



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



Company Profile



# Creating new values based on material technologies

Ferrotec Material Technologies Corporation (FTMT) is a domestic operating company of the Ferrotec Group, established in 2020 by merging three companies: Ferrotec Corporation, which was founded on the application technology of Thermo-electric modules, a type of electronic cooling component, as well as Ferrofluid, which was born from the NASA (National Aeronautics and Space Administration) Apollo Project; Ferrotec Ceramics Corporation, which was founded on the Fine Ceramics born from ceramic sintering technology; and ADMAP Inc, which was founded on chemical vapor deposition technology.

As a company that brings together a diverse range of technologies, our name, features the term "Material Technologies" in, as an expression of our commitment to "create new value based on materials technology" and "lead semiconductors into a new world with cutting-edge materials and technologies."

Our basic policies are to rigorously pursue growth, emphasize speed, and strengthen teamwork. This begins by firmly integrating the three former companies, and striving to foster a corporate culture of unity.

To achieve our mid- to long-term goals, in terms of human resources, we are working to digitalize our domestic factories and build new or additional ones, and to expand our employment of engineers. On the sales front, we are working to rebuild relationships with customers at all levels, from the persons in charge to the upper management.

And in the area of new product development, we have developed a constant-heat water circulator, or Chiller, as part of our thermal

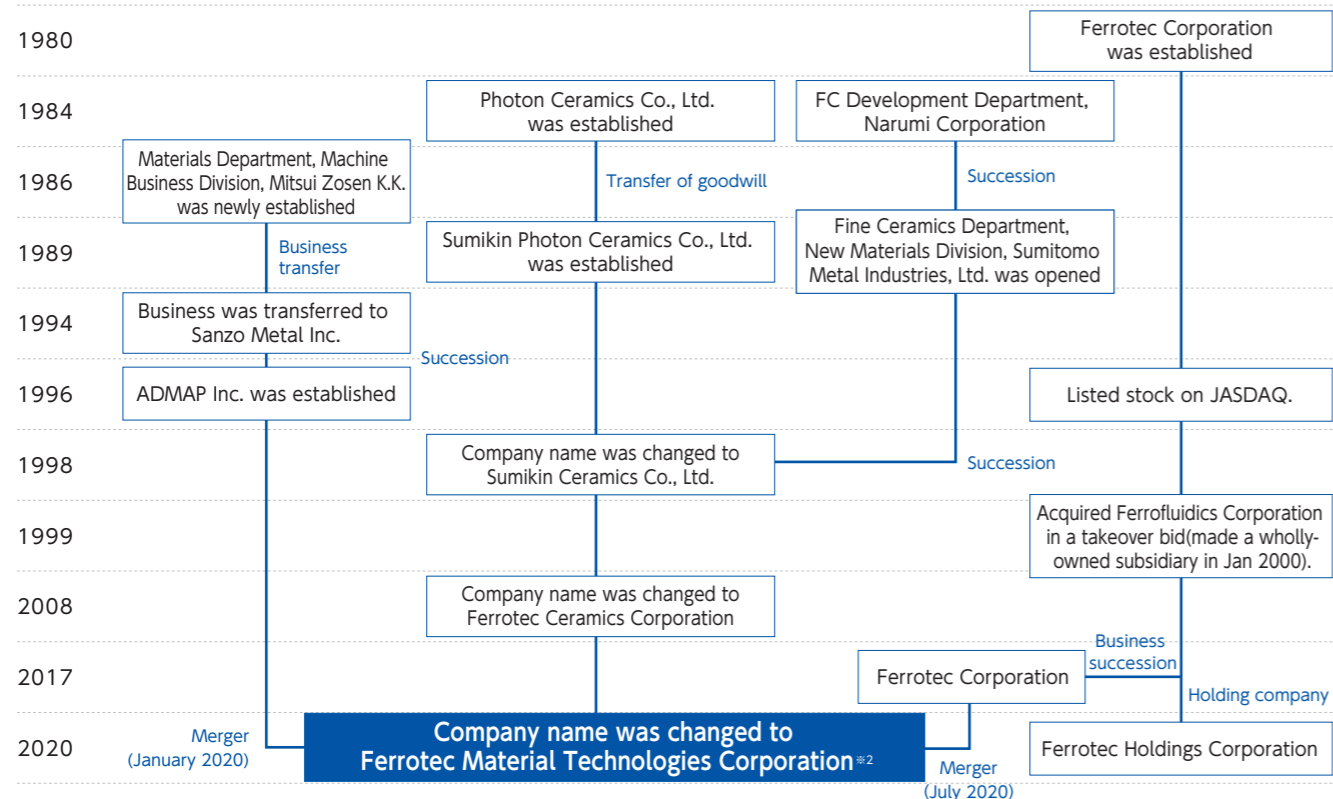
solutions. We will continue to solve our customers' heat-related issues in a single integrated manner by utilizing our knowledge of Thermo-modules/assemblies. In the metal processing business, in addition to the manufacturing and sales of vacuum seals, we will also collaborate with our consolidated subsidiary Cosmo Science Inc., to meet the demand for contract metal processing for semiconductor and other manufacturing equipment. In the area of Ferrofluid, which is another of our core businesses, we have developed magnetic beads that will help us pioneer the biotechnology market.

Ferrotec Holdings (HD), the parent company of the Ferrotec Group, aims to achieve consolidated sales of JPY500 billion in FY2030, and we will create a flourishing organization to achieve this goal. This will include the launch of a new business division system, expanding the authority of business divisions to increase speed, and creating an organization that can achieve its goals through inter-group teamwork.

In 2022, the Ferrotec Group announced a "Back to Japan" Policy. We, as the core of our domestic operating companies, will accelerate the expansion of domestic manufacturing bases and research and development, and strive to propose new technologies and values not only to the semiconductor field, but also to other fields, in a timely manner. We will continue to contribute to our customers based on our group-wide corporate philosophy of "Satisfaction to our Customers, Earth Friendly and Environmentally Conscious, and Dreams and Vitality to our Society." We sincerely hope that you will continue to support us in the future.

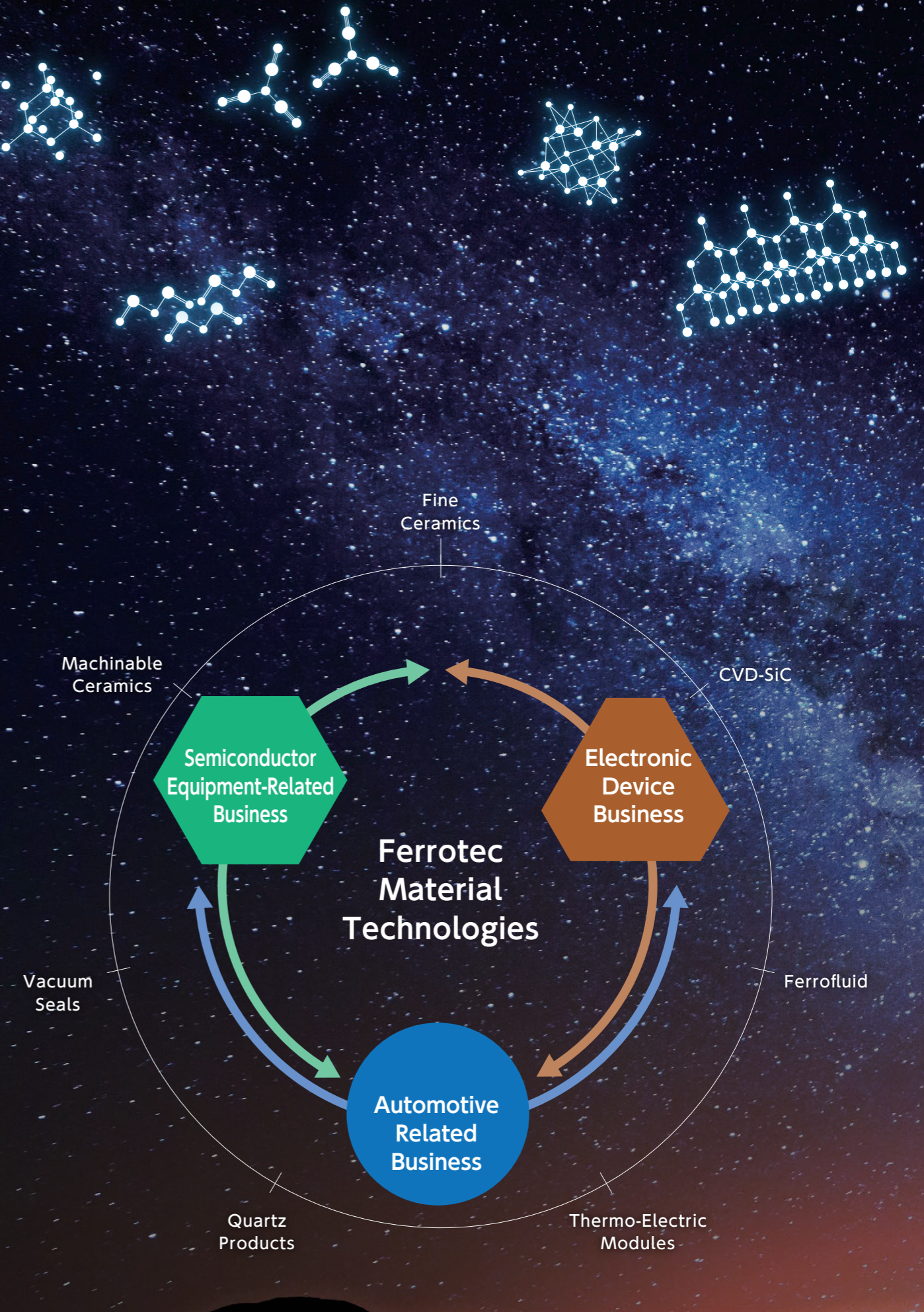
## In July 2020, Ferrotec Material Technologies and Ferrotec have merged and became Ferrotec material technologies Corp.

### 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.

## 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.



## 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



## 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.

FRONT-END



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.

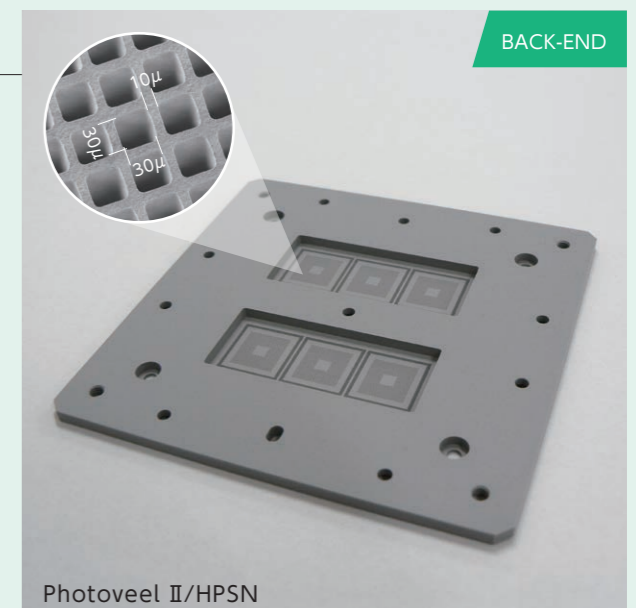
## Machinable Ceramics Products

### 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.

世界最高強度・各種熱膨張率  
ホトベール®

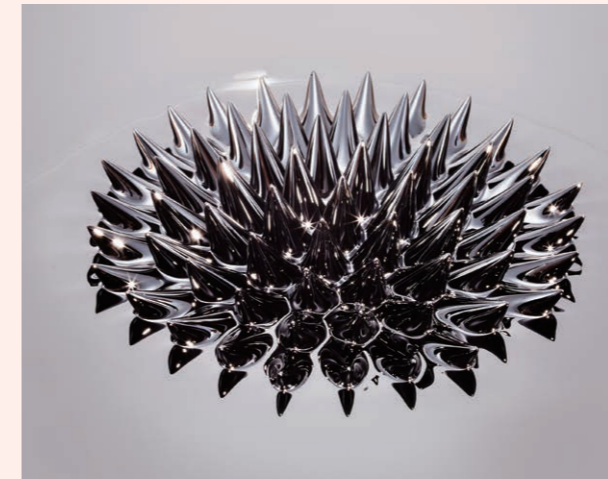
BACK-END



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°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.

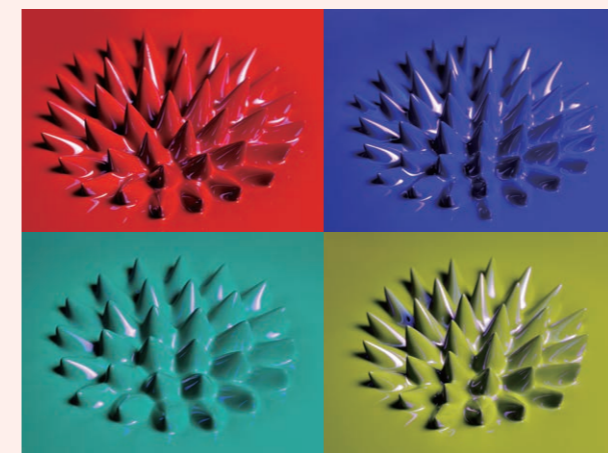


## Ferrofluid

### 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)



## 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.



## Hzero® Composite

Superparamagnetic magnetic materials tailored to your application

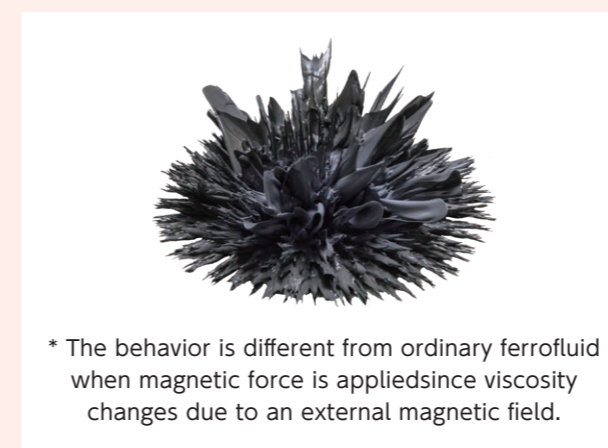


Hzero® (hysteresis zero) is a superparamagnetic magnetic material in which magnetic nanoparticles in ferrofluid are kneaded in a resin solid, silicone gel, sponge-like foam, or viscoelastic substance. It is expected to be used for various purposes such as the reduction of magnetic flux loss and in high-performance 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.



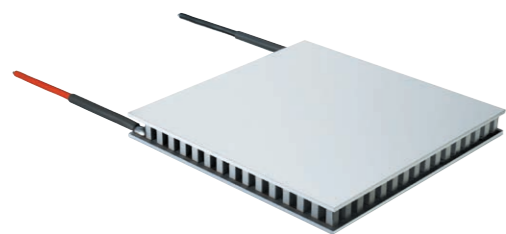
\* The behavior is different from ordinary ferrofluid when magnetic force is applied since viscosity changes due to an external magnetic field.

## 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.

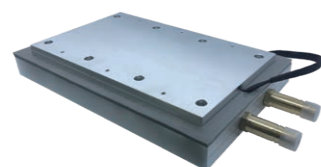
Examples of Products Used For:  
Car temperature control seat (CCS),  
HUD, ADAS, optical communication,  
LD temperature control, chiller, PCR,  
small refrigerator, neck cooler, facial  
massager, thermoelectric power  
generation, air conditioner, dryer



Thermo-Electric Modules (Peltier Elements)



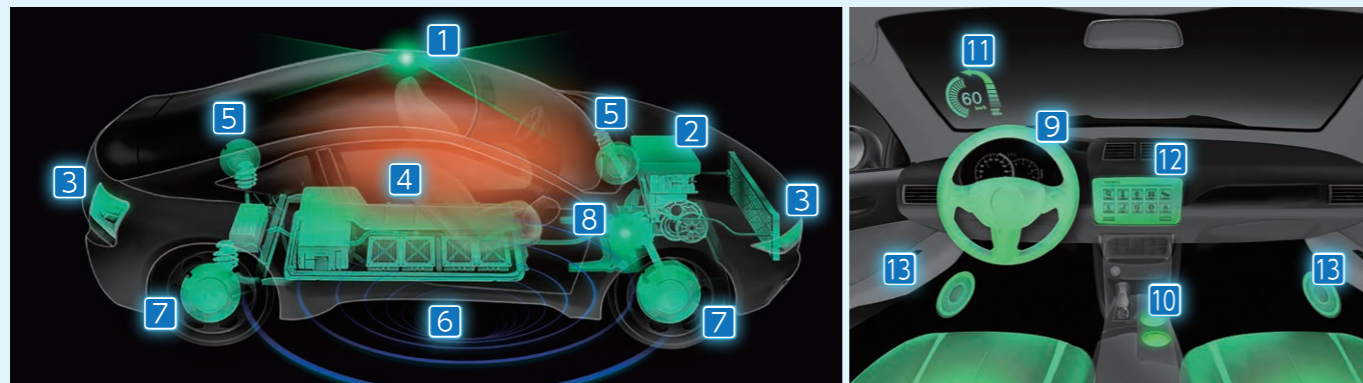
Assembly product (Cooling side: Forced air cooling, Exhaust heat side: Forced air cooling)  
Application example: Bio-analytical equipment, Medical equipment, Cooler, etc.



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

# 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.

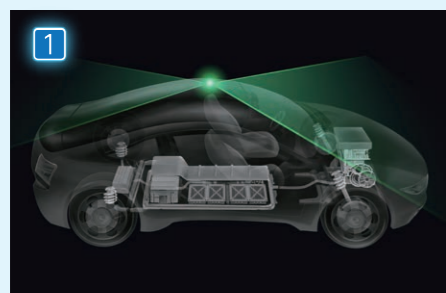


## Thermo Module Application

- 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

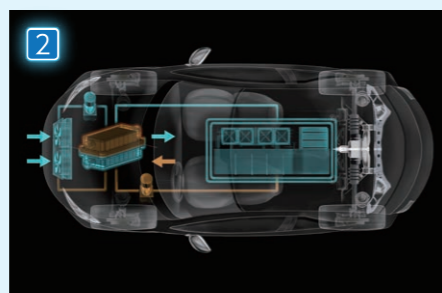
## Ferrofluid Application

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



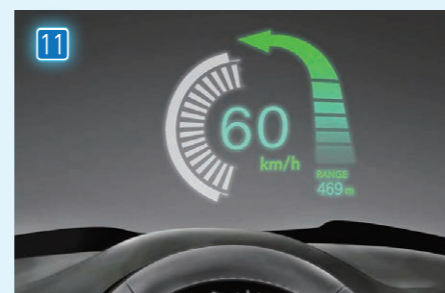
### Laser Radar

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.



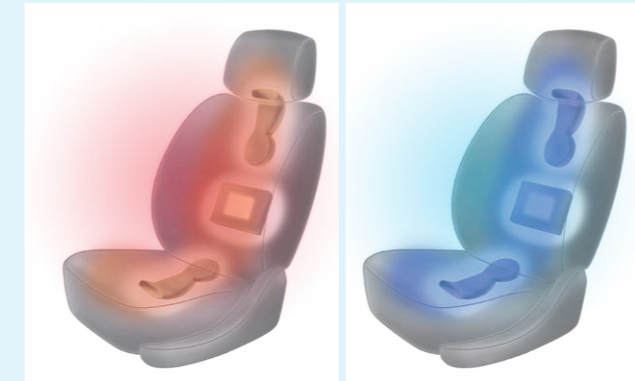
### Head Up Display

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

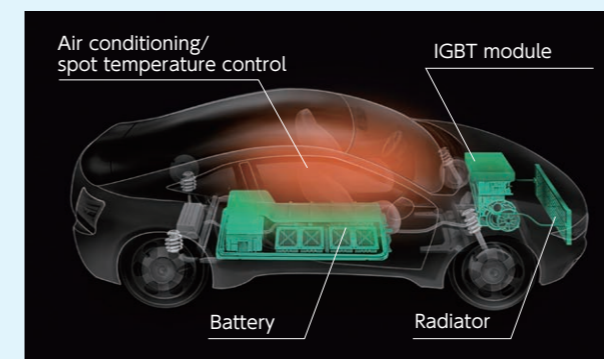
CMOS image sensors are used in cameras for ADAS. When the temperature increases, the CMOS image sensor generates dark current noise. By using the thermal magnetic module, the temperature of the CMOS image sensor can be controlled easily, compactly, and lightly, and dark current noise can be reduced.



## 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 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

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

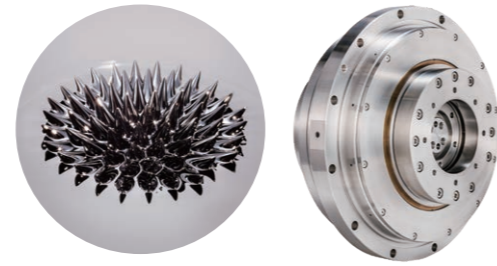
## Sales Sites

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 (m <sup>2</sup> )	Clean room	Facility
1982	3,400	Class 1,000	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 <sup>2</sup> )	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 (m <sup>2</sup> )	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 (m <sup>2</sup> )	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 (m <sup>2</sup> )	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

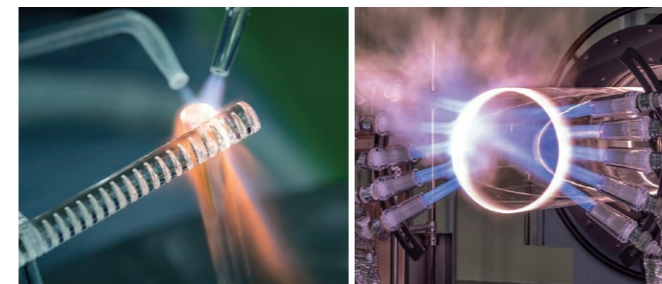
### Hyogo



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

Founded	Total area (m <sup>2</sup> )	Clean room	Facility
1989	5,700	Class 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 Ferrotec Alion Corporation



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

Founded	Total area (m <sup>2</sup> )	Clean room	Facility
2019	3,300	Class 1,000	Machining centers, Rotary grinders, Grooving tools, Glass lathes, Annealing furnaces (vertical/horizontal), Coordinate measuring machines, Strain testers

### Hiratsuka (Kanagawa) Cosmo Science Inc.



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

Founded	Total area (m <sup>2</sup> )	Clean room	Facility
1984	3,300	Class 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)

Founded	Total area (m <sup>2</sup> )	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 (m <sup>2</sup> )	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 (m <sup>2</sup> )	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 (m <sup>2</sup> )	Clean room (Class)	Products
2014	13,162	10,000 100	• Fine Ceramics



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

Founded	Total area (m <sup>2</sup> )	Clean room (Class)	Products
2018	32,817	10,000 1,000 100	• Quartz



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

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

Zhejiang Advanced Precision Co., Ltd. (Changshan)

Founded	Total area (m <sup>2</sup> )	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%) <a href="https://www.ferrotec.co.jp/en/">https://www.ferrotec.co.jp/en/</a>
Business Contents	<ol style="list-style-type: none"> <li>1. Manufacturing and sales of Semiconductor equipment related products (Vacuum Feedthrough, Quartz products, Fine ceramics products, CVD-SiC products, Machinable ceramics products, etc.)</li> <li>2. Manufacturing and sales of Electronic device products (Ferro fluids, Thermo-electric modules)</li> <li>3. Manufacturing and sales of Automobile related products</li> </ol>
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	<a href="https://www.ft-mt.co.jp/en/">https://www.ft-mt.co.jp/en/</a>



## 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
Consolidated Subsidiary	Ferrotec Alion Corporation 2-37-4 Miharashi no oka, Yamagata-City, Yamagata, 990-2317, Japan TEL +81-(0)23-676-8880 FAX +81-(0)23-676-8250  Cosmo Science Inc. 7-3-10 Shinomiya, Hiratsuka-shi, Kanagawa 254-0014 Japan TEL +81-(0)463-51-2031 FAX +81-(0)463-51-2034

## Major Overseas Production Sites

<b>Shanghai</b>	Shanghai Shenhe Investment Co., Ltd. 181 ShanLian Road, BaoShan Vrban Industrial Garden ,Shanghai, China
<b>Hangzhou</b>	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
<b>Dongtai</b>	Ferrotec (Jiangsu) Quartz Technology Co.,Ltd. 18 Hongda Road, Chengdong new district, Dongtai City, China
<b>Changshan</b>	Zhejiang Advanced Thermolectric 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