with lower dielectric properties, products for interlayer insulating materials, products with low molecular weight, and rigid materials. Furthermore, Denka carries low dielectric silica, a silica filler used in circuit boards like SNECTON, in a variety of sizes to support the trend of multi-layers.

Denka is the only manufacturer that handles the three main low-dielectric substrate materials soft resin, rigid resin, and various filler additives. In the future, Denka will propose materials that meet the diverse needs of its customers and provide a one-stop solution for customers' low dielectric material needs.

Electrical characteristics addressable by SNECTON

Meeting the low dielectric property demands of customers



*Df: Dissipation factor

Message



Combining seeds and needs to make cutting-edge products

Tomoya Kowada

Deputy General Manager, Business Promoting Dept./ General Manager, Advanced Specialty Materials Dept. Electronics & Innovative Products

SNECTON was born from combining coordination polymerization,* Denka's core technology, and the needs of customers who required a low dielectric material. This approach of linking seeds (opportunity) and needs may seem basic, but it is the very essence of creating something new. I believe the numerous core technologies owned by Denka, a company with 110 years of history and involved in a wide range of business areas, hold much potential and make for interesting work.

The name “SNECTON” begins with an “S,” repre-

senting “styrene-based resin,” and reflects a desire to pass it on to the next generation, drawing inspiration from the words “next” and “nexus.” By combining Denka's inorganic filler, which holds the world's top market share, and SNECTON, the first organic material for electronic materials, Denka can provide optimal solutions tailored to various needs such as electrical characteristics and heat dissipation performance.

Including SNECTON and fillers, we aim to achieve an annual sales revenue of 20 billion yen by 2030.

Furthermore, if we promote technological development and SNECTON becomes able to be applied in not only motherboards but all electronics packaging, I expect our business scale will grow exponentially.

Denka will continue to collaborate with people inside and outside the company to create cutting-edge products that will support the future digital society.

*Coordination polymerization: Technology that uses a metal catalyst to coordinate and activate monomers while polymerizing them. It can create advanced polymers by precisely controlling the molecular structure and stereoregularity.

and the Future

SNECTON's development started from scratch. The next step is developing it into a standard product for the industry. (Kume)

After 30 years of working in the research and development of materials, I am deeply moved to have finally achieved results. I am glad that we were able to combine seeds with frontline needs. (Arai)

This field was new to us, and we started by searching for colleagues and partners. I will support the challenges of our young members so that we can continue to create innovative products. (Inoue)

I have received many inquiries from overseas manufacturers and have been busy taking business trips. I feel joy to be able to stay up-to-date with the latest information, including on other organic materials. (Nakagawa)



Scenery That Inspired a Dream Denka's First Step Witnessed by Tsuneichi Fujiyama

At the end of the Meiji era, as Japan shifted its focus from light to heavy industries and began to explore the potential of electrochemistry, one engineer stepped forward to pioneer carbide production—a feat no one in Japan had yet achieved. That engineer was Tsuneichi Fujiyama, a chief engineer at Miyagi Bouseki Dento's Sankyozawa Power Plant. In this issue, we tell the story of Denka's founding from his perspective.



Tsuneichi Fujiyama. He was the first to successfully produce carbide in Japan and founded DENKI KAGAKU KOGYO (currently Denka). He was the engineer that opened up possibilities for electrochemistry.

The light shining on Japan's chemical industry

In 1901, I was invited to work as a chief engineer at Miyagi Bouseki Dento's Sankyozawa Power Plant, to focus on the excess electricity generated at the plant and develop new applications for it. I was particularly drawn to carbide, a versatile material applicable in industry, agriculture, and daily life. I was supported by a friend from

my time at Tokyo Imperial University, Shitagau Noguchi, who had a strong interest in the potential of new industries that use electricity. Thus, we decided to take on the challenge of the unknown sector of carbide production. There wasn't much information and there were no facilities, but we had passion.

We built an experimental furnace using rocks we collected from the hill behind the plant and assembled a transformer by hand outside of working hours in the mornings

and evenings. We mixed raw materials using lime for disinfecting we bought from the drug store and crushed, and charcoal. Then, we opened holes in a fire-resistant brick, used the carbon rods from an arc lamp to create an arc through the holes, and melted the raw materials. The method was very primitive, but the production attempt was successful. It was at that moment I was sure we had just taken the first step toward the future of Japan's chemical industry.

History of Denka



1901

Tsuneichi Fujiyama and Shitagau Noguchi begin experimental research of carbide production in Sankyozawa, Sendai. Carbide was first successfully produced in Japan in 1902.

1907

Nippon Carbide Shokai is established in Minamata, Kumamoto Prefecture. The company begins commercially producing 15 tons of carbide per month.

1908

Nippon Carbide Shokai merges with Sogi Electric Company to become Nippon Chisso Hiryo (currently JNC CORPORATION). Fujiyama later left the company.

1912

Hokkai Carbide Plant is later established in Tomakomai, Hokkaido. Fujiyama established a testing plant.



1915



1916

Omuta Plant begins producing carbide. The same year, Meguro Analysis Laboratory is established, strengthening the company's research and development structure.



DENKI KAGAKU KOGYO KABUSHIKI KAISHA is established with support from Mitsui Group's capital.

1921

Omi Plant begins producing carbide



Oyodogawa Power Plant No. 1 begins supplying electricity to Omuta Plant

1926



Three important figures that greatly contributed to Denka's establishment



Shitagau Noguchi

An engineer known as the father of Japan's electrochemistry. Together with Fujiyama, he succeeded in commercializing carbide, after which he built the foundation for Asahi Kasei, SEKISUI CHEMICAL, and more.



Tamaki Makita

An executive at the time of Denka's founding. Raised the importance of fertilizer production with Fujiyama, and later contributed to the long-term development of Denka.



Ginjiro Fujiwara

Former senior executive officer of Oji Paper. Introduced carbide production as a method of using excess electricity and supported the establishment of Hokkai Carbide Plant.



Hokkai Carbide Plant—the parent of DENKI KAGAKU KOGYO (Denka)

DENKI KAGAKU KOGYO is born from Support and Trust

Following this success, Noguchi and I established Nippon Carbide Shokai in Minamata City, Kumamoto Prefecture, and began the commercial production of carbide. However, with the expansion of the business came disputes over management policies. In 1908, with support from Mitsubishi Group, the company merged with Sogi Electric Company to become NIPPON CHISSO HIROYO (currently JNC CORPORATION), but I decided to leave the company.

I was then reached out to by Tamaki Makita of Mitsui Mining and Ginjiro Fujiwara of Oji Paper. Makita came to me with advice, saying "Why don't you work in fertilizer? Japan needs it." Fujiwara opened the path for me to use the excess electricity from Oji Paper's Tomakomai Plant, displaying his trust in me as an engineer.

With their support, I established the Hokkai Carbide Plant, a testing plant in Tomakomai, Hokkaido.

At the plant, in addition to carbide, we also produced calcium cyanamide and ammonium sulfate, which were used as fertilizer. It was my duty to Japan to establish domestic production of fertilizer that supports the country's agriculture.

But this was not enough to satisfy me. I believed we could contribute to even more industries as long as we had electricity and raw materials. That said, it was impossible to invest in facilities, procure raw materials, and secure electricity on my own. My skills earned me the trust and support of Mitsui Gomei Kaisha, enabling me to found DENKI KAGAKU KOGYO KABUSHIKI KAISHA in May 1915.

Many elite members of Japan's business community were involved in the company's establishment. For example, Kyohei Magoshi, founder of Nippon Beer (currently Sapporo Breweries Ltd.) who was known as the "Beer King of the East," was chairman and director and Takuma Dan, who managed Mitsui Miike Coal Mine and was leading Japan's business community, was an advisor.

Establishing the Omuta Plant and striving to secure electricity

In 1916, with a clear prospect of receiving electricity and raw materials from Miike Coal Mine, we established Omuta Plant in Omuta Town, Fukuoka Prefecture. In order to secure a stable source of electricity, we worked to establish a hydroelectric power plant on Oyodo River in Miyazaki Prefecture.

In 1923, the Great Kanto Earthquake heavily damaged Tokyo headquarters, but we pushed forward with the plant's construction, completing Power Plant No. 1 on Oyodo River in Miyazaki Prefecture, in 1926. Enhancing the company's self-sufficient power supply system contributed directly to its steady business. Furthermore, we introduced a new electric furnace at the Omuta Plant, multiplying our carbide production capacity. We continued to self-manage our company's electricity and facilities. It was our conviction to do so. This conviction was imbued with our single desire to shape the future of chemistry. That aspiration still burned bright within me.

Story 1

Attempting to secure stable electricity

DENKI KAGAKU KOGYO, at the time of its founding, required an enormous amount of electricity for producing carbide and calcium cyanamide. While the lack of a stable supply of electricity would put the business at risk, Denka proceeded with the construction of its own power generation system. The symbols of this challenge are Power Plants No. 1 and No. 2 in the Oyodo River basin in Miyazaki Prefecture. Recognizing the potential of this area, which was abundant in hydroelectric resources, Denka built power plants, securing a reliable power supply to the Omuta Plant.



“ Buying electricity from other companies is more expensive than is ideal. Our best option is to supply our own. ”

(From the December 10, 1927 issue of *Toyo Keizai Shimpō*)

Story 3

Meguro Analysis Laboratory: the origin of technological development

DENKI KAGAKU KOGYO set its eyes on expanding beyond fertilizer and into the chemical business and established the Meguro Analysis Laboratory in Meguro Town (currently Nakameguro, Meguro District), Tokyo Prefecture, in 1916. Equipped with a two-story, wooden research center and office, and two testing plants, the research center researched producing soda ash through the ammonia soda process as well as metallic aluminum. The Meguro Analysis Laboratory would then expand to the Meguro Research Laboratory, Central Research Laboratory, and Innovation Center, setting the foundation for Denka's technological development.

From here, we will challenge ourselves to become more diverse!



“ We aim to develop a diverse range of chemical industries. ”

(From the DENKI KAGAKU KOGYO Statement of Purpose)



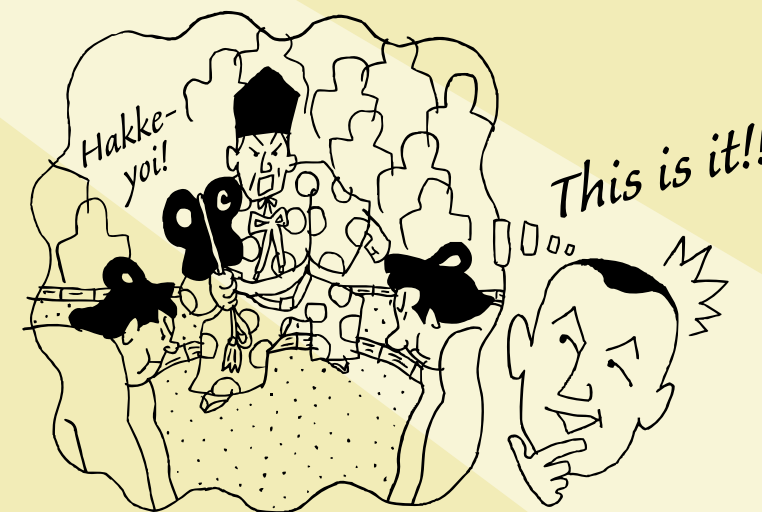
Story 2

The thought behind the company name

In 1915, Fujiyama gathered 21 influential figures of Mitsui Group for a Promoter's meeting at the Yurakucho Mitsui Meeting Place. In regard to the company name, Fujiyama wanted to include "Mitsui" in the company name, but abandoned the idea due to Mitsui's circumstances. He then said, "Then let's leave it as it is—without adding anything," and named the company DENKI KAGAKU KOGYO KABUSHIKI KAISHA. "DENKI KAGAKU KOGYO" translates to "electrochemical industries." Despite being established as a fertilizer production company, Fujiyama did not include "fertilizer" in the name because he believed, in the future, the company would not only work in fertilizer but also electrochemistry. From the time of the company's founding, Fujiyama saw its future as an integrated chemical company.

“ The company's future isn't only fertilizer. We will make it an electrochemical company. Fertilizer is only one part of its future. ”

(From *The 100-Year History of DENKI KAGAKU KOGYO KABUSHIKI KAISHA*)



Story 4

The connection to Denka's trademark gunbai

Toward the beginning of the Showa era (1926-1989), sales of calcium cyanamide were sluggish, so Denka needed an approachable trademark to promote sales. It was at this time that Kihei Abe, who worked for the Commercial Affairs Section, was ordered to come up with a design and conceived the idea for a *gunbai* (short for "*gunbai uchiwa*," or a military fan used by Japanese commanders to direct troops). *Gunbai* symbolize national peace, prosperity, and abundant harvests and are a lucky item used when announcing victories in sumo, so they are familiar to those in rural areas, too. Since registering the trademark in February 1927, it has become a well-known symbol of the trust and familiarity of Denka's products.

“ I forget who it was, but someone left to go watch sumo. This made me think of a *gunbai*, and I knew this trademark was the one. ”

(From the inaugural issue of *Gunbai*, Denka's original internal company magazine)

CROSS Baton

Exploring the thoughts of the Denka employees behind our products from sales and development to manufacturing

Calcium cyanamide is our way of addressing agricultural changes

I'm in charge of international business surrounding calcium cyanamide with the Water & Agri-Products Department. Our main market focus is currently India, where we are looking to expand the potential of the product via proposals to existing customers, cultivation of in-roads to new markets, and even market research aimed at developing new use cases. I also help ensure a stable and steady supply of product, staying involved with domestic and international order and inventory management, as well as delivery arrangement, ensuring smooth operations of every part of the supply chain.

Recently, many changes have been taking place in the field of agriculture. Calcium cyanamide is poised to play a big role within that. For example, it's being eyed as an effective method of pest control for species like channeled apple snails, whose damage is growing more widespread with global-warming-based migration. It also helps contribute to the realization of a zero-carbon society, aiding the reduction of methane gas emissions. It feels good to be able to work with a product poised to contribute to positive change in this way.

Getting the most value I can out of the product

I don't want to simply be confined to my role in sales. I want to be part of the workforce helping draw the most value we can out of our products. That's my goal. Transitioning from regional sales at the Fukuoka Branch to business coordination at the main headquarters, and now to my current work in international sales, I've been able to experience business surrounding the product from multiple angles. Now my goal is to put that experience to use, crossing silos to respond flexibly and ably to product- and sales-based needs.

Calcium cyanamide has a long history of use in agriculture, but it is now set to play new roles in diverse arenas like environmental initiatives and even in industrial fields. We've established Sustainable Living as a key focus area within our Mission 2030 management plan. As a product that can help solve societal issues, I'm confident in its acquiring even greater value in the future. Through my work in sales, I'm doing my part to establish a more sustainable foundation for the future. That is my mission in this role.

Pursuing greater potential in calcium cyanamide



Yuka Ito

Water & Agri-Products Department,
Elastomers & Infrastructure Solutions

Profile

Joined Denka in 2020, gaining experience at the Fukuoka Branch Agri-Product Section before moving to the Agri-Products Department at the Denka headquarters. She is currently involved in developing uses and expanding market bases for calcium cyanamide both within and outside of Japan. Her favorite way of recharging for work is spending relaxation time at home.

Product Spotlight

Calcium Cyanamide



Could you summarize the product in a few words?

A product that continues to evolve with the times

What kind of specialist do you aspire to be?

I wear several hats in my office, not simply limited to sales. In my future career development, I want to be seen as someone who can respond flexibly with new ideas and new projects without feeling fixed to one area.



Supporting the future of farming from right here in Omi



Profile

Joined Denka in 2000. Currently works in the Inorganics Department's Inorganics Products Section at the Omi Plant, serving as lead for production and production planning for calcium cyanamide. Also oversees production operations to ensure a stable product supply and consistent quality. His latest hobby is exploring Kyoto.

Nobuaki Ono

Inorganic Products Group,
Inorganic Products Section,
Inorganics Department,
Omi Plant

A cornerstone of Denka manufacturing

Denka has continuously produced calcium cyanamide since its founding. Calcium cyanamide is a nitrogen-based fertilizer manufactured by making carbides (derived from limestone) absorb and compound nitrogen at high temperatures. We carry out over 30 types of tests, and have it inspected in strict accordance with the Agricultural Chemical Control Law, having it registered as an agricultural chemical as well. Its main constituent, calcium cyanamide, has no residual properties after it has demonstrated its effectiveness as an agricultural chemical (insecticidal, fungicidal, and sterilization), decomposing into its components in the soil.

Data

■ Lead production site: Omi Plant
■ Sales: Water & Agri-Products Dept.

Could you summarize the product in a few words?

A product supporting the future of crops and soil

What kind of specialist do you aspire to be?

I want to pass on the skills, knowledge, and passion I hold for calcium cyanamide, with its century-plus-long history, onto the next generation. That is my image of the ideal specialist.



Contributing to agriculture through stable product supply

Denka has been producing calcium cyanamide for more than a century. I feel incredible pride in that—and a sense of responsibility.

I currently serve as production lead for calcium cyanamide at the Omi Plant and am responsible for production planning and overseeing operations. We have two main product types—granule and powder. I oversee the entire production process for both, from setting production schedules based on necessary production volume and sales conditions to final packaging. All to ensure a stable product supply to our customers.

The greatest appeal of this work for me is the feeling that I'm contributing to society. Denka's calcium cyanamide doesn't just support crop growth as a fertilizer—it helps improve the soil while also fulfilling herbicidal and pesticidal functions. It's a multi-functional product. It's working hard to support crops within and underneath the soil—an unsung hero of agriculture.

Passing on refined technologies to the next generation

I feel it's my responsibility to pass on the accumulated technologies and techniques regarding calcium cyanamide production to the next generation. We're working hard every day to build in small improvements for safer and more efficient production. Our small, continued efforts can help improve product quality and reduce environmental burden, contributing significantly to sustainable agriculture.

Finally, I'm incredibly happy to be doing all of this in my home region of Omi. I'm surrounded by the people and nature of my home area, working for a company rooted in the local community. At the same time, I'm contributing to the agricultural future not only within Japan, but globally, through my work. I want to keep delivering safety and peace of mind to all those working in agriculture through the production of calcium cyanamide.

6-8
Jun. Aug.Pick Up
Jul.

Established R&D center for plant-based production of valuable proteins

In collaboration with industry, government, and academia, Denka has established a research and development center for producing valuable proteins through plant-based biomanufacturing on the campus of Yokohama National University. The company aims to develop low-carbon and highly safe manufacturing technologies with potential applications in pharmaceutical raw materials.

Denka has collaborated with five industry-academia-government institutions,^{*1} including Yokohama National University, to establish a plant-based biomanufacturing R&D center on the university's campus.

This initiative is part of a research and development project that has been underway since FY2020, under the auspices of NEDO.^{*2} Its goal is to implement the social application of valuable protein production using genetically modified plants.

The newly established R&D center serves as a core hub for next-generation, plant-based biomanufacturing. It not only conducts research and development activities such as plant cultivation, gene introduction, extraction, and purification but

also supports demonstration, manufacturing, human resource development, and information dissemination. With potential applications spanning pharmaceutical raw materials, like vaccines and antibodies, diagnostic reagents, and enzymes, the initiative aims to promote the adoption of low-carbon and highly safe biomanufacturing technologies, while supporting the creation of new industries.

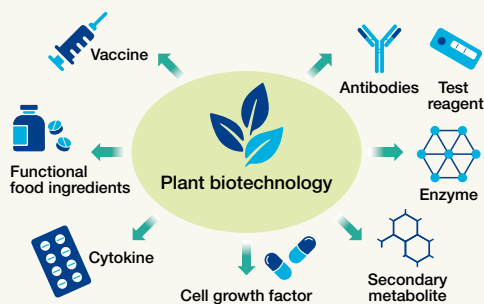
^{*1} Yokohama National University, National Institute of Advanced Industrial Science and Technology, KAJIMA CORPORATION, the Graduate School of Agricultural and Life Sciences, the University of Tokyo, and Hokkaido University

^{*2} New Energy and Industrial Technology Development Organization

Interview with the project leader!

The future of sustainable protein manufacturing opened up by biomanufacturing

Denka is taking on the challenge of commercializing low-environmental-impact protein production technologies through industry-academia-government collaboration. We spoke with Mr. Ogasawara from the Diagnostics Research Department about the background of the initiative and its future outlook.



Explanation!

What are the benefits of plant-based proteins?

Currently, most of the valuable proteins industrially used in biotechnology are produced using microorganisms or animal cells. Plants, however, absorb CO₂ through photosynthesis as they grow, enabling the production of valuable proteins with a lower environmental impact. Moreover, the initial equipment investment can be minimized, allowing for relatively cost-effective production. Since these proteins are plant-derived, the risk of contamination by pathogens or toxins is also reduced. Thanks to these advantages, research and development in this field is actively underway around the world.



Interview with a key person!



Daisuke Ogasawara
Diagnostics Research Dept.,
Life Innovation

Q. What led Denka to participate in this project?

Denka introduced plant-based protein production technology in 2015 and initiated research within Life Innovation. As the technology advanced toward practical application, the company established relationships with several key opinion leaders, ultimately leading to its participation in a NEDO project.

Q. Please tell us about the significance of the project.

The project's greatest strength lies in its low environmental impact. By absorbing CO₂ through photosynthesis and producing organic matter, greenhouse gas emissions can be significantly reduced. Denka is implementing highly efficient production technologies to promote practical application, aiming to contribute to the realization of a sustainable society.

Q. Could you share the outlook and future aspirations for this project?

The Diagnostics Research Department is developing cost-reduction technologies for protein purification, aiming for a tenfold increase in efficiency compared to conventional methods. The results will be applied to raw material production, paving the way for commercialization.

Toward a sustainable future with plant biotechnology



Kazuyuki Hiratsuka
Faculty of Environment and
Information Sciences,
Yokohama National University

This research and development center, established on the Yokohama National University campus, is a facility dedicated to fostering cutting-edge plant biotechnology and disseminating its advancements to society. It also functions as a hub for talent development, education, early-stage project experimentation, and information exchange, promoting interaction among diverse individuals pursuing plant biotechnology. Plant biotechnology, which has a low risk of pathogen contamination and low environmental impact, excels in responsiveness and versatility, giving it the potential to meet social needs. By combining these technologies, further improvements in productivity are anticipated. Moving forward, we aim to leverage our research outcomes and accumulated know-how to establish groundbreaking high-efficiency technologies and promote their practical implementation in society.

Jun.

The 166th ordinary general meeting of shareholders held

On June 20, the 166th ordinary general meeting of shareholders was held at Nihonbashi Mitsui Hall. It was attended by 73 shareholders and broadcasted live on the internet. On the day, Toshio Imai, Ikuo Ishida, and Rumiko Nakata were re-elected as directors, while Rimuru Hayashida, Masanobu Kosaka were newly appointed. All agenda items were approved as originally proposed, and the meeting adjourned. Following this, Toshio Imai was appointed chairman and representative director, and Ikuo Ishida was appointed representative director and president.



Jun.

Honored with Responsible Care Excellence Award from JCIA

Denka's Chiba Plant received the 19th Responsible Care (RC) Excellence Award from the Japan Chemical Industry Association (JCIA). The plant was recognized for its efforts to foster a strong safety culture through the establishment of Anzensoseikan (Safety Creation Center). This facility offers hands-on training in technical and non-technical skills, with a particular focus on communication among employees. The award highlights the plant's unique approach to safety education, including its diverse annual curriculum, efforts to prevent training fatigue, and its continued activities even during the COVID-19 pandemic.



Jun.

Received A rating in the fourth consecutive year in the JRECO CFC Control Measure Rating

Denka has received an A rating for the fourth consecutive year in the 4th Chlorofluorocarbon (CFC) Control Measure Rating conducted by the Japan Refrigerants and Environment Conservation Organization (JRECO). This rating is independently carried out by JRECO based on publicly available information from 1,641 companies listed on the Tokyo Stock Exchange Prime Market. It evaluates each company's understanding, awareness, and initiatives related to the Act on Rational Use and Proper Management of Fluorocarbons. Denka was highly recognized for its ongoing efforts to reduce and manage fluorocarbon emissions, including the implementation of its refrigerant management system RaMS and comprehensive employee training programs across the company.



Jul.

Signed an MoU with Omuta City Former Omuta Plant housing site now a public parking lot

On July 8, a memorandum of understanding (MoU) regarding the lease of land between Omuta City and Denka's Omuta Plant was signed at Omuta City Hall. It was agreed that the former company housing site owned by the Omuta Plant (the former Takarazaka housing site) will be leased to the city free of charge for use as a parking lot serving public facilities such as the Omuta Culture Hall, Karutax Omuta, and Omuta Arena, primarily for the use of facility visitors. The signing ceremony was attended by many stakeholders, including Mayor Seki of Omuta City and Plant Manager Nishimura of the Omuta Plant. At the ceremony, Plant Manager Nishimura expressed his commitment to continue contributing to the development of the local community.



Aug.

FY2025 1Q financial results briefing held

On August 7, Denka announced its financial results for the first quarter of fiscal year 2025. On the same day, the company held an earnings briefing via teleconference. A total of 59 participants, including institutional investors and analysts, joined the session. Various questions were raised regarding demand trends in Electronics & Innovative Products, particularly on AI and xEVs, as well as the sales performance of clinical reagents and test kits in Life Innovation. Progress on the chloroprene rubber production facilities at DPE was also discussed.



Aug.

Started online sales of the humic acid magnesium fertilizer AZUMIN

Denka has launched a home gardening package for the humic acid magnesium fertilizer AZUMIN. This product, which has long been used by professional farmers, primarily contains humic acid and magnesium. It helps activate plant roots and improve soil conditions to enhance fertilizer effectiveness. In response to strong demand from general consumers, Denka has begun offering the product in smaller quantities. It is now available on JA Town, the official online shop operated by ZEN-NOH.

