

Fukui Prefecture

Kiyokawa Plating Industry Co., Ltd. (Fukui City)

Electrode plating of electronic parts by nano plating joint technology

KST World Corp. (Fukui City)

Silicon wafer coating

Tanaka Chemical Corporation (Fukui City)

Producing positive electrode material essential for nickel metal hydride batteries

NAC Corporation (Fukui City)

Producing various molded products such as curve mirrors for roads

Matsuura Machinery Corporation (Fukui City)

High-Quality 5-Axis Machining Center used for machining the components for Motor Sport (Formula 1)

Electrode plating of electronic parts by nano plating joint technology

Kiyokawa Plating Industry Co., Ltd.

1-414 Wadanaka, Fukui City, Fukui Prefecture

Established in 1968
TEL +81-776-23-2912

<http://www.kiyokawa.co.jp/>



Tadashi Kiyokawa
President

By using nano plating joint technology, the company is working on the joint of electronic parts that are getting smaller and smaller. It has the top share in Japan with electrode plating for electronic parts of mobile phone chips.

Challenge of plating company

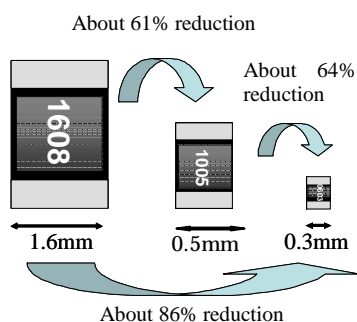
For the joint of electronic parts that are getting smaller and smaller, joint technology using nano control is required. There is a plating company in Fukui Prefecture that is challenging this nano joint. With the idea of "technology is the key for plating company", Kiyokawa Plating Industry Co., Ltd. has been working on the development of state-of-the-art technologies of plating for 0.7 micron powder, superhydrophobic plating, and lead-free in electroless nickel plating.

Has the top share in Japan with electrode plating for electronic parts of mobile phone chips

Mr. Kiyokawa, Managing Director, who likes something new and is full of challenging spirit, has continued development of new technologies. The company has the top share in Japan with electrode plating for electronic parts of mobile phone chips (0603 chip of 0.6 mm x 0.3 mm).

"Nano plating" joint technology is indispensable for downsizing and laborsaving of electronic parts, and is also the key for CO2 reduction

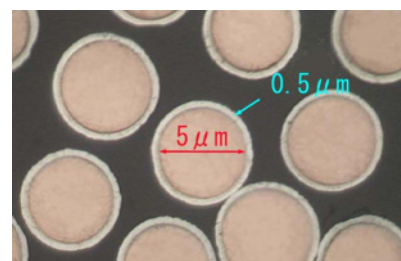
The company's "nano plating" joint technology is indispensable for downsizing, weight saving, and electric power saving of electronic parts. For environmental issue as well, it plays an important role in the development of technology for CO2 reduction. As the result of such efforts, the company received the first Japan Grand Prize for Manufacturing in 2005.



Reduction rate of the area chip is mounted



Inside a mobile phone



Cross-sectional CCD photograph of powder plating

Silicon wafer coating

KST World Corp.

13-23 Shimorokujo-cho,
Fukui City
Fukui Prefecture

Established in 1998
TEL +81-776-41-7333

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Masahiro Kawasaki
President

With its original ultra thick thermal oxide technology, the company is producing 25 μm thermal oxide wafer that is strong for high temperature thermal treatment and does not cause board warpage by film stress.

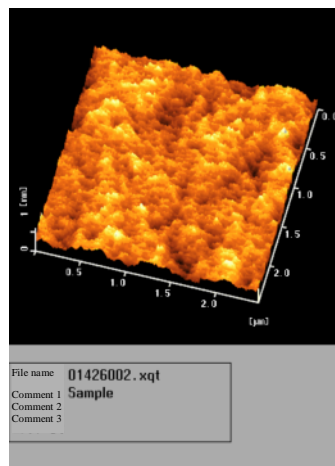
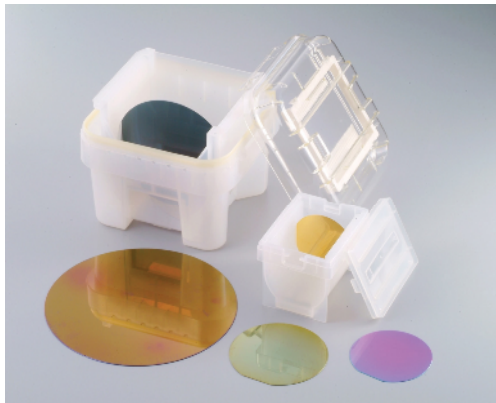
The only maker in Japan specializing in silicon wafer coating for semiconductors and optical communication

KST World Corp. has a plant with state-of-the-art Class 10 clean room and up-to-date production and testing facilities, and is providing various kinds of silicon wafer processing services, with thin and thick coating by thermal oxide processing as its core business. Especially, 25 μm thermal oxide wafers and SOI wafers developed by the company's original technologies are shipped to the leading semiconductor makers all over the world.

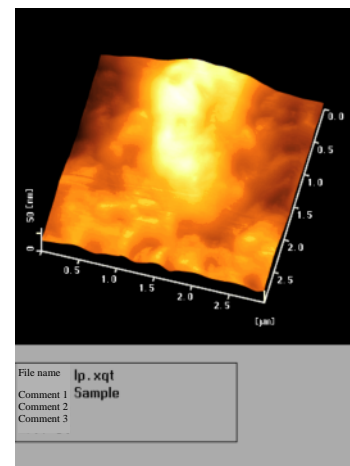
The thickest in the world 25 μm thermal oxide wafers

Ultra thick thermal oxide technology, original technology of KST World Corp., is a silicon wafer coating technology with "thermal oxide", by which thick coating was considered to be difficult. The wafers are used by the major makers of optical communication devices inside and outside Japan.

Until the company's technology was established, coating had been done by CVD or flame hydrolysis deposition (FHD). The company's products achieved refraction index of 1.445 to 1.446. As for uniformity, thickness is 3% or below and refraction index is ± 0.0003 or below. It is also strong for high temperature thermal treatment and does not cause board warpage by film stress. The maximum thickness of the thermal oxide wafer is 25 μm .



AFM observation of the surface of 20 μm thermal oxide wafer



AFM observation of the surface of 25 μm thermal oxide wafer

Producing positive electrode material essential for nickel metal hydride batteries

Tanaka Chemical Corporation

5-10, Sunahamawari, 45-Aza,
Shirakata-cho, Fukui City
Fukui Prefecture

Established in 1957
TEL +81-776-85-1801

<http://www.tanaka-chem.co.jp/>



Tamotsu Tanaka
President

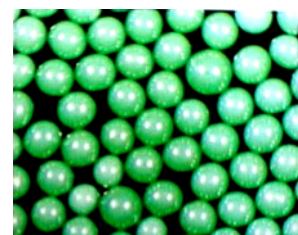
Providing positive electrode material for nickel metal hydride batteries and lithium ion batteries to battery makers inside and outside Japan. Contributing to elimination of cords and mobilization of electronic equipments.

Has 70% share in the world in the area of positive electrode material for nickel metal hydride batteries

Tanaka Chemical Corporation has the top share in the world as a maker of high-performance positive electrode material for nickel metal hydride batteries and lithium ion batteries.

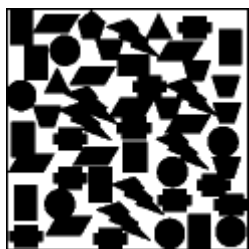
Secrets and features of revolutionary material for rechargeable batteries

The company was successful for the first time in the world in making the shape of nickel hydroxide particles "spherical." When nickel particles are packed in a certain cubic capacity, this technology can make the vacant space between particles less and can realize 20% or more higher density compared to traditional products. In addition to contributing to make nickel metal hydride batteries of higher volume by increasing the quantity of nickel hydroxide itself that is filled as positive electrode material, it also established the sphere control technology to freely control the characters of the sphere such as size, shape, and character to form crystal structure.

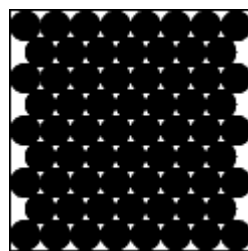


Beautiful surface of spherical nickel hydroxide under microscope

<Effect of spherical particles>



When fractions of a material of various shapes are packed into a certain space, an opening is generated as illustrated.



Compared to the various size and shape of materials, if materials are uniform spherical particles, more grain particles can be packed in a certain capacity.

Key factor for downsizing and weight saving of electronic equipments

This technological innovation has contributed to a drastic increase in the capacity of rechargeable batteries and has become a key factor for downsizing and weight saving of laptop computers and mobile phones.

<p>Producing various molded products such as curve mirrors for roads</p>	<p align="center">NAC Corporation</p> <p align="center">8-20 Kushino-cho, Fukui City, Fukui Prefecture</p> <p align="center">Established in 1970 TEL +81-776-83-1188</p> <p align="center">http://www.nacks.co.jp/</p>	 <p align="center">Hajime Kaido, President</p>
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Has 70% share in Japan for curve mirrors (the part of mirror for mirror posts used at road curves) and 100% share in Japan for FRP reinforced large acrylic jacuzzi bathtubs. Gaining top shares one after another in niche areas by manufacturing wide variety of products in small quantities using its original FRP and molding technique for thermoplastic resin.

No. 1 in Japan for curve mirrors (the part of mirror for mirror posts used at road curves), and FRP reinforced large acrylic jacuzzi bathtubs

NAC Corporation (NAC Group) is concentrating its resource on niche market. It is devoting on the strategy to gain good shares by cultivating niche market by FRP and molded products. Typical products are the part of mirror for curve mirrors (70% share in Japan) and large-size jacuzzi bathtubs (100% share in Japan). In addition, the company is diversifying its business into the productions of engineering plastic material made by extrusion molding and of acrylic pipes.

What is the secret for high quality curve mirrors?

The curve mirror, using unique vacuum molding technology and taking full advantages of reflection and weather durability of acrylic resin, has realized bright and clear reflection and safety. Severe quality control and cost reduction were achieved by building an integrated production system from material selection to delivery. At present, the company is in a process of developing the curve mirror with defogger and the mirror with dirt-resistant titanic coating.

Features of FRP reinforced large acrylic jacuzzi bathtubs with 100% share in Japan

The jacuzzi bath-tubs are produced by vacuum molding apparatus the company developed, which can mold acrylic plate into various shapes by low cost to cope with small quantity of production for wide variety of products. This apparatus is solely used for bathtubs, and the quality and economy of products were improved compared to the production by general-purpose equipment.

The company at present has many sizes of bath tubs to meet variety of needs including large ones for public facilities to small ones for hotel rooms and ordinary houses.



Curve mirror



FRP reinforced large acrylic jacuzzi bathtubs



Engineering plastic materials and acrylic pipes

**High-Quality 5-Axis
Machining Center used
for machining the
components for Motor
Sport (Formula 1)**

**Matsuura
Machinery
Corporation**

1-1 Urushihara-cho, Fukui City
Fukui Prefecture

Established in 1960
Tel. +81-776-56-8100

<http://www.matsuura.co.jp/>



Masanori Matsuura
President

Matsuura Machinery Corporation manufactures high-quality 5-axis machining centers developing and designing them in-house.

More than 70 % of the products are exported to be used in a variety of industries in the

What is a 5 axis machining center?

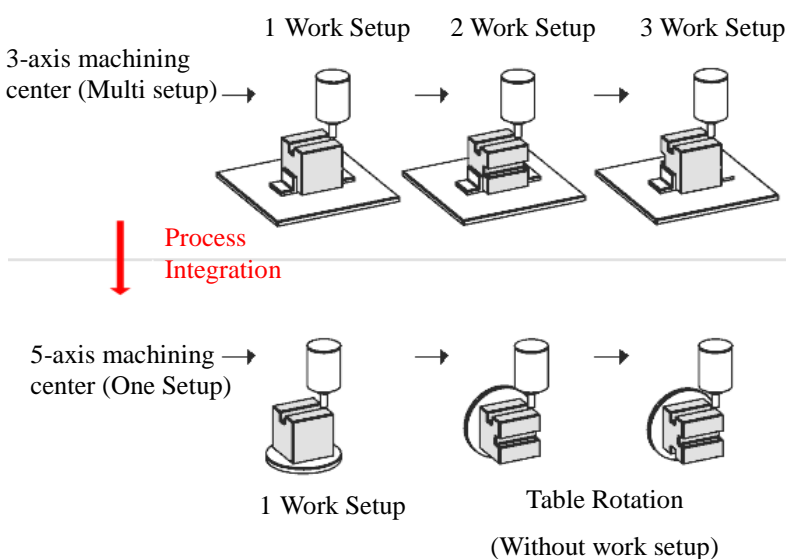
To meet the demands for manufacturing of a wide variety of products in small quantities and quick delivery, Matsuura manufactures 5-axis machining centers with the Matsuura designed and built 4/5th axis table. The concept behind 5-axis machining is to complete the component in “one hit, one loading”, which enables 5-axis multiface machining and simultaneous 5-axis machining to achieve process integration and complicated machining..

5-axis multitask machining center superior to 5-axis machining center

The 5-axis multitask machining center is based on the 5-axis machining center to which the turning and grinding functions are added. Compared to the conventional lathe-based Mill-Turn machine, our 5-axis multitask machining center achieves higher-speed precision machining to offer proven ability in terms of reliable unmanned production.

Used for machining the components related to motor sport (Formula One)

Our machining centers are used for machining the components for motor sport (Formula 1) in Europe, and are gaining high reputation of reliability beyond the level of international standard.



Advantages in 5-axis machining

- The 5-axis multiface machining integrates the conventional multi-processes into one.
- Because of this process of “one hit, one loading”, setup times between different operation are eliminated.