



Overview of Fine Ceramics Business

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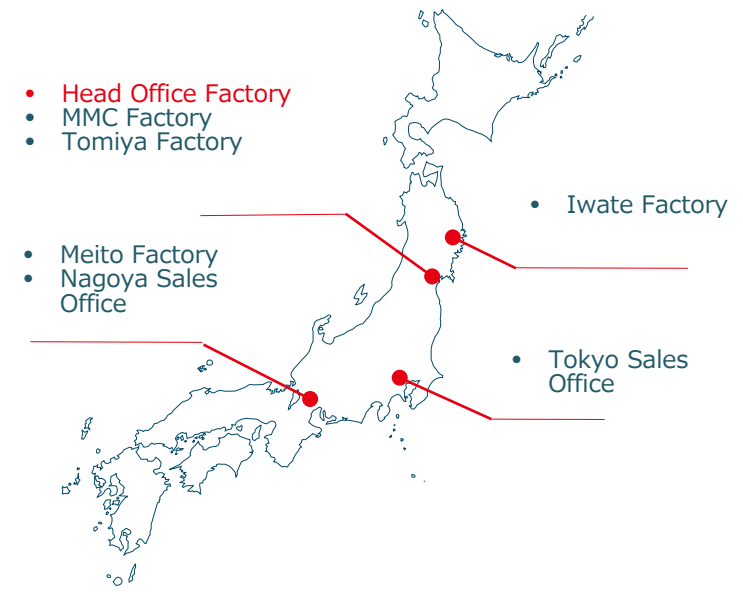
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Future policies

01

Corporate profile

| | |
|------------------|---|
| Name | Japan Fine Ceramics Co., Ltd. |
| Head office | Sendai, Miyagi Japan |
| Business | Development, production, and sales of fine ceramic products Integrated production system, from materials to processing |
| Established | 1984 |
| Capital | 300 million yen (wholly owned subsidiary of JGC Holdings Corporation) |
| Employees | 460 |
| Sales offices | Tokyo Sales Office Nagoya Sales Office |
| Production sites | Miyagi Prefecture: Head Office Factory, MMC Factory, Tomiya Factory Aichi Prefecture: Meito Factory Iwate Prefecture: Iwate Factory |





02

Overview of main products

A closer look at fine ceramics

Inorganic materials distinguished not only by enhanced characteristics of typical ceramics (that is, thermal resistance and hardness) but also by new electrical, magnetic, optical, or chemical properties

Source: Kagaku Jiten (chemistry dictionary), second edition

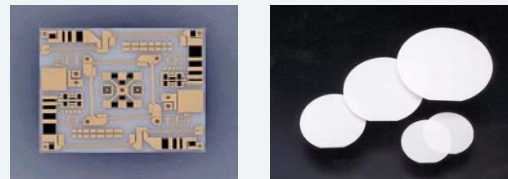
Engineering Ceramics



- General industrial equipment parts
- Precision manufacturing equipment parts

Used mainly as parts in semiconductor manufacturing equipment and pumps

Electronic Ceramics



- Thin-film circuit substrates
- Ceramic substrates

Used mainly as parts in optical communication equipment and sensors

Metal-Matrix Composites (MMCs)



- Al/SiC composites
- Si/SiC composites
- Al-Si composites

Used mainly as parts in flat panel display (FPD) manufacturing equipment and semiconductor manufacturing equipment

Contract Precision Ceramic Machining



- Lapping
- Polishing
- Grinding
- Ultra high-precision planing, etc.

Contract machining mainly of parts in semiconductor manufacturing equipment

01

Engineering ceramics: ceramic production

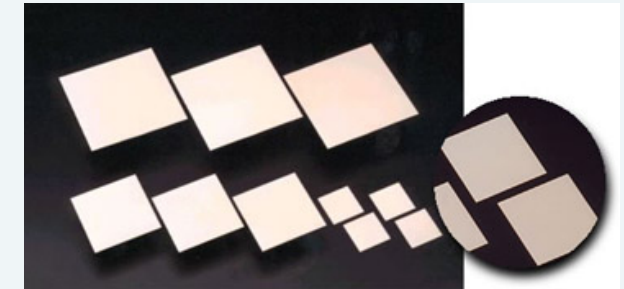
Precision parts taking advantage of the thermal, corrosion, and wear resistance of ceramics



02

Electronic ceramics: electronic parts/materials production

Electrical and electronic parts taking advantage of the electrical properties of ceramics



03

Metal-matrix composites: MMC production

Precision equipment parts taking advantage of ceramics' light weight, high rigidity, and vibration damping



04

Contract ceramic machining

Precision machining of ceramic products for semiconductor manufacturing equipment parts



Market



Main clients

Manufacturers of general industrial equipment
Manufacturers of semiconductor manufacturing equipment



Competitors

Ceramics manufacturers in Japan



Conditions

Advances in IoT and AI are expected to drive semiconductor demand and increased investment in semiconductor manufacturing.
Demand is expected to recover.

Strengths

- Providing ceramic parts and materials with outstanding thermal, wear, and corrosion resistance meeting client needs
- Minimal loss of mechanical strength at high temperatures; high wear resistance
- Outstanding resistance to thermal shock and wettability from molten metal



Market



Main clients

Manufacturers of parts used in optical communication



Competitors

Ceramics manufacturers in Japan

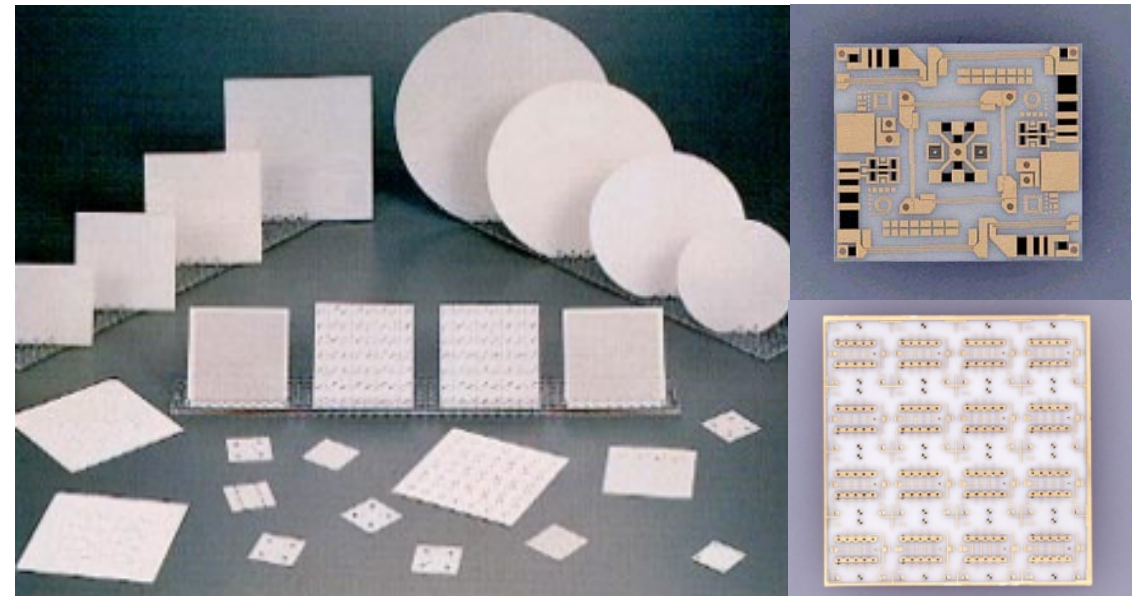


Conditions

The advent of 5G communication services has brought investment in infrastructure, and capital investment is brisk. However, some caution is warranted, due to uncertainty from U.S.-China trade friction.

Strengths

- Providing high-quality products through integrated production, from ceramic substrates to thin-film circuit formation
- Prompt delivery and rapid response to design changes



Market



Main clients

Manufacturers of flat panel display production equipment
Manufacturers of semiconductor manufacturing equipment



Competitors

Material manufacturers in Japan
MMC manufacturers overseas



Conditions

In the market for FPD manufacturing equipment, tenth generation investment remains stagnant, but there are prospects for ongoing growth in the fifth to sixth generation used for OLED.

Strengths

- Optimal metal-ceramics combinations and blending ratios for use in a variety of applications
- Combines metal and ceramic properties: lightweight and highly rigid with low thermal expansion
- World-class material manufacturing and processing methods for large products



Market



Main clients

Ceramics manufacturers in Japan that supply manufacturers of semiconductor manufacturing equipment



Competitors

Manufacturers in Japan that accept contract machining



Conditions

The market is expanding. A recovery in capital investment in semiconductor manufacturing equipment has been driven by factors such as renewed demand for semiconductor memory.

Strengths

- Contract ceramic machining, from small lots of samples to volume production
- High-precision machining of many kinds to meet client needs



03

Future policies

Strengthen and expand initiatives in five fields through existing technologies

01 Green energy

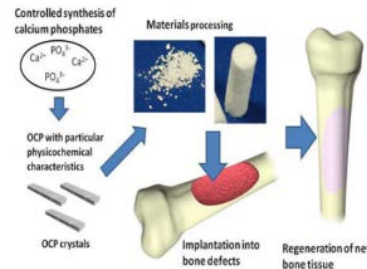
Solar panel sheets, fuel cells, rechargeable batteries

- Fuel cell prototype development
- Bearings for hydroelectric power generation
- Integrated power modules with high heat resistance
- High-performance heatsinks

02 Medical

Parts for regenerative medicine and medical equipment

- Ventricular assist device bearings
- Orthodontic brackets
- Dental zirconia
- Bone regeneration parts/materials



03 Next-generation automotive

Sapphire alternative substrates for in-vehicle devices

- High-power IGBT heatsinks
- MMC pressure/vibration casting
- Collision sensor circuit substrates
- In-vehicle camera lens molds
- High thermal conductivity silicon nitride substrates

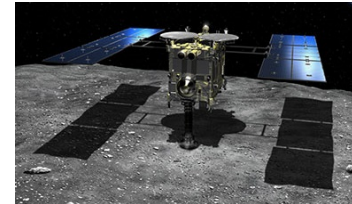


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Aerospace

Heat-resistant composites, metal substrates

- Circuit substrates for space communication
- Silicon carbide base material for satellite mirrors
- Aspherical machining of satellite mirrors



05

Emerging industries

- Photolithography equipment parts used in FPD production
- Parts in high-speed electronic component mounting equipment
- Parts in semiconductor LED production equipment
- Linear motor parts for photolithography equipment
- Smartphone lens molds