



Ferrotec Material Technologies

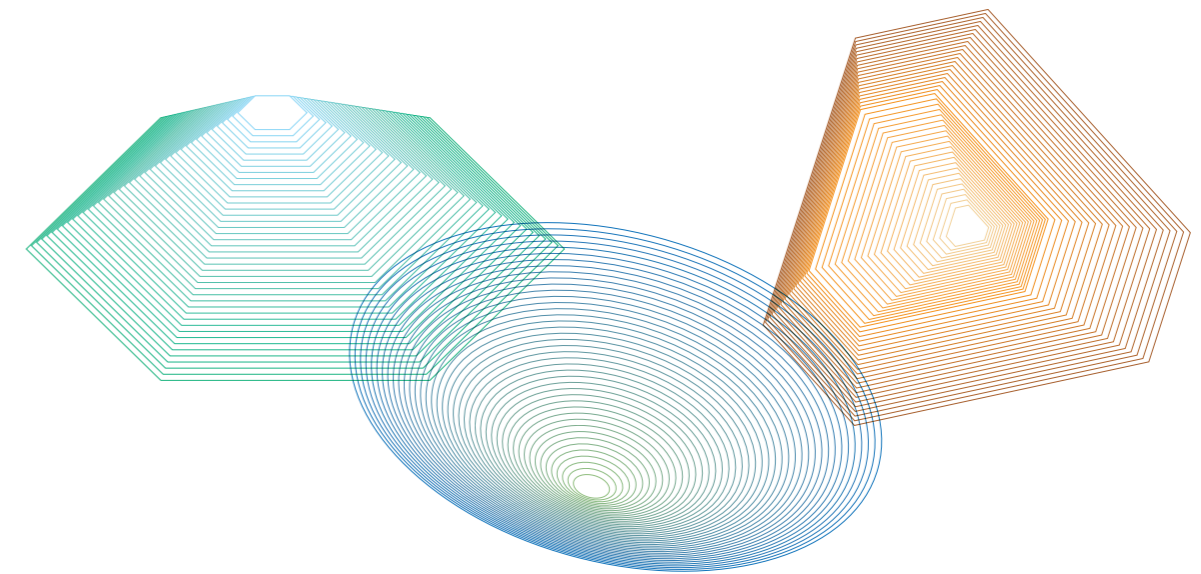
<https://www.ft-mt.co.jp/en/>



Name	Ferrotec Material Technologies Corporation
Established	December 1, 1989
Capital	485,500,000 yen
Share Holder	Ferrotec Holdings Corporation (100%) https://www.ferrotec.co.jp/en/
Business Contents	<ol style="list-style-type: none"> 1. Manufacturing and sales of Semiconductor equipment related products (Vacuum Feedthrough, Quartz products, Fine ceramics products, Silicon Parts, CVD-SiC products, Machinable ceramics products, Quartz Crucible, Silicon Wafers , etc.) 2. Manufacturing and sales of Electronic device products (Ferro fluids, Thermo-electric modules, Power semiconductor substrate) 3. Manufacturing and sales of Automobile related products
Representative	President Yasuaki Matsuda
Tokyo Headquarters, Sales Division	5th Floor, Nihonbashi Plaza Building 2-3-4, Nihonbashi, Chuo-ku, Tokyo, 103-0027, Japan TEL +81-(0)3-3516-0800 FAX +81-(0)3-3516-0801
Sendai Sales Office	13-18 Station Plaza Building 603, Futsuka-machi, Aoba-ku, Sendai-City, Miyagi, 980-0802, Japan TEL +81-(0)22-722-4588 FAX +81-(0)22-722-4608
Kansai Sales Office	No.10 MAIDA Building 1F, 11-34 Toyotsu-Cho, Suita-City, Osaka, 564-0051, Japan TEL +81-(0)6-6310-3600 FAX +81-(0)6-6310-3611
Chiba Plant	1-4 Midoridaira, Sousa-City, Chiba 289-2131, Japan TEL +81-(0)479-73-6601 FAX +81-(0)479-70-1012
Ishikawa Plant	1142, Urushijima-machi, Hakusan-shi, Ishikawa, 924-0835, Japan TEL +81-(0)76-274-9800 FAX +81-(0)76-274-7790
Kansai Plant	1st Higashi-mukojima, Nishino-Cho, Amagasaki-City, Hyogo, 660-0856, Japan TEL +81-(0)6-6411-7643 FAX +81-(0)6-6411-7778
Okayama Plant	3-16-2, Tamahara, Tamano-shi, Okayama 706-0014, Japan TEL:+81-(0)863-33-1161 FAX:+81-(0)863-33-1168
Development Center	1101 Mukaijima-machi, Hakusan-City, Ishikawa, 924-0833, Japan TEL +81-(0)76-203-9300 FAX +81-(0)76-203-9302

Overseas Sales Sites

- USA 3945 Freedom Circle, Suite 450 Santa Clara, CA 95054 USA
- Germany THE SQUARE, Am Flughafen, 60549 Frankfurt am Main Germany
- China
 - 6515 Jiandong 3th Road, DaJiangdong Industrial District, Hangzhou, Zhejiang, China
 - 777 Binkang Rd, Binjiang, Hangzhou, Zhejiang, China 310053, China
 - 181 Shanlian Road, Shanghai Baoshan City Industrial Zone 200444,P.R.China
- Taiwan 6F-2, No.25, Puding Rd., Hsinchu City, Taiwan
- Korea Indeogwon IT Valley B-610, 40, Imi-ro, Uiwang-si, Gyeonggi-do Zip 16006 Korea
- Singapore 12 Tannery Road #09-03 HB Center 1 Singapore 347722



Creating new values based on material technologies

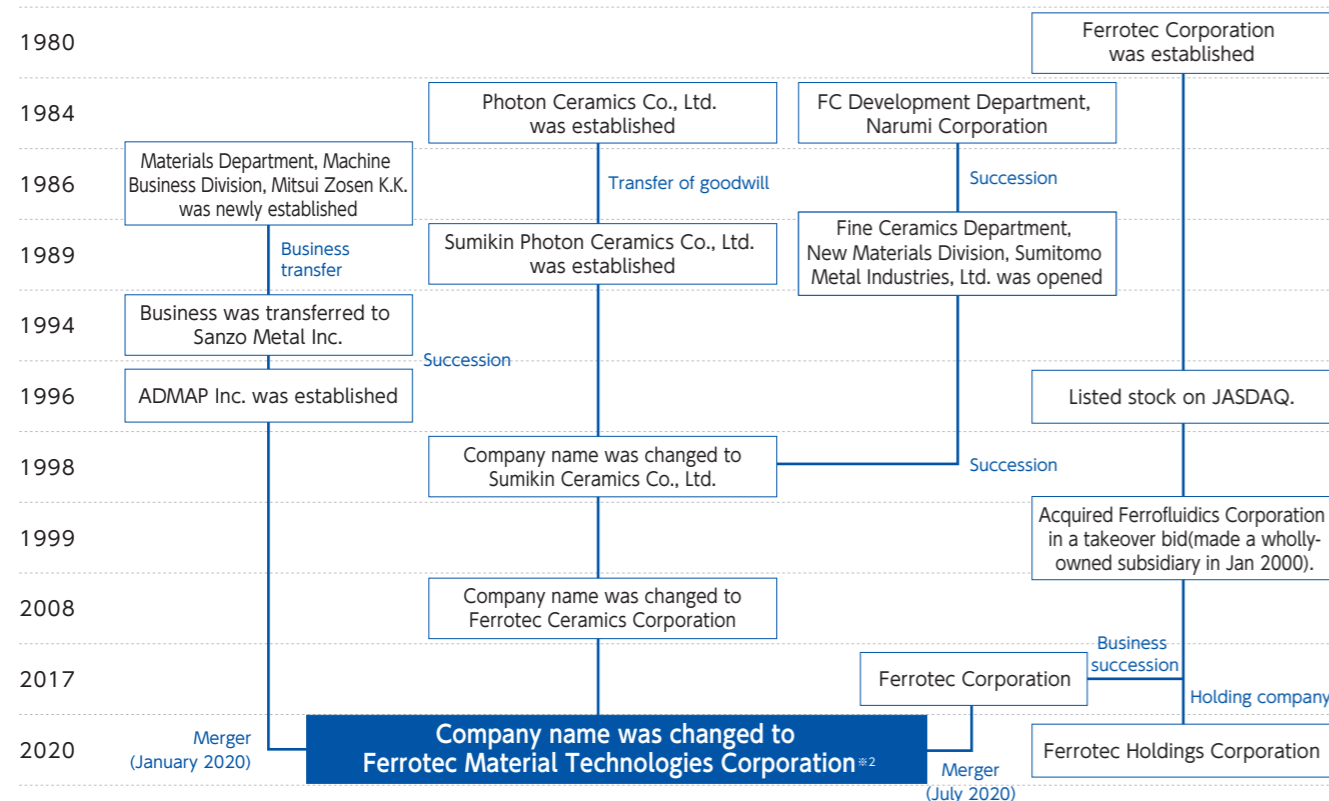


Yasuaki Matsuda

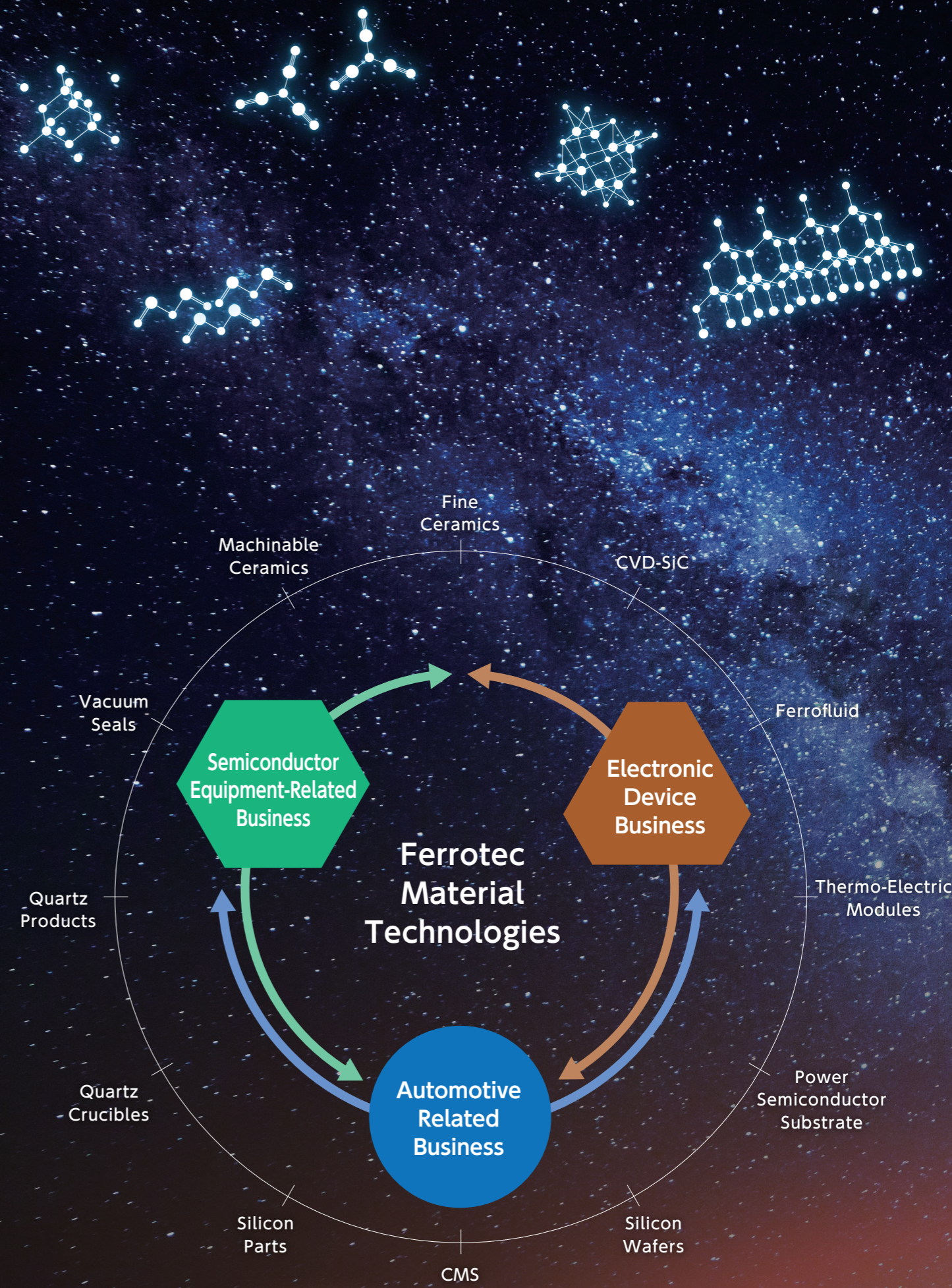
Ferrotec Material Technologies Corporation, a consolidated subsidiary of Ferrotec Holdings Corporation, has merged with another consolidated subsidiary of the corporation, named Ferrotec Corporation. Our company name "Material Technologies" reflects our philosophy to "create new values based on material technologies." The materials we supply are used for products related to semiconductor and organic EL production equipment, electronic devices, and in-vehicle items. Our materials have been further used for various other purposes as there is an increasing use of AI and big data that support IoT and next-generation communication standards and power semiconductors are being put into practical use. To take full advantage of this opportunity, we are committed to the further active development of production bases in Japan, China and other countries as well as the acceleration of research and development, and will offer new values in a timely manner. Meanwhile, although the development of new technologies such as IoT has made our lives more convenient, people are facing issues such as the ever-present conflicts in the world and the threat of coronavirus. In such circumstances, our styles of business and lives are beginning to change dramatically. Ferrotec Material Technologies values our entrepreneurial spirit and diversity, which have been the corporate culture since our foundation. We will ensure that all employees think about and carry out what should and can be done to contribute to the new society. We appreciate your continuing support for our activities.

In July 2020, Ferrotec Material Technologies and Ferrotec have merged and became Ferrotec material technologies Corp.

Company History



*1 Became a wholly-owned subsidiary of Ferrotec Holdings Corporation via the transfer of all shares.
 *2 Ferrotec Material Technologies Corporation is a wholly-owned subsidiary of Ferrotec Holdings Corporation



Semiconductor Equipment Related Business

Semiconductor and FPD industries are the backbone of today's mobile, technology-driven society. At Ferrotec Material Technologies, we contribute to these industries by providing Si wafers and critical components for semiconductor and FPD manufacturing equipment, and now we're expanding into fields that are complimentary and essential to our two primary industries.

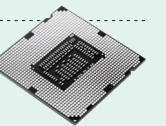


Quartz Products

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



Fine Ceramics Products

Supporting cutting edge technology with the products made with high in hardness / purity ceramics using our advanced machining skills.

Utilizing advanced materials and production techniques, our fine ceramics materials are manufactured through integrated production based on quality control that achieves the highest industry standards. These materials offer advanced functions and superior characteristics that meet the absolute-highest customer requirements for product development and production across a variety of fields and applications. They are especially optimal for parts and components used in the manufacture of liquid crystals displays semiconductor manufacturing (wafer fabrication, processing, assembly, and inspection), where high purity, high rigidity, and high precision are mandatory. In general industrial machineries, our materials provide superior resistance to wear, heat, and chemicals.



Vacuum Seals

Ensuring a Clean Sealed Environment with Ferrofluids

Our vacuum seals use ferrofluids and serve as rotational motion feedthroughs in a vacuum atmosphere. They are used in the manufacturing equipment for semiconductors, FPDs, LEDs, and solar cells.

Vacuum seals are our core products. They are mainly used in the film formation processes for semiconductor wafers, the vacuum transfer unit of FPD manufacturing equipment, and transfer robots. They assume a role in accurately transferring the rotative power while isolating an enclosed space from the outside.



Silicon Parts

High-Purity Polysilicon Jigs used in Manufacturing Process

Our SiFusion™ 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.

FRONT-END



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 made from our unique CVD-SiC are ultrapure and highly resistant to corrosion, oxidation, heat, and wear, and are used in many fields. As we offer them to semiconductor manufacturing equipment manufacturers. We correspond to customer needs, and plan to further enhance our production structure.



Silicon Wafers

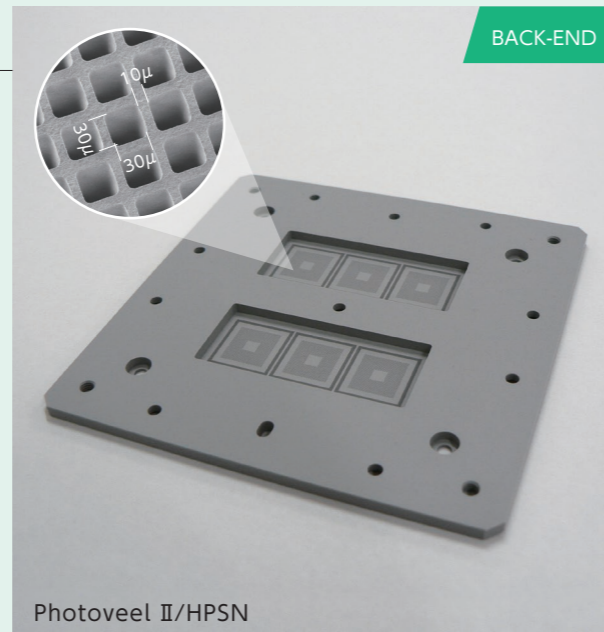
Integrated Production from the Single-Crystal Ingot

We have an integrated system for processing single-crystal ingots into semiconductor wafers for small diameter silicon wafers up to twelve inches. We have built a global supply system centered on mass production for bipolar IC, discrete circuit applications, and MEMS.

Machinable Ceramics Products

With the excellent machinability, we will deliver High quality, precision product in short lead time.

Machinable ceramics provide easy machinability by conventional machining machine. Various precision machining are possible with synthetic diamond-based cutting tools and also with general carbide tools. Inspection jigs and parts for the manufacture of liquid crystals display and semiconductors required in a large-variety, and a small-quantity production. In the face of growing expectations for shorter lead time in all production processes, from design to trial production, the machinable ceramics are widely used from their precision machining and quick-delivery.



BACK-END

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.



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.



CMS (Contract Manufacturing Service)

We provide contract processing and manufacturing of various devices by utilizing our production capability and operational expertise in China.

We meet our customers' needs with our high-precision metal processing technology and device manufacturing technology we have developed for vacuum seals and silicon crystal pulling apparatus. We meet a wide range of needs of customers from the electronics and other industries, including various types of metal processing, manufacturing of electric furnaces, and assembly of vacuum equipment. Our group has an over 10-year track record of providing contract processing and manufacturing of various devices.

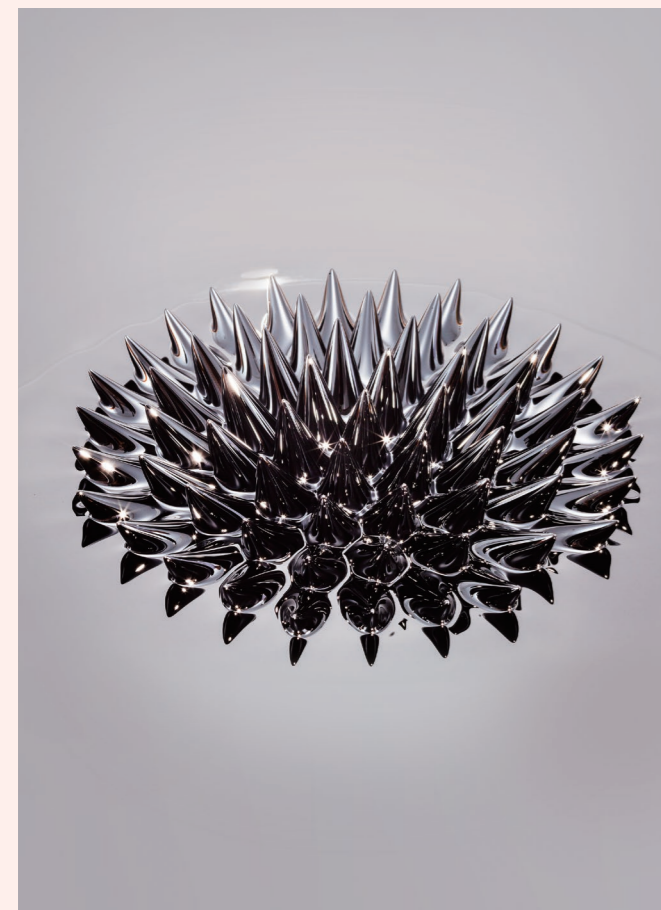
Electronic Device Business

In the electronic device business, there are the core technologies of Ferrotec- ferrofluid and thermo-electric modules, also known as Peltier cooling devices.

Ferrofluid is used inside vacuum seals,utilized for wafer transfer robots, and installed in clean room equipment to prevent the intrusion of dust.

Because thermo-electric modules act as a heat pump that transfers heat when an electrical current flows, they are used as a material to maintain and manage temperature for electronics.

Capable of reaching temperatures from minus 20°C -equal to that of a freezer- to easily surpassing the boiling point of 100°C, our products are utilized in a wide range of fields, from medical equipment, semiconductors, and the telecommunication industry.

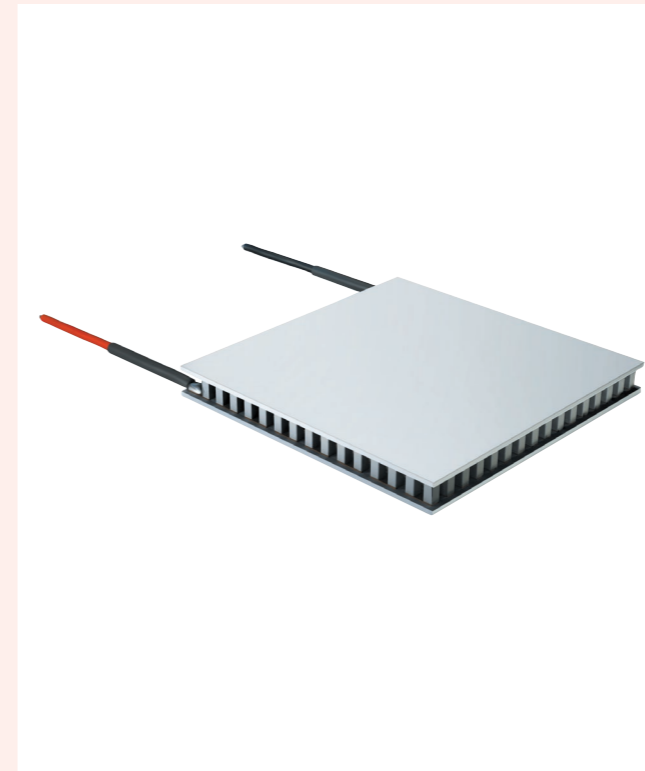


Ferrofluid

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.

Examples of Products Used For:
Speakers (Automotive & Home), Haptic Actuators and Magnetic Separation Materials (Medical Diagnostics & Research)



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 conditioners, Hair-dryers and a variety of consumer electric products.

Examples of Products Used For:
Climate Control Seats (CCS) for Automobiles, Air Conditioners, Small refrigerators, Hair Dryers

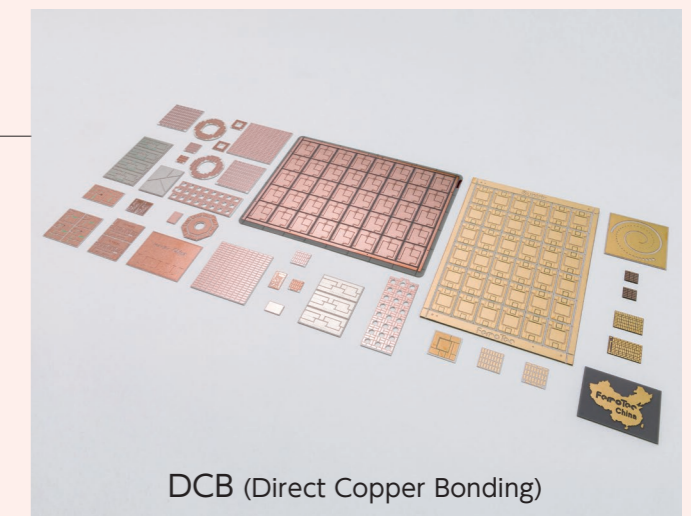


Power Semiconductor DCB & AMB Substrates

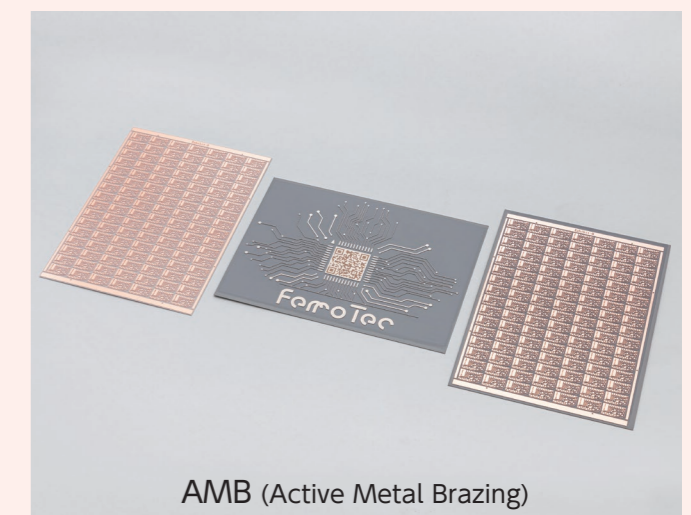
Application of Thermo-electric module Manufacturing Technology for Heat Dissipation and Insulation Substrate

Power Semiconductor Substrate is an Insulated Substrate manufactured by bonding a copper circuit on Aluminium Ceramics, Aluminum Nitride Ceramics, and Silicon Nitride Ceramics. It is sure that the global market of Silicon Nitride Ceramics will grow up due to HEV and EV is launched. Also, our long-termed experiences for manufacturing of DCB substrates and the technology of AMB (Active Metal Brazing) makes it possible to bond thicker copper, and it contribute to be small sized package and saving energy also.

Examples of Products Used For:
Electric Vehicles, Machining Tools, Servers
*Used in these products



DCB (Direct Copper Bonding)



AMB (Active Metal Brazing)

Automotive Related Business

Ferrotec Materials Technology, which has grown in the semiconductor market, will provide core technologies such as thermomagnetic modules and Magnetic fluids for the automotive market, which is expected to have considerable changes in the future for applications such as EV, PHV, and autonomous driving systems.

Thermo Module Application

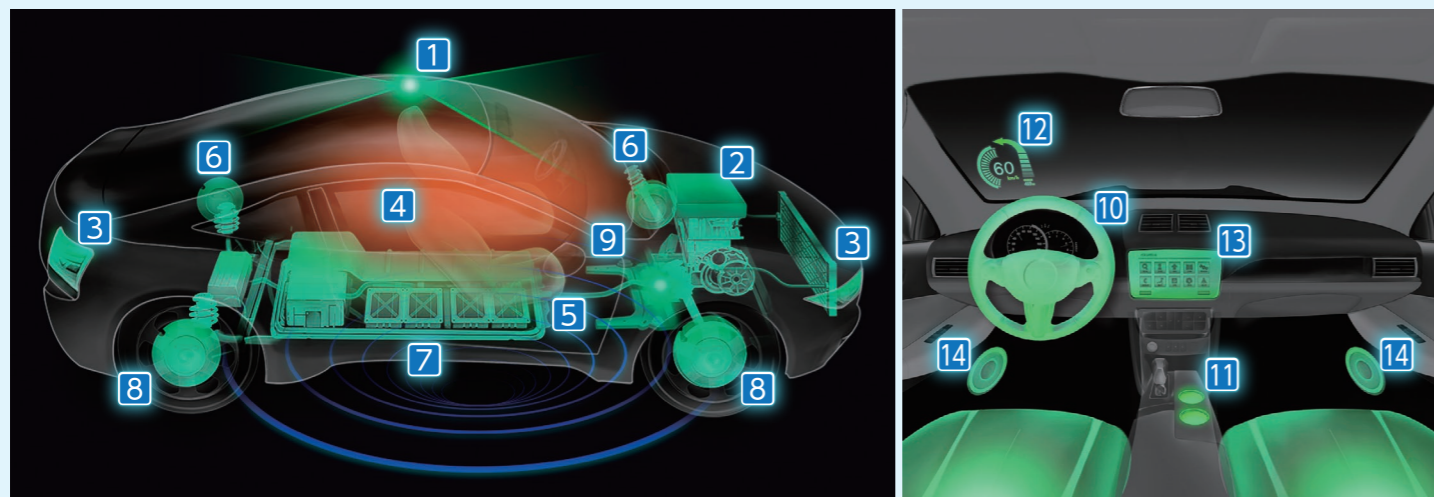
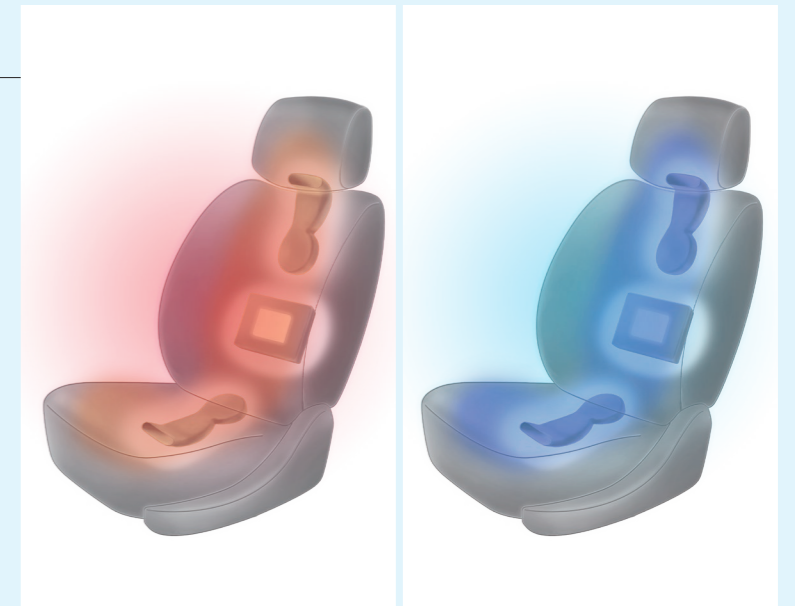


Thermo-Electric Cup Holder

By using the thermo module, it is possible to easily add heating and cooling functions to the drink holder. Cold drinks can keep cold and hot drinks can keep warm.

Climate Control Seat

By using the thermo module for the driver's seat, passenger seat, and even the rear seats, cold air and warm air can be emitted from the seat. Therefore, comfortable driving is possible even for a long time.



Thermo Module Application

- 1 Laser Radar
- 2 Battery Cooling
- 3 Laser Head Light
- 4 Seat Cooling System
- 9 ADAS GPU CPU Cooler
ADAS CMOS Cooler
- 10 Steering Heater/Cooler
- 11 Cup Holder
- 12 Head Up Display

Ferrofluid Application

- 2 Engine suspension
- 4 Seat suspension
- 6 Car's suspension
- 7 Hzero® DC sensor for
SOC monitoring
- 8 Hzero® Composite
In-wheel motor
- 13 Touch Panels
- 14 Speakers

Power Semiconductor Substrates Application

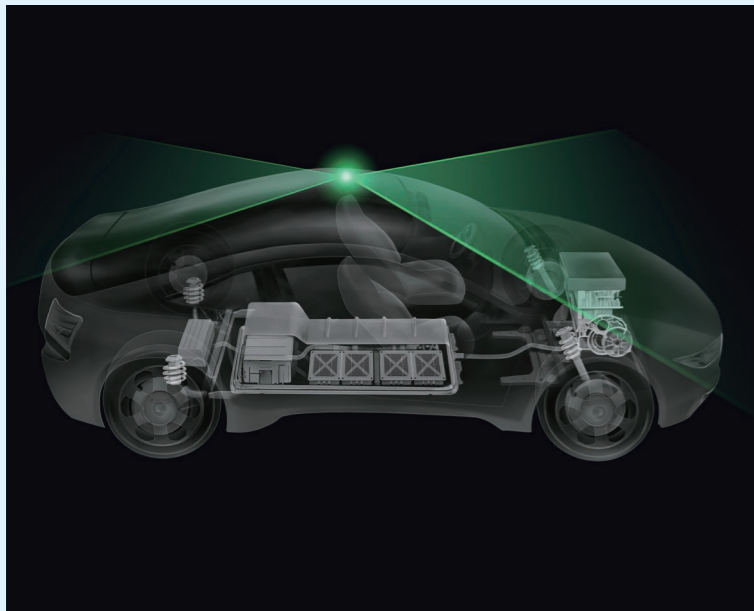
- 2 Engines
Engine control
- 3 Body
Headlamp control
Room light control
- 5 Power Trains
Hybrid electric vehicle (HEV) motor control
Brakes
Transmissions
Steering control

Thermo-Electric CMOS Cooler for ADAS



CMOS image sensors are used in cameras for ADAS. When the temperature increases, the CMOS image sensor generates dark current noise. By using the thermal magnetic module, the temperature of the CMOS image sensor can be controlled easily, compactly, and lightly, and dark current noise can be reduced.

Thermo Module Application

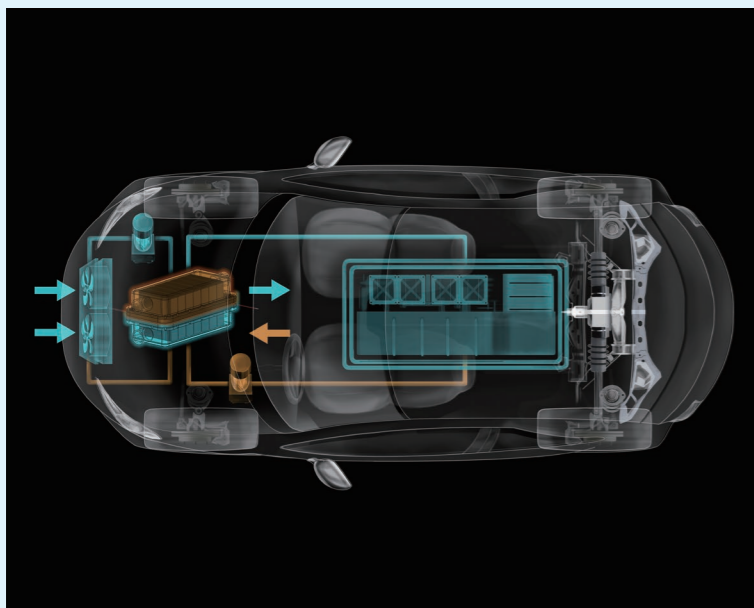
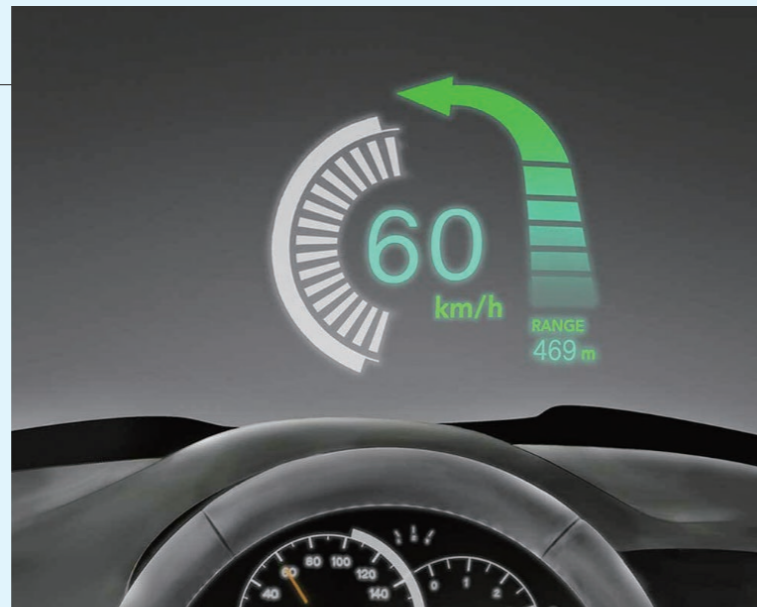


Laser Radar

By scanning the laser beam and illuminating the target object and observing the reflected light, the distance to the target object can be measured and the characteristics of the target object can be specified. Due to the influence of heat, the laser is difficult to make accurate measurements. Thermo module can be used to control the laser light source and stabilize the measurement accuracy.

Head Up Display

A head-up display (HUD) projected on the windshield requires a clear image. For HUDs scanned by RGB laser light sources, thermo module can be used to suppress image degradation caused by heat generated by the light source.



Thermo-Electric Battery Heater Cooler

The batteries used in EVs, HEVs, and PHEVs are very sensitive to temperature. At the same time, the high temperature environment will affect the battery life, while the low temperature environment will affect the battery performance. By using thermo module, in addition to its small size, light weight, and convenience, the

Ferrofluid Application



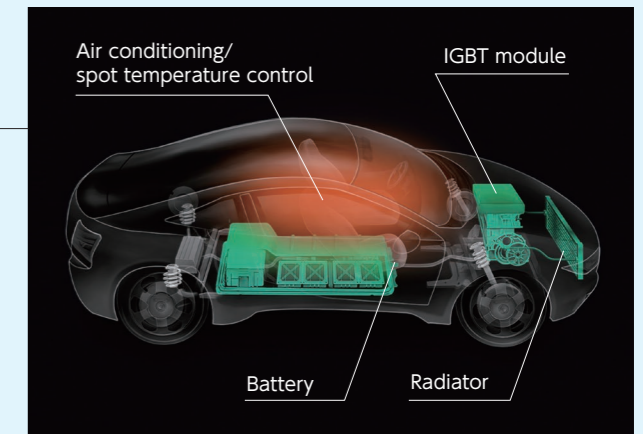
Hzero® Composite



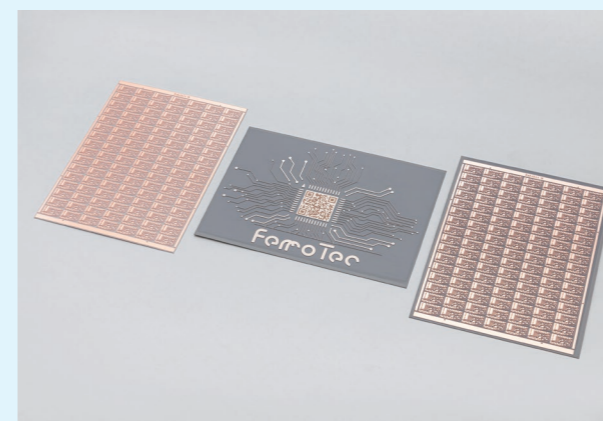
Nano composite products having very superior to high speed magnetic frequencies by adapting ferrofluid nano technology. This name represents the unique property of extremely zero magnetic hysteresis. This material can be controlled by magnetic field and good for crack detection & repairing. Also it has an unique role to improve leakage of magnetic gap.

Temperature Sensitive Ferrofluid for Pump-less Heat Transfer System

New unique product "Temperature Sensitive Ferrofluid" is newly launched. The unique property provides researchers to put more effort on developing a new "closed loop heat transportation system". This pumpless thermal circulation method without any energy consumption is being known very promising as future standard automotive technology.

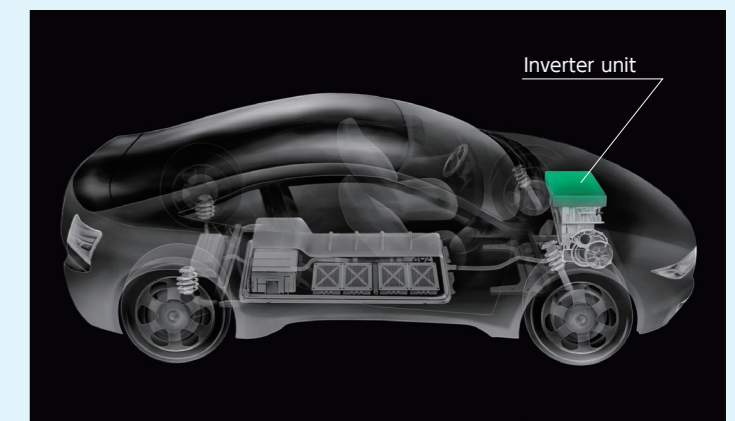
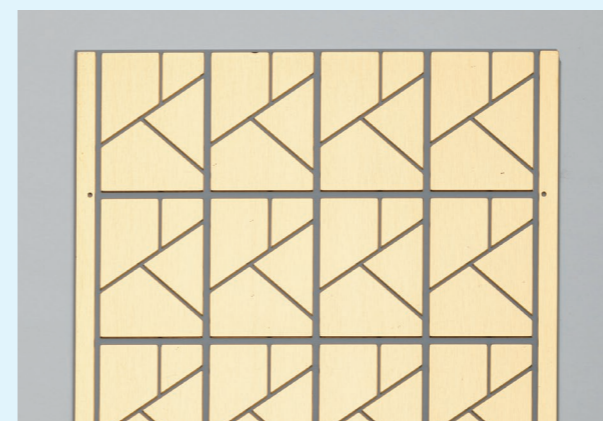


Power Semiconductor Substrates Application



AMB (Active Metal Brazing)

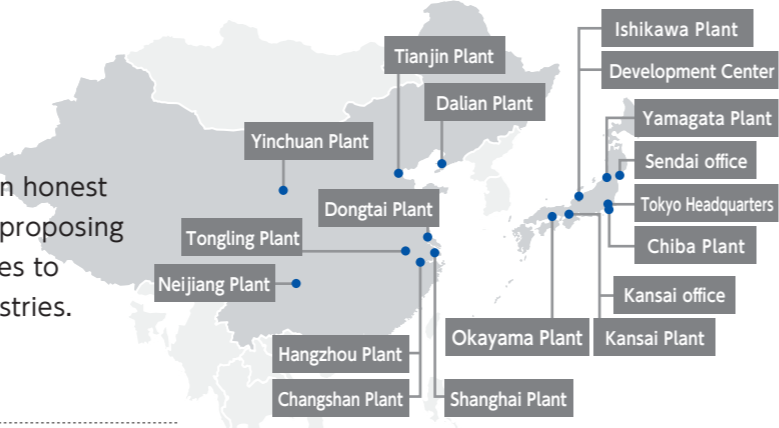
The technology of AMB (Active Metal Brazing) makes it possible for higher-reliability/performance product. Silicon-Nitride Substrates is really high-performance, it expect to avoid copper peeling and copper crack after ended heat-cycle test by 3,000 cycles.



Locations

Sales and Production Sites for Ferrotec Material Technologies

Ferrotec Material Technologies aims to become an honest and trusted company that satisfies customers by proposing high-quality cost-competitive products and services to customers in the new energy and electronics industries.



Tokyo

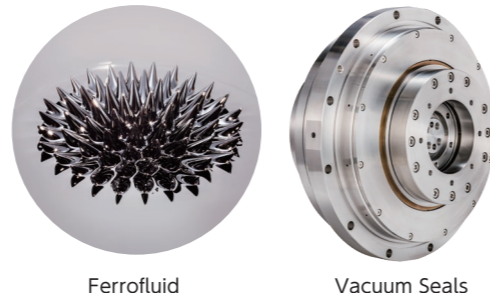


Tokyo Headquarters, Sales Division

Our main products are ceramics products, CVD-SiC products, magnetic fluids and application products, parts for semiconductor manufacturing equipment, and electronic equipment parts.

By further enhancing the technological superiority of our company's products, the Group is expanding its markets from Japan to the world, not only in Japan, but also in Europe, the United States, and China, making use of its overseas bases as a member of the Ferrotec Group.

Chiba



Ferrofluid

Vacuum Seals

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

Founded	Total area (m ²)	Clean room	Facility
1982	3,400	Class 1000	Machining centers, Numerically controlled lathes, TIG welding machines, Coordinate measuring machines, Roundness measuring instruments, Toolmaker's microscopes, Helium leak detectors

Ishikawa



Ishikawa Plant

Mass production bases for the Machinable ceramics [Photoveel]

Founded	Total area (m ²)	Clean room	Facility
1989	4,700	Class 10000	Machining center, melting furnace, CNC Lathe, three-dimensional measuring machine, Image measuring equipment, elemental analysis equipment, ultrasonic flaw detector



Development Center

Develops raw materials and machining technology for Ferrotec Material Technologies products.

Okayama



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

Founded	Total area (m ²)	Clean room	Facility
1987	7,000	Class 100	Machining center, CVD equipment, lapping machine, ultrasonic processing machine, blast machine, coordinate measuring machine, surface roughness/shape measuring machine

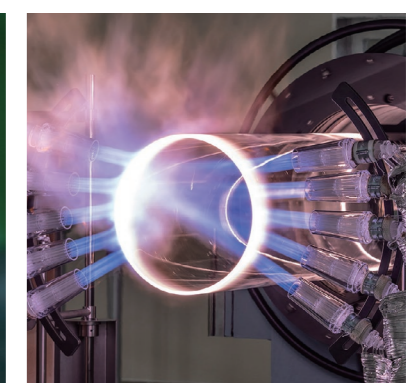
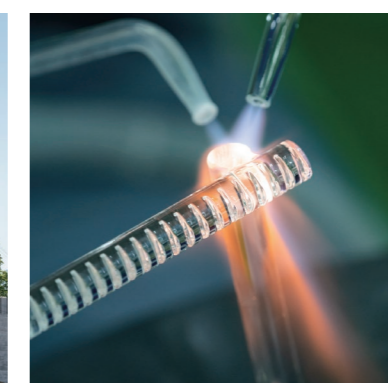
Hyogo



Kansai Plant Evaluates machining technology for fine ceramics before transition to high volume production.

Founded	Total area (m ²)	Clean room	Facility
1989	5,700	Class 1000	Grinding center, machining center, lapping machine, coordinate measuring machine, SEM, surface roughness/shape measuring machine, spray dryer, molding machines, large atmosphere/air furnaces

Yamagata Ferrotec Arion Co., Ltd.



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

Founded	Total area (m ²)	Clean room	Facility
2019	3,300	Class 1000	Machining centers, Rotary grinders, Grooving tools, Glass lathes, Annealing furnaces (vertical/horizontal), Coordinate measuring machines, Strain testers

Group Locations

China



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

Founded	Total area (m ²)	Clean room (Class)	Products
1995	44,151	10000 1000 100 10	•Thermo-Electric modules (materials) •Power semiconductor substrates •Semiconductor wafers - Cleaning



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

Founded	Total area (m ²)	Clean room (Class)	Products
1992	33,228	10000 1000 100	•Vacuum seals •Quartz



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

Founded	Total area (m ²)	Clean room (Class)	Products
1992	62,103	10000 1000 100	•Thermo-Electric modules (assembly) •Silicon parts •CMS



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

Founded	Total area (m ²)	Clean room (Class)	Products
2014	13,162	10000 100	•Fine Ceramics



Hangzhou Semiconductor Wafer Co., Ltd. (Hangzhou)

Founded	Total area (m ²)	Clean room (Class)	Products
2017	139,200	10000 1000 100 10	• Semiconductor wafers



Ferrotec (Ningxia) Semiconductor Technology Co., Ltd. (Yinchuan)

	Founded	Total area (m ²)	Clean room (Class)	Products
Plant 1	2015	38,246	10000 1000 100	•Semiconductor Ingots
Plant 2	2018	44,447	100	



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

Founded	Total area (m ²)	Clean room (Class)	Products
2018	46,003	10000 1000 100	•Power Semiconductor AMB & DCB Substrates



Zhejiang Advanced Thermo-Electric Technology Co., Ltd. (Changshan)

Founded	Total area (m ²)	Clean room (Class)	Products
2018	2,835	—	•Thermo-electric modules

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

Founded	Total area (m ²)	Clean room (Class)	Products
2018	32,817	10000 1000 100	• Quartz

Zhejiang Advanced Precision Co., Ltd. (Changshan)

Founded	Total area (m ²)	Clean room (Class)	Products
2018	34,312	10000 1000	•Vacuum seals - Quartz •CMS



Ferrotec (Anhui) Technology Co., Ltd. (Tongling)

Founded	Total area (m ²)	Clean room
2018	24,000	2,000m ²

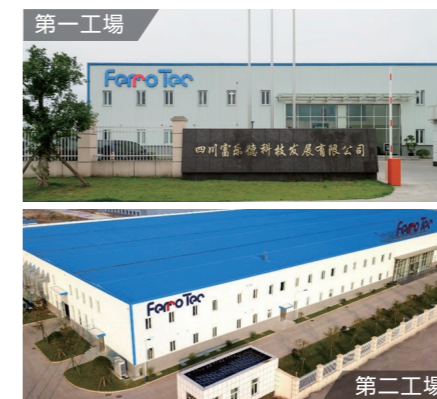
Facility
•Precision cleaning •Alumite •Plasma spraying •Arsenic treatment •Water jet cleaning •Improved quartz cleaning •Bead blasting •Ti-Al arc spraying



Ferrotec (Dalian) Technology Co., Ltd. (Dalian)

Founded	Total area (m ²)	Clean room
2017	6,400	360m ²

Facility
•Precision cleaning •Improved quartz cleaning •Bead blasting •Ti-Al arc spraying



Ferrotec (Sichuan) Technology Co., Ltd. (Neijiang)

	Founded	Total area (m ²)	Clean room
Plant 1	2011	5,201	550m ²
Plant 2	2018	15,534	900m ²

Facility
•Precision cleaning •Bead blasting •Al arc spraying



Ferrotec (Tianjin) Technology Co., Ltd. (Tianjin)

Founded	Total area (m ²)	Clean room
2011	3,600	400m ²


Facility
•Precision cleaning •Bead blasting •Al arc spraying

Eyes on the World

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.



EUROPE



Frankfurt (Germany) 



Stuttgart (Germany) 

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


Moscow (Russia)

 
Products:
Thermo-electric modules




Lyon (France) 

Milan (Italy) 

Madrid (Spain) 



CHINA

Hangzhou 


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



Shanghai 

Products:
Thermo-electric module (Material), Power Semiconductor Substrate, Semiconductor Wafers, Cleaning



Yinchuan 

Products:
Quartz Crucibles for Semiconductors, Semiconductor Ingots



Dongtai  Products: Power Semiconductor Substrate, Quartz

Changshan  Products: Quartz

Tianjin  Products: Cleaning

Neijiang  Products: Cleaning

Dalian  Products: Cleaning

Tongling  Products: Cleaning

SOUTHEAST ASIA

Singapore 




Kuala Lumpur (Malaysia) 



Hsinchu (Taiwan) 



Uiwang-si (South Korea) 



JAPAN

Tokyo [Headquarters] 

Sales office:
Sendai Sales Office
Kansai Sales Office



Chiba Plant  Products: Vacuum Seals, Ferrofluid

Kansai Plant  Products: Fine Ceramics

Ishikawa Plant, Development Center 

Products: Machinable Ceramics
Development theme: Materials and processing technology for various ceramics

Okayama Plant  Products: CVD-SiC

AMERICA

Bedford, NT 

Products:
Vacuum Seals, Ferrofluid

Livermore 

Products:
Vacuum Coating System

Santa Clara, CA 

