

Japan's hidden champions reign supreme

While Japan has faced increasingly larger competition from the likes of China, South Korea and Southeast Asia in recent decades, many Japanese manufacturers have maintained large global market shares in B2B and niche fields characterized by high-mix, low-volume production. Working behind the scenes by supplying high-quality parts, materials and machinery, these niche companies are the so-called 'hidden champions' of Japanese manufacturing. They have and will continue to excel thanks to a strict adherence to the tenets of *monozukuri*, the Japanese manufacturing philosophy that centers around craftsmanship, excellence and the constant pursuit of innovation.

From automotives and electronics, to industrial equipment, chemicals and material science, these hidden champions will continue to play an important role in the Industry 4.0 era as Japan looks to place itself at the forefront of industrial development in the 21st century.

Kobelco Compressors Corporation is one such hidden champion whose compressors play a vital role functioning "as the heart of a manufacturing plant", says president Horoki Iwamoto. It is due to this extremely important role that high quality and high reliability are in turn of the utmost importance, and why Japan still excels in such fields. "We've been working for over seven years in China so we understand Chinese quality and we can tell that the manufacturing quality there is improving each year. However, regardless of their price advantage, they still can't compare to Japanese levels of quality. We pay meticulous attention to the standards and policies being implemented in various manufacturing facilities, and we have a very solid level of development standards that we constantly update and improve."

When it comes to competing with regional competitors, Japan must continue to focus on high-end, value-added technology, says Yasuhiro Takeuchi, President of Hitachi Industrial Equipment Systems, which also manufactures compressors and other important industrial equipment. "Japan must avoid mass production-style manufacturing and focus instead on value-added products. At Hitachi Industrial Equipment Systems, we focus on the development of advanced engineering and value-added products. Our solutions play a critical role in our customers'

businesses. For example, our G series screw compressors are oil free and equipped with noise control devices. Only a few companies in the world are able to develop such products, and Hitachi is one of them. Our ability to develop such innovative and complex products is the reason why we play a major role in the global industry."

Yu Nakata, President of KEYENCE, which manufactures factory automation equipment such as sensors, machine vision systems and measuring instruments, also stresses the importance of added value. "We have continued to create truly useful products by directly addressing the problems of our customers and the challenges they face at their production sites. This process has led to the result that about 70% of our new products are world or industry firsts. We strongly believe that the meaning of our existence is to create added value, and we would like to produce products that have unprecedented value in the world. That's how we are trying to support our clients."

Giving his take on *monozukuri*, Fumiya Kanai, president of semiconductor manufacturing equipment maker KOKUSAI ELECTRIC CORPORATION, highlights the importance of '*Tai-wa*' and technology as the foundation of the company's philosophy. "'*Tai-wa*' is a Japanese word meaning 'dialogue'. We use *Tai-wa* to hear the voices of the clients and partner companies, and really understand their needs as fundamental to our business," he explains.

"Another important point for us is 'Technology'. Technology is obviously necessary in order to realize the needs of customers at a high level. In conventional fields there are regional competitors coming up, which inevitably intensifies competition. We are not a company that wants to compete in that red ocean. Our strategy is to compete in a field where we can leverage our unique technological capabilities. We cater to an incredibly cutting-edge and high-end market. In order to do that, of course, we always pursue advanced technology and innovate by fusing our technologies, refined across multiple fields."

Indeed, it is in the field of semiconductor manufacturing equipment that Japan's high-end technology continues to be indispensable, while other regional competitors have taken the lead when it comes to the production of the semiconductors themselves.

"Back in the 1980s Japan became number one in terms of market share [of semiconductors]. But regional players came like Taiwan, and most recently South Korea and China, and the market share has shifted over to them now," says Minoru Shichino, President of Elionix Inc., a manufacturer of electron beam lithography systems for cutting-edge R&D and nanofabrication. "On the other hand, Japan is doing really well in creating manufacturing equipment for semiconductors. Electrical components is also another field that we are really good at, with companies such as TDK leading the way. While it is true that semiconductors themselves have shifted away, the support in production is coming from Japanese firms, so I can say that Japan still holds a strong advantage in this field."

Within the industry, Hightec Systems Corporation has carved out a niche for itself as a supplier of refurbished semiconductor and flat panel display (FPD) manufacturing equipment. CEO Moriaki Abe explains that the demand for older refurbished equipment has and will continue to remain high even as semiconductors become more advanced. "Producing the latest semiconductors doesn't require the most advanced equipment, and can be produced by equipment that is 20 years old, or perhaps even older. As such, 650 fabrication plants around the world need to fine-tune or calibrate their equipment. In the used equipment market, therefore, the maintenance and prolonging of the equipment's life is key, so that really makes up the focus of our business," he explains.

"In the past, the main focus and application of semiconductors were for PCs, but now we see that it has shifted to mobile devices. The next frontier for semiconductors will be electric vehicles and drones. Once Japanese companies take that seriously I think that they will once again reign supreme in the markets of semiconductors."

Given the strength and size of the Japanese automotive industry, many of the nation's hidden champions are engaged in the manufacture and supply of parts to car and motorcycle makers, both in Japan and across the globe. The shift to CASE (connected, autonomous, shared, electric) vehicles presents both a challenge and opportunity for these companies, with the majority forced to reorient and diversify

their business in light of the fact that the conventional internal combustion engine will eventually disappear.

Having cemented its reputation as a leading provider of clutches, FCC is expanding its core technologies to lead new developments in advanced material science, including ceramic paper technology and its collaboration with Carbon Fly on its high-performance multi-walled carbon nanotube (MWCNT).

"It is said that clutches will gradually disappear. So we have two main activities to combat this trend," says president Yoshitaka Saito. "The first activity is mobility. Even in this CASE era, we still want to go ahead and serve the mobility world. We're trying to develop new products. How we're doing so is through our core technologies. First of all, we have the aluminum die casting technology, which would be necessary for the lightweight trend and also for heat management.

"The second activity we're doing is related to our core technology that we initially used for paper but found that it can also be used for fields other than mobility. We are in development to utilize our paper technology for environment purification and energy solution applications. Our core technologies are being implemented for non-mobility sectors, as well as fuel cell products."

AIDA is a leading developer of press metalforming solutions, with the automotive industry serving as one of its main clients. While president Kimikazu Aida acknowledges that the changes are having a major impact on the business, the increasing demand for drive motors and batteries for EVs presents opportunities for the company's renowned MSP and UL presses.

"The demand for MSP is increasing rapidly because it is used for producing EV drive motors," he says. "MSP stands for Multi Suspension Press. Motor cores for EVs are made by laminating about 300 silicon steel sheets with a thickness of 0.25 mm. Punching of the 0.25 mm thin plate, dowel forming, laminating and caulking are performed simultaneously at high speed. So you can imagine extremely high accuracy is required for the press machine," explains president Kimikazu Aida. "When it comes to the MSP, we change the structure of the machine depending on its purpose. In order to achieve the highest accuracy, we have made various changes and improvements. This machine has the



Yu Nakata, President and Representative Director, KEYENCE Corporation



Shinichi Taniguchi, President, Representative Director and COO, Mabuchi Motor Co., Ltd.



Masayoshi Fujimoto, President, Representative Director and CEO, Sojitz Corporation



Yasuhiro Takeuchi, President and Director, Hitachi Industrial Equipment Systems Co., Ltd.

best reputation in the world. Some of our European customers have said that the MSP is the best."

Mabuchi Motor, the world's largest manufacturer by volume of small electric motors, also sees opportunities being presented by the CASE era. "In terms of EVs, in order to increase the battery efficiency and manage its temperature, we have this new technology called thermal management, where we install a motor into thermal management systems to control the temperature. When you look at the car as a whole, there is a need to cool down the battery, but we can also utilize the heat that is generated by the battery to warm up the car, for example," explains president Shinichi Taniguchi.

He adds: "We are not going to produce any large-scale motor that will replace traditional internal combustion engines (ICE), however, when talking about mirrors, door locks, and power window lifters I think our motors will remain in the EV society. With increasing expectancy for EVs to run more efficiently and be able to drive further distances, everything needs to become more compact and lightweight. I think this is where our existing technology can come into play."

Fine Sinter is a pioneer in powder metallurgy whose main client has historically been Toyota. President Yoichi Inoue is also optimistic about the future as the company looks to diversify its business. "Some in the industry have been joking that the only thing left for us to make will be the wheel axles, but I think that diversification not only for the automotive industry, but also hydraulic equipment, agricultural equipment, and industrial products, has meant that we are not putting all of our eggs in one basket. Beyond automotive, there are so many possible industries and opportunities for our manufacturing techniques. The only way to survive these harsh times is to diversify," he explains, adding that there is great potential for the company's reactor core technology when it comes to next-generation batteries.

"The reactor core is for the inverter, and right now we are looking into new applications in battery charging. Battery charging, not just in automobiles, needs to have good features. People need shorter and faster charging times, and that itself is presenting a bright future for our type of inverter reactor core."

Japan's chemical industry is also representative of the nation's industrial evolution, with Japanese companies leading the way in value-added, functional materials while the mass production of base chemicals has shifted to other countries. "The applications of functional materials include batteries, semiconductors, cellulose nanofibers and films. These products were developed to meet the demand of end-users and to provide added value to existing products," says Matsu Kishida, President and Representative Director of N.E. CHEMCAT CORPORATION, a manufacturer of precious metal catalysts for a wide range of industries that is focused on developing materials for the new energy value chain in line with carbon neutrality goals.

"Japanese companies have grown by catering to ever-changing client needs. The functional material sector also grew because of the uniqueness of the Japanese market, which requires a short production cycle and high innovation. These are the driving forces that inspired Japanese companies to evolve. Private and public Japanese companies and research centers such as AIST have conducted research on functional materials to provide additional value, and this led to Japan receiving a Nobel Prize in the chemical sector. Japanese companies will continue to provide added value and not focus on mass production to stay competitive with countries such as China, Korea, Taiwan and other ASEAN countries."

Katsumi Ishizaka, President and CEO of Fuji Silysia Chemical (FSC), shares a similar perspective on Japan's chemical industry. "Japanese firms are focusing on high value-added products and functional materials.

They are trying to cultivate superb technology, and it is the same with us when it comes to the specialized field of chemical R&D," he explains.

FSC's products are used in a range of industries, including pharmaceuticals, foods, cosmetics, paints and plastics. "Our products are always evolving as we try to keep up with customer requirements. For example, with paints and plastics, they are making new technological innovations and our products are always needed for them, especially with paint, which is used everywhere," adds Mr. Ishizaka. "With plastic, for example, think about plastic films. Many kinds of plastic film are needed for solar panels and smartphones, and our silica is always needed, so we need to keep up with client innovations through partnerships."

Having previously formed part of the Bridgestone Group, Archem Inc. recently became an independent company and focuses on urethane materials to develop products across three areas: seat pads, chemical products and office automation. Satoru Kusano, Global CEO and Representative Director, is confident that focusing solely on the urethane business will give Archem an advantage as it looks to expand in the global market.

"In order to establish Archem as the No.1 in the urethane industry, to build a foundation to be recognized by stakeholders around the world, and to be recognized as a first-class company, we are focused on building a growth strategy for Archem as a whole and to developing human resources who can meticulously assemble and execute PR strategies. We are looking to raise the talent that will bring about change, thoroughly promote DX, and build a strong, globally diversified team. A single company focused only on the urethane business also increases the potential for new use cases and new business ideas to come to fruition quickly."

Japan's pyramid-shaped industrial structure has been key to its success in manufacturing, with SMEs, known

as *chusho kigyos*, providing the materials, parts and technologies to larger companies higher up the value chain, while the nation's famous trading houses (or *sogo shosha*) have also played an important role.

"Typically SMEs, which can produce parts at lower costs than large enterprises, manufacture components and deliver them to large enterprises, which then assemble the parts," says Toshihiko Kawai, President of Hanshin Metallics Corporation. "This also helps large companies concentrate on marketing, design, assembly, and quality assurance. Since large companies are often publicly listed, they tend to be slow in making decisions to invest in new equipment. There are cases where smaller companies can get business opportunities by making quick decisions about investing in new equipment. Our company's role is to purchase materials from steelmakers and deliver finished products to our customers, including those SMEs in the fastest and most cost-effective way possible."

Masayoshi Fujimoto, President and CEO of trading firm Sojitz Corporation, meanwhile, explains the important role of *sogo shosha* in Japan's manufacturing history. "We were able to make a significant contribution to Japan's enlightenment and industrialization through the establishment of a wide range of manufacturing businesses, and these trading firms then helped to sell Japanese products abroad."

With 75-plus bases internationally through more than 300 interconnected companies, Sojitz is currently focusing on renewable energy development projects while it looks to expand its global reach. "My vision is for Sojitz to become a true global *sogo shosha* that pursues business initiatives based on unique regional needs," adds Mr. Fujimoto. "In Japan, there are many companies which have been in existence for 100 to 150 years, continuing from the Meiji era to the present. My hope is that Sojitz will continue to evolve in different forms, while continuing its legacy as a *sogo shosha*."



Oil-free screw compressor
"EMERAUDE" series

Kobelco Compressors: Change the Future by Air and Heat technology

KCC continues to provide compressors of unmatched quality (reliable, efficient and innovative) to a wide range of industries.

For over a century, Kobe Steel Group has been leading the compressor industry by producing reliable, efficient and innovative air compressors, refrigeration systems, heat pumps and other energy solutions. In 1997, subsidiary Kobelco Compressors Corporation (KCC) was established as a total solution provider of compression technology.

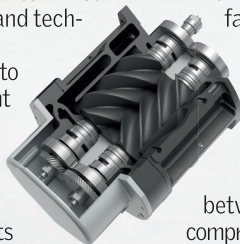
While KCC's success may stem from the necessity of its product, KCC president Hiroki Iwamoto is in no doubt that it is based first and foremost on three interlinked factors: trust, quality and technical capability.

Of these, Mr. Iwamoto says, the most important is quality: "Our clients need to be able to trust us, and what builds trust is providing high-quality products and aftermarket support."

Quality assurance, of course, has several different strands. "When trouble arises, our policy is to question why it happened, to try and understand exactly what went wrong so that we can provide a solution and prevent repeating issues," Mr. Iwamoto states.

Transparency with suppliers breeds trust, while routine visits to suppliers allows for a hands-on approach to improve quality levels and helps ensure that the breakdown rate of electric motors remains at a staggeringly low rate.

As for KCC's technical capabilities, Mr. Iwamoto is in no doubt about the company's global standing. "In terms of oil-free screw compressors which require the highest precision in design, machining and assembling, we are one of only four manufacturers in the world that can process and assemble the air end, the core component of a compressor, into a finished product."



Oil-free
air-end

Explaining that the gap between two rotors that compress air is measured in microns, Mr. Iwamoto highlights how KCC has the technology to keep its rotors running at more than 20,000 revolutions per minute, 24 hours a day, and for 365 days a year.

"We are very proud of our designs, machining, and assembling technique that allows our machines to run continuously throughout the

year and at such high speeds, with the same or higher speed than that found in a Formula 1 engine."

Behind this kind of advanced technology are highly skilled technicians capable of operating with phenomenal levels of precision, performing top-class in-house engineering to manufacture rotor shapes.

To operate with such precision, while producing reliable, efficient and innovative products at scale is something very few companies are able to achieve, and Mr. Iwamoto is keen to emphasize that KCC has succeeded where many others have failed.

Looking to the future, a key priority is to accelerate the pace at which KCC conducts its business. A new partnership with Miura Co., Ltd. has the potential to allow for faster decision-making, which will allow management to operate with greater flexibility.

When pressed on his future outlook, Mr. Iwamoto expresses a desire to provide solutions for the environment. Citing the company's "strong foothold" when it comes to quality assurance and reliability, he signals his wish to invest more heavily in R&D "to provide compressors that may be reused or recycled,



"Through our range of energy-saving products and solutions, we believe KCC can make a great contribution to solving customer issues and help build a brighter future for the world."

Hiroki Iwamoto, President,
Kobelco Compressors
Corporation

to somehow provide clients with lifecycle solutions that take into account the needs of the environment."

If he can do that while maintaining KCC's commitment to trust, quality, and technical capability, then the company's first 107 years might only represent the beginning of its story.

コベルコ・コンプレッサ株式会社
KOBELCO COMPRESSORS CORPORATION
www.kobelco-compressors.com

Pressing ahead: AIDA Engineering provides press forming solutions for sustainable industries

AIDA Engineering has been supporting industry with its key metalforming machinery for over 100 years.

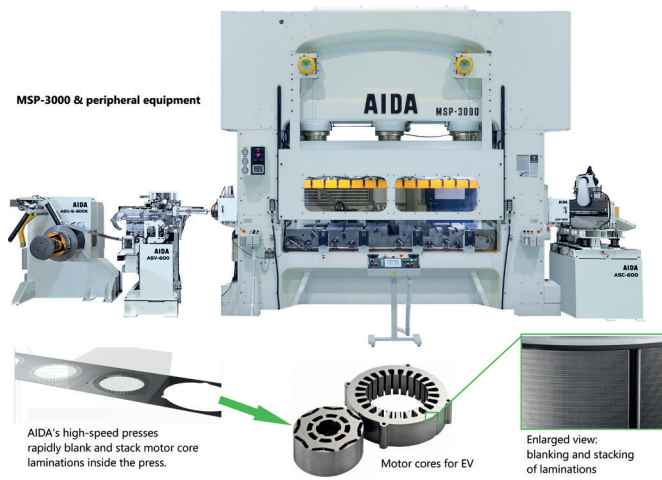


"We design and build our press systems with high accuracy in order to meet the requirements of diverse fields in high precision-forming industries."

Kimikazu Aida, President, AIDA ENGINEERING, LTD.

Over the past century, AIDA has concentrated on the development, manufacture, and sale of presses, and has grown into a global company with production and R&D facilities in Japan, Asia, China, the United States, and Europe. As a global brand in the press industry, AIDA's equipment is used by customers around the world. Press metalforming is a crucial production technology that is essential for manufacturing a wide array of industrial products using environmentally friendly methods.

"The AIDA Group is a forming systems builder," states Kimikazu Aida, President of AIDA ENGINEERING, LTD., "which means that we support the general development of press metalforming technologies and that we contribute to the business of our custom-



MSP-3000 High-Speed Precision Press and Peripheral Equipment

ers and the betterment of society. Our strengths can be divided into three areas. The first is our product development capabilities. The second is our advanced production technologies. And the third is that we have sufficient capital to support these efforts."

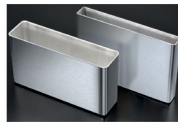
While AIDA continues to pursue this strategy, in recent years it has also begun focusing on a variety of other diversified business areas in order to respond to changing market needs, including leveraging its metalforming technologies to provide solutions for electric vehicles (EVs), energy conservation, and carbon reduction. AIDA is contributing to customer productivity improvements by introducing advanced automated systems and AI and DX technologies across its business.

In the automotive market there has been increasing demand recently for high-tensile steel as

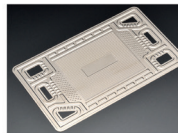
a way to reduce vehicle weight – particularly for EVs, where batteries add significantly to the



Bicycle sprocket



EV battery packs



Separators for fuel cell vehicles



UL-4000

'UL-4000', Sprocket, Separators, EV Battery Packs

weight of the car. However, this high-tensile steel is extremely hard and easily springs back after forming. Hot stamping—where the steel is heated in order to make it more pliable—is widely used. However, AIDA's cold stamping methodology uses servo and back-pressure technologies to prevent material spring-back without heating, which helps significantly reduce CO₂ emissions in the manufacturing process.

Together with lighter car components, there is also increasing demand for drive motors and bat-

teries as EV production increases. As President Aida notes, "These changes are also leading to business opportunities, such as sales of our MSP and UL presses." AIDA's MSP (Multi Suspension Press) Series is suited for forming laminations used to manufacture motor cores, and they can produce a single product using multiple processes. "In the case of our MSP presses, we changed the press design based on its intended usage, incorporating various improvements in order to achieve the highest possible accuracy. This press has an incredible global reputation. Some of our European customers have even said that the MSP is the best there is."

Another best-selling AIDA press product is the UL Series, which is more compact than a conventional



Servo Tandem Line



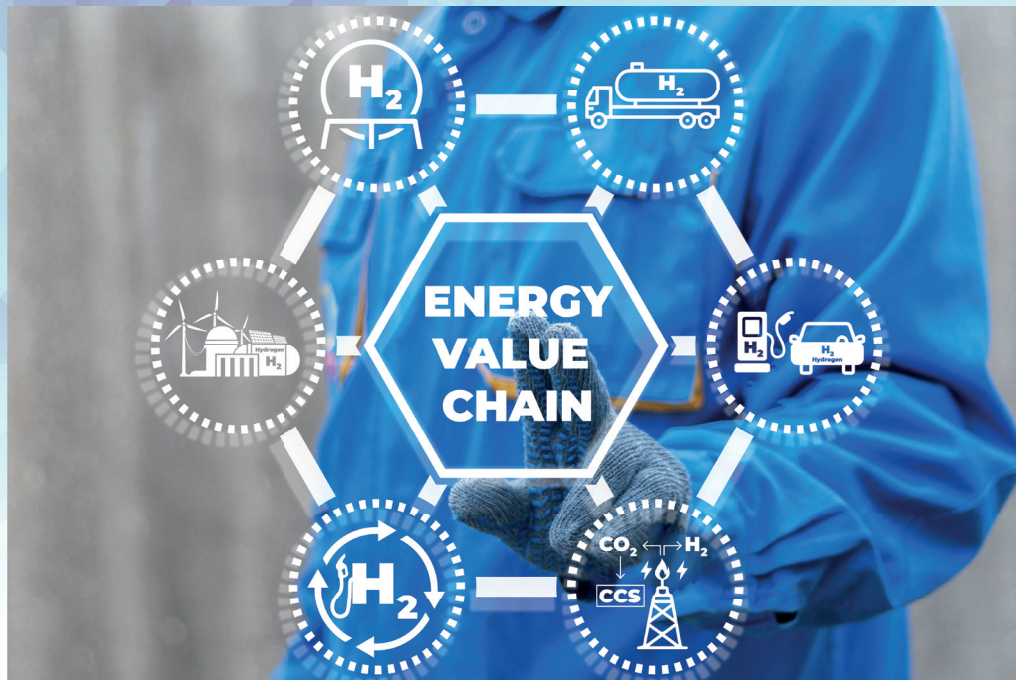
D-MAT: Press-to-Press Transfer System



Aluminum Vehicle Body Panel



www.aida.co.jp/en



"Our target is to enter new fields of opportunity, and sustain a circular economy and society."

Matsuura Kushida,
President &
Representative Director,
N.E. CHEMCAT CORPORATION

Excite the Imagination

A company whose catalysts contribute to a variety of industries, N.E. CHEMCAT has the SDGs in its sights as part of its Vision 2030.

A part of BASF Group, the world's largest chemical producer, N.E. CHEMCAT CORPORATION is a major Japanese manufacturer of precious metal catalysts for a range of applications. A company whose corporate slogan is 'excite the imagination', it supplies an extensive portfolio of clients in both the domestic and international market.

Founded in 1964 in a joint venture between Sumitomo Metal Mining and BASF Corporation (then known as Engelhard Corporation), N.E. CHEMCAT has three chief product areas: auto exhaust catalysts that neutralize harmful emissions from combustion engines; chemical catalysts used to manufacture industrial goods such as chemical fibers, plastic bottles and medical products; and fuel cell catalysts that produce electricity from hydrogen and oxygen.

Headquartered in Tokyo, N.E. CHEMCAT has production and R&D locations in Numazu City and Bando City, and works closely with its fellow group members.

As Japan, along with many other countries, targets carbon neutrality by 2050, N.E. CHEMCAT has in recent years stepped up its focus on catalysts for new energy value chain applications using alternative energy sources such as hydrogen and ammonia. The company has started to develop catalysts to reduce carbon emission in energy production, storage, delivery, usage and recycling.

Especially when it comes to the usage of hydrogen, catalysts for fuel cell vehicles (FCVs) are emerging as a growing alternative to combustion engine vehicles. "Fuel cell catalysts represent a new business area which we have been putting most emphasis on," says the company's president and representative director, Matsuura Kushida.

"There is a surge in EVs (battery electric vehicles) and FCVs to work towards zero emissions. Contributing to this trend of electrification, our fuel cell electrode catalyst has great potential for growth, being a vital component of the FCV."

N.E. CHEMCAT's fuel cell business is key to Vision 2030, a company action plan that targets the Sustainable Development Goals (SDGs) developed by the United Nations.

"We see new opportunities in fields related to SDG applications that are focused on lowering carbon emissions and climate temperature," Mr. Kushida says. Fuel cells are also integral to N.E. CHEMCAT's global expansion plans – "we would like to approach global OEMs and suppliers to provide catalysts for FCV buses and trucks," Mr. Kushida notes – while the use of hydrogen power in areas other than the automobile sector is a target for the company, too.

In addition to reducing emissions, N.E. CHEMCAT's fuel cell technology has a role to play in creating a circular economy – a goal that is another major element of Vision 2030. For example, the firm is committed to recovering and recycling the precious metals used in the catalysts it creates both for hydrogen power generation and other applications. "We also call ourselves a refining com-



A wide variety of catalysts

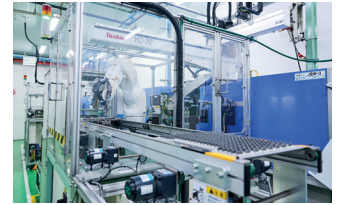
pany," Mr. Kushida explains. "We recover precious metals from spent products, utilizing our extensive history and experience in base and precious metals. We want to provide a comprehensive FCV service that includes the collection of precious metals."

N.E. CHEMCAT also aims to work towards achieving the SDG relating to food security, by making fruit and vegetables last longer. "When they are transported, they produce gasses that hasten their aging process," Mr. Kushida says. "To reduce the gasses produced by food, we can combine a catalyst with the active gas to slow down the rotting process and be more efficient in transporting it. This is something we can pursue."

N.E. CHEMCAT
www.ne-chemcat.co.jp/eg

Fine Sinter: The powder metallurgy specialist that's branching out

Boasting over 70 years of experience, the cutting-edge maker of vehicle and machinery parts is adapting and diversifying as it looks to the future.



Automated line



"Fine Sinter is a pioneer in powder metallurgy, which requires a large amount of precision and high quality."

Yoichi Inoue, President, Fine Sinter Co., Ltd.

Fine Sinter specializes in manufacturing metal parts for automobiles, locomotives and industrial machinery – but also offers a va-



Sintered parts

riety of other products as part of a growing, increasingly diverse portfolio of services.

The Japanese company, which has international locations in China, Indonesia, Thailand and the U.S., crafts vehicle and machinery components using a process known as powder metallurgy: metal powders are pressed into molded shapes, which are then hardened through sintering.



Hydraulic motor pump

"The automobile manufacturer Toyota has historically been our main customer," says president Yoichi Inoue. "We follow the rules and production systems Toyota is famous for, and the principles of *kaizen* – continuous improvement – drive our dedication to quality assurance."

Amid the shift to greener cars, Fine Sinter is keeping pace with a radically-changing automotive industry. "Electric and hybrid vehicles are the way of the future, so we're introducing new products to meet the demands of the market."

Aside from powder metallurgy, Fine Sinter also boasts expertise in hydraulic systems. For example, the firm manufactures pumps used to adjust dentist chairs.

"They're the quietest and smoothest around," Mr. Inoue notes.

Meanwhile, a fresh addition to the company's increasingly varied product range – "we're not putting all our eggs in one basket," Mr. Inoue says – is insect food: "It's a business that actually shares plenty of similarities with powder metallurgy. Both deal with powders and heat treatments – two areas we excel in."

Moving forward, Fine Sinter is not only branching out into new directions, but is focused on establishing what it calls "the factory of the future" at its Mirai Factory. "Automation is the ultimate goal," Mr. Inoue says. "We want to simplify strenuous tasks with automated and semi-automated robots."



www.fine-sinter.com

The Macro Possibilities of Micro Particles

With its high-quality synthetic silica, Fuji Silysia is supporting key industries, from food to chemistry.



Super Micro Bead (SMB)

When Fuji Silysia Chemical (FSC) was founded in 1965 as a company specializing in synthetic amorphous silica, at that time the value of silica as a natural resource was yet to be fully recognized. Today, with its exceptional chemical stability, synthetic amorphous silica is used in a wide range of commercial applications and has become indispensable for our modern way of life.

Through its SYLYSIA brand, FSC is continuously exploring silica's dynamics to develop new applications for this versatile material. "Similarly,



"We cultivate niche markets where there is a need from the customers."

Katsumi Ishizaka, President & CEO, Fuji Silysia Chemical Ltd.

we are guided by evolving technology to uncover greater possibilities toward meeting the needs of a diverse marketplace," says Katsumi Ishizaka, the company's president.

"Our products are always evolving as we try to catch up with customer requirements based on our company philosophy 'ONE CUSTOMER, ONE GRADE'." For example, with paints and plastics, these industries are making new

technological innovations and our products are always needed to support them, especially with paint, which is used everywhere. Plastic films, on the other hand, are also widely used, in everything from solar panels to smartphones. Our silica gel is a crucial part of the manufacturing process."

Even in these existing fields, the FSC president says he sees great potential for growth, but that the compa-



CARIACT

ny's strategy is to explore niche fields too.

"In the field of chemistry, there is an important mission to respond to eco-friendly needs for CO₂ capture with CARIACT, a specialty silica gel for catalyst supports. One example is called FT catalyst. There are lots of big companies now studying e-fuels and other processes, and we collaborate with them."



SYLYSIA



www.fuji-silysia.co.jp

FCC diversifying into advanced material science technologies

Japan's premiere clutch manufacturer is expanding its core technologies to target exciting new applications in advanced material science.



www.fcc-net.co.jp/en

Having steadily expanded its business alongside the development of the automotive industry, FCC – Japan's premiere clutch manufacturer – has claimed the top worldwide share in motorcycle clutches in recent years.

"Our global production system consists of 22 manufacturing facilities covering 10 overseas countries in addition to our Japanese facilities," says Yoshitaka Saito, President of FCC. "Amidst today's unrelenting competition, the FCC group mission is to be a company that can be counted on for safety and respect for the environment and to meet customers' every need with an uninterrupted supply of innovative products incorporating advanced technologies"

One of the group's greatest assets, Mr. Saito points out, is that it manufactures clutches through an integrated system, extending from research and development of frictional materials to the assembly of parts. However, with the automotive industry today seeing huge shifts both from traditional engines to electric vehicles (EVs), and from heavier materials such as steel to lighter ones like aluminum, manufacturers like FCC are facing new challenges in order to remain competitive in a rapidly changing marketplace. In particular, the industry has been heavily impacted by CASE (Connected, Autonomous, Shared, and Electric) trends, and with this ongoing transition to more efficient and more environmentally friendly methods of transport, it is expected that the use of clutches will gradually decrease.

"We are implementing two main activities to combat this trend," says Mr. Saito. "The first activity is in the mobility world that we already serve. In this CASE era we're trying to develop new products through our core technologies."

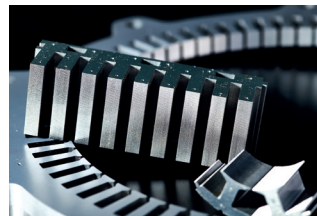
First of all, FCC is developing aluminum die casting technology necessary for the lightweight trend for EVs and also for heat management, which is essential for EV driveability and safety.



FIM EWC 2022 champion, F.C.C. TSR Honda France



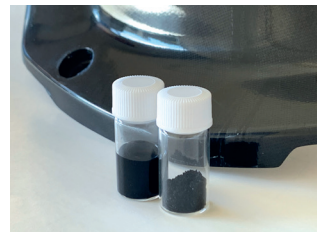
Suzuka, Japan (paper plant)



e-Motor laminated stacks



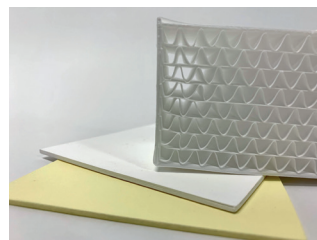
Automotive step-ratio AT clutch



CNT prototype product samples



Automated clutch assembly



Porous ceramic honeycomb catalyst

"We also have steel forming-machining technology and our unique friction material bonding technology in our Clutch Friction Discs," highlights Mr. Saito. "We have strength in welding technology too, even bi-metallic welding of dissimilar metals is another example of our strengths. As we have all these various elemental technologies, even in this CASE era, we believe we can come up with

functional combined material products. For instance, laminated stacks for e-motors and rotor shafts."

"One of our unique capabilities as a company is that we're able to chemically multiply mechatronics. This is very unique, and I don't think a lot of suppliers are doing this," he says.

The second activity that FCC is focusing on as it diversifies from clutch

manufacturing is related to a core technology that was initially used for friction materials (functional paper sheets). The company found that this paper technology can also be used for fields other than mobility, with plans to utilize it for environment purification, energy solution applications, and fuel cell products.

"Our unique paper making technology has the possibility of becoming a breakthrough for the social implementation and commercialization of advanced functional materials. Especially in the field of CO₂ absorption, we are making a major shift toward technology development to commercialize applications with innovative absorbents materials," explains Mr. Saito.

FCC is additionally collaborating with partners, Carbon Fly and Kanematsu Corporation (Japan), on its high performance multi-walled carbon nanotube (MWCNT) development for the creation of new products.

"We have agreed to collaborate, combining our know-how accumulated from clutch friction material development, for the creation of attractive products and taking advantage of their MWCNT characteristics," says Mr. Saito. "We are working on technology development to uniformly disperse while maintaining the long fiber length characteristics, enabling the possibility for applications for various products and their implementation across society."

The company also has an ongoing collaboration with Cell Impact AB (Sweden) to set up a new demonstration production line at FCC (Japan) which involves an innovative stamping technology for hydrogen fuel cell flow plates (or separators). "There are various development and research programs FCC is involved in, which expand the utilization of our core technologies," Mr. Saito explains. "These are just some examples of our expansion, which are only possible by combining our knowledge from the company's chemistry-based background, and our unique capability to chemically multiply mechatronics."

HTFT: Go beyond impossible

When it comes to automobile innovation, HTFT takes a leading role in its comprehensive development of areas such as design, testing, analysis, prototyping, IT system development and intellectual property management.

With over three decades of business experience, Honda Techno Fort has long enjoyed a fruitful collaboration with automobile, motorcycle and power equipment manufacturer Honda.



Key to the firms' relationship, according to HTFT president and CEO Masahito Kanekuro, is a shared value system based on three vital principles: "going to the actual place," "knowing the actual situation" and "being realistic." Or the so-called "Three Reality Principles."

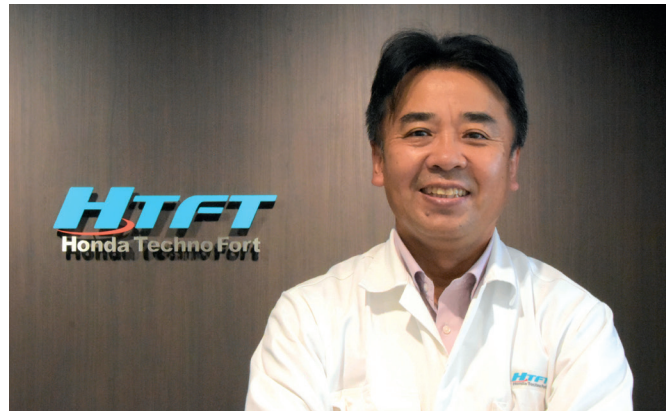
While admitting that the shift to remote development had worked at the beginning of the Covid pandemic, Mr. Kanekuro stresses that product verification and communication between different development teams is usually best conducted on site, in line with the three principles. Now, the company partly incorporates remote development so that employees are able to both grow and learn on site and work efficiently at home, in line with the current and future needs of customers.

Indeed, changes to the way the company operates are emblematic of wider societal challenges such as Japan's birth-rate and workforce issues which affect not just HTFT but the country as a whole.

And nowhere, arguably, are changes taking place at greater speed than in the automobile industry. A typical combustion engine, for example, requires more than 30,000 components for an entire car; the number of parts for the next generation of vehicles, meanwhile, is significantly lower.

Mr. Kanekuro remains unfazed: "We have yearly business meetings with Honda to discuss what vehicles we need to develop in five years and what skills we need to acquire, so that we can meet Honda's strategic needs in the future."

Human resources are key to this enterprise and to this end, HTFT

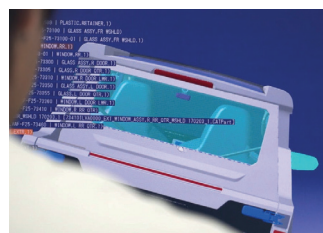


"Since our establishment in 1987, our company has thrived as a Honda group partner for developing mobility."

Masahito Kanekuro, President & CEO,
Honda Techno Fort Co., Ltd.

has been sending its personnel to Honda for training. Honda has returned the favor, sending staff to HTFT to strengthen the company's technical knowledge base.

Elsewhere the hierarchical nature of the automotive industry is slowly being broken down, with companies such as Toyota entering into partnerships with companies outside the keiretsu, or "hierarchy", like electronics giant Panasonic.



While that is not yet a possibility for HTFT, Mr. Kanekuro doesn't completely rule it out for the future. He is more forthcoming, however, when it comes to the question of how the industry might look in 10 years' time, pointing out that customer needs and requirements are changing at the same speed as the industry itself.

"In regard to four-wheel development," he says, "I believe that our business model will further expand from mainly selling vehicles to providing customers with a variety of services and

values that integrate hardware and software."

With its ability to develop vehicles in all directions, of course, HTFT is uniquely placed to take advantage of such opportunities.

As for the company's position on the environment, Mr. Kanekuro is clear: "In 2018, we launched an environmental policy to aim for total carbon neutrality so that we might leave an enriched and beautiful Earth to the next generation. With regard to CO₂ emissions at Techno Fort, we have already started working towards the 2050 carbon neutrality goals. We have made the switch to LED lights, and installed solar panels on the company building's rooftop and in the employee parking lot."



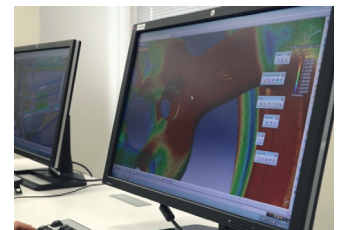
And while Mr. Kanekuro has ruled out collaborations with companies other than Honda for the foreseeable future, Techno Fort remains an ambitious company with an international presence in both the U.S. and Thailand.

With regards to the latter, HTFT has operated a test site, the

so-called proving ground, since 2017 and hopes to use its experience and knowledge to develop its presence there.

The North American office, meanwhile, serves a twin function. On the one hand it is there for vehicle development; on the other hand, it functions as a link to the Japan office, with requests from Honda America being transferred to head office.

Mr. Kanekuro adds: "As far as the U.S. business is concerned, we have been mainly working on designing multiple car parts. Not only car parts alone, however. We are also trying to develop multiple parts as a package, so that we can build and maintain our relationship with Honda America."



Looking to the future, Mr. Kanekuro is keen to strengthen HTFT's long standing partnership with Honda further still. "In order to be able to do that," he states, "we need to refine and polish our development capability."

While committed to incorporating the advantages of remote development, Mr. Kanekuro is quick to emphasize that the concept itself is something of a red herring.

The most important thing, he believes, is not the concept, but the people charged with implementing it in practice.

"What's vital in terms of development," he concludes, "is not whether or not we can develop remotely at home, but whether we can support our personnel to develop their abilities and skills to adapt to future roles and needs five or ten years down the line."

HTFT
Honda Techno Fort
www.honda-tft.co.jp/en

A new era for the urethane masters bringing comfort to people's lives

Freshly independent company Archem is challenging itself to maximize the possibilities of chemical materials in the areas of seat pads, chemical products and office automation.

Commencing its business in August 2022 with its head office in Tokyo and development center in Yokohama, independent company Archem uses urethane materials to develop products across three areas: seat pads, chemical products and office automation (OA).

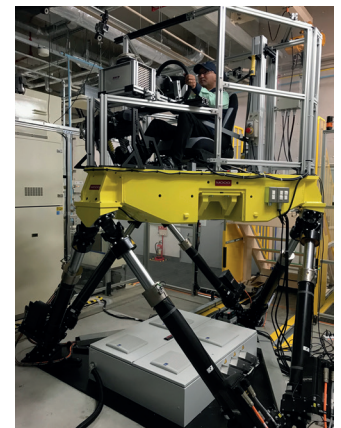
"We are a urethane specialty company that recently became independent from Bridgestone," explains Satoru Kusano, Global CEO and Representative Director. "Archem is a coined word combining 'Arc' (signifying a comprehensive and broad range) and 'Chemicals'.



"We are thinking about expanding our business not only in Asia but in western regions, such as the U.S. or Europe."

Satoru Kusano,
Global CEO &
Representative
Director, Archem Inc.

"Our OA business also adapts to people's dramatically evolving lifestyles. Our strength lies in our product design and production technology that imparts electrostatic performance to urethane. The prod-



Simulator room with six axes that enables Archem to check vibration and tilting

talent that will bring about change, thoroughly promote DX, and build a strong, globally diversified team. A single company focused only on the urethane business also increases the potential for new use cases and new business ideas to come to fruition quickly.

"We plan to solicit and reward business plans from employees through an open application system, and this self-fulfillment of their own proposal will lead to happiness across the board."

With a clear employee-centric strategy, Archem is looking to get the word out on their aforementioned three-pronged business focus.

"Japanese *omotenashi* is the culture of meeting the expectations of the customer, and also something we value," says Mr. Kusano. "We are able to respond to our customers' needs through our integrated production process, from formulation to manufacturing technology and onto evaluation technology. We design products by quantifying the sensory and qualitative requirements of our customers through our evaluation technology."

"The seat pad business accounts for a large portion of our sales, and we expect further growth," he adds. "We are able to take the lead in joint design and development with our customers in many areas compared to our competitors. We have a huge simulator room with six axes which enables us to check the vibration and tilting, among many other properties. Customers rely upon these technologies."

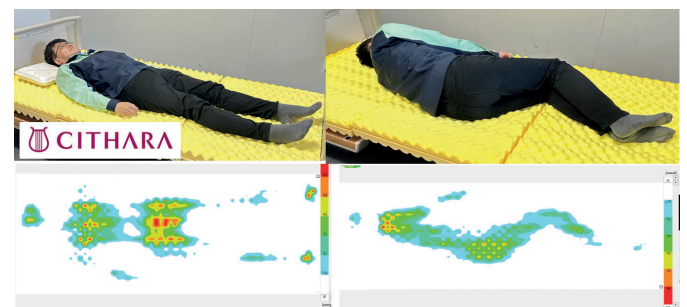
"We see our chemical products business as most compatible with our vision of spreading comfort in every aspect of the world," he continues, "targeting a wide range of

uct mix is expected to change with teleworking more prevalent, resulting in demand for large office printers declining and that for home-use



Seat pad and CAD drawing

"In order to establish Archem as the No.1 in the urethane industry, to build a foundation to be recognized by stakeholders in the world, and to be recognized as a first-class company, we are focused on building a growth strategy for Archem as a whole and developing human resources who can meticulously assemble and execute PR strategies. We are looking to raise the



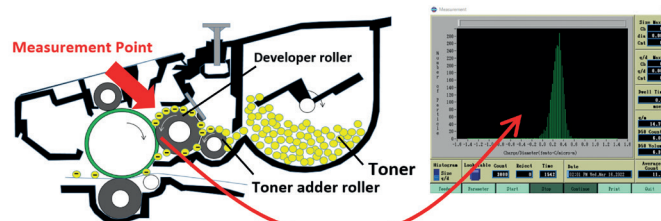
Pressure dispersion evaluation of Archem brand "CITHARA" mattresses

fields, including automotive, home bedding and general consumer goods including residential use. For example, we are able to quantitatively evaluate comfort and sleep and use this information in product design for home bedding.

"In addition to growth in health-consciousness, and the impacts of COVID 19, there is an increasing need for comfort in daily living. We hope to deliver more suitable products by approaching consumers directly, not just in the B2B market.

and small printers picking up. We are responding to these changes with agility, while utilizing our overseas bases in China and other regions where market growth is anticipated, transferring and expanding our operations to overseas production bases."

Toner cartridge diagram



Developer roller charge distribution measurement and measurement results



PNK: The heat treatment specialists creating that perfect finish

A member of the Nihon Parkerizing Group, which consists of more than 30 companies, PNK has set in stone a policy to sell their products globally.



Vacuum heat treatment furnace

Established in 1956, Parker Netsushori Kogyo (PNK) forms part of the wider Nihon Parkerizing Group and is striving forward on a mission of growing global sales through increased new development of its heat-treating technologies. Company president Masataka Watanabe explains some of the elements behind the growth. "Controlling CO₂ emissions is stringent, with vacuum heat treat-

"PNK's *monozukuri* spirit is definitely responding to the needs of the customers."

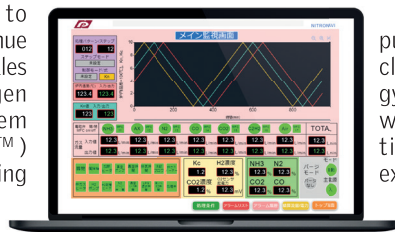
Masataka Watanabe,
President,
Parker Netsushori
Kogyo Co., Ltd.



ment now an international trend, so we are focusing on selling modern vacuum furnaces that contribute to the reduction of emissions.

In addition to this, we continue to promote sales of the nitrogen control system (NITRONAVI™) for our nitriding treatment process, which was

created based on the needs of our customers. We have high expectations for this technology," says Mr. Watanabe.



Gas Nitriding by NITRONAVI™

"We are also pursuing recycled technology for chemical waste reduction and we expect further synergistic effects with our



Recycled salt for waste reduction

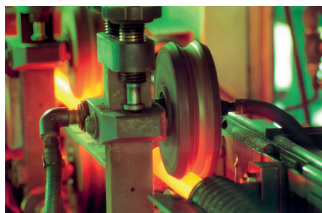
heat treatment business. Meanwhile, with ambitions to become a more globalized company, we are developing a cloud-based remote monitoring system. In order to be successful, we continue to look for further tie-ups and alliances with foreign heat treatment companies."

As the company looks to go global, Mr. Watanabe wants clients to know they can rely on PNK to provide what they need and respond effectively. "In the heat treatment field, people will be rushing to us for their needs to be solved," he says, "If we can successfully achieve that, we can satisfy our customers as well as contribute to our society."

 PARKER NETSUSHORI KOGYO CO., LTD.
www.pnk.co.jp/en

Neturen leading the way in induction heating

Neturen is the flag-bearer of induction heating (IH) technology, which is seen as an environmentally friendly heating method for our climate-conscious world.



Induction heating of PC steel bars

Neturen is the first company in Japan to successfully commercialize and industrialize induction heating (IH) technology, an environmentally-friendly technology that is both non-polluting and resource-saving. As a pioneer of IH, Neturen has applied the know-how it has accumulated in the field and its sophisticated technological and development capabilities to take on heat-treatment machining while also successfully developing highly



"When we are able to achieve global expansion of our IH technology, we believe that the specific areas we enter into can become more eco-friendly."

Katsumi Omiya,
President, Neturen Co., Ltd.

original products that have contributed to and brought about innovations in a wide range of industries.

"Our IH technology requires only electricity. So, in the future when energy sources have all been switched to renewables, we'll help to achieve zero carbon emissions," says Katsumi Omiya, President of Neturen. "Therefore, we want to expand IH technology rather than utilizing, for ex-

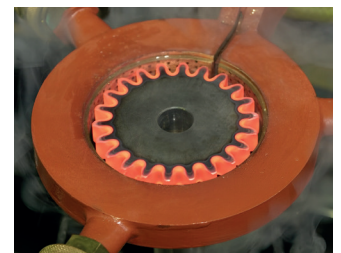
ample, furnace heating, filtration heat treatment, and other carbon-intensive methods. We believe that there is big potential in IH."

Aside from IH, another key focus of Neturen is its large-diameter, high-strength spring steel wire for cold forming (coiling), which is being put to use in the rapidly growing electric vehicle (EV) industry.

"We've started production and sales of the large-



Spring steel wire ITW®



Induction heating of gear

diameter ITW® for cold forming, which has the world's largest diameter and can withstand the weight of EVs," says Mr. Omiya. "At the moment, we are commercializing the product in China, but have also invested around \$8 million to put in place a dedicated facility in the United States. Not only EVs, but in the United States, as you know, there are many heavy vehicles which use big thick springs. We believe that we can also expand our market share beyond EVs to other sectors of the car market too."

 NETUREN
www.k-neturen.co.jp



"Our strength is that we can provide for the whole process, starting with patterning and going through to etching."

Minoru Shichino,
President, Elionix Inc.



Electron Beam Lithography System ELS-BODEN Σ

Nanotechnology set to change the landscape of research and development

Founded in 1975, Elionix manufactures high-performance and sophisticated devices valued by researchers and engineers worldwide.

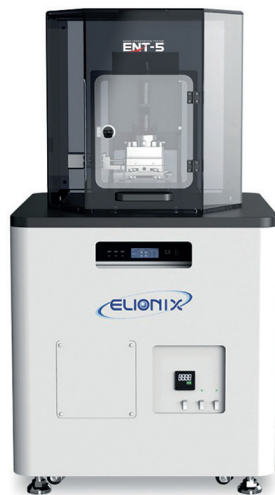
With the company's 50th anniversary just a couple of years away, Elionix president Minoru Shichino is excited about the plans to open new offices and a factory as part of its continued growth and prosperity.

With expertise in nanotechnology devices, using electron beam lithography, Elionix is able to offer a variety of product line-ups to cater to its clients.

"We have two divisions: firstly the measurement and analysis division, and then the nano-fabrication division," explains Mr. Shichino. "The main system we provide is in the latter of those, and that would be our ELS series with the most recent unit being the ELS-BODEN Σ, which accounts for around 60% of our total sales. It is our major product and is being used for various applications including in cutting-edge research. We have received a lot of inquiries for the system to create quantum computing devices, so we have seen a lot of interest from that field recently."

"We also have the EIS series which is our ion-based system

designed for etching and processing applications. By having the ELS and EIS series together we can utilize the ELS-BODEN for patterning and then after



Nanoindentation Tester ENT-5

that, the customer can use the EIS for etching and grinding," the president continues. "Actually, we are the only company worldwide that has these two types of equipment together. This is key to our strength,

where we can provide the whole process, starting with patterning and going through to etching. Another service we provide for our customers is a demonstration before purchase, which we see as a big plus in reassuring them."

With a presence in the United States and additional partners in Korea, Taiwan, Singapore and China, the need for domestic and overseas partnerships are certainly a feature of the plans of Elionix and this is where there is a close alignment with research and academia.

"Our products are for R&D equipment, so where we would deliver to would be the university professors and government research institutions, as well as corporate labs," says Mr. Shichino. "Partnerships will result to a certain extent because we do have production equipment, but this would also be to create communication devices for mobile phones.

"What is important for us is how we develop new systems or devices and that communication with end users is vital. Constant

communication and exhibitions enable us to hear the opinions of not only those end users but others that are in related fields. This is something we are always moving towards both domestically as well as globally.

"Our production capability is pretty much full currently, but we understand that if we're able to expand and deploy our products overseas our sales would grow."

And so to the future of the company, and how Mr. Shichino sees the years that lie ahead. "On the last day of my presidency, I hope to have doubled sales and doubled the number of employees at Elionix," he states. "That would really contribute to the physical strength of the company. My mission is to be able to continuously provide equipment and devices that are really taken positively by all academics across the world."



www.elionix.co.jp/english

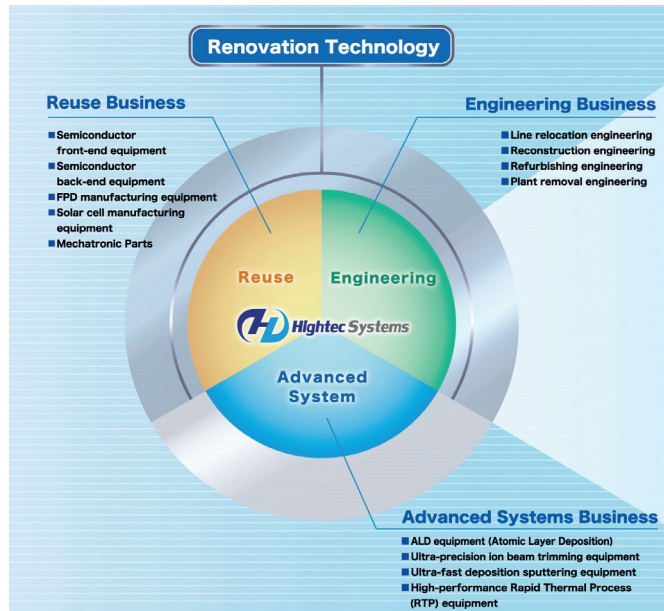
Hightec Systems continues to grow as essential partner for semiconductor and FPD manufacturers

Led by CEO Moriaki Abe, Hightec Systems Corporation has defied a challenging economic climate to blossom into a market-leading provider of manufacturing equipment and engineering services.



"The trust of our customers will always be our highest priority. I believe that building long-term relationships is more important than anything else."

Moriaki Abe, CEO, Hightec Systems Corporation



Proven business model covering R&D to mass production

Companies always say that's what they're about, Mr. Abe says – but how many really mean it? "The trust of our customers will always be our highest priority," he declares. "I believe that building long-term relationships is more important than anything else."



Fuji Technical Center

Mr. Abe is a future-oriented CEO; his sights are always set on five or 10 years down the line. And for Hightec Systems, the focus of the decade ahead is clear: looking for new horizons.

Since the collapse of the bubble economy in 1991, Japan has stagnated; indeed, the following decades have come to be known in the country as the 'lost 30 years'.

At Hightec Systems Corporation, however, it's been anything but three decades of stagnation. Founded in the immediate aftermath of the bubble crash, the Yokohama-based firm has overcome Japan's tough economic climate to go from strength to strength. Today, it brings in sales of \$200 million a year.

So, what is its secret?

Well, there are a few things that set Hightec Systems apart – starting with a three-pronged business model that's unique in Japan.

"We buy and sell used manufacturing equipment for semiconductors and flat-panel display (FPD) devices," Hightec Systems CEO Moriaki

Abe explains. "But on top of that, we also have two other business divisions.

"One offers engineering services such as repairs, modification and maintenance of the manufacturing equipment, and the other focuses on importing and selling new advanced technology for producing microelectromechanical systems.

"Put simply: there is no other company with such a business model, and it has been a major driving force behind everything that we have achieved."

Mr. Abe himself is also integral to the Hightec Systems success story. A bold, fearless CEO, he has tirelessly traveled the length and breadth of Japan, defying the country's conservative business culture to secure new customers among semiconductor and FPD manufacturers.

"When I first started here at Hightec Systems, almost nobody knew of the company, and

Japanese companies really value a track record," he says. "We had difficulty dealing with long-established companies, so I personally visited countless manufacturers in every prefecture in Japan over a couple of years.

"There was one occasion when I went to a major Japanese manufacturer and stood at their front gates trying to hand out fliers that let people know all about Hightec Systems.

"I stuck at it, repeating the same approach even after being rejected. And before I knew it, a major Japanese company had opened its doors. This was the first step in building the foundation of the company today."

Hightec Systems' growth – its workforce has flourished from three to 100 employees – also comes down to an organization-wide culture of listening to customers and being prepared to go the extra mile for them.



SCIA system (Germany)



Veeco CNT (USA)

Already having a lot of business in China, South Korea and Taiwan, the company is now targeting two further markets: the United States – where

the Biden administration's CHIPS Act seeks to increase the country's semiconductor production – and Europe.

"The U.S.'s role in the global semiconductor sector will only become more important, and its strategic value to the company will grow," Mr. Abe says. "We are now preparing step by step for the next leap forward."

"Once we enter the U.S. market, we can use it as a foothold to expand our business further abroad to Europe. In that sense, breaking into the U.S. is a strategic move of great importance."



STEC the go-to OSAT partner

With origins as a joint venture, STEC has become an integrated company for OSAT that can offer a one-stop service.

Founded in 1979 as part of a joint venture between Sharp Corporation and Takaya Corporation, S-Takaya Electronics Industry Co., Ltd. (STEC) is a trusted provider of outsourced semiconductor assembly and testing (OSAT), catering to clients in both the Japanese and international markets. An independent company since 2020, STEC creates semiconductor products that are key components for the electronic devices we use in our daily lives, including smartphones, televisions, cameras, and video-game consoles, among others.

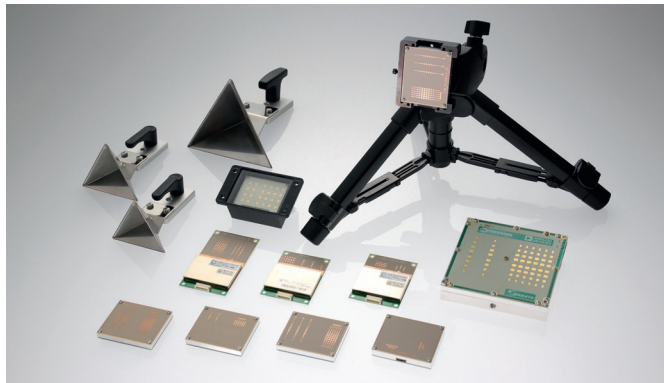
And STEC also does so much more. "As well as the OSAT of large-scale integration devices and modules which is our main business, our businesses also include the manufacturing and sale of semiconductor manufacturing equipment, in addition to the research and development of radar modules and sales and maintenance of environmental-related products," president Futoshi Yunoki says.

The comprehensive service STEC provides is one of the firm's major calling cards. "Our OSAT business handles various types of semiconductor packages – and thanks to our unique technology, we provide a one-stop service," Mr. Yunoki explains. "The different processes in semiconductor production include wafer testing,



"Our clients are assured that we can meet their OSAT requirements."

Futoshi Yunoki, President, S-Takaya Electronics Industry Co., Ltd.

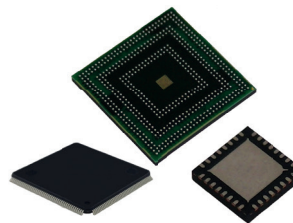


Radar module

tion," Mr. Yunoki says. "We listen to the customers' needs and try to develop manufacturing equipment based on that. These pieces of equipment were originally used in our own production sites – and we realized that we could start to sell this know-how to our customers."

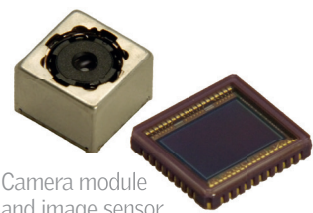
In its R&D division, STEC is developing radar technology for a range of applications. "We're focusing on millimeter wave radar now because it's starting to draw attention, especially in the automotive sector – it's well-known for its use in autonomous driving," Mr. Yunoki reveals. "However, the millimeter wave radar can be used in so many other scenarios in our lives: for example, it can check the surface level of a river to prevent damage from flooding. And as well as being able to measure distances and angles, it can also detect vital signs, so it

can be used for purposes such as healthcare, as it has the ability to monitor a person's breathing and heart rate."



BGA (Ball Grid Array)

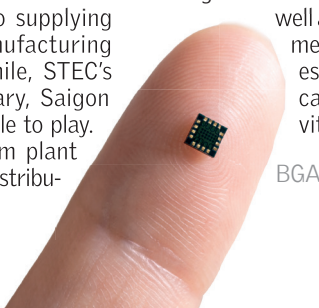
Such uses of technology go hand in hand with STEC's commitment to helping achieve a "safe and secure society" as part of the U.N.'s Sustainable Development Goals (SDGs). So too does the company's portfolio of environmental products, which come with a pledge to "leave a beautiful Earth for the future". Focused on saving, storing and generating energy, they include batteries for collecting solar power, and maintenance services such as solar panel cleaning and coating.



Camera module and image sensor

dicing, polishing, bonding, encapsulating, molding and final testing. Our advantage is that we offer all of these, and we have testing know-how for wafer testing (front-end process) to final testing (back-end process)."

When it comes to supplying semiconductor manufacturing equipment, meanwhile, STEC's Vietnamese subsidiary, Saigon STEC, has a major role to play. "We use the Vietnam plant for overseas market distribu-



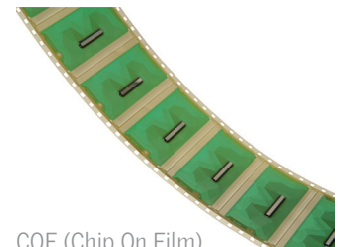
BGA



Fully automatic tester for camera module

STEC's pursuit of SDGs is integral to STEC Vision 2030, a company strategy that also includes a drive to create new partnerships. "The Japanese semiconductor sector is shrinking, but we believe there will be a revival of the business in Japan," Mr. Yunoki says. "When that time comes, we'd like to become one of the main companies in the semiconductor sector.

"The manufacturing and development of sensing technology and power devices that are our core technologies are drawing a lot of attention in the semiconductor in-



COF (Chip On Film)

dustry. We'll continue to focus on these areas and find partners we can work with. We provide a strong OSAT service, which is the back-end process, but without wafer suppliers, we won't be able to offer these services, so we're looking for partners in the front-end process area.

"We're not limiting ourselves domestically. We're open to overseas partners. Overseas companies may find us a good production firm to supply their products to end users around the world. Our aim is to provide high-quality, low-cost services that meet the delivery time of end users. We're looking to create synergies with partners that can realize this goal."



www.s-takaya.co.jp

Glass ceramics and optical parts supporting next generation industries

Beginning with glass-metal sealing, Yamamura Photonics continues to support a wide range of industries through its glass ceramic material and small component assembly technologies.

The art of working with glass dates back millennia, but innovative technology is pushing the glass industry into the modern era. One of the companies at the vanguard of glass-to-metal sealing technology is Yamamura Photonics. Founded in 1949, the company has grown into an industry leader

and its core Glass To Metal Seal (GTMS) technology has applications ranging from X-ray devices to high-voltage railroads.

Sealing glass to metal is a complicated process. Yamamura's GTMS technology has enabled the company to develop a wide range of products such as

the TO-Cap, a flat window or lens cap with high hermeticity used in LD or PD hermetic packages, and the Glass LID used in thinner packages such as LEDs or lasers.

These products have been developed through Yamamura's own take on *monozukuri*, which company president Tomoyuki Taguchi describes: "The most important thing for us is to manufacture and then provide products which can cater to customers' needs. This is a process of continuous improvement."

Yamamura recently introduced its Low Temperature Co-Fired Ceramics (LTCC) green sheets for substrates, which are lead-free and have been developed for 5G applications, having a lower dielectric loss compared to conventional sheets. This understanding of the develop-



"We at Yamamura Photonics will continue to make the impossible possible through our wide range of core technologies."

Tomoyuki Taguchi, President, Yamamura Photonics Co., Ltd.

ing needs of the market comes from the company's dedication to communicating with its customers, which Mr. Taguchi says differentiates Yamamura from its competitors. The company's customer-centric approach has been key to its expansion into the Asian market, and Mr. Taguchi reveals plans to grow in North America and Europe as well.

YAMAMURA PHOTONICS CO., LTD.

www.yama-ph.co.jp/en



Yamamura's GTMS, Glass LID, TO-Cap, and LTCC products

Nishimura Chemitech expands manufacturing to enhance added value

The company president is eager to usher in a new era of change as Nishimura Chemitech seeks to cement its future as a trading firm with manufacturing capabilities.



"I want to recruit employees who can both listen independently and analyze the needs of customers creatively."

Osamu Nishimura, President and Representative Director, Nishimura Chemitech Co., Ltd.

An established trading company in Japan, Nishimura Chemitech took the decision to expand into manufacturing almost a decade ago, in 2014.

The reason is simple, says company president Osamu Nishimura: "We can no longer survive by operating solely as a trading firm."

And so far, it has proved to be an inspired move.



Chemical dilution and delivery system

By the time the Covid pandemic began creating logistical issues in the semiconductor market, Nishimura was already an established presence, having successfully penetrated the Japanese market with gas scrubbers manufactured in Korea. A rarity for

a domestic market not known for embracing foreign-made equipment.



Drum cabinet for undiluted chemicals

The secret? Nishimura's ability to both sell new products and provide maintenance services alongside, a development which, according to Mr. Nishimura, "sets the company apart", as well as earning it a strong reputation among South Korean manufacturers.

With a patent in the works for its point-of-use (POU) system, meanwhile, an advanced chemi-



Scrubber and chiller

cal mixing system which has many applications in semiconductor processes, the company's future appears bright.

Looking ahead, Mr. Nishimura is keen to secure a partner that can offer maintenance services in overseas markets: "Basically we are trying to find someone who can do what we are doing domestically, to help us introduce Japanese products abroad."

Breaking into mainland China remains high on his wish list.

Above all, however, he says, it is vital that the company continues to add value, as only that can lead to growth.

NYS NISHIMURA CHEMITECH
nishimura-ct.com

NITTOSEIKO's innovative technologies support global industry

From the unique AKROSE to microbubble generators, NITTOSEIKO is looking to push its technologies further in the global market.

Founded in 1938, NITTOSEIKO has been a respected manufacturer of industrial machinery, fasteners and screws for over 80 years, with established bases all over the world.

With Japanese production costs rising in recent years the company has shifted to the production of value-added, special screws for the domestic market, with the manufacture of standard screws taking place in countries like Indonesia and Thailand.

Company president Masami Zaiki explains the group's outlook: "Our business is not to pro-



Various precision screws

duce the screws themselves, but to provide a solutions business where we propose solutions to customers' problems using technology in order to enhance their performance and productivity."

One such example is the development of AKROSE, a patented cold-heading technology that attaches different kinds of metals like aluminum and copper, and is currently generating a lot of business opportunities in the battery industry.

As Mr. Zaiki explains, cold-heading technology can help achieve significant energy

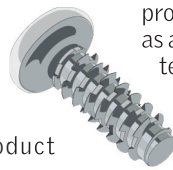
savings, and the company performs simulations during the design phase to confirm how the final product will be formed.

NITTOSEIKO's policy of developing all machine tools in-house, meanwhile, creates advantages for their clients in an already competitive market.

Mr. Zaiki adds: "Take, for example, a 0.6mm diameter screw. If you tried to make such a thing, you would use a cutting machine, but we are one of the companies that can make it using heading and rolling technology. With the header we developed in-house, we can mass-produce such items with high precision, ensuring the quality is consistent." In this case, the part is then supplied to the watch industry.

Elsewhere, the weight of the company's FM514VZ automatic screwdriver has been reduced by 30%, while the group's unique microbubble technology is being trialed in both the agriculture and aquaculture industries.

Industrial components require oil, which in turn needs to be cleaned using a chemical agent. NITTOSEIKO's microbubble cleaning device, BubbRemo, however, requires only water and air to run. As well as bringing obvious environmental benefits, the technology is also highly efficient. "Our microbubble generator has been recognized for its microbubble generating performance and was the first



Tapping screws for plastic (GIZA TITE)

product in Japan to be certified as a product utilizing fine bubble technology," Mr. Zaiki explains.

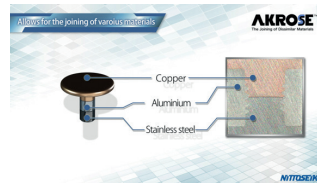
New products based on this technology, which has been verified by universities, have already been launched for applications in hair salons.

Having previously pursued the development of technology, intellectual property and R&D independently, NITTOSEIKO is now looking to collaborate with like-minded firms in order to enhance the group's growth strategy.

An established presence in countries/regions such as Taiwan, Hong Kong, China, Indonesia, Thailand, Malaysia, the U.S. and South Korea, the company is aiming to expand into Europe. "We exhibited at an exhibition in Germany in May this year," Mr. Zaiki says, "and we would like to increase our presence in Europe in the future. Europe is likely to be our next target."

But the future of the company is not just about growth and international expansion. "We also want to contribute to society," Mr. Zaiki confirms.

In earthquake-prone Japan, he explains, ground inspection is required before the construction of single-family houses. NITTOSEIKO



The joining of dissimilar materials (AKROSE)

EIKO currently has a 90% share of the domestic market for the equipment used to perform such inspections, a profitable line of



"We are pursuing new technology and special products that our competitors do not have, and we are trying to cater to our clients' needs."

Masami Zaiki, President, NITTOSEIKO Co., Ltd.

products which is also, crucially, of tangible benefit to society.

"We believe that we can



Single Spindle screw driving machines (FM514VZ/CZ)

contribute to any market in the world," Mr. Zaiki states.

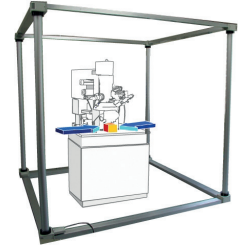
As proof, he cites the example of the group's GIZATITE fastening technology, which is resistant to heat and vibration, and can be applied to mobile phones and cars.

Though when pressed on his legacy, Mr. Zaiki highlights the importance of enhancing the group's revenue, while it is clear that the wellbeing of NITTOSEIKO's employees is also an issue close to his heart.

"We are putting a lot of effort into taking care of people, into educating our employees. I want to achieve revenue growth in my time here, of course, but I would also like to see our employees working energetically and enthusiastically towards that goal."

NITTOSEIKO
Taking new steps forward together
www.nittoseiko.co.jp

Oscillation science specialists presenting integrated solutions for vibration control



Tokkyokiki Corporation is a manufacturer specializing in vibration, and pursues cutting-edge technologies to realize the optimum vibration environment for its customers' business spaces.



Pneumatic Active Isolation Unit

Everything that exists vibrates. Being able to control these vibrations is critical across all industries, from the construction of buildings to the manufacturing of semiconductors. One of the companies at the vanguard of vibration control is Japan's Tokkyokiki Corporation.

Founded in 1969, the company built its success with the development of an OS-type vibration isolator for building equipment before getting involved in semiconductor plants. From this foundation, Tokkyokiki has moved into



"Our dream is to develop a company that delivers vibration control technologies and solutions to the world."

Kenji Goto, CEO, Tokkyokiki Corporation

the world of micro-vibration control, and created the world's first active vibration isolation system controlled by pneumatics.

The company's deep knowledge and extensive experience in solving the complex vibration issues of the semiconductor industry



Large Size Vibration Isolation Table

enables it to provide high-performance vibration isolation and suppression systems for companies in the booming sector. Company president Kenji Goto explains that the geology of the areas where semiconductor companies are based also plays a role in the solutions his company develops and proposes: "The semiconductor industry is currently booming in eastern Asian countries, where earthquakes occur frequently, and we believe collaboration between micro-vibration control

Active Magnetic Field Cancellation technology and seismic isolation technology is required."

Tokkyokiki is actively developing new solutions for the market and pushing innovation by collaborating with customers through sales and technical engineering and understanding their needs. Furthermore, Tokkyokiki has also collaborated with universities and research institutions in its quest to improve vibration control technologies.

Tokkyokiki has always been at the cutting-edge of vibration control and will continue to develop innovative solutions to carry out its mission of "delivering a comfortable environment to the world through vibration control technology".



Haneda Shokai: The trading company of the future

Originally established as a trading house, Haneda Shokai's business has grown to encompass manufacturing capabilities in order to offer the best possible service to its customers.



PT. Haneda Indonesia

With bases in Japan and overseas, Haneda Shokai has been providing trading services since 1951, and president Yuichi Sato is acutely aware that the role of traders has evolved in recent times.

"All trading companies in Japan are at a crossroads, wondering which direction they should take," he says. "The role of distribution and financing is at risk from on-



"As a trading house, we are focusing on our added-value concept and, as such, have hired engineers to give more support to our customers with the automation of their operations."

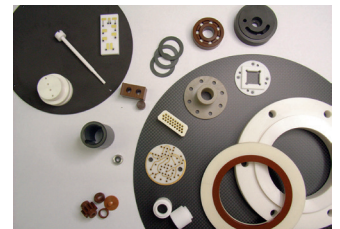
Shin Sato (left), Yuichi Sato (right), President, Haneda Shokai Co., Ltd.

line services, however, they cannot meet the security demands required from just-in-time businesses. We have established a system to respond to these demands.

"We can also expand the industries and regions

we cover, and switch from mechanical to electronic parts, including software."

With the next generation preparing to take over in the coming years, Mr. Sato has a clear idea of the future of Haneda Shokai.



Ceramic products

"The company's vision for 2030 is to be a European-style, high-profitability company," he explains. "With the situation in Japan right now, our profits are thin, having been exposed to fierce competition. We would like to adopt the relaxed model we see at European companies, with unique products and high efficiency, targeting new and interesting markets, while diversifying the industries we cater to."

"This is how we define ourselves in the trading house added-value business."



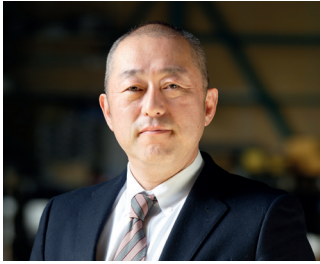
Haneda Shokai locations



www.haneda-shokai.co.jp

Filtration solutions for global industry

As the originator of automated filtering systems, Kurita Machinery supplies its unique products and techniques throughout the world.



"We are continuing our development for the coming century to cope with the many needs for pressure filtration."

Yoshinao Kurita, President, Kurita Machinery

Filtration plays an essential role in today's world by meeting the wide ranging and varied needs of industry. It is one of the most important industrial processes; one that has developed in step with the historical progress of civili-

zation. Since it was established in 1930, Kurita Machinery has grown and prospered in the field of filter press manufacturing.



MF type (center feed)

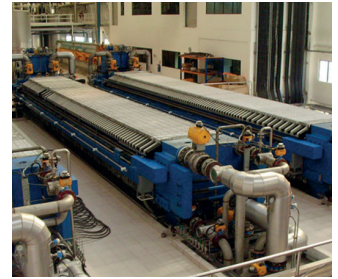
"As the originator of automated filtering systems, we have supplied our unique products and techniques throughout the world," says Yoshinao Kurita, President of Kurita Machinery. "And we are continuing our development for the coming century to cope with the many needs for pressure filtration, and to retain the confidence of our customers by meeting their expectations."

The company's custom made, fully automatic dehydrator (filter press) is one of its most popular customer solutions. Based on filtration laboratory methods and with its uniquely developed dehydration techniques, it supplies units of fully-automatic filter presses for various applications in this field internationally.



BF type (bottom feed)

Now, the company has its sights set on further global expansion. "One way of doing this is to provide support for Japanese companies which would like to establish plants in overseas markets," says Mr.



5MPa squeezing type

Kurita. "Back in the 1950s, we achieved full automation of the filter press, and at that time Japan suffered a lot of environmental pollution. We would like to go to markets that are experiencing the same issues now. Additionally, we would like to go to more advanced countries like America or European countries which have more advanced technologies where we could help by supplying our filtration press machines."



www.kurifil.co.jp

Top quality bottles for high-end applications

Already Japan's top domestic manufacturer of large synthetic resin blow-molded products, Kodama Plastics is expanding its range of high-purity containers to overseas clients.

The adage that a chain is only as strong as its weakest link applies just as well to supply chains as it does in the world of security.



Highly sensitive products, from chemicals to semiconductors, must be transported in extremely pure containers, and one of the companies leading the way in this field is Japan's Kodama Plastics.

Founded in 1927, Kodama creates high-performance plastic containers that maintain the functional qualities of its customers' products. One such container is Kodama's Hyper Pure Bottle, noteworthy for its overwhelming cleanliness. Made by the company's blow-molding machine



which avoids dispersing oil mist, Hyper Pure Bottles contain fewer resin particles than similar products and ensure the contents remain pure.

The company's products also come in much larger sizes, with its 1,000-liter IBC container currently undergoing improvements to reach the cleanliness standards required for the semiconductor



"The world is undergoing drastic changes, but our company's mission, which is to do our best to meet the needs of our customers, remains the same."

Eiichi Kodama, President, Kodama Plastics Co., Ltd.

and chemical compound manufacturing industries. Company president Eiichi Kodama explains:

"The idea is to take those clean room products and increase the size without compromising on cleanliness or purity."

The sustainability of plastic products is becoming increasingly important, and Kodama ensures all its manufac-



turing scraps are collected to be reused. Kodama's Tamakan bottle is the first UN-approved dangerous liquid container to be made with biomass-derived polyethylene. "Hopefully this will become a star product for Kodama Plastics," Mr. Kodama states.

As the company approaches its 100-year anniversary, fourth-generation president Mr. Kodama continues to ensure the firm works to its original motto of "giving shape to the needs of the time", developing products around the expectations and necessities of its customers.

KODAMA
www.d-kjk.co.jp/en