Ferrotec Material Technologies

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

2209CP-G06-EN

Company Profile

Creating new values based on material technologies

President, Takeru Yamamura

We have a business that operates in Japan.

The company was established in 2020 through the integration of three companies: Ferrotec Corporation which was borne from a technology based on thermoelectric-modules and Ferro fluids that came from NASA's Apollo program; Ferrotec Ceramics Corporation which was borne from a fine ceramic sintering technology; and ADMAP Inc. which was borne from chemical vapor deposition technology.

Our company name, “Material Technologies,” expresses our desire to create new value based on materials technology and to lead the semiconductor industry into a new world with innovative materials and technologies.

Our materials are used in a wide range of applications, including semiconductors and organic EL manufacturing equipment, electronic devices, automotive, medical, communications, etc., and continue to expand into other areas by putting IoT, AI, and autonomous driving technologies into practical use.

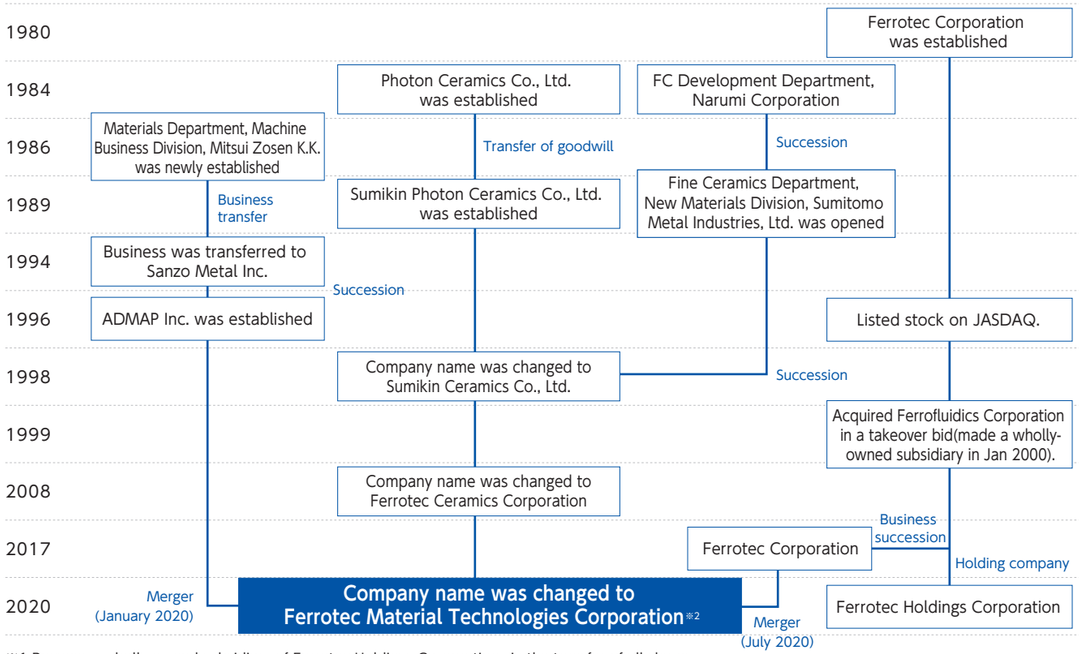
These technologies have responded to the increase in demand for various fields such as semiconductors due to expansion of EC and telework, wearable devices due to severe heat and testing in the medical field, and we will continue to contribute to the cutting-edge fields with our technologies.

To this end, we will enhance domestic production sites determinedly and accelerate our research and development to propose new technologies and values in a timely manner.

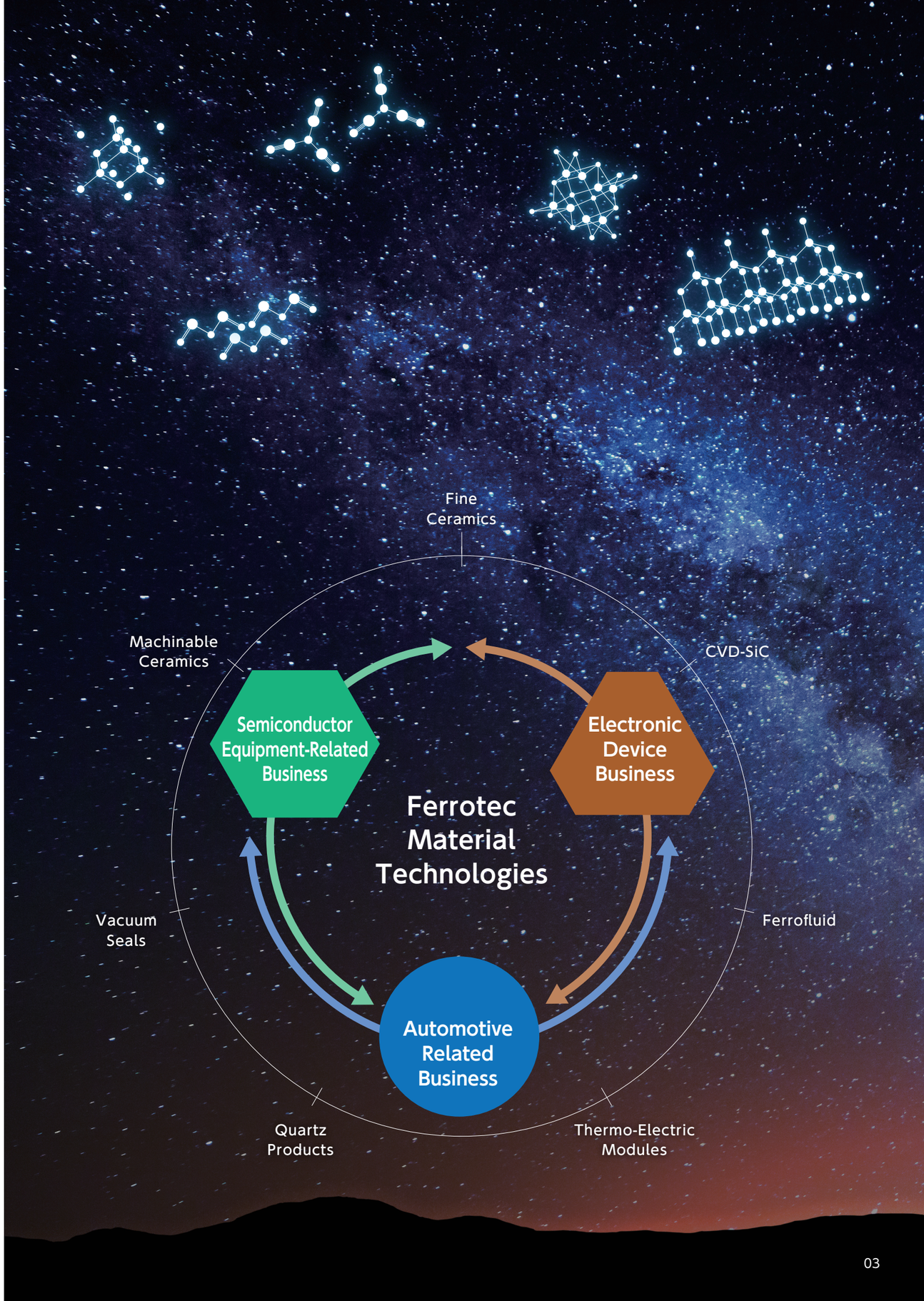
We cordially solicit your continued support. Sincerely,

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 componen s for semiconductor and FPD manufacturing equipment, and now we're expanding into fields that are complimentary and essential to our two primary industries.

Fine Ceramics Products

FRONT-END

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.

FRONT-END

SiC Parts (CVD-SiC)

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

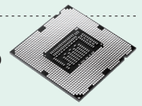
Our SiC products made from our unique CVD-SiC are ultrapure and highly resistant to corrosion, oxidation, heat, and wear, and are used in many fields. As we offer them to semiconductor manufacturing equipment manufacturers. We correspond to customer needs, and plan to further enhance our production structure.

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



FRONT-END

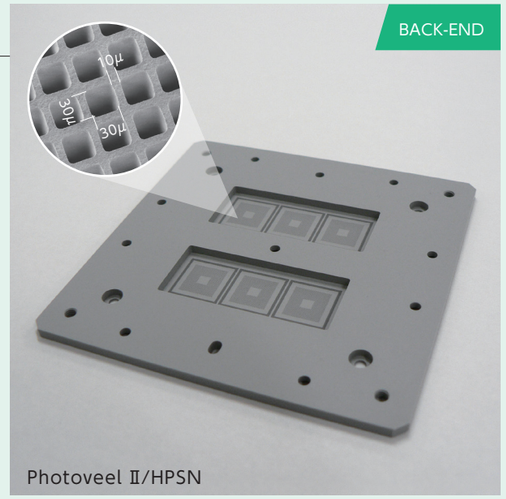
Machinable Ceramics Products

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 precisionmachining and quick-delivery.

世界最高強度・各種熱膨張率
ホトベール®

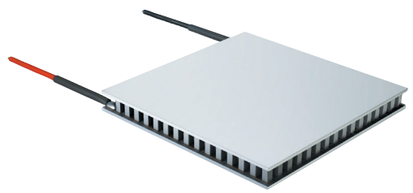
BACK-END



Photoveel Ⅱ/HPSN

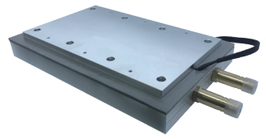
Electronic Device Business

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℃ -equal to that of a freezer- to easily surpassing the boiling point of 100℃, our products are utilized in a wide range of fields, from medical equipment, semiconductors, and the telecommunication industry.



Thermo-Electric Modules (Peltier Elements)

Assembly product (Cooling side: Forced air cooling, Exhaust heat side: Forced air cooling)
Application example: Bio-analytical equipment, Medical equipment, Cooler, etc.



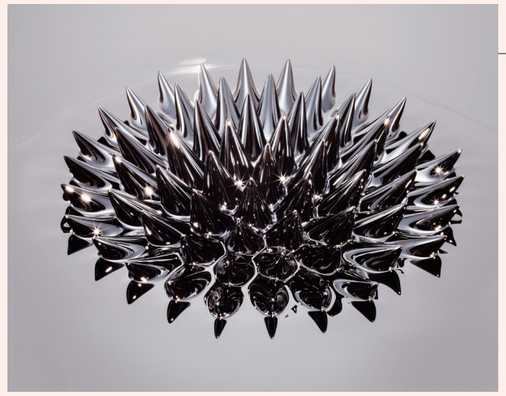
Assembly product (Cooling side: Plate, Exhaust heat side: Water cooling)
Application example: Chiller, Various inspection devices, etc.

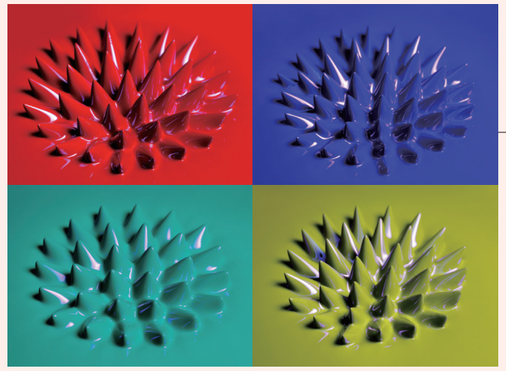
Thermo-Electric Modules

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

A thermo-module is a plate-shaped semiconductor cooling element utilizing the effect of heat transfer from one metal to another when a current is passed through the junction of the two metals. It has the characteristics of compactness, light weight, and no requirement for Freon (precision temperature control/local cooling), and it is widely used in the field of optical communication, optical field, and consumer sector including the semiconductor field and bio/medical field. Recently, it has also been adopted for heat wave countermeasure equipment, and expansion of utilization in many fields such as applied products in the automotive field and waste heat power generation business is being considered for the future. We also provide thermo-modules and custom assembly according to customer requests. We are open to consultation on various specifications in addition to the type of assembly shown in the image on the left.

Examples of Products Used For:
Car temperature control seat (CCS), HUD, ADAS, optical communication, LD temperature control, chiller, PCR, small refrigerator, neck cooler, facial massager, thermoelectric power generation, air conditioner, dryer





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)

Fluorescent Ferrofluid

A fluorescence function is added to magnetic fluid using original technology.

A fluorescent ferrofluid that develops color when exposed to certain ultraviolet rays is currently used for media art and is expected to be used to prevent counterfeiting and for inspection use in future.

Magnetic solid

Magnetic sponge

Viscoelastic material (gummy)

Magnetic gel

* The behavior is different from ordinary ferrofluid when magnetic force is appliedsince viscosity changes due to an external magnetic field.

Hzero® Composite

Superparamagnetic magnetic materials tailored to your application

Hzero® (hysteresis zero) is a superparamagnetic magnetic material in which magnetic nanoparticles in ferrofluid are kneaded in a resin solid, silicone gel, sponge-like foam, or viscoelastic substance. It is expected to be used for various purposes such as the reduction of magnetic flux loss and in high-performance sensor cores as a magnetic material without residual magnetization.

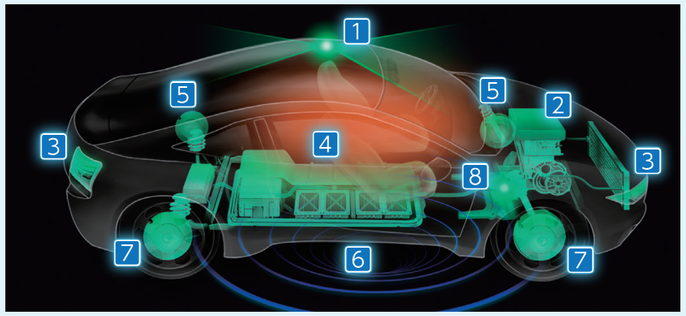
Magneto Rheological Fluid

Changes in shear stress due to an external magnetic field

Magneto-rheological fluid is a functional material whose viscosity changes with an external magnetic field. Since it becomes possible to tune the viscosity by controlling the external magnetic field, applications are expanding to seismic isolation dampers, and brakes and clutches for industrial machinery including active dampers (suspension) for automobiles.

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.

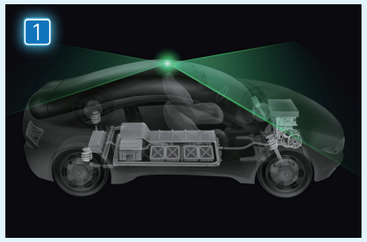


Thermo Module Application

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

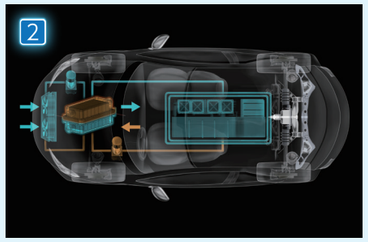
Ferrofluid Application

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



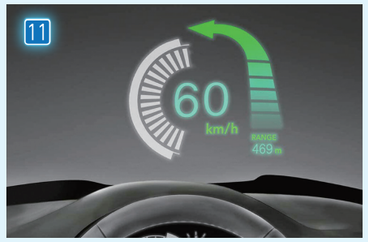
Laser Radar

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.



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 temperature of the battery can be controlled in an efficient manner.



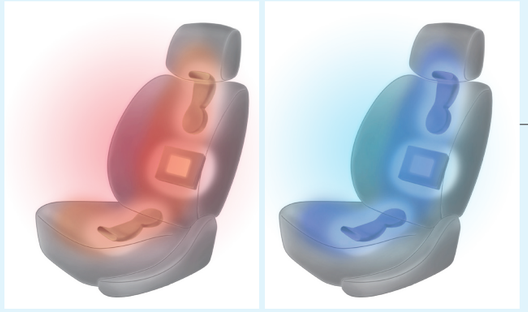
Head Up Display

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 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.

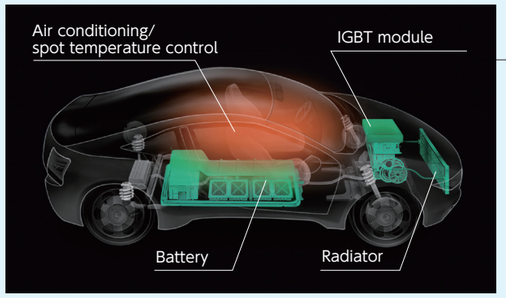
Thermo-Electric CMOS Cooler for ADAS

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.

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 controled by magnetic field and good for crack detection & reparing. Also it has an unique role to improve leakage of magnetic gap.



Temperature Sensitive Ferrofluid

This is a ferrofluid in which the magnetic properties change with temperature changes. It enables a self-circulating heat transport system with no power source required by using this temperature-sensitive magnetic fluid and magnetic volume force due to an external magnetic field.

Locations

Sales Sites

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

Production and Development Sites

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 (m²)	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 (m²)	Clean room	Facility
1989	4,700	Class 10,000	Machining center, melting furnace, CNC Lathe, three-dimensional measuring machine, Image measuring equipment, elemental analysis equipment, ultrasonic flaw detector

Ishikawa Second Plant

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

Founded	Total area (m²)	Clean room	Facility
2022	5,400	Class 10,000 100	* Wire saw * Double-sided lapping machine * Melting furnace * Heat treatment furnace * Raw material manufacturing line * Ultrasonic flaw detector"

Development Center

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

Founded	Total area (m²)	Clean room	Facility
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.

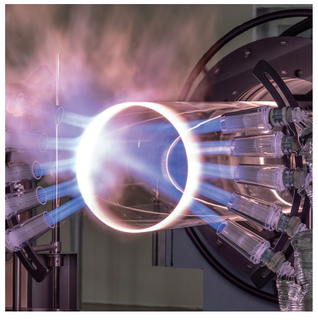
Founded	Total area (m²)	Clean room	Facility
1987	7,000	Class 100	Machining center, CVD equipment, lapping machine, ultrasonic processing machine, blast machine, coordinate measuring machine, surface roughness/shape measuring machine

Hyogo

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

Founded	Total area (m²)	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 (m²)	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

Major Overseas Production Sites

China

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

Founded	Total area (m²)	Clean room (Class)	Products
1995	44,151	10,000 1,000 100 10	・Thermo-Electric modules (materials)

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

Founded	Total area (m²)	Clean room (Class)	Products
1992	33,228	10,000 1,000 100	・Vacuum seals ・Quartz

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

Founded	Total area (m²)	Clean room (Class)	Products
1992	62,103	10,000 1,000 100	・Thermo-Electric modules (assembly)

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

Founded	Total area (m²)	Clean room (Class)	Products
2014	13,162	10,000 100	・Fine Ceramics

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

Founded	Total area (m²)	Clean room (Class)	Products
2018	32,817	10,000 1,000 100	・Quartz

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

Founded	Total area (m²)	Clean room (Class)	Products
2018	2,835	—	・Thermo-electric modules

Zhejiang Advanced Precision Co., Ltd. (Changshan)

Founded	Total area (m²)	Clean room (Class)	Products
2018	34,312	10,000 1,000	・Vacuum seals - Quartz ・CMS

Eyes on the World

The Ferrotec group is deploying "The spirit of craftsmanship"around the world as a manufacturer.
We cooperate with each other while taking advantage of the regional characteristics
of each region such as the United States, which is good at marketing and research and development,
Japan that is good at manufacturing technology in addition to material development,
China for mass production, and Asia where infrastructure technology is expanding.
Our group is a transnational company having established bases in various countries
around the world focusing on manufacturing and sales.

ASIA

Hangzhou

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

Dongtai

Products:
Power semiconductor substrates,
Research Institute,
Quartz

Shanghai

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

Changshan

Products:
Quartz,
Thermo-Electric Modules,
CMS

Yinchuan

Products:
Quartz Crucibles for Semiconductors,
Semiconductor Ingots

Jiaxing

Products:
Thermo-electric module
(Automotive Related)

Tongling Products: Parts Cleaning, Reclaim Wafers, SiC Wafers

Dalian Products: Cleaning

Neijiang Products: Cleaning, Power semiconductor substrates

Hsinchu (Taiwan)

Kuala Lumpur (Malaysia)

Uiwang-si (South Korea)

Tianjin Products: Cleaning

Guangzhou Products: Cleaning

Lishui Products: Epitaxial Wafers

Singapore

Kulim (Malaysia)

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

Milan (Italy)

AMERICA

Bedford, NT

Products: Vacuum Seals, Ferrofluid

Livermore

Products: Vacuum Coating System

Santa Clara, CA

Sales Sites　Production Sites

Ferrotec Material Technologies Corporation

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	1. Manufacturing and sales of Semiconductor equipment related products (Vacuum Feedthrough, Quartz products, Fine ceramics products, CVD-SiC products, Machinable ceramics products, etc.) 2. Manufacturing and sales of Electronic device products (Ferro fluids, Thermo-electric modules) 3. Manufacturing and sales of Automobile related products
Representative	President Takeru Yamamura
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　TEL +81-(0)3-3516-0801 TEL +81-(0)3-3516-0802 (Sales)
Sendai Sales Office	Station Plaza Building 603, 13-18 Futsuka-machi, Aoba-ku, Sendai-shi, 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
Kumamoto Sales Office	TAMA Building 203, 1-1-12 Higashino, Higashi-Ku, Kumamoto-shi, Kumamoto, 861-2106, Japan TEL +81-(0)96-300-9600　FAX +81-(0)96-300-9601
Website	https://www.ft-mt.co.jp/en/

Domestic Production and Development Sites

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
Ishikawa Second Plant	1101 Mukaijima-machi, Hakusan-City, Ishikawa, 924-0833, Japan TEL +81-(0)76-203-9661　FAX +81-(0)76-203-9663
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

Major Overseas Production Sites

Shanghai	Shanghai Shenhe Investment Co., Ltd. 181 ShanLian Road, BaoShan Vrban Industrial Garden ,Shanghai, China
Hangzhou	Hangzhou Dahe Thermo-Magnetics Co., Ltd. FAB1 777 Binkang Rd, Binjiang, Hangzhou, Zhejiang, China 310053, China
	Hangzhou Dahe Thermo-Magnetics Co., Ltd. FAB2 No.668 Binkang Road, Binjiang District, Hangzhou, Zhejiang, China
	Hangzhou Dahe New Material Technology Co., Ltd. 6515 JiangDong 3th Road, DaJiangdong Industrial District, Hangzhou, Zhejiang, China
Dongtai	Ferrotec (Jiangsu) Quartz Technology Co.,Ltd. 18 Hongda Road, Chengdong new district, Dongtai City, China
Changshan	Zhejiang Advanced Thermoelectric Technology Co., Ltd. No.7 longjiang road, jinchuan District, changshan county, Quzhou City, Zhejiang 324200 P.R., China
	Zhejiang Advanced Precision Machinery Co.,Ltd. No.7 longjiang road, jinchuan District, changshan county, Quzhou City, Zhejiang 324200 P.R., China