

Corporate Profile

Kanadevia

Technology for people and planet

Kanadevia Corporation

[Head Office

7-89, Nankokita 1-chome, Suminoe-ku, Osaka 559-8559, Japan Phone: +81-6-6569-0001 Fax: +81-6-6569-0002

[Tokyo Head Office]

15th Floor, Omori Bellport 26-3, Minamioi 6-chome, Shinagawa-ku, Tokyo 140-0013, Japan Phone: +81-3-6404-0800 Fax: +81-3-6404-0809

Kanadevia Brand Concept

Our brand concept is our compass for continuing our new challenges as Kanadevia; it is a definition and verbalization of the mission we need to achieve, our raison d'être, and what we want to become.

Taking on the challenge, through the power of technology, to create a world that lives in balance with nature.

The Earth we all inhabit is life, shelter, and promise. That it can be both kind and cruel simply means that we do not control it and cannot presume to force our will upon it.

Through its unique technologies, Kanadevia will realize a society in harmony with the planet. It will act carefully and decisively to use the world's resources wisely, support the environment, and mitigate the threats of an uncertain future.

This is Kanadevia's way to enable our coming generations to enjoy happier lives in unity and with total peace of mind.

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Challenges and Our Track Record of Changes

Based on our corporate philosophy of

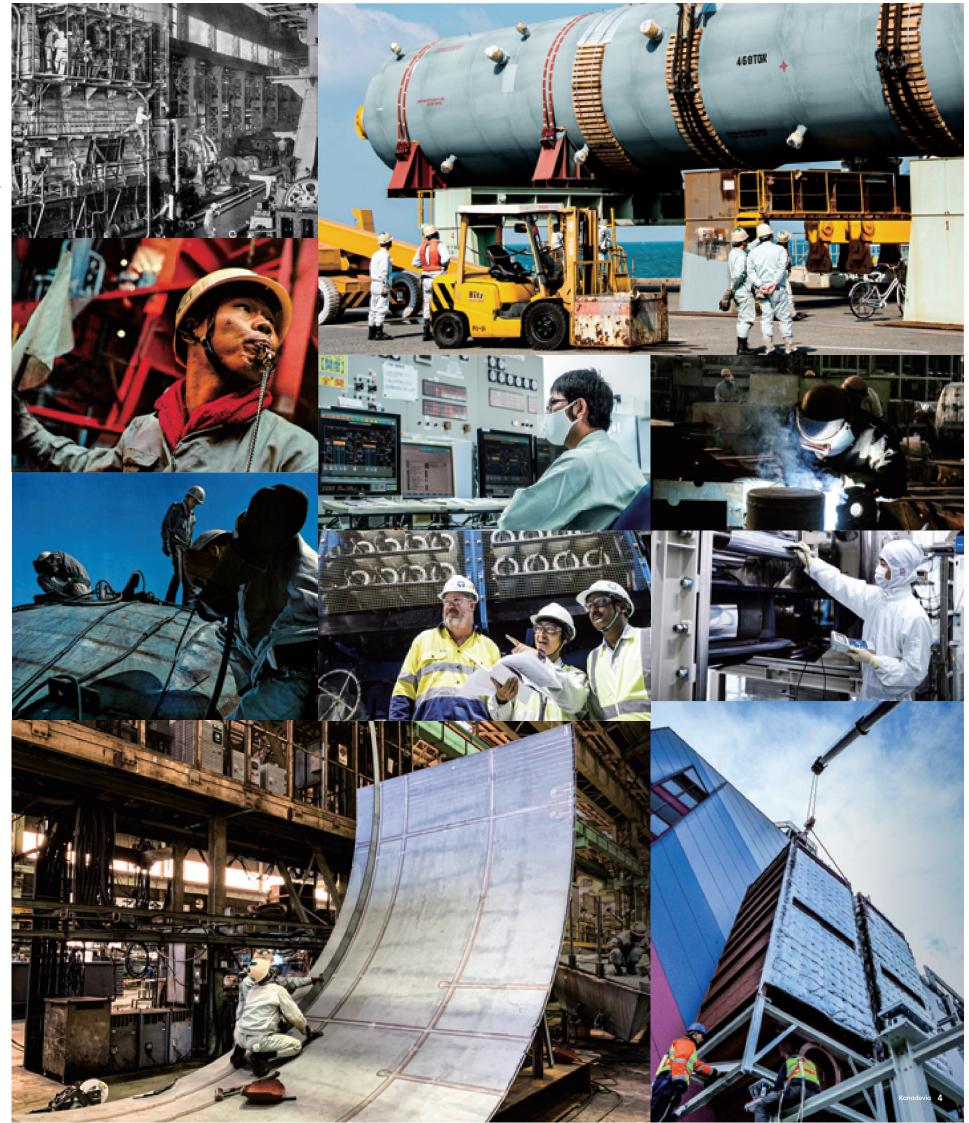
where we are today.

"We create value useful to society with technology and integrity to contribute to a prosperous future" and the enduring spirit of Edward Hazlett Hunter,

who came to Japan at the end of the shogunate and founded numerous businesses, we have tackled many challenges up to the present day,

looking towards the future we need to achieve and with our responsibilities as a corporation.

We split off from the shipbuilding business in 2002, and today our focus has moved to the ever-worsening global environmental issues, so our main business fields are now in Decarbonization, Resource Circulation and Creating Safe and Prosperous Communities. It is our track record of repeated challenges and changes that has taken Kanadevia to



Our History

1881-1899

Linking Japan with the world

While relations with foreign countries expanded, the need to travel overseas increased.

In response, We began constructing the first-of-its-kind-ship in Japan.

●1881

E.H.Hunter from Londonderry founded Osaka Iron Works on the banks of Ajikawa river, Osaka.



The Hatsu Maru (14GT wooden ship), the first ship, was newly constructed.

●1890

The Kumagawa Maru, Japan's first steel-hulled ship, was constructed for Osaka Shosen (now Mitsui O.S.K. Lines).

The Mukogawa Maru, our first electric-light wired ship was constructed.



1900-1949

Improving infrastructure in Japan

While expanding our shipbuilding business, our skills for cutting plates and precision welding for shipbuilding were applied to ground products such as bridges and hydraulic gates starting from the Taisho era.

Bridge building business starts.

●1927

Dojima Ohashi, an arch bridge, and other structures were built for the city of Osaka.



The company makes a new start as Osaka Iron Works

The company renamed to Hitachi Zosen Corporation.

1950-1979

Bringing overseas technologies to Japan

Improved our technical capabilities and promoted technical collaboration with overseas companies. After entering the iron machinery field, the challenge started for refuse incineration plant engineering.

Technological collaboration agreement with B&W-type diesel engines was concluded.



Technological collaboration agreement with Von Roll Environmental Technology Ltd. of Switzerland for incineration plants was concluded.

●1965

Sakai Works started operation. Incineration plant for the city of Osaka was completed (the first mechanical incineration



●1969

Incineration plants for Tokyo were built.

1980-2000

Making a better world with our technology

Bringing technological innovation to various fields with engineering technologies passed on through the generations.

100th anniversary of foundation

●1987

World's first multiple-face shield tunneling machine completed.



Construction of Japan's first double hull VLCC completed.

●1994

World's first triple-face shield tunneling



Operation of Japan's first incineration plant with super power generation



Order received for the world's first fifth-generation semisub rig.

Yumemai Ohashi, the world's first floating swing bridge constructed.



2001-

Solving the world's problems

Helped solve water shortages around the world with the construction of desalination plants in the Middle East. 2011, celebrating the 130th anniversary of foundation.

2001

Large-scale seawater desalination plant constructed in Saudi Arabia.

Shipbuilding business separated.

Seawater desalination plant for Oman constructed.



2006

Seawater desalination plant for Abu Dhabi constructed.

Order received for the world's largest coal-to-liquids (CTL) reactor from the Republic fo South Africa.

Aquired AE&E Inova AG (now Hitachi Zosen Inova), a European refuse



●2011

130th anniversary of foundation

●2017

Received the first order for a Selective Catalytic Reduction system for marine engines in compliance with the International Maritime Organization's Tier III NOx emission control by applying proven denitrification technology for the elimination of NOx from exhaust gases from land-based plants.



2021

140th anniversary of foundation

●2024

Changed trade name to Kanadevia Corporation.

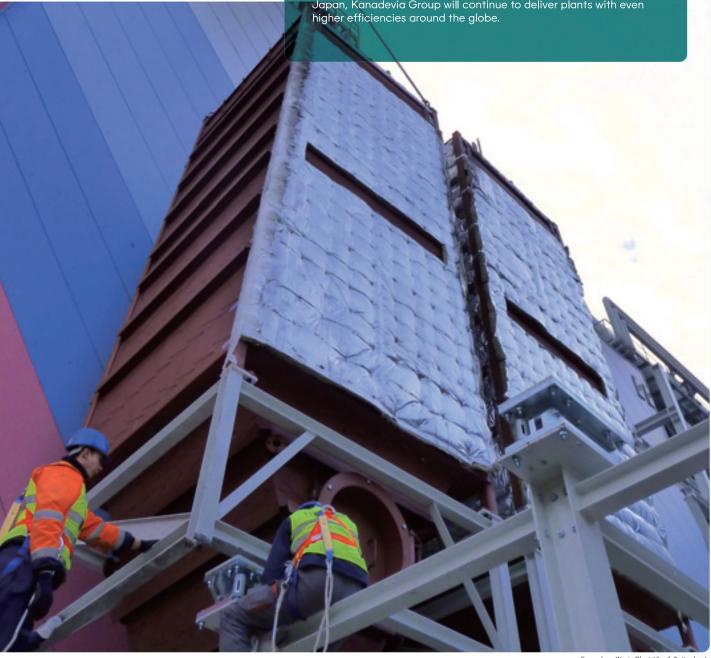
Energy

- Energy-from-Waste Plants
- Biomass Plants
- Wind Power Generation
- PPS (Power Producer and Supplier)
- Power Generation Plants
- AOM Business

(After-sales Service, Operation and Maintenance)

Connecting the world with our environmental technology network and contributing to the preservation of the global environment

Kanadevia Group technology is at work 24/7, all over the world. For example, our Energy-from-Waste Plants take the garbage you discard and turn it into energy to be delivered back to your home. Energy-from-Waste technology transforms waste into fuel used to produce electricity. Kanadevia Group has delivered over 1500(As of March 2024) such plants worldwide; our plants are converting waste to electricity 24/7 somewhere in the world. As a leader in Energy-from-Waste, having built the first plant in Japan, Kanadevia Group will continue to deliver plants with even



Technology / Products



Energy-from-Waste plants are designed to produce power from energy generated through hygienically controlled waste incineration and treatment processes. Together with Kanadevia Inova AG (Switzerland), Kanadevia has built Energy-from-Waste plants all over the world.



• Wind Power Generation

Producing power from wind. In Akita prefecture, a full-scale wind farm with a capacity of 2,000kW×4 units are in operation.



Biomass Plants

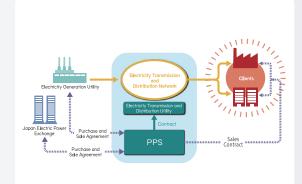
Energy-from-Waste Plants

Akita Biogas Power Station

Energy recovered from Biomass Plants through methane generated from

raw garbage.

Our solutions include design, operation and management of biomass power plants that generate electricity from woody biomass including



• PPS (Power Producer and Supplier)

Contributing to a low carbon society by utilizing energy from waste, a form of renewable energy.



Power Generation Plants

We supply power generation facilities and cogeneration systems such as gas turbines, gas engines and diesel engines operated and controlled depending on electric power demand.



(After-sales Service, Operation and Maintenance)

Providing after-sales services to more than 140 refuse incineration facilities and recycling facilities. Also contracted for operation control services with more than 50 facilities and comprehensive operation services with more

Desalination / Water **Treatment**

- Seawater Desalination Plants
- Sewage Treatment Plants
- Sewage and Industrial Waste Water Treatment Plants
- Filter Presses
- AQSEV Membrane Filters

Contributing to supply safe drinking water through desalination and purification

About 1/6 of the world's population is unable to secure safe drinking water. Many of our plants are built in the is made from seawater and provided to the local



Technology / Products



Seawater Desalination Plants

Starting with our first desalination plant built in 1971, Kanadevia has constructed about 40 plants to date, mainly in Japan and the Middle East. Through an effective transformation of seawater to fresh water, our plants serve domestic water to about 4 million people.



Sewage Treatment Plants

As a leading company in sewage treatment, our solutions are tailor-made, taking into consideration the qualities and quantities of liquid organic waste and regional conditions. Our experience extends to installation of numerous facilities for hygienically treating raw sewage and septic tank



Filter Presses

Filter Presses are solid-liquid separation apparatus that can filter. cleanse and dehydrate.

Our Filter Presses have been delivered to various industries, achieving the highest number of installments in their class.



• Sewage and Industrial Waste Water Treatment Plants

With extensive experience and achievements in the fields of potable water, sewage, and industrial waste water treatment, the facilities and equipment Kanadevia provides cover various processes and meet client



AQSEV Membrane Filter

Limiting piping as much as possible reduces the space required for the combined equipment of a membrane filter.

The membrane filter can be loaded on a truck to be deployed to disaster water stations as part of disaster response for immediate water

Marine **Equipment**



Technology / Products

- Marine Engines
- SCR (Selective Catalytic Reduction) Systems for **Marine Engines**

gases from land-based plants, Kanadevia produced the world's first SCR systems for marine diesel engines that are compliant with Tier III NOx emission standards of the International Maritime

Dual Fuel Engines



Marine Engines

Since establishing a long and sound technical cooperation relationship with MAN Energy Solutions (formerly MAN Diesel & Turbo) and Winterthur Gas & Diesel, Hitachi Zosen Marine Engine has been mainly producing mid- to large-scale electronically controlled marine diesel engines. The marine diesel engines we produce are shipped all over the world using a 500t crane, after passing a strict and thorough test run for performance and quality.



 SCR (Selective Catalytic Reduction) Systems for Marine Engines

To comply with NOx emission standards, our SCR systems for marine engines (HP / LP) are available for any fuel (high sulfur, low sulfur, LNG) and main unit size.



Dual Fuel Engines

As next generation marine engines, Dual Fuel Engines can run not only on conventional heavy oil but also on natural gas. Conventional diesel engines, can be converted to run on natural gas as DF

Plant Equipment / **Press Machines**



Technology / Products

- Pressure Vessels
- Nuclear Fuel Cycling-Related Equipment
- Boilers
- Press Machines



Pressure Vessels

As one of the few manufacturers to have established the technology to manufacture plate construction reactors with vanadium-enhanced chrome molybdenum steel, Kanadevia can deliver high-quality reactors.



Nuclear Fuel Cycling-Related Equipment

With a US engineering company joining our group, Kanadevia is now providing global all-in-one solutions, from consultation, design and manufacturing to transportation of spent nuclear fuel transport casks and storage



All for delivering

high-quality products

Equipment for plants are manufactured with a

10,000t Press Machine that can process steel plates up to 300mm thick and an annealing

> As an important element of a cogeneration facilities and a combined power generation facilities, Kanadevia has and continues to provide many Waste Heat Recovery Boilers.



Press Machines

With a focus on the automobile industry, more than 3,300 units of our highly-trusted mid- to large-scale Press Machines have been delivered to customers in Japan and all over the wolrd.

Semiconductor **FPD-related** Equipment



Technology / Products

can meet a variety of requirements.

- Polishing Equipment
- Lapping Plates
- High Quality Films / Sheet Extruding Equipment
- Vacuum Valves Vacuum Equipment Polishing Technique



Polishing Equipment

We design and manufacture polishing equipment to respond to the ever growing size of glass substrates and special needs.



Lapping Plates

Our material produced mainly through casting methods are supplied as parts for the precision machinery such as Lapping



High Quality Films / Sheet Extruding Equipment

With our own developed elastic metal rolls (UF Roll) and super-precise reducer, high quality sheets and films, used for various application such as optical and semi conductor, and more are easily and stably produced.



Vacuum Valves

We offer optimal driving systems, as shown by the many deliveries of our Vacuum Valves to equipment manufacturers in a variety of industries such as semiconductors, FPDs, organic ELs, and more.



Vacuum Equipment

Our Vacuum Equipment is designed and manufactured for purposes ranging from research and development to mass production, supporting manufacturers of FPDs, semiconductors and solar batteries



Polishing Technique

Using Electrochemical Buffing and the Juno Process, a next-generation precision polishing process, we provide nano-level smoothness, excellent homogeneity, corrosion resistance, non-adhesion, and cleanliness.

FPD : Flat Panel Display OLED : Organic Light Emitting Diode

Food and **Pharmaceutical** Equipment



Food Filling and Packaging Systems

Technology / Products

- Food Filling and Packaging Systems
- ACSTERIA, a space sterilizer using deep UV LEDs

delivering filling and packaging systems for foods, cosmetics, and medical products. With

peace-of-mind and safety as our watchwords, we offer solutions that increase efficiency and

- Foreign Substance Separation Systems for Food
- Image and Image Processing and Storage Systems



• Food Filling and Packaging Systems

From container feeding to filling and packaging. With extensive achievements and technologies, our full range of production system offerings can perform filling, cleaning, packaging and



countermeasures: ACSTERIA ACSTERIA is a commercial-use space

sterilizer that uses deep ultraviolet LEDs to sterilize 99.9% of airborne viruses. Space sterilization is possible in a short time that is difficult to achieve when using general air purifiers. For example, at maximum air volume, ACSTERIA achieves 99% sterilization of a space with a floor area of 100 m2 (about 60 tatami mats) in approximately 50 minutes.



• Foreign Substance Separation Systems for Food

With more than 30 years of experience in manufacturing equipment for identifying foreign substances in food products, we offer two types of equipment: image and mechanical. Our equipment has been supplied to over 400 clients with more than





• Food Defense and Management **Recording Systems**

Our digital recorder is specially designed for food production facilities. Using cameras installed at CCP, all images of products conveyed on production lines are stored for a period extending past the recommended best-by date.

Electric Control **Equipment**



Technology / Products

- Various Control Systems
- High-precision GNSS Systems
- Accelerator Control Systems Electronic Boards







Various Control Systems

High precision and high stability systems are built by incorporating board computers, personal computers and PLCs into control

This apparatus records forward images of railway operations by applying our original Digital Video Recording (HSR) technology.



Accelerator Control Systems





• High-precision GNSS Systems

Based on high precision GNSS (Global Navigation Satellite System) technology, Kanadevia provides combined systems consisting of various sensing technology, such as RFID, lasers, gyros, and map



Kanadevia developed the Control Systems for Japan Photon Accelerator Research Complex "J-PARC", Super Photon ring-8 "SPring-8", and X-ray Free Electron Laser (XFEL) facility "SACLA".



Electronic Boards

Enabling Life Cycle extensions of legacy boards with over 30 years of experience Customizing service made available based on reference boards mounted with our original



Hydrogen and Methane related **Equipment**



Hydrogen Generation Systems

- SOFC Power Systems
- Electro-chlorination Systems
- Methanation Equipment

Technology / Products



Electro-chlorination Systems

Sodium hypochlorite generated by a direct electrolysis process of seawater or brine is used to disinfect water and sewerage and to prevent system bio-fouling in power plants, refineries, and other



Methanation Equipment

Uses technology to generate methane by reacting a renewable energy sourced hydrogen with CO₂.



SOFC Power Systems

With high expectations as a stationary power generator for its supreme power generation efficiency, low noise and low vibration, and fuel diversity, the SOFC (Solid Oxide Fuel Cell) is a power generator that converts the fuel's chemical energy directly to electricity.

• Hydrogen Generation Systems

anticipation of a future hydrogen society. We have also been continuously involved in the research and development of

reactions between renewable energy sourced hydrogen and

CO₂, virtually promoting carbon-neutral measures that are

methanation that generates methane through chemical

effectively reducing the use of fossil fuels.

HYDROSPRING is an onsite hydrogen generator that electrolyzes water to generate and supply high-purity hydrogen gas. In recent years, hydrogen has been attracting attention as a form of next-generation energy.

It is expected to be used as clean energy by combining it with CO2-free electricity such as renewable energy (Power to Gas). HYDROSPRING® meets this demand.

Kanadevia will meet the demands of a wide variety of water electrolysis systems and contribute to the realization of a

Infrastructure and Disaster Prevention Systems



Kanadevia group is connecting today's safe living to tomorrow's by making improvements to social infrastructures and realizing sustainable disaster

prevention and mitigation for society.

- Bridges
- Steel Stacks
- Hydraulic Gates
- Shield Tunneling Machines • Flap-Gate Type Seawall against flood disaster
- Large Marine Structures

Technology / Products



Bridges

Over 2,500 bridges built in Japan and overseas, including the Wakato Bridge, which was the first hanging bridge in Japan, and the Akashi-Kaikyo Bridge and the Stonecutters Bridge in



Hydraulic Gates

Kanadevia has a history of more than 100 years as a manufacturer of hydraulic gates and penstocks, delivering many large and middle-sized gates for dams and rivers in Japan and

Playing an active role in the redevelopment of dams without disrupting the dam's operation.



Floating Temporary Closing Facility (Tsuruta Dam)



Shield Tunneling Machines

The originally made Shield Tunneling Machines are the monument of bringing together the technologies of the Kanadevia group, where they have been deployed all over the world, including the massive underground automobile road construction in Seattle, USA, the Bosporus Cross-Channel Tunnel in Turkey and subways in India.



Kanadevia has built more than 200 steel stacks in Japan and overseas since the middle of the 1950s, contributing to social infrastructure improvement based on technical knowledge and experience accumulated through the design, manufacture, and construction of ships, bridges and hydraulic gates.



neo RiSe® Land-Mounted Flap-gate Retractable Seawall



Flap-Gate Type Seawall against flood disaster

Using the buoyancy of inundation from tsunamis, high tides and floods, a Flap-Gate that rises automatically was developed as a flood control facility (above). Board-like shutter seabed-mounted types that use the buoyancy and water pressure from tsunamis and high tides to rise are placed at entrances of ports on the seabed



Large Marine Structures

Many structures on, in, and under the water, including immersed tunnels, floating structures, steel jackets, and steel plate cells.

Kanadevia has built over 40 undersea tunnels, where the main unit has a structure made of steel and concrete, including the Osaka Port Sakishima tunnel, and the Kobe Port Minatojima tunnel.

*On October 1, 2021, Underground Infrastructure Technologies Corporation, newly established based on the joint incorporation type company split with Kawasaki Heavy Industries, Ltd., hereafter will provide Tunnel Boring Machine (TBM) business ((including the design, development, repair and sales of TBMs, civil engineering machines, etc., and their parts; however, excluding manufacturing related business)



Solid-state Lithium-ion Batteries

The following materials are being jointly developed with our customers, some of which have already been launched in the market. Development will continue extensively, while also discovering other market needs.

A next-generation battery expected to be a game changer in the future

Solid-state Lithium-ion Batteries are made by replacing the organic electrolytes, used in mainstream lithium-ion batteries, with solid electrolytes. Some of its main features are high safety, high environmental resistance and long lifetime. They can operate from ultracold to high temperature conditions and can be used in to situations where it was difficult for lithium-ion batteries to be applied.

- •An all-solid-state lithium-ion battery (AS-LiB®) is a battery that uses solid substances for all its constituent materials.
- •Kanadevia has developed a proprietary manufacturing method that utilizes machining technology.
- •This manufacturing method eliminates the mechanical pressurization required when charging and discharging conventional all-solid-state lithium-ion batteries.



Technology / R&D Bases

Uniting all of Kanadevia with our leading technologies

Kanadevia continues to apply ourselves to technical development by having the business headquarters and Group Companies closely cooperate with one another to speed up development of new businesses and new products, and to further develop production technologies.

Also by utilizing ICT, Kanadevia intends to enhance and add value to our business and products. Additionally, hubs have been established to enhance work on leading technologies such as IoT (Internet of Things), big data and AI (artificial intelligence).

Research & Development Hubs



Technical Research Institute



Precision Machinery Center

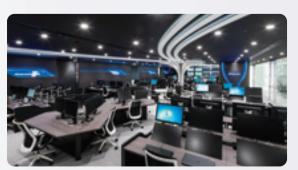


Business & Product Development Center



Control Equipment Center

ICT Hubs



• Remote Monitoring and Operational Support Center Providing remote monitoring services, operation support, and diagnostic services to various facilities, including Energy-from-Waste plants and equipments.



- Advanced Information Technology Center
- Creating new value for business by establishing a hub for IoT and big data analytics
 Sharing open spaces with customers and partners for co-creation and
- Sharing open spaces with customers and partners for co-creation and open innovation
- 3. A new ICT hub to be opened in October 2018 on the premises of the Osaka Head Office with the aim of expanding the AOM Business, accelerating the creation of new business and new products by fully utilizing leading technologies such as AI (artificial intelligence).

AOM: After-sales Service, Operation and Maintenance

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Kanadevia Group network around the world

Date founded April 1, 1881 Date established May 29, 1934

Domestic Offices

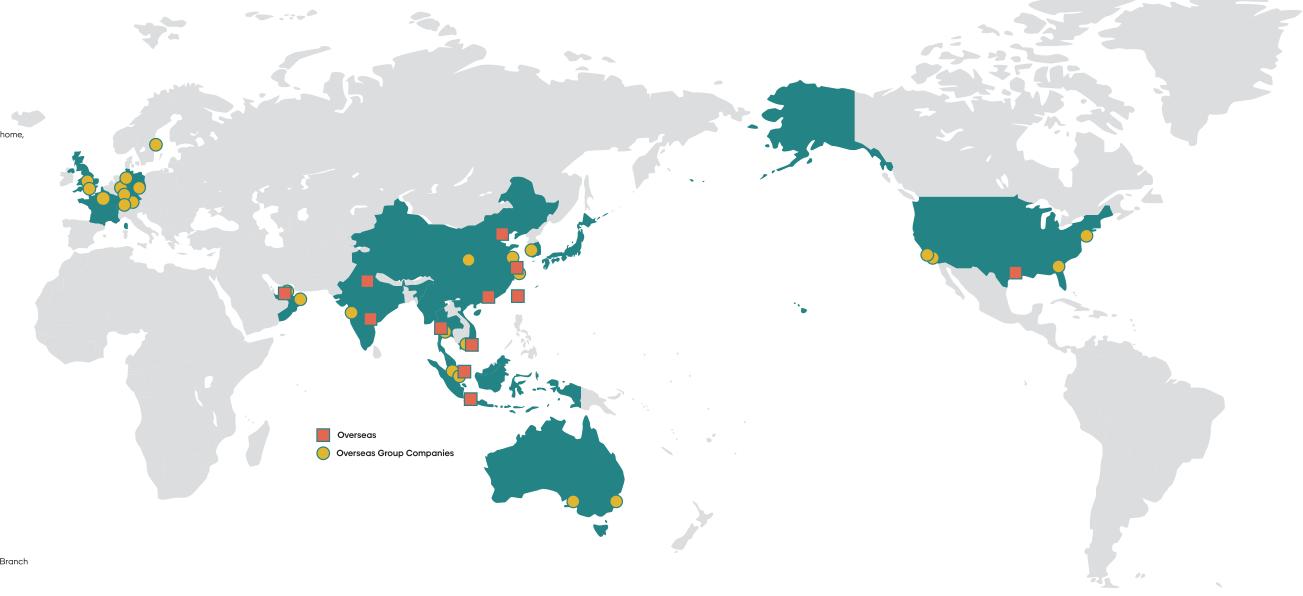
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- Phone: +81-3-6404-0800 Facsimile: +81-3-6404-0809
- Technical Research Institute
- Sapporo Office
- Sendai Office
- Nagoya Office
- Hiroshima Office
- Fukuoka Office
- Kumamoto OfficeOkinawa Office

Domestic Works

- Ariake Works
- Mukaishima Works
- Innoshima Works
- Chikkou Works
- Sakai WorksMaizuru Works
- Ibaraki Works

Overseas

- Abu Dhabi Branch
- Taipei BranchSingapore Branch
- Kanadevia U.S.A. Ltd.
- Kanadevia India Private Limited
- Kanadevia India Private Limited Hyderabad Branch
- Kanadevia (THAILAND) CO., LTD.
- PT. Kanadevia INDONESIA
- Kanadevia (Shanghai) Trading Co., Ltd.
- Kanadevia (Shanghai) Trading Co., Ltd. Beijing Branch
- Kanadevia (Shanghai) Trading Co., Ltd. Guangzhou Branch



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