

# id

Sumitomo Electric Group Magazine

vol. 24

**Innovative Development,  
Imagination for the Dream,  
Identity & Diversity**

Feature

## The Future of the Digital Society Connected by Thunderbolt™



# From Creative Work to E-sports

## Enhancing convenience in digital society.

As a result of the significant growth of data traffic in today's world, there is a growing desire for large-capacity and high-speed data transmission. Among those at the forefront are esports athletes, whose field is becoming more widely known, and digital artists who create impressive works with computer-generated imagery and animation. For them, in order to enhance their performance, it is not just the processing speed of their personal computers (PCs) that matters. It is also essential to have an optimal connection to displays, storage, and other devices – in other words, a cable that will get the most out of their equipment.

Against this backdrop, in 2011, Intel Corporation (hereafter "Intel"), the world's largest semiconductor manufacturer at the time, introduced the next-generation communication standard, Thunderbolt™, to the market. Thunderbolt™ is a standard designed to enable high-speed data transmission. The Sumitomo Electric Group has been responsible for developing and manufacturing Thunderbolt™ cables, the market for which is expected to grow significantly in the future. In this issue, we look at the Sumitomo Electric Group's efforts in the development and sales of this outstanding cable.



A single Thunderbolt™ cable simultaneously connects a PC to two 4K displays and multiple external storage devices, creating a comfortable working environment.  
(Image courtesy of Intel.)



Thunderbolt™ cables can be connected to many kinds of peripheral devices.  
(Image courtesy of Intel.)



A single interface meets a variety of user needs.  
(Figure courtesy of Intel.)

# A Single Interface for Power Supply, Data Transfer, and Video Display

## Improvement of Data Transmission Speeds to 80 Gbps

Thunderbolt™ is a standard for high-speed, general-purpose data transmission between PCs and peripheral equipment such as external displays and storage devices. It features the use of a single interface to

enable the three functions of power supply, data transfer, and video display.

Thunderbolt™ was first released in 2011 with a maximum transmission speed of 10 Gbps. That rate was twice as fast as USB3.0 at the time. Subsequent versions achieved even higher speeds: Thunderbolt™ 2 came out in 2013 and offered 20 Gbps;

Thunderbolt™ 3 (in 2015) and the USB4-compliant Thunderbolt™ 4 (in 2020) delivered 40 Gbps speed. The upcoming Thunderbolt™ 5 achieves 80 Gbps. What such higher bandwidth allows, for example, is for gamers to enjoy smoother motion and lower latency, and for creators to quickly back up large video and photo files while working on multiple displays. With these features, Thunderbolt™ provides strong support for improving digital work performance, including



Thunderbolt™ active optical cable capable of transmission up to 50 m



Thunderbolt™ 5 cable

games and video production.

Currently, three kinds of cables are in use: passive copper (electrical) cables that transmit signals directly for short lengths of around 1 m, active copper cables equipped with circuits that reduce signal attenuation for lengths over 1 m, and active optical cables that can transmit signals over a distance from 3 m to a maximum of 50 m.

## Flexible Cables for High-Speed Communication

The company responsible for developing and manufacturing Thunderbolt™ cables is Sumitomo (SEI) Electronic Wire, Inc. (hereafter "SEIW"), a member of the Sumitomo Electric Group. For many years, the company has developed and manufactured electrical wires for electronic and information devices, and is especially well regarded for its

micro-assembly technology. Hiroyuki Semba has been involved in the development of Thunderbolt™ cables since the early days.

"One of the features required of Thunderbolt™ is high-speed transmission. The cables that were mainstream for high-speed transmission at the time were twisted-pair cables, which were made of twisted pairs of wires, and had issues with being stiff and difficult to use. As an alternative, we proposed a micro-coaxial cable to Intel. Its biggest advantage is that it enables high-speed communication while being flexible. The design was approved, so the development and manufacturing were entrusted to our company." (Semba)

The Cable Assembly Department, led by Semba, was tasked with maintaining the cable's characteristics through optimal processing. To meet the challenge, SEIW made full use of the micro-assembly technology that the

company had developed over the years.

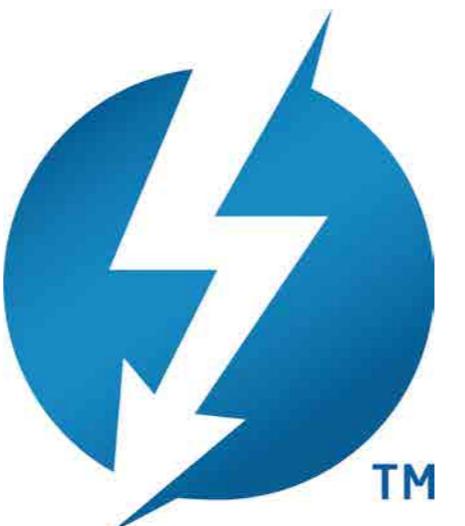
"Since the launch, other suppliers have received Intel's approval and have entered the Thunderbolt™ market. To maintain our advantage, I believe it is important to hone the fundamentals of development and manufacturing: quality (Q), cost (C), and delivery (D)." (Semba)



Hiroyuki Semba  
General Manager  
Cable Assembly Department  
Sumitomo (SEI) Electronic Wire, Inc.

# The Inside Story of the Development of Thunderbolt™

## Sumitomo Electric's comprehensive strength in responding to Intel's requests



### The Real Need Is Not Optical Fiber, It's a High-Speed Interface

The Sumitomo Electric Group first became involved in the development of Thunderbolt™ back in 2009. At the time, Mitsuaki Tamura was a member of Optical Communications Laboratory and was promoting Sumitomo Electric's intra-equipment optical fiber

connection technology to businesses, mainly in Silicon Valley. During this time, he had the opportunity to give a presentation to Intel.

"At the time, there was momentum to transition intra-equipment high-speed signal wiring from copper to optical. We made a presentation on our optical wiring technology to Intel. Intel was studying optical interface as

Thunderbolt and the Thunderbolt logo are trademarks or registered trademarks of Intel Corporation in the United States and other countries.

a next-generation communications protocol for PCs and showed great interest. This is how we started developing Light Peak, the predecessor to Thunderbolt™." (Tamura)

Initially, the plan was to adopt an optical interface, but the situation changed during product development.

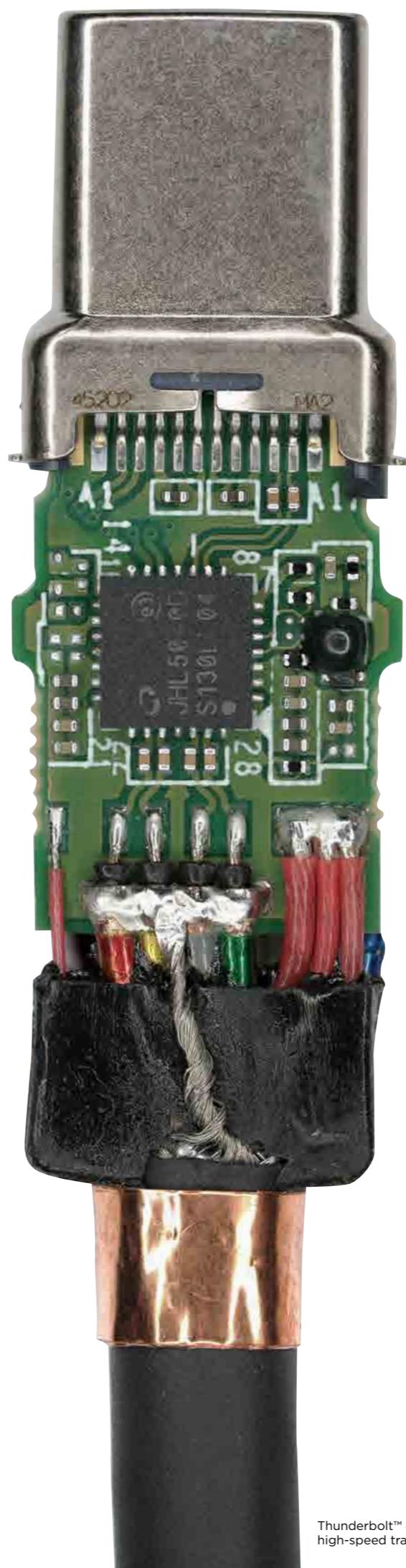
"Optical fiber connections are vulnerable to dust. There were concerns about their reliability for consumer use. Also, an optical interface costs more than one with copper. The decisive factor was our realization that Intel's true need was not to switch to optical fiber but to achieve a high-speed data transmission. Sumitomo Electric's world-class micro-coaxial cable harness technology was used in the hinge assembly of mobile phones and



Mitsuaki Tamura  
Senior Assistant General Manager  
Innovative Network I Department  
New Business Marketing & Promotion Division  
Information Transmission Department  
Optical Communication Laboratory

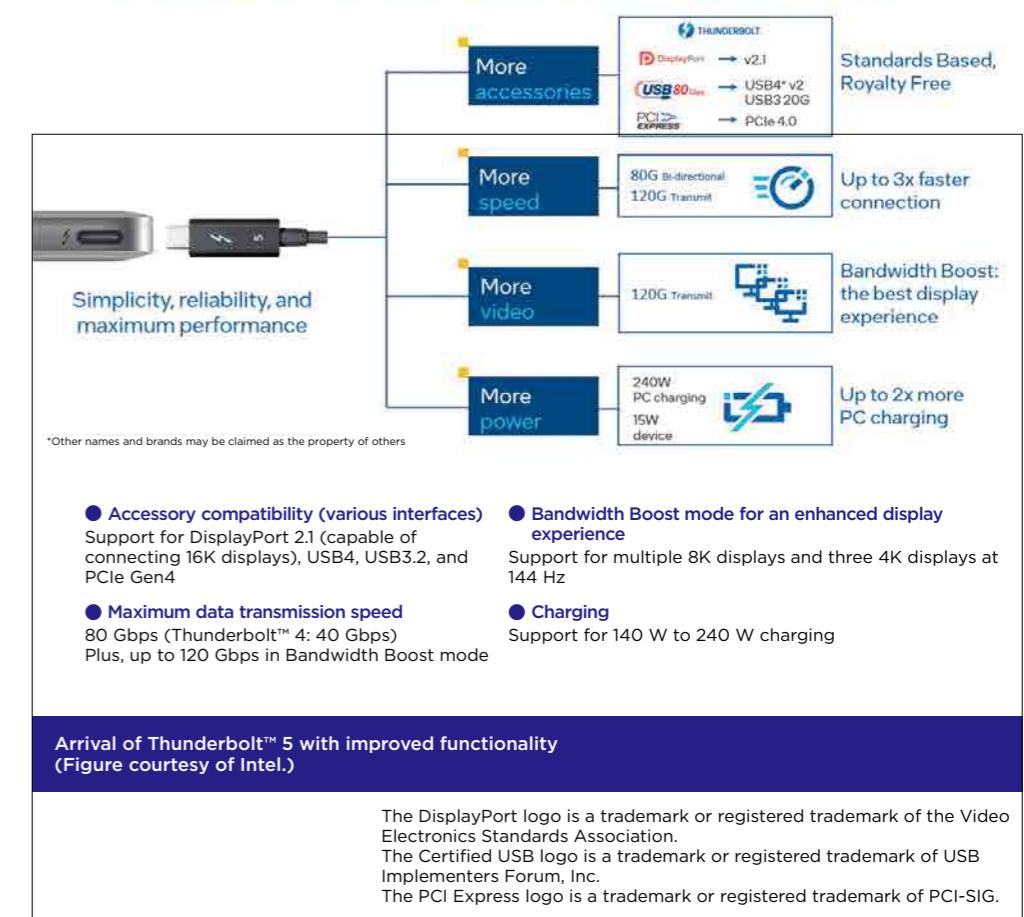


Jason Ziller  
Vice President and General Manager,  
Client Connectivity Division, Intel Corporation



Thunderbolt™ 4 cable equipped with electronic circuitry to enable high-speed transmission

### Thunderbolt™ 5 Provides Industry Leading Experience



notebook PCs. The company also had the ability to propose both copper and optical solutions. In this context, we proposed using micro-coaxial cables as Thunderbolt™ cables. The proposal was well received and helped us build a strong relationship with Intel." (Tamura)

### Relationships Built Through Thunderbolt™

Thus began the development of Thunderbolt™ cables, with the aim of creating a high-speed interface. A key challenge was improving the delay time difference in signal transmission that occurs between the two cores of a pair cable, known as "intra-pair skew." The goal was to reduce this skew to as close to zero as possible. Another major challenge was to improve the phenomenon of sharp signal attenuation at certain frequencies. By overcoming these challenges one by one, we were able to create a high-speed interface with 20 Gbps bandwidth. In 2011, Thunderbolt™ cables were launched.

Mr. Jason Ziller, currently vice president and general manager of the Client Connectivity Division at Intel,

served as the marketing leader during the early stages of Thunderbolt™ development and has worked closely with the Sumitomo Electric Group on a number of fronts.

"When we were considering whether to go with optical fiber or metal, we were amazed by the micro coaxial cable proposed by Sumitomo Electric. It promised the possibility of creating a high-speed interface using metal. Since then, they have become one of our leading partners in the Thunderbolt™ cable ecosystem, and we highly value their high level of technical expertise, as well as their diligence and commitment. Sumitomo Electric has built a really good relationship with Intel. We hope to continue this relationship in the future," said Ziller.

Ziller predicts that the needs of e-sports and other gamers and digital creators, who are the core users in the Thunderbolt™ market, will continue to expand.

"Thunderbolt™ is simple yet highly engineered and reliable. The number of people needing it will surely grow. Wherever there is a PC, there is Thunderbolt™—that's the world we're aiming for," said Ziller.

## Acting as a Bridge Between Intel and the Development Team in Japan

In 2011, the Thunderbolt™ Project was launched within SEIW. One of the members who took part in this project is Toru Takahashi.

"When creating Thunderbolt™, we worked with Intel to develop the specifications, including the optimum cable length and diameter, reducing transmission loss, and microtechnology for connecting cables and connectors. I felt like I was at the forefront of bringing Thunderbolt™ to the world, acting as a bridge between Intel and our developers in Japan, and creating and evaluating samples." (Takahashi)

Takahashi then worked at a factory in Shenzhen, China to ramp up mass production of Thunderbolt™ 3 cables. He is currently leading the development team for Thunderbolt™ 5, the next-generation protocol. Yunfei Zhu, a member of that team, has been involved in the development of Thunderbolt™ 4 since 2018.

"The Thunderbolt™ 4 cable was required to be USB4 compliant while



Development meeting using Thunderbolt™ 4 cables for connections to a projector and a large display (SEIW)

offering ultra-high speeds of 40 Gbps. An ultra-high-speed cable is a composite cable made up of a variety of wires. Each cable in a composite cable is required to be thin. My task was to change the internal structure of the cable to its optimal shape. This has made high-speed transmission possible." (Zhu)



Research on IC connected (Optical Communications Laboratory)

Takahashi and his team are expected to take the lead with regard to Thunderbolt™ 5.

### Development of Transmission Lines Compatible with High-Frequency Bands

Optical Communications Laboratory

at Sumitomo Electric has been collaborating with SEIW to develop Thunderbolt™ cables. Takeshi Inoue describes the laboratory's role as follows:

"Thunderbolt™ cables differ from conventional ones in that they require both circuit design and software development to occur in tandem. The

question was what protocol would be suitable for exchanging data. Since this was the first time we had handled this product, we started by understanding not only Thunderbolt™ but also the history of consumer communications standards." (Inoue)

Masaki Suzuki says that when he first joined the development team, it was a trial-and-error process.

"With Thunderbolt™ as a product built to a new standard, we started without any tacit knowledge and had to go through a process of trial and error to deepen our technical understanding and proceed with development in an environment of undetermined specifications. During this process, we started from scratch, collecting data and verifying factors such as board design and transmission characteristics." (Suzuki)

The Sumitomo Electric Group's copper cables support the world's infrastructure in the fields of electricity and communications, while its diverse optical cable products underpin the field of cloud computing. By combining the technical capabilities and

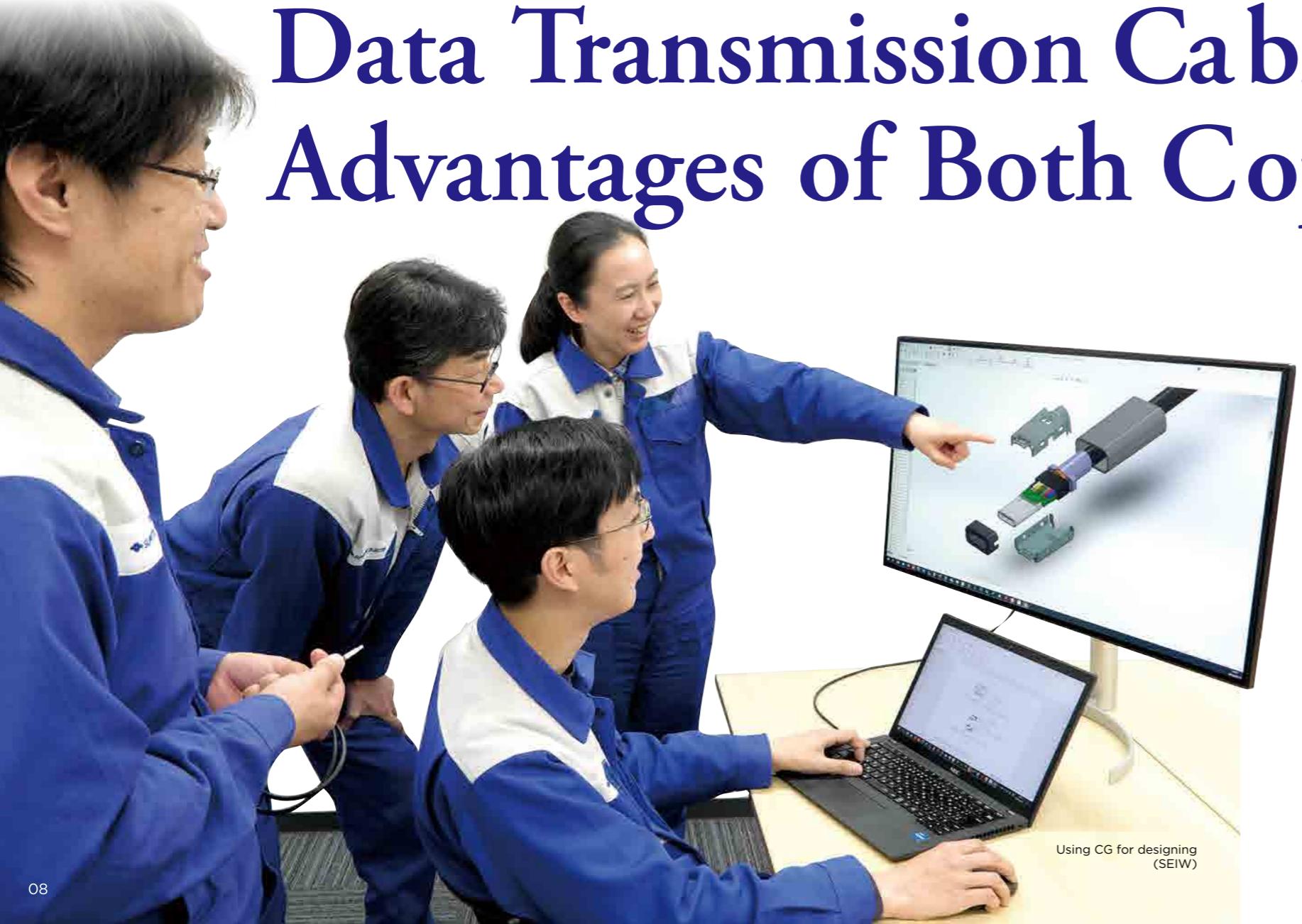
knowledge of copper and optics that have been built up over a long history of development, the company was able to meet Intel's needs. In particular, adapting to new versions was one of Inoue and his team's most important missions.

"The upgrade from Thunderbolt™ 4 to Thunderbolt™ 5 doubles the communication speed. The trend towards higher speeds will continue into the future. The goal is to develop a signal transmission line that can handle greater bandwidth. We need to rethink the coaxial cable structure we have used up until now and constantly seek out and develop new solutions." (Inoue)

High-speed communication, in other words, a higher frequency band, means increased transmission loss. There is a constant demand for transmission lines that minimize this loss.

"Thunderbolt™ connections use connectors and circuit boards. For them, cables are essential. It feels like a never-ending battle to advance the development of technology as transmission speeds increase." (Suzuki)

# Accelerating the Development of High-Speed Data Transmission Cables with the Advantages of Both Copper and Optical



Using CG for designing (SEIW)



Toru Takahashi  
Manager  
Cable Assembly Engineering Section  
Cable Assembly Department  
Sumitomo (SEI) Electronic Wire, Inc.



Yunfei Zhu  
Assistant General Manager  
Cable Assembly Engineering Section  
Cable Assembly Department  
Sumitomo (SEI) Electronic Wire, Inc.



Takeshi Inoue  
Group Manager  
Information Transmission Department  
Optical Communications Laboratory



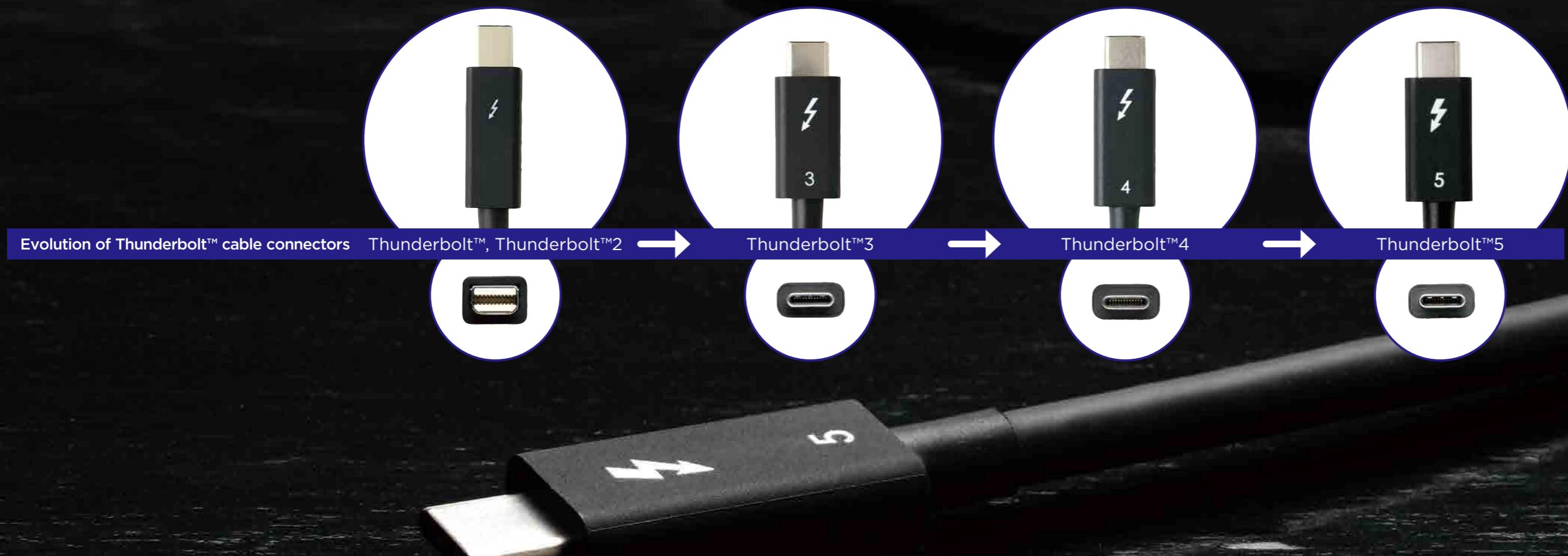
Masaki Suzuki  
Assistant Manager  
Information Transmission Department  
Optical Communications Laboratory



Sumitomo (SEI) Electronic Wire, Inc. in Kanuma, Tochigi



Thunderbolt™ cables are manufactured in and supplied from the Shenzhen Plant in China (top) and the Vietnam Plant (bottom).



# Strengthening Its Market-Oriented Strategy Through B2C Promotion

## Use of the Type-C Connector Was the Key to Growth

More than 10 years has passed since Thunderbolt™ was first released on the market. From the very beginning, Motoi Matsuo focused on expanding sales. He has been managing the sales of Thunderbolt™ since 2012.

"We approached PC peripheral device manufacturers mainly in Europe and North America to raise awareness of the features and product appeal of Thunderbolt™, a product that can connect to any device and achieve high-speed transmission. Every manufacturer gave it high marks. Furthermore, Thunderbolt™ 3 enabled the use of USB Type-C ports, which led to its widespread market penetration." (Matsuo)

What is noteworthy here is that while the basis of the Sumitomo Electric Group's business is B2B, with regard to

Thunderbolt™, the group is promoting it as B2C with end users in mind while still keeping B2B at the core.

## Awareness-Raising Strategy Through B2C Promotion

Thunderbolt™ cables provided by the Sumitomo Electric Group have been sold by major online retailers for about 10 years. Although sales are small, they represent a valuable opportunity to understand the needs of end users. Then in 2024, new strategies to expand sales were launched. One is the B2C promotion strategy. In addition to traditional B2B promotion, this involves directly approaching end users with the aim of raising awareness and expanding demand. Sumitomo Electric also plans to distribute Thunderbolt™ 4 cables to customers in other business divisions as giveaways, and also aims to have them adopted as giveaways by

their customers.

"Thunderbolt™ cables are well known among B2B customers such as PC-related device manufacturers, but awareness of them among end users is currently low. Therefore, we hope to use various opportunities, such as communicating through social media, revamping our website, developing brand pages on major ecommerce sites, and exhibiting at overseas exhibitions, in order to ultimately increase awareness among end users and spur increased sales. If these efforts prove successful, we would like to expand them to our sales bases around the world." (Matsuo)

When Thunderbolt™ cables were first released, the Sumitomo Electric Group had a lion's share of the market. However, overseas suppliers and manufacturers have since followed suit, so the market is now in a state of fierce competition. Let us see how the sales

side is going to secure a market advantage.

"What's important is to quickly respond to various requests for minor changes from our B2B customers, leveraging the high level of technical expertise we have developed thus far. At the same time, it is also important to respond accurately to the feedback we receive directly from end users through



Motoi Matsuo  
General Manager  
Electronic Wire Sales Department  
Electric & Information System Materials Sales Division

B2C channels, while proactively using this feedback for our market-oriented B2B strategy. We also want to demonstrate our strength in terms of price and supply by thoroughly reducing costs to enhance our competitiveness and by expanding production in Vietnam." (Matsuo)

The Sumitomo Electric Group has also begun manufacturing and selling USB4 cables (the latest standard) for the large USB market. It will be interesting to see how the Sumitomo Electric Group's new B2C business, which started with the first generation of Thunderbolt™, develops with the upcoming release of Thunderbolt™ 5.

## Thunderbolt™ cables can be used as giveaways from your company!

Use Thunderbolt™ cables as a giveaway for your company. For more details, please contact us at [thunderbolt-enquiry@info.sei.co.jp](mailto:thunderbolt-enquiry@info.sei.co.jp)

### Giveaway details

Product name: Thunderbolt™ 4 or 5 (passive cable)  
Cable length: 0.5 to 1.0 m  
Color: Black  
Box: 115 mm × 82 mm × 28 mm  
\* Box design can be customized according to your preference.



## Kyohei Sakaguchi

Kyushu Sumiden Seimitsu, Ltd.  
Leader, Machinery Team, Equipment Section, Equipment Group,  
Engineering Department

Apr. 2006: Joined Kyushu Sumiden Seimitsu, Ltd.  
Oct. 2006: Assigned to the Micro Drill Section of the Production Department  
Oct. 2009: Assigned to the Machinery Team, Equipment Section, Equipment Group, Engineering Department  
Apr. 2022: Promoted to Leader of the Machinery Team, Equipment Section, Equipment Group, Engineering Department  
Apr. 2023: Recognized as expert\* (in general maintenance of equipment and machinery)

\* Expert: Sumitomo Electric places importance on the skills that underpin the foundations of manufacturing and recognizes employees who have critical skills as experts in order to maintain, improve, and pass on these skills.



# The Pride and Responsibility in Conducting Maintenance Is the Source of Motivation.

A sense of mission to support approximately 400 pieces of production equipment

### The Impact of the Micro Drill, Thinner Than a Hair

“Meticulous attention and accuracy” ensures stable operation of production equipment—this is the fundamental rule of maintenance work. To achieve this, I pursue a high level of maintenance skills.

I loved making things when I was a child, so I went to a technical high school. When I was in my second year of high school, I visited Kyushu Sumiden Seimitsu—where I currently work—as part of the curriculum. The tour included observing the manufacturing process for various cutting tools made of hard metals, or cemented carbide alloys. During the tour, I came across a product called a micro drill. This is a drill capable of fine, high-precision hole drilling. I was amazed at the world of precision machining and honestly thought it was great. I was strongly attracted by the technical capabilities of the company in producing high-precision cutting tools and also to its stability, being a member of the Sumitomo Electric Group, so when the time came to look for a job, I applied to join the company. My wish came true and after joining the company, I was assigned to the Production Department. Four years later I was transferred to my current position in the Machinery Team, Equipment Group, Engineering Department. Since then, I have been involved in the maintenance and management of production and utility facilities.

### To Achieve Manufacturing Precision in the Micrometer Range

Kyushu Sumiden Seimitsu supplies customers with products that enable them to achieve high precision and performance, such as turning tools, milling tools, end mills, and drills, which underpin the foundations of manufacturing. There are approximately 400 pieces of equipment used to produce these products. My role is to ensure that these production facilities operate smoothly and continuously. My daily work involves quickly and accurately identifying and understanding the causes of any malfunctions that occur in production equipment, and quickly restoring the equipment. Additionally, major events include overhauls, which require the equipment to be shut down for periods ranging from three days to a week, depending on the size of the equipment. The products are required to be extremely precise in the micrometer range. Therefore, the production equipment used to make this possible must also maintain a high level of precision, and overhauls are carried out for this purpose. We disassemble the equipment, repair or replace any damaged parts, and then reassemble it. This is work that requires extreme precision and accuracy, and it is no exaggeration to say that overhauls are the key to maintaining and improving the productivity of the factory.

When carrying out these maintenance tasks, we make sure to



Thorough guidance on important points  
(Top: centering after replacing a ball screw; bottom: checking the operation of a grinding wheel spindle)

communicate closely with operators in the production department. We believe that communication is important in order to build relationships that allow them to speak up immediately if they detect any abnormalities. And when the equipment is restored, the words of gratitude from the operators give us a sense of accomplishment that is beyond compare.

### The Frustration Felt Following a Power Recovery and the Sense of Accomplishment as a Leader

After being transferred to the Equipment Group, I absorbed the knowledge and skills of maintenance work under the strict but warm guidance of my senior colleagues. It took two years to memorize the structures of approximately 400 pieces of production equipment and acquire the skills to accurately assemble them during overhauls. At that time, I was working the night shift by myself. A power outage occurred that doesn't normally occur. As a matter of course, all facilities stopped and needed to be restored quickly. But I had no idea what to do. I called my supervisor at 3 am. He told me how to restore the facilities. I felt very frustrated that I was unable to carry out the restoration myself, which wasn't particularly difficult. This



Kyushu Sumiden Seimitsu's main product, SUMIBORON inserts. Cubic boron nitride (CBN) is second only to diamond in hardness.

experience motivated me to work harder than ever to acquire new knowledge and skills.

I then became the Leader of the Equipment Group's mechanical team and had a number of subordinates. It was around this time that we undertook an overhaul, and I approached it with a completely different mindset than I had before. As a leader, I needed to guide my subordinates to complete their work. Unlike before, however, I was no longer receiving instructions from my seniors but was expected to take the initiative in managing the site. Although I found it difficult to provide guidance, I successfully completed the overhaul and improved the precision of the production equipment. As a leader, I gained a sense of accomplishment unlike anything I had ever experienced before. For me, it felt like I was entering a new phase in my career.

### Develop the Next Generation of Employees and Become a Person Who Is Trusted by People Around Me

In April 2023, I was recognized as an expert. I feel very honored. I believe that this recognition reflects my thorough knowledge of approximately 400 pieces of production equipment and my skills, such as the ability to respond appropriately when equipment malfunctions occur. Additionally, I believe that becoming an indispensable member of the Machinery Team was also a factor in my evaluation. My senior colleagues will be retiring in a few years. This means I will be the only maintenance engineer with the required knowledge and experience. As a maintenance expert, I now feel a stronger sense of responsibility than ever to ensure the stable operation of our equipment so that the factory runs efficiently.

My key mission is to train the next generation. The most important thing in training is to thoroughly implement safety first. For example, during an overhaul, safety cannot be ensured without an understanding of the structure of the equipment. The same goes for everyday repair work. Following the wrong procedure can be dangerous. Each piece of equipment and the nature of each problem requires a different response. To avoid danger, we make sure that the switches are turned off and there is no residual energy before starting work. We also provide danger prediction training. Meanwhile, I have made it my policy to adopt a positive approach without fear of failure. I would like to pass on this attitude to my juniors. It is also important to approach everything with curiosity. Being curious makes work more fun. While enjoying my work, I hope to grow into a person who is trusted by my younger colleagues, my peers, and the operators in the production department.

# Groundbreaking Ceremony Held for Subsea Cable Factory in Scotland, UK

## Preferred Bidder notice received for power transmission network for offshore wind power generation project in the UK

On May 14, 2024, Sumitomo Electric held a groundbreaking ceremony to mark the start of construction work on its subsea power cable factory in the Scottish Highlands.

In addition, we have received a preferred bidder notice from SSEN Transmission (headquarters: Perth, Scotland; hereafter "SSEN") for the Shetland 2 525 kV high voltage direct current (HVDC) XLPE cable project, planned by SSEN, which will interconnect the UK mainland to the northernmost part of the Shetland Islands over approximately 330 km.



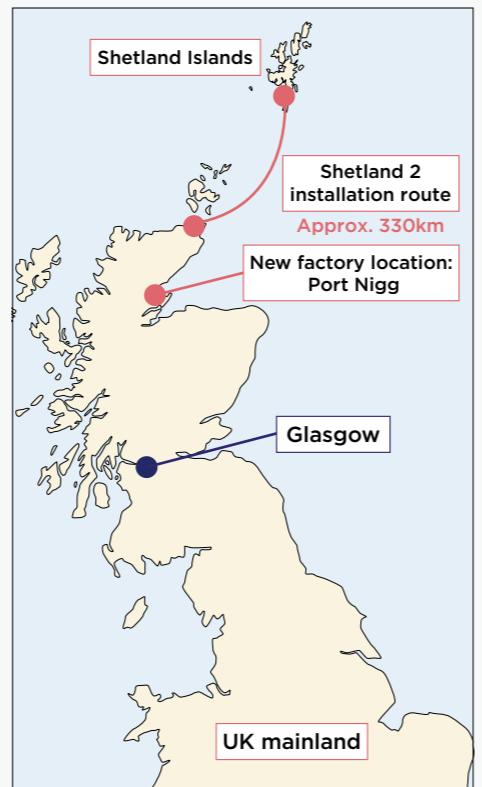
President Osamu Inoue giving a speech at the groundbreaking ceremony



Sake barrel opening at the groundbreaking ceremony

In April last year, Sumitomo Electric announced the establishment of a state-of-the-art subsea power cable factory at Port Nigg in the Scottish Highlands in a significant boost for the UK green energy supply chain. We have now started construction work on the factory. The factory will play a role in reinforcing the UK's electricity transmission grid by manufacturing and supplying cables to connect offshore wind farms to the grid.

To mark the start of construction of the factory, a groundbreaking ceremony was held at the construction site on May 14, attended by Mairi McAllan, Scottish Cabinet Secretary for Net Zero and Energy, Rob MacDonald, President of



British mainland over a distance of approximately 330 km to bring 2 GW of renewable electricity to the UK grid. Under the plan, SSEN plans to invest a total of £5 billion (approximately ¥1 trillion) in the electricity transmission system in the north of Scotland, including Shetland 2. It is therefore expected that the factory will be put to further use.

The establishment of this factory is a project worth £350 million (approximately ¥70 billion) and will make a significant contribution towards the realization of the UK Net Zero Target by contributing to critical electricity transmission infrastructure to deliver renewable energy to the UK mainland and beyond. In addition, it will create 150 highly skilled jobs and maximize the utilization of local supply chains in cable production and transmission system construction.

Sumitomo Electric will continue to work towards creating a carbon-free society by leveraging the high quality and engineering of the power cables that we have developed over the years.

Please scan the QR code for more details.



# Order for Large-Scale DC XLPE Cable Project from a German Power Transmission Company

## Acquisition of land cable manufacturer Südakabel

Sumitomo Electric has received an order from German electricity transmission system operator Amprion (headquarters: Dortmund) for the 525 kV high voltage direct current (HVDC) XLPE cable project, Korridor B V49, and has also signed a preferential negotiation contract for the supply of cables for a portion of Amprion's interconnector project, Rhein-Main-Link.

In connection with this agreement, to have a manufacturing site in Germany, Sumitomo Electric will acquire 90% of the shares of land cable manufacturer Südakabel GmbH (headquarters: Mannheim; hereafter "Südakabel") and make it a subsidiary on October 1 of this year (planned date).



Sake barrel opening at the signing ceremony

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## TOPICS

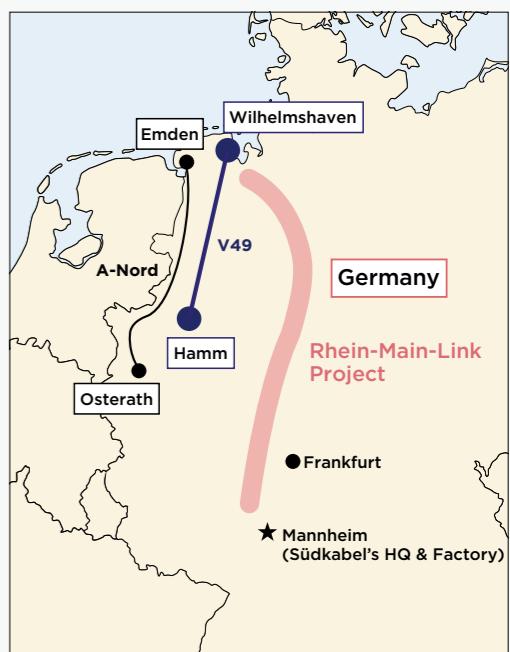
Topics from the future-shaping Sumitomo Electric Group

The total order value of Korridor B V49 and part of the Rhein-Main-Link exceeds €3 billion (approximately ¥500 billion). Cables for both of these large-scale projects are scheduled to be manufactured at Südakabel's factory. The signing ceremony for the order contract and share acquisition was held in Berlin on June 5.

In 2020, Sumitomo Electric received an order from Amprion for the world's first 525 kV HVDC XLPE cable project, A-Nord, which will connect Emden in northern Germany to Osterath (west of Düsseldorf), and has been outsourcing part of the cable manufacturing for this project to Südakabel.

The Korridor B V49 project will connect Wilhelmshaven and Hamm with a route length of approximately 300 km, while the Rhein-Main-Link project will have a route length of approximately 650 km. Both projects will transmit electricity from various offshore wind power sources in the North Sea to the main demand area in southern Germany and are scheduled for completion in 2033. All of the 525 kV HVDC XLPE cables used in these projects will be manufactured at Südakabel's Mannheim plant.

In response to this order, Sumitomo Electric has decided to invest approximately €90 million (approximately ¥15 billion) to increase production. Going forward, Sumitomo Electric will acquire 90% of Südakabel's shares from the Wilms Group, which currently holds 100% of the company's shares and then, with the Wilms Group, subscribe for additional capital increases in Südakabel (a total of



€30 million, or approximately ¥5 billion) in accordance with the investment ratio. The acquisition is scheduled to be completed by October 1 of this year, subject to regulatory approvals.

By locally producing the HVDC XLPE cables necessary for Germany's energy transition, we will also contribute to the local economy and employment.

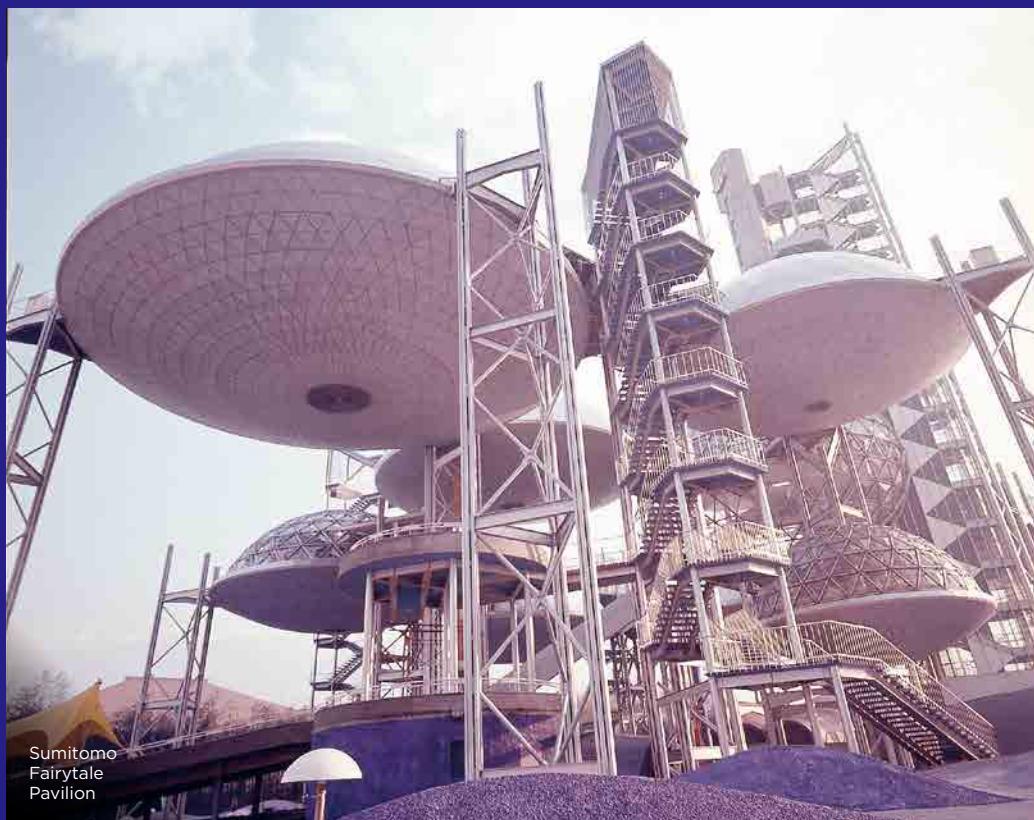
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A Place Related to Sumitomo's History

# Japan World Exposition 1970

“Progress and Harmony for Mankind”



Fifty-five years after Japan's first World Expo, the World Expo will be held again in Osaka, Kansai in 2025.

In 1970, Japan's first international exposition, the Japan World Exposition Osaka was held for 183 days. Its theme was “Progress and Harmony for Mankind,” and it fascinated visitors from all over the world.

The Sumitomo Group exhibited the Sumitomo Fairytale Pavilion under the theme of “Fountain of Beauty, Love and Hope.”

In addition, a traffic game developed by the company was unveiled as a highlight of the Automobile Pavilion. This was a rare type of exhibit at the site, where visitors could actually participate and enjoy the experience. The game involved colorful miniature cars on a grid-like track set up in a circular plaza. Although it was extremely difficult, with only

a 3% success rate out of 250,000 participants, it attracted a great deal of attention. Moreover, Sumitomo Electric's power cables and steel cords also played an important role. In particular, steel cords were used for moving walkways, which led to their widespread use across the country.

In 2025, more than 50 years later, the World Expo will be held again in Osaka, Kansai (from April 13 to October 13, 2025). The theme is “Designing Future Society for Our Lives,” and the event is just around the corner.



Traffic game at Expo '70

Please scan the QR code for the Sumitomo Pavilion at Expo 2025.



**id** vol. 24

Information and videos not posted in this magazine are found on the “id” special site



<https://sumitomoelectric.com/id>

Issue: October 2024

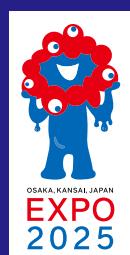
Publisher: Sumitomo Electric Industries, Ltd.

(Public Relations Department)

4-5-33, Kitahama, Chuo-ku, Osaka, Japan

Publisher in charge: Maki Tanaka

Editor: Universal Combo Inc.



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