Ferrotec Corporation

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Ferrotec Corporation

Company Profile

The Future by Ferrotec

I think this company's background is a rather unique one. We were established in Japan as a subsidiary of an American company in 1980, and became independent seven years later in 1987. We built a domestic factory and expanded into China in 1992. We took the company public in 1996, keeping that momentum through 1999 when we acquired our NASDAQ listed former parent company via a friendly take over bid. Twelve years had passed since becoming independent. The parent-child relationship had reversed, but by becoming "Ferrotec Group" once again, we were able to achieve dramatic growth.

The sources of growth were applications of the company's core ferrofluid technologies, born from the Apollo Space program, and technologies of thermo-electric modules; heating and cooling elements.

Since that time, our offering has expanded and our portfolio has diversified. Ferrotec products are currently being utilized in a wide range of fields, such as, the electronics and automobile industries, household appliances, medical equipment, and photovoltaics.

We will continue to strive to supply products that contribute to the society while being a company that helps to make the world a better place, a company that cares for the environment, and a company that continues to grow.

Representative Director, President & Group CEO

He Xian Han

Satisfaction for our Customers
Earth Friendly and Environmentally Conscious
Dreams and Vitality to our Society

With a global perspective, Ferrotec operates in harmony with international and local communities, acting in good faith as a company that provides products and services that contributes to people everyday's life.

Earning satisfaction and trust from our customers
Contributing to solving global environmental problems
Devoted to serving society through manufacturing.

A company that is conscious, improves, and pursues happiness. Ferrotec.

Semiconductors that create the future Ferrotec supports these foundations

Semiconductors are manufactured through numerous processes. Ferrotec's technology and products have become indispensable in these manufacturing processes.

IT Innovation moving at an accelerated pace

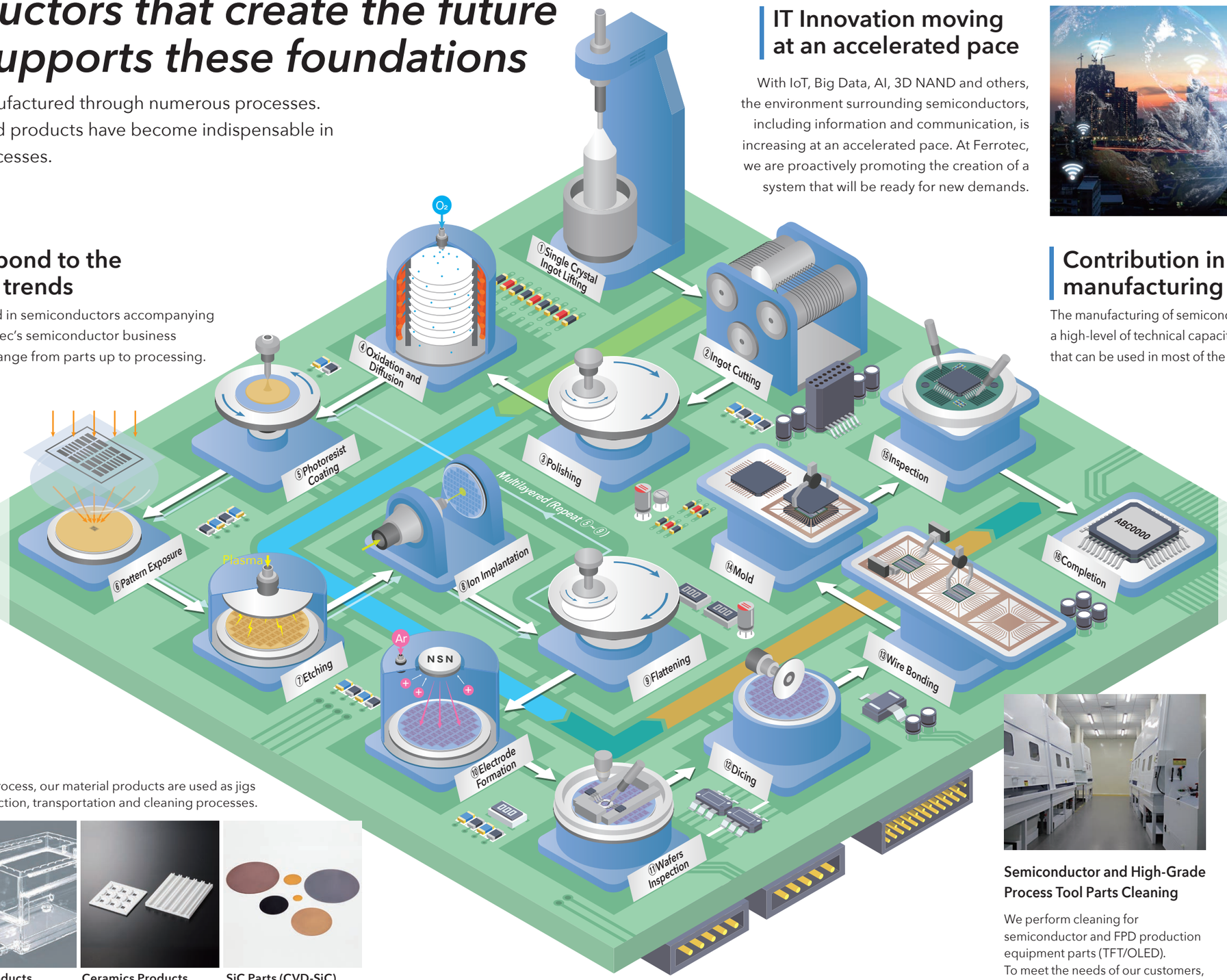
With IoT, Big Data, AI, 3D NAND and others, the environment surrounding semiconductors, including information and communication, is increasing at an accelerated pace. At Ferrotec, we are proactively promoting the creation of a system that will be ready for new demands.

Products that respond to the latest technology trends

In order to answer future demand in semiconductors accompanying technological innovations, Ferrotec's semiconductor business covers numerous products that range from parts up to processing.

Vacuum Seals

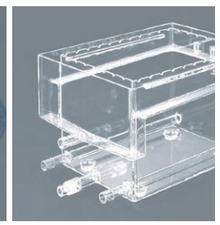
For semiconductors boasting high-performance and high-yield, it is important to secure an airtight space without impurities during the manufacturing process. Our company's equipment related products demonstrate their performance in many processes.



Material Products

During the wafers manufacturing process, our material products are used as jigs and consumables in thin film production, transportation and cleaning processes.

Silicon Parts



Quartz Products

Ceramics Products

SiC Parts (CVD-SiC)

Contribution in the semiconductor manufacturing process

The manufacturing of semiconductors is complicated and requires a high-level of technical capacity. At Ferrotec, we provide products that can be used in most of the manufacturing processes.

Silicon Wafers Production

At our Chinese plant, we implement integrated manufacturing of silicon wafers from single crystals. Following small calibers of 6 inches or less, we will start the production of 8-inch wafers from FY2017.

Semiconductor and High-Grade Process Tool Parts Cleaning

We perform cleaning for semiconductor and FPD production equipment parts (TFT/OLED). To meet the needs of our customers, we have the latest equipment that supports Sub-28nm Microstructure.

Contract Manufacturing Service

In addition to the manufacturing of a variety of electric furnaces and assembly of deposition apparatus for the electronics industry, We also provide contract manufacturing service for any type of device.

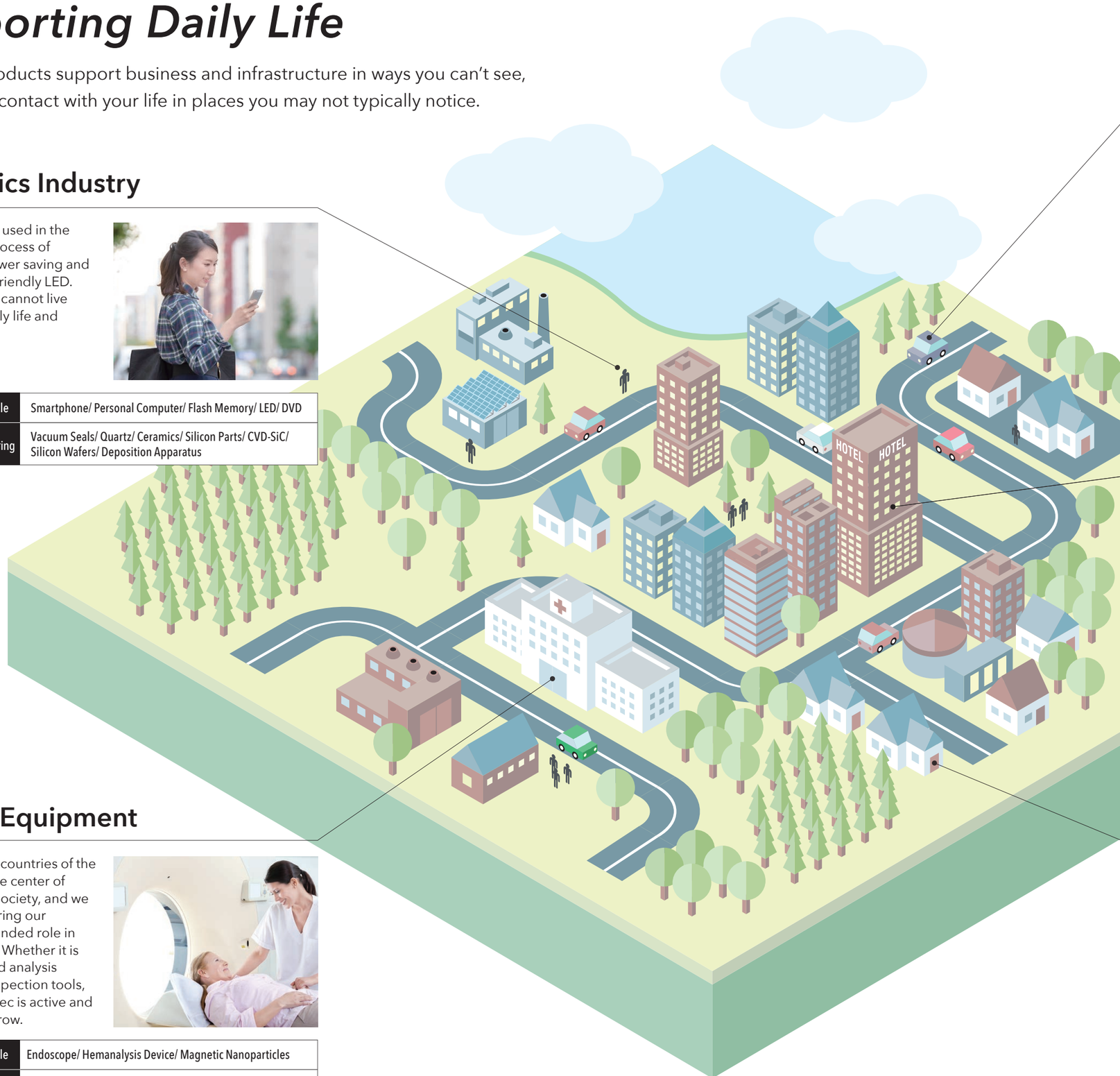
Silicon Wafers Manufacturing — Pattern Formation — Assembly

① Single Crystal Ingot Lifting → ② Ingot Cutting → ③ Polishing → ④ Oxidation and Diffusion → ⑤ Photoresist Coating → ⑥ Pattern Exposure → ⑦ Etching → ⑧ Ion Implantation and CVD → ⑨ Flattening → ⑩ Electrode Formation → ⑪ Wafers Inspection → ⑫ Dicing → ⑬ Wire Bonding → ⑭ Mold → ⑮ Inspection → ⑯ Completion

Multilayered (Repeat ⑤~⑨)

Supporting Daily Life

Ferrotec's products support business and infrastructure in ways you can't see, and come in contact with your life in places you may not typically notice.



Electronics Industry

Our products are used in the manufacturing process of smartphones, power saving and environmentally friendly LED. Products we now cannot live without in our daily life and business.

Final product example	Smartphone/ Personal Computer/ Flash Memory/ LED/ DVD
Ferrotec's product offering	Vacuum Seals/ Quartz/ Ceramics/ Silicon Parts/ CVD-SiC/ Silicon Wafers/ Deposition Apparatus

Automotive Industry

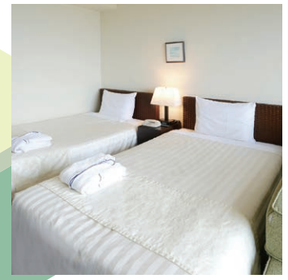
In this era, when self-driving taxis are undergoing field testing, EV and hybrids, and GPS has become universal, we need to safely manage and teach these technologies. Ferrotec is always there to accompany fun driving and safe transportation of people.

Final product example	temperature control seats/ car audio/ car navigation/ power control power semiconductor
Ferrotec's product offering	Thermo-electric Modules/ Ferrofluid/ Power Semiconductor Substrate/ Thermistor

*Thermistors are produced by our group company Ohizumi Mfg. Co., Ltd.

Laundry Equipment

Tourists to Japan appreciates the high quality of linen products at Japan's hotels. Supporting this are Ferrotec's exceptionally automated, energy and resource-conserving industrial laundry equipment. Increasing needs for high quality linen in China and emerging countries are expected in the future. Ferrotec supports the behind-the-scenes work for comfortable hotel life.



Final product example	Continuous washing machine/ Spin dryer/ Dryer/ Rolling machine etc.

* Manufactured by group company, Asahi Seisakusho.

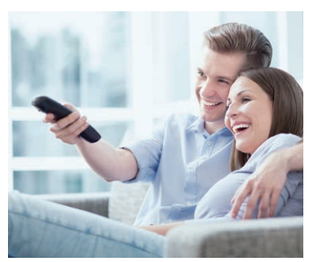
Medical Equipment

In the developed countries of the world, Japan is the center of increased aging society, and we believe this will bring our company an expanded role in the medical field. Whether it is endoscope, blood analysis equipment, or inspection tools, in this field Ferrotec is active and will continue to grow.

Final product example	Endoscope/ Hemanalysis Device/ Magnetic Nanoparticles
Ferrotec's product offering	Ceramics/ Thermo-electric Modules/ Ferrofluid

Consumer Electronics

The IoT connects a variety of people, goods, and information on the internet, erasing the boundary between net products and consumer electronics, which will bring an era when consumer electronics will watch over and take care of people. At the forefront of this, Ferrotec is always there.



* Incorporated into the final product, such as thermo-electric modules. There are also those used in the manufacturing process such like quartz and ceramics.

Final product example	LCD TVs/ Air Conditioners/ Wine Cellars/ Dryers/ Audio speakers
Ferrotec's product offering	Thermo-electric Modules/ Ferrofluid/ Power Semiconductor Substrate/ Thermistor

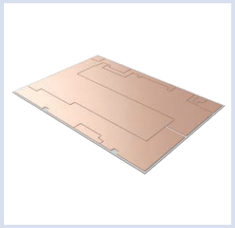
Ferrotec's automotive-related business drives the EV era.

With the spread of electric vehicles (EVs), semiconductor technology now plays a central role in in-vehicle systems. Power semiconductors improve power efficiency, ADAS (Advanced Driver Assistance System) and autonomous driving technology are put to practical use, and battery management systems have evolved. Ferrotec's core technologies support these technological innovations and will support the next generation of mobility.

Power semiconductor substrate Application

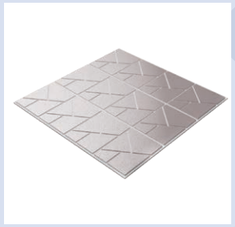
DCB substrate

This is an electronic component that forms a copper circuit by directly bonding a copper plate to a ceramic substrate such as alumina (Al_2O_3) or alumina zirconia (Al_2O_3/ZrO_2). It is widely used in power devices that require electrical insulation as well as efficient heat dissipation.



AMB substrate

This is an electronic component that forms a copper circuit by bonding a copper plate to an aluminum nitride (AlN) or silicon nitride (Si_3N_4) substrate with active metal brazing material. It achieves higher reliability and heat dissipation than DCB substrates.

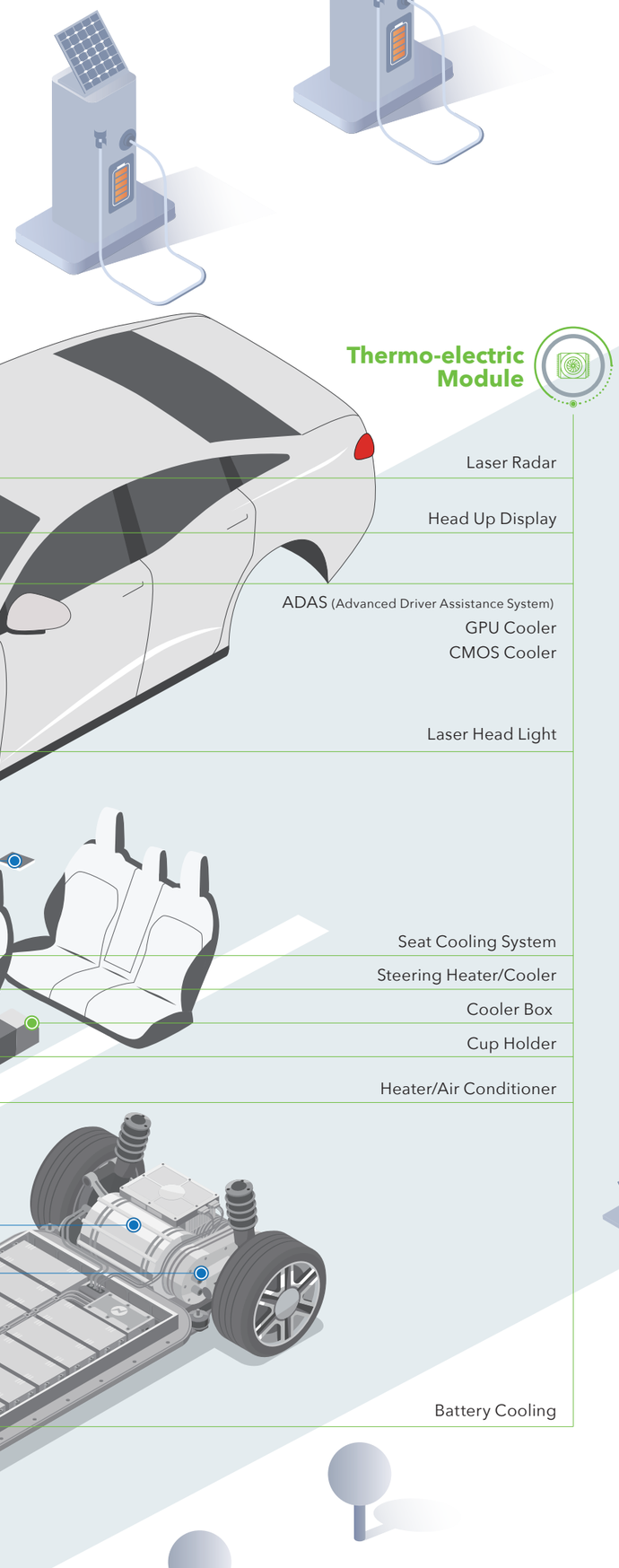


Thermistor Application

Thermistor

Thermistors are semiconductor ceramics that show an extremely large change in resistance in response to temperature changes. They are used as temperature sensors and are essential components for controlling a variety of devices, including air conditioners, batteries, and fuel injection.

センサで世界を測る、未来を拓く。
OHIZUMI



Thermo Module Application

Laser Radar

Laser light is irradiated onto an object to measure distance and identify the object's characteristics. A thermo-module is used to suppress the effects of heat and stabilize measurement accuracy.

Climate Control Seat

Heated and cooled driver, passenger and rear seats make for a comfortable drive.

Cooler Box (refrigerator)

Since EVs have a relatively large interior space, the number of models equipped with cooler boxes is increasing. We are currently working on joint development with manufacturers.

Thermo-Electric Cup Holder

Conventional cup holders also use thermo modules to provide heat and cold insulation functions, making driving more comfortable.

Semiconductor Equipment-related Business

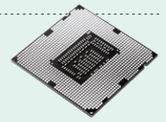
In the semiconductor equipment related business, we handle a wide variety of products and services, mainly for semiconductor manufacturing equipment and FPD manufacturing equipment. We handle material products (quartz, ceramics, silicon parts, CVD-SiC, etc.) used in vacuum seal semiconductor manufacturing equipment that applies magnetic fluid technology, as well as metal processing services and parts cleaning services.
We also have accumulated a wealth of technology and know-how necessary for mass production of products.

Quartz Products

Ultra-High Purity Glass, Tough against Heat and Chemical Changes

The semiconductor manufacturing process involves frequent treatments of high heat and chemicals. Coming into play here are quartz products composed of ultra-high-purity silica glass. Whether it is in the thin film generation and diffusion process, or as jigs and consumables in the transport and cleaning process of wafers, our quartz products play an important role in the processing of increasingly thinning and high purification semiconductors.

Examples of Products Used For:
LCD TV's, Smartphones, PC's, Flash memory, CPU's, LED
*Used in the manufacturing process



Vacuum Seals

Ensuring a Sealed Environment with no Contamination

The vacuum seals which use ferrofluid to enable transmission of rotational movement into the vacuum atmosphere are used in the manufacturing process of semiconductors, FPD, LED, and solar cells. They account for the company's core, and are used mainly in the etching and deposition processes of semiconductor wafers, as well as in the rotary mechanisms of delivery robots for FPD panels, isolating the sealed space from the outside, while precisely transmitting the necessary power for processing.

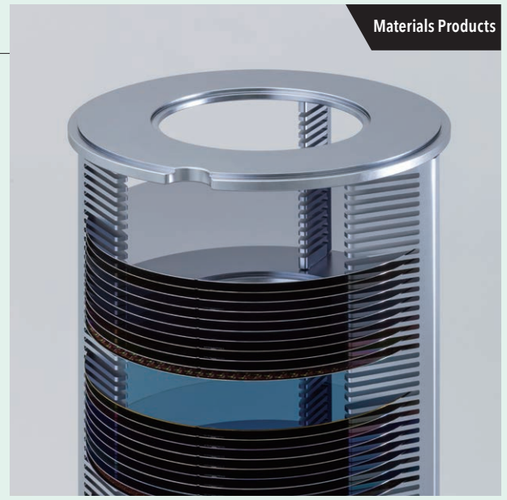
Examples of Products Used For:
LCD TV's, Smartphones, PC's, Flash Memory, CPU's, LED
*Used in the manufacturing process

Silicon Parts

High-Purity Polysilicon Jigs used in Manufacturing Process

Our SiFusion TM product makes the manufacture of silicon jigs from ultrapure polysilicon possible for the first time, offering innovative solutions in the formation of the wafer and diffusion processes. It contributes to total cost saving for customers by achieving extended usage and improved operating rates in the diffusion process of reactive gas and reduced number of washes.

Examples of Products Used For:
LCD TV's, Smartphones, PC's, Flash memory, CPU's, LED
*Used in the manufacturing process



Contract Manufacturing and Assembly Service

Based on our metal processing technology cultivated in vacuum seals, we developed a contract manufacturing and assembly business for large-format equipment

Contract Manufacturing Service: In Hangzhou, Changshan, and Shanghai, China, a wide range of components are processed and contract production and assembly of equipment is done based on Ferrotec's precision machining and equipment assembly technologies.
Responsible for contract processing of precision metal parts (from small to large), contract assembly of units and equipment, local procurement support, equipment installation and start-up. For Semiconductors, FPDs (OLED/LCD), and other industrial fields.

*In April 2023, 'Cosmo Science Co., Ltd.' has joined our company group to expand its business in the contract manufacturing of semiconductor production equipment and FPD manufacturing equipment.

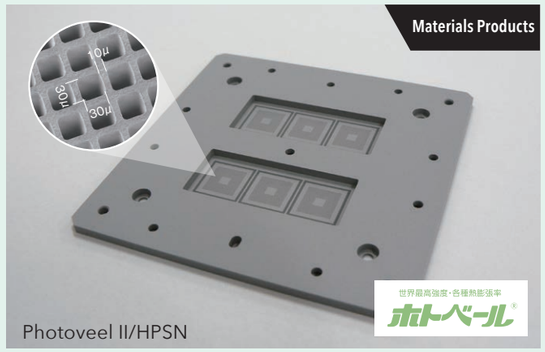
SiC Parts (CVD-SiC)

Ultra-High Purity, High Heat Resistance and High Wear Resistance Silicon Carbide Products from Original CVD Production Method

Our SiC products are a one to one compound of silicon (Si) and carbon (C), ultrapure and highly resistant to wear, heat, and corrosion. They are used widely in the manufacturing of semiconductors as wafer boats and tubes, and silicon wafer replacement dummy wafers, as jigs used at high temperatures.

Examples of Products Used For:
LCD TV's, Smartphones, PC's, Flash memory, CPU's, LED
*Used in the manufacturing process

Ceramics Products



Ceramics Products

Highly Strong and Pure Ceramics Supporting State-of-the-Art Processing Technology

We have achieved integrated production of fine ceramics and machinable ceramics that leverage advanced material technology, production technology, and precision processing technology under the strictest quality controlled conditions. Our ceramic products are widely adopted as high quality parts suited for the manufacturing process of semiconductors, which require high grades of purity, rigidity and precision.

Machinable Ceramics Products

Achieving excellent machinability, we can provide high-precision, high-quality products in a short delivery time.

It is a ceramic that can be easily machined, and can be precision-machined using not only diamond tools but also ordinary carbide tools. Semiconductor and liquid crystal manufacturing parts and inspection jigs are produced in small quantities and in a wide variety of types, and there is a demand for shorter lead times from design to prototyping. Machinable ceramics are widely used in these fields, taking advantage of their excellent features such as precision machining, short delivery times, and excellent thermal, optical, and electrical properties.

Vacuum Coating System

US-made Temescal Vacuum Coating Systems

High-performance e-beam guns and high-voltage power supply at the heart of Temescal devices offer a wide array of equipment from bell jar systems for universities, research laboratories, and small-scale manufacturing, to high throughput systems for large-scale manufacturing. As a global standard machine in compound semiconductors, they have been adopted by many customers, and are progressively being introduced in the manufacturing of LED's and communication chips.

Quartz Crucibles

A clean, excellently heat-resistant, high-purity quartz crucible

Clean, heat resistant, pure quartz is indispensable for semiconductor manufacturing processes. These same high purity quartz crucibles are used as substrate containers for raw single-crystal Si material. Ferrotec provides its quartz products to manufacturers for the process of single-crystal Si applications including semiconductor and solar cell..

Process Tools Parts Cleaning

Precision Cleaning of Semiconductor and FPD Process Parts

We provide parts cleaning services for semiconductor and FPD manufacturing equipment.
We meet our customers' needs with our state-of-the-art equipment, including sand blasters, plasma spraying equipment, and alumite treatment equipment, in addition to chemical cleaning and pure water cleaning.

Reclaim Wafers

Reclaim wafer service based on Ferrotec's prime wafer processing and process tools parts cleaning technologies

For many years, we have had an integrated system for processing single-crystal ingots into semiconductor wafers, and have maintained the largest market share in the process tools parts cleaning business in China. On the basis of these polishing and cleaning technologies, as well as our network of customers, we have developed a reclaim wafer service to meet customer needs associated with increased domestic production in China.

Silicon Wafers

Integrated Production from the Single-Crystal Ingot

We have an integrated system for processing single-crystal ingots into semiconductor wafers for small diameter silicon wafers up to 6 inches, as well as 8 and 12-inch wafers.
We have established a global supply system focusing on mass production of polished, annealed, and epitaxial wafers.

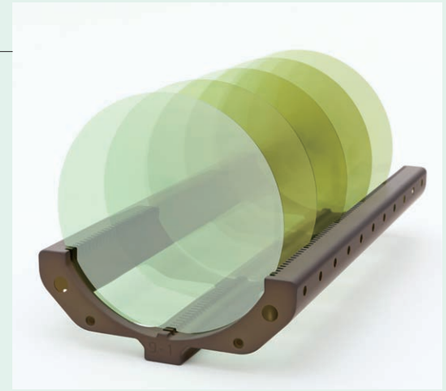
Equity method affiliate

SiC Wafers

Advanced technology for electric vehicles and other next-generation applications: SiC (silicon carbide) single-crystal wafers

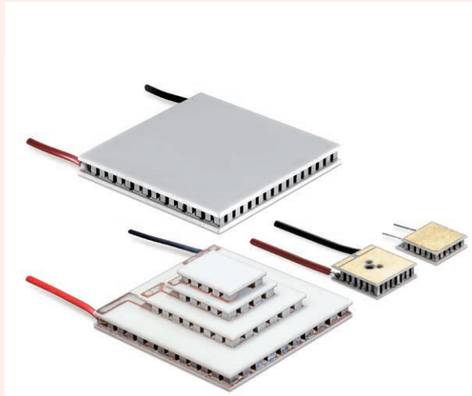
Building on the strengths of our defect control technology cultivated in the semiconductor silicon (Si) single-crystal business, our equipment manufacturing technology, and our SiC expertise and customer base gained through the CVD-SiC business (jigs for semiconductor manufacturing equipment), we are engaged in the development and manufacture of SiC (silicon carbide) single crystal ingots and wafers in a joint venture with China's top SiC research institutes. (trial production is scheduled to start in 2021).

Equity method affiliate



Electronic Device Business

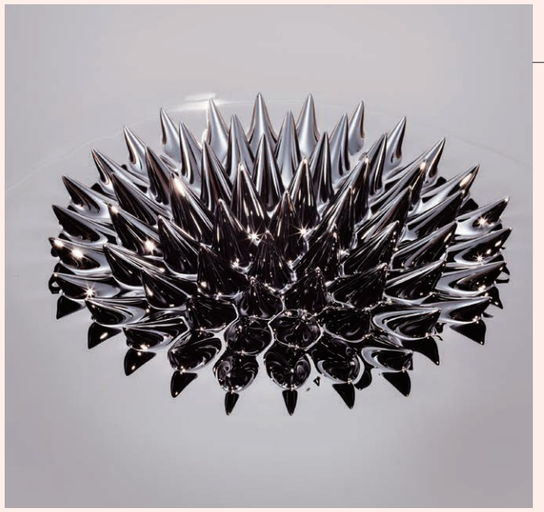
In the electronic device business, we handle thermo modules (Peltier elements), power semiconductor substrates, magnetic fluids, temperature sensors (thermistors), etc. These products have a wide range of applications and are used in a wide range of industries, including medical equipment, semiconductors, communications, and industrial equipment. We also offer a wide range of customization options to suit your needs and specifications.



Thermo-Electric Modules

By passing a direct current and resulting into thermo amplitude, here is the Temperature Control Semiconductor (Peltier Elements)

Thermo-electric modules are plate-like semiconductor cooling devices that work by using the movement of heat when a current flows through the junction of two different metals. Compact, lightweight, and Freon-free, they are used in temperature control seats of automobiles, cooling chillers, optical communications, biotechnology, air conditionners, dryers and a variety of consumer electronic products.



Ferrofluid

A Mysterious Liquid with Magnetic Attraction

While being a fluid, it is a functional material attracted to magnets and magnetized by external magnetic fields. In the 1960's NASA Space Program, it was developed to transport fuel in zero gravity. Currently it is used in speakers, actuators, sensors, recycling separation applications, and also in Vacuum seals—one of our company's core products.

Chillers

By cooling or heating a circulating liquid to the set temperature, this system ensures that equipment and devices are maintained at a consistent temperature

A chiller (constant-temperature water circulator) is a device that supplies a circulating liquid such as water while cooling/heating to a preset temperature.
It is used to keep an object at a constant temperature such as heat sources in facilities and equipment via temperature-controlled circulating water.

Thermistor

Semiconductor ceramic sensitive to temperature changes

Thermistor is a semiconductor ceramic that exhibits extremely large changes in resistance with temperature changes. This characteristic makes the thermistor an ideal temperature sensor that is widely used in areas such as in-vehicle technology, home appliances, and optical communication, and its demand is expanding with the increase in vehicle electrification and digitization. As a niche leader in the thermistor market, Ohizumi Mfg. supplies high quality thermistors to global Tier 1 companies.

* The term "thermistor" is derived from "thermally sensitive resistor".

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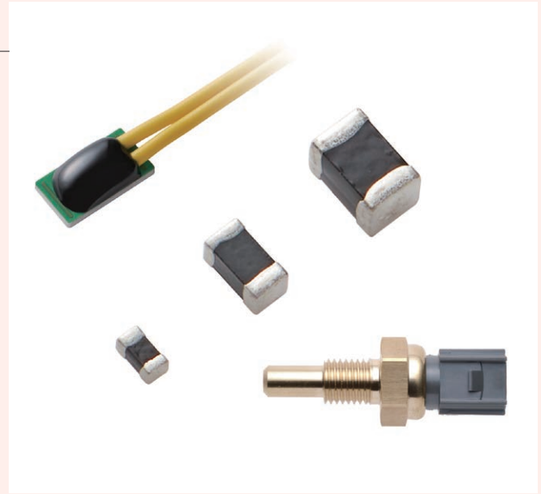
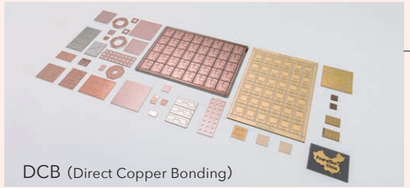
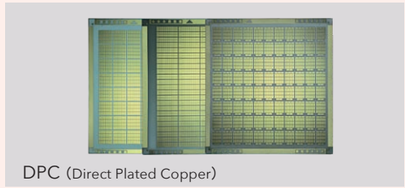
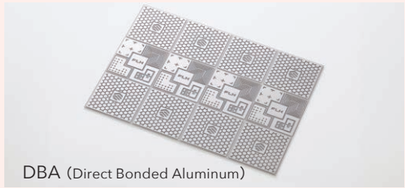




DCB (Direct Copper Bonding)



DPC (Direct Plated Copper)



DBA (Direct Bonded Aluminum)

Power Semiconductor DCB & DPC & DBA Substrates

Heat dissipation insulating substrate using thermo-electric module manufacturing technology

Insulating heat dissipation circuit boards that apply thermo-module manufacturing technology generally use organic substrates and metal plates for low-power home appliances and PCs, but substrates such as alumina, aluminum oxide, and silicon oxide are used for insulating heat dissipation circuit boards for power modules that handle high power. In particular, silicon oxide substrates are attracting attention for power modules for inverters and converters for electric vehicles. Our company has the world's largest production capacity for both conventional DCB (Direct Copper Bonding) substrates and AMB (Active Metal Brazing) substrates. We can also manufacture DPC (Direct Plated Copper) substrates for data centers in the 5th generation mobile communication system (5G), and D B A (Direct Bonded Aluminum) substrates used in areas where high reliability and heat dissipation characteristics are required, such as cars, steel, and renewable energy.

Automotive-related Business

Our company, which is growing mainly in the semiconductor market, will continue to introduce power semiconductor substrates, thermo modules (Peltier elements), temperature sensors (thermistors), and other products to the automotive market, which is expected to see major changes in applications such as EVs (electric vehicles), PHVs (plug-in hybrid vehicles), and autonomous driving systems.

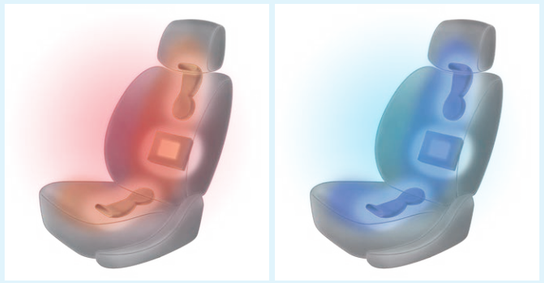
Thermo Electric Module Applications

Thermo Electric Cup Holder

By using a thermo module, you can easily provide a small, lightweight cup holder with a heat/cold insulation function, keeping cold drinks cold and hot drinks hot.

Thermo Electric Cooler Box

Since electric vehicles have a relatively large interior space, the number of models equipped with cooler boxes is increasing. We are currently working on joint development with manufacturers.



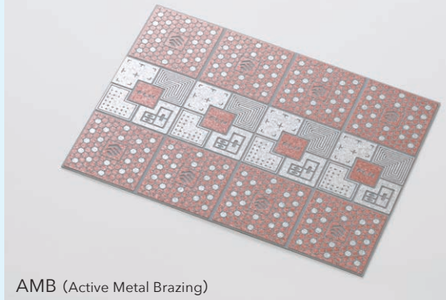
Climate Control Seat

By using thermo modules in the driver's seat, passenger seat, and even the back seat, cool or warm air can be blown from the seats to regulate body temperature, making for a comfortable drive even for long periods of time.

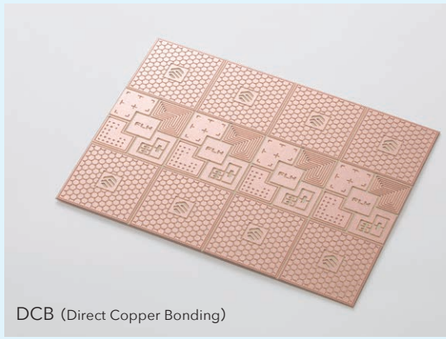
Thermo Electric CMOS Cooler for ADAS

CMOS image sensors are used in cameras used in ADAS. CMOS image sensors generate dark current noise when their temperature rises. By using a thermo module, it is possible to control the temperature of CMOS image sensors in a compact, lightweight, and easy way, and reduce dark current noise.

Power Semiconductor Substrates



AMB (Active Metal Brazing)



DCB (Direct Copper Bonding)

Power Semiconductor AMB & DCB Substrates

AMB*1 substrates are electronic components that form copper circuits by bonding a copper plate to an aluminum nitride (AlN) or silicon nitride (Si_3N_4) substrate with active metal brazing material. They achieve higher reliability and heat dissipation than DCB substrates. Applications include electric vehicles, electric railways, power transmission systems, industrial equipment, etc.
DCB*2 substrates are electronic components that form copper circuits by directly bonding a copper plate to a ceramic substrate such as alumina (Al_2O_3) or alumina zirconia (Al_2O_3/ZrO_2). They are widely used in power devices that require electrical insulation as well as efficient heat dissipation.

*1: AMB=Active Metal Brazing
*2: DCB=Direct Copper Bonding

Examples of Products Used For:

Sensor

Motor temperature sensor

By using Teflon material that can withstand heat up to 200°C, it can be used under high temperatures. In electric vehicles, thermistors detect the temperature of the motor coils to prevent burning due to abnormal overheating.

Rechargeable battery temperature sensor

Rechargeable batteries are essential for electric vehicles. By monitoring and controlling the temperature of rechargeable batteries during charging and discharging, the battery condition is kept optimal.

センサで世界を測る、未来を拓く。
OHIZUMI

* The term "thermistor" is derived from "thermally sensitive resistor".

Other-related Business

In addition to the products from its mainstay semiconductor equipment-related business and electronic device business, the Ferrotec Group is also engaged in a range of businesses, including commercial washing machines for the linen industry, woodworking and metal cutting tools, and ingot puller for silicon and SiC.
These products are delivered to customers around the world through Japan, China, and other overseas bases and business networks.

Machine Blade

Industrial Knife

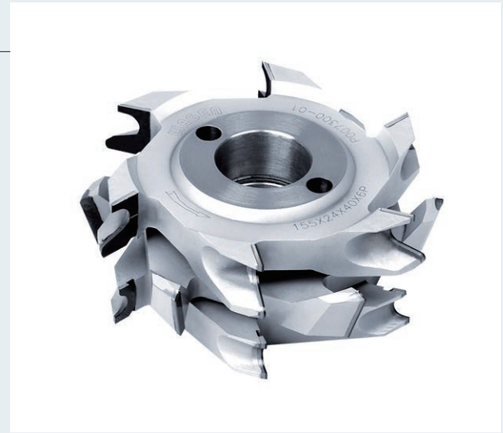
Tokyo Knife Co., Ltd. manufactures industrial knives used in a variety of manufacturing processes, including for smartphone electronic parts, automobiles, and cardboard. Taking advantage of its technologies and quality that have been honed since 1925, the company meets customers' needs by offering industrial knives that can cut all types of materials in information technology, iron and steel, paper, wood, food, and other industries.

東洋刃物株式會社
TOYO KNIFE CO.,LTD.

Wood Processing / Metalworking Sawblade

Hangzhou Wagen Precision Tooling Co., Ltd. develops, produces, and distributes precision cutting tools, such as a variety of saw blades, including cold, aluminum alloy, hard alloy, and diamond saw blades, under the WAGEN brand. The tools are widely used in industries for a broad range of applications, including automotive and aircraft components manufacturing, aluminum alloy die casting, furniture manufacturing, wood processing, and organic glass processing.

WAGEN 和源®



Industrial Cleaning Equipment

Industrial Cleaning

Asahi Seisakusho Co., Ltd. maximizes consumption efficiency and provides economical and environmentally friendly products by not only cleaning and reusing materials without throwing them away but also recycling water and heat. The industrial cleaning equipment with the world's highest hygiene level is widely used everywhere; for example, in cleaning plants, hospital facilities, and hotels.

ASAHI

Semiconductor Silicon Ingot Puller

12-inch Semiconductor Single Crystal Silicon Ingot Puller

This is a monocrystalline silicon ingot manufacturing device that utilizes our core technology cultivated in the semiconductor process. The raw material polysilicon is melted in a vacuum electric furnace, and the silicon molten liquid is pulled up to create the shape of an ingot. The vacuum state inside the device is maintained by our own vacuum seal technology. The carbon heater that melts the raw material at high temperature and the crucible that receives it are also our products. This supports the world's top-class high conversion efficiency of monocrystalline modules.

6-8 inch SiC Ingot Puller

We also manufacture ingot pulling equipment for SiC wafers, which have better voltage characteristics than silicon wafers and are used in solar power generation and power semiconductors.
We offer a full product line of induction/resistance heating types, LPE types, and PVT types, and also provide semi-customization services to meet customer needs.

Eyes on the World

Sales Sites

Head Office (Tokyo) / Sendai Sales Office /
Kansai Sales Office / Kumamoto Sales Office

Production and Development Sites

Chiba

Chiba Plant — Manufacturing site for development and manufacturing of ferrofluids and prototype evaluation and transition to high volume production of vacuum seals

Ferrofluid

Vacuum Seals

Ishikawa

Ishikawa Plant

Mass production bases for the Machinable ceramics "Photoveel"

Ishikawa Second Plant

Mass-production second base for the machinable ceramic "Photoveel"

Ishikawa 3rd Plant

Production and Development Sites

Development Center

Develops raw materials and machining technology for Ferrotec products.

Production and Development Sites	Founded	Total area (m²)	Clean room (Class)	Facility
Chiba Plant	1982	3,400	1,000	Machining centers, Numerically controlled lathes, TIG welding machines, Coordinate measuring machines, Roundness measuring instruments, Toolmaker's microscopes, Helium leak detectors
Ishikawa Plant	1989	4,700	10,000	Machining center, melting furnace, CNC Lathe, three-dimensional measuring machine, Image measuring equipment, elemental analysis equipment, ultrasonic flaw detector
Ishikawa Second Plant	2022	5,400	10,000/100	• Wire saw • Double-sided lapping machine • Melting furnace • Heat treatment furnace • Raw material manufacturing line • Ultrasonic flaw detector
Ishikawa 3rd Plant	2025	13,000	10,000/1,000	Firing furnaces, heat treatment furnaces, machining center, cleaning machine, three-dimensional measuring machine, image measuring machine
Development Center	2018	1,600	—	• Powder mixing equipment • Various heat treatment furnaces • Scanning electron microscope • Various physical property evaluation equipment

Okayama

Okayama Plant

Deposits SiC films by CVD and produces ultra-high purity ceramics.

Hyogo

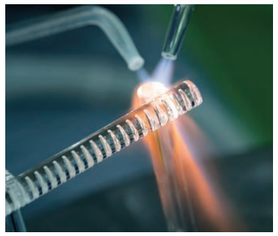
Kansai Plant

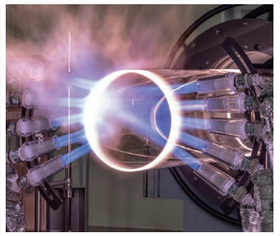
Evaluates machning technology for fine ceramics before transition to high volume production.

Yamagata　Ferrotec Alion Corporation

Yamagata Plant

Manufacturing site for prototype evaluation and manufacturing of small- to medium-quantity quartz products





Hiratsuka (Kanagawa)　Cosmo Science Inc.

Hiratsuka Plant

Design and manufacture of custom-built vacuum equipment, contract manufacturing base

Production and Development Sites	Founded	Total area (m²)	Clean room (Class)	Facility
Okayama Plant	1987	7,000	100	Machining center, CVD equipment, lapping machine, ultrasonic processing machine, blast machine, coordinate measuring machine, surface roughness/shape measuring machine
Kansai Plant	1989	5,700	1,000	Grinding center, machining center, lapping machine, coordinate measuring machine, SEM, spray dryer, surface roughness/shape measuring machine,molding machines, large atmosphere/air furnaces
Yamagata Plant	2019	3,300	1,000	Machining centers, Rotary grinders, Grooving tools, Glass lathes, Annealing furnaces (vertical/horizontal), Coordinate measuring machines, Strain testers
Hiratsuka Plant	1984	3,300	10,000/1,000	Forklift truck, Crane, Helium leak detectors, Measuring devices, Drying machines,Vacuum gauges, Log devices

Major Overseas Production Sites

China

Shanghai Shenhe Thermo-Magnetics Electronics Co., Ltd. (Shanghai)

Hangzhou Dahe Thermo-Magnetics Co., Ltd. Plant 1 (Hangzhou)

Hangzhou Dahe Thermo-Magnetics Co., Ltd. Plant 2 (Hangzhou)

Hangzhou Dahe New Material Technology Co., Ltd. (Hangzhou)

Ferrotec (Jiangsu) Quartz Technology Co., Ltd. (Dongtai)

[Changshan Factory 1]

Ferrotec (Zhejiang) Quartz Technology Co.,Ltd.
Zhejiang Advanced Precision Machinery Co.,Ltd.

[Changshan Factory 2]

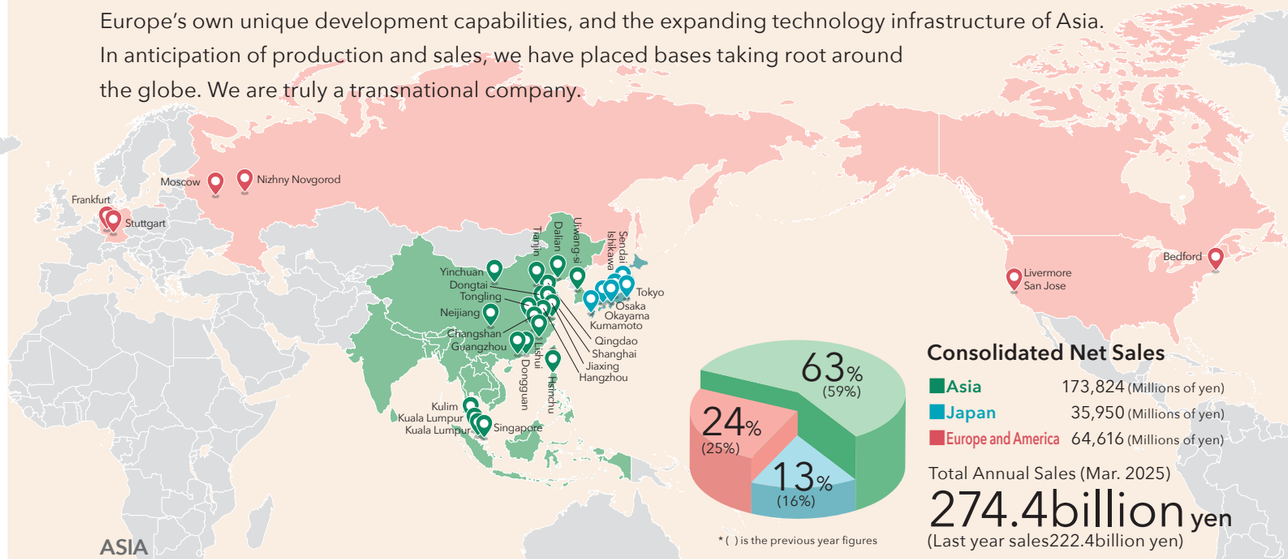
Ferrotec (Zhejiang) Quartz Technology Co.,Ltd.
Zhejiang Advanced Precision Machinery Co.,Ltd.
Zhejiang Advanced Thermoelectric Technology Co., Ltd.

[Changshan Factory 3]

Zhejiang Dunyuanjuxin Semiconductor Technology Co., LTD
Ferrotec (Zhejiang) Semiconductor Material Technology Co., Ltd.

Production and Development Sites	Founded	Total area (m²)	Clean room (Class)	Products
Shanghai Shenhe Thermo-Magnetics Electronics	1995	44,151	10,000/1,000/100/10	• Thermo-Electric modules (materials)
Hangzhou Dahe Thermo-Magnetics Plant 1	1992	33,228	10,000/1,000/100	• Vacuum seals • Quartz
Hangzhou Dahe Thermo-Magnetics Plant 2	1992	62,103	10,000/1,000/100	• Thermo-Electric modules (assembly)
Hangzhou Dahe New Material Technology	2014	13,162	10,000/100	• Fine Ceramics
Ferrotec (Jiangsu) Quartz Technology	2018	32,817	10,000/1,000/100	• Quartz
Ferrotec (Zhejiang) Quartz Technology Co.,Ltd.	2018	34,312	10,000/1,000	• Quartz
Zhejiang Advanced Precision Machinery Co.,Ltd.	2018	80,000	10,000/1,000	• Vacuum seals - Quartz • CMS
Zhejiang Advanced Thermoelectric Technology Co., Ltd.	2018		–	• Thermo-electric modules
Zhejiang Dunyuanjuxin Semiconductor Technology Co., LTD	2023	80,000	10,000/1,000/100	• Silicon parts
Ferrotec (Zhejiang) Semiconductor Material Technology Co., Ltd.	2023			• Ceramics • CVD-SiC

Ferrotec Group has developed a "Spirit of Craftsmanship" as a manufacturer all across the world. The United States' marketing and R&D expertise, Japan's industrial technology, China's development of mass production, Europe's own unique development capabilities, and the expanding technology infrastructure of Asia. In anticipation of production and sales, we have placed bases taking root around the globe. We are truly a transnational company.



*( ) is the previous year figures

Consolidated Net Sales

Asia	173,824 (Millions of yen)
Japan	35,950 (Millions of yen)
Europe and America	64,616 (Millions of yen)

Total Annual Sales (Mar. 2025)
274.4billion yen
(Last year sales222.4billion yen)

ASIA

Hangzhou
Products: Thermo-electric module (Assembly), Vacuum Seals, Quartz, Fine Ceramics, Silicon Parts, Contract Manufacturing, Saw Blades, Semiconductor Wafers

Dongtai
Products: Power Semiconductor Substrate, Quartz

Shanghai
Products: Thermo-electric modules (Material), Power Semiconductor Substrate, Semiconductor Wafers, Wafers for Semiconductor, Solar Cell Manufacturing Equipment, Cleaning, Surface Treatment

Changshan
Products: Quartz, Thermo-Electric Modules, CMS, Fine Ceramics, CVD-SiC, Silicon Parts

Yinchuan
Products: Quartz Crucibles for Semiconductors, Semiconductor Ingots, Silicon Parts Ingots

Jiaxing
Products: In-vehicle thermo-modules applecations

Tongling Products: Cleaning, Reclaim Wafer, SiC Wafer

Dalian Products: Cleaning

Neijiang Products: Cleaning, Power Semiconductor Substrate

Dongguan Products: Thermistor

Singapore

Kulim (Malaysia) Product: Quartz, Ceramics, Contract Manufacturing, Robot Assembly

Johor Bahru (Malaysia) Products: Power Semiconductor Substrate

Tianjin Products: Cleaning

Guangzhou Products: Cleaning

Qingdao Products: Cleaning

Lishui Products: Semiconductor Wafers, Epitaxial Wafer, Thermistor

Hsinchu (Taiwan)

Kuala Lumpur (Malaysia)

Uiwang-si (South Korea)

EUROPE

Frankfurt (Germany)

Stuttgart (Germany)
Products: Electron Beam Guns
(Vapor deposition apparatus for electronic gun)

Moscow (Russia)
Products: Thermo-electric modules

Nizhny Novgorod (Russia)
Products: Micro-electric module

AMERICA

Bedford, NT
Products: Vacuum Seals, Ferrofluid

Livermore
Products: Vacuum Coating System

San Jose
Products: Vacuum equipments, Vacuum components

Sales Offices　Production Bases

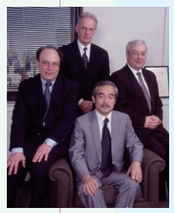
Honing our Technology, Connecting the Future

Without constantly improving our technology, we could not survive in the quickly innovating industry of electronics, which deals with semiconductors. The same goes for manufacturing, where day-to-day effort is required to connect to the next generation. M&A is also regarded as a powerful option for acquiring new technologies and expanding business.

At Company Founding

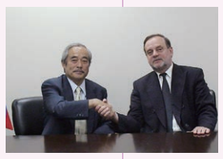
Development staff for semiconductor crystal manufacturing equipment

At the time of 1987 independence



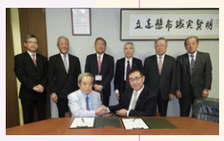
With United States executive after TOB

With CEO of US Company Amerigon

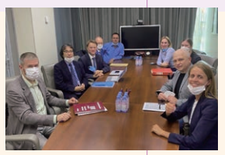


With CEO of NORD, Russia

In Yinchuan Factory



Signing Ceremony with Asahi Seisakusho



Signing Ceremony RMT Ltd.

Location Agreement for New Kumamoto Plant with The Town of Ozu

Our Chinese Parts Cleaning subsidiary was listed on Chinext with an IPO on December 30th, 2022.

Groundbreaking Ceremony for Malaysia's Kulim Factory

1980 1985 1990 1995 2000 2005 2010 2015 2020 2025

80 Established Ferrotec as the Japanese subsidiary of the US company (formerly Nippon Ferrofluidics)
81 Full-scale sales of vacuum seal commence
82 Opened the Chiba factory to start production of 5.25 inch small seals for HDD
85 Started selling silicon single-crystal pulling apparatus
87 Developed the multi-chamber system vacuum seal.
Became independent from the United States parent company
89 Developed 1mm thick HDD for laminate seal
90 Developed fluorine-based magnetic fluid for ultra-vacuum seal
92 Expanded to Hangzhou, China, founding the first of its China manufacturing base
94 Started mass production of vacuum seal for the three axes of LCD plasma etching apparatus
95 Established second plant in Shanghai, China.
Renamed company as Ferrotec
96 In October, became listed on the Japan Securities Dealers Association (now the Tokyo Stock Exchange, JASDAQ Standard)
98 Established Ferrotec Quartz and started quartz products business
99 Acquired all outstanding shares of former US parent company Ferro Fluidics Inc. via friendly TOB
01 Set up business alliance with US company Amerigon Inc. (now Gentherm) for temperature control seat systems for automobiles
02 Began commissioning the manufacture of small-diameter silicon wafers at Shanghai, China factory
05 Subsidiary acquisition of Russia's thermo-electric module maker SCTB NORD Inc.
06 Sales began of solar cell silicon pulling apparatus
08 Acquired subsidiary for ceramics business, Sumikin Ceramics & Quartz, Inc.
10 Acquired subsidiary of vacuum deposition equipment business from England's Edwards Vacuum, Inc.
11 Established new large factory in Yinchuan, China
13 Implemented structural reforms for Photovoltaic economic bubble
15 Made affiliate of CVD-SiC product maker Admap Inc. through capital participation
16 Acquisition of industrial equipment manufacturer Asahi Seisakusho through capital participation
18 Start of 8-inch semiconductor wafer production
19 Basic business alliance agreement with industrial machines and blades manufacturer Toyo Knife
20 Made affiliate of RMT Ltd. through capital participation
21 Business alliance with Ohizumi Mfg. Co., Ltd.
Business alliance with cado Co., Ltd.
22 Acquired Toyo Knife Co., Ltd. as a subsidiary
Acquired Ohizumi Mfg. Co., Ltd. as a subsidiary
Ferrotec (Anhui) Technology Development Co., Ltd. was Listed on the ChiNext market of the Shenzhen Stock Exchange.
23 Acquired shares of Cosmo Science Co., Ltd.
25 Merged with Ferrotec Material Technologies and changed the company name to Ferrotec Corporation.

(million of yen)
300,000
250,000
200,000
150,000
100,000
50,000
0

80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

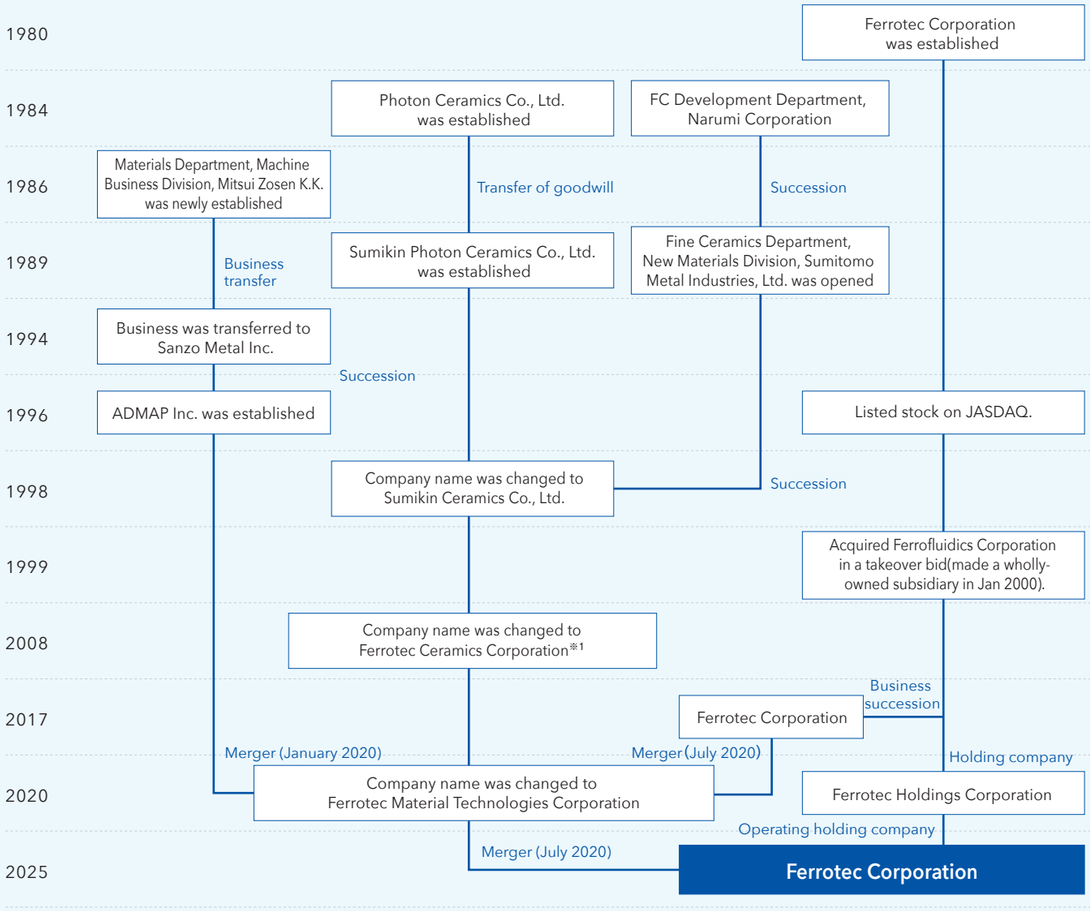
Foundation — 1980-1986 (Founding and Market Involvement)
Independence — 1987-1995 (Began Operations in China)
Expansion period — 1996-2001 (M&A Continuation)
Accelerated Growth — 2002-2013 (Chinese Market)
Second Accelerated Growth — 2014- (Global Market)

Trends in Consolidated Sales
Changes in consolidated total equity

The Joy of Growth

More than 40 years have passed since our founding. We have overcome many peaks and valleys of the business environment such as the IT bubble and the economic downturn from the collapse of Lehman Brothers, to become the Ferrotec of today.
We will continue to be a company in which our stakeholders can enjoy enduring growth.

Company History



※1 Became a wholly-owned subsidiary of Ferrotec Holdings Corporation via the transfer of all shares.

Company Profile

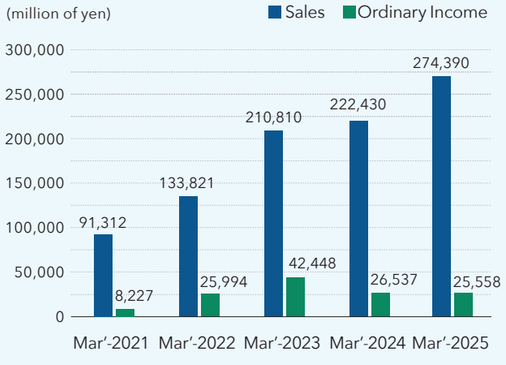
Trade name	Ferrotec Corporation
Founded	September 27, 1980
Head Office	Nihonbashi Plaza Building 5F, 2-3-4 Nihonbashi, Chuo-ku, Tokyo 103-0027
JASDAQ Standard	JASDAQ, October 18, 1996 (Stock code: 6890) Current : TSE Standard Market.
Representative	He Xian Han (Representative Director , President & Group CEO)
Business Description	Manufacturing and sales of semiconductor-related parts and equipment materials ,etc.
Capital	29,549,417,527 yen
Shares Issued	47,177,949 shares (Including 297,422 shares of treasury stock)
Affiliated Companies	[Consolidated Subsidiaries] 80 companies [Equity Method Subsidiaries] 13 companies
Employees	[Consolidated] 15,983

Group company business
Semiconductor Equipment-related Business: vacuum seal, contract manufacturing services and metalworking Metalworking, quartz products, ceramics products, silicon products, SiC products, process tools parts cleaning, reclaim wafers, quartz crucibles, (Equity method affiliate) silicon wafers, SiC wafers
Electronic Device Business: thermo-electric modules, ferrofluid, power semiconductor substrate, Thermistor
* Others Laundry equipment and other related industrial equipment, silicon for solar cells, Industrial knife

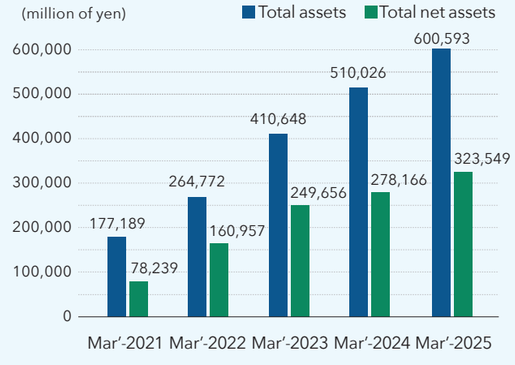
See here for more information about financial data https://www.ferrotec.co.jp/en/ir/ir_finance_data.php

Financial Highlights

Sales/ Ordinary income



Total Assets/ Total net assets



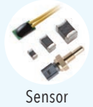
Segments

Semiconductor Equipment-related Business / Electronic Devices Business / Automotive-related Business / Others

Automotive-related Business Segments


Power-semi Substrate (AMB)


Climate Control Seat

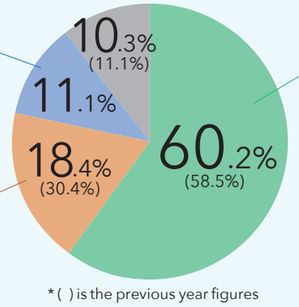

Sensor

Electronic Devices Business Segments


Ferrofluid


Thermo-electric Modules


Power-semi Substrate (DCB)

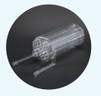


*( ) is the previous year figures

Semiconductor Equipment-related Segment


Vacuum Seals


Ceramics Products


Quartz Products


SiC Parts