

Japan's chemical industry players a step ahead of the competition

The Japanese chemical industry has suffered when it comes to the production of base chemicals due to regional competitors' capacity to offer products at lower costs. However, Japanese chemical manufacturers still remain leaders in highly functional and specialized chemicals. Furthermore, Japan can count on a variety of SMEs to develop niche chemical and material technologies. As such, Japan is well-positioned to meet the ever-evolving demands of a wide range of industries, including automotives and advanced semiconductors.

"The strengths of the Japanese chemical industry is seen by the number of patents that Japanese companies hold in the field. These still outnumber some other countries out there only because of the foundation that Japanese companies have developed," says Shigeru Takaragi, President & CEO of TODA KOGYO CORP. "Another strength lies in the ability to be niche and produce difficult chemical compounds. This demonstrates Japanese companies' strengths, especially in comparison to some regional competitors that are inherently cheaper and tend to specialize in more conventional chemical compounds. While it is true that regional competitors have mass production, cheaper labor forces, and accessibility to cheaper raw materials, Japanese companies will continue to be competitive and survive, especially when we talk about specialty and complicated chemical compounds."

As they often deal with specialty high-mix, low-volume products, customization and the ability to meet specific client needs is another factor that sets Japanese companies apart from regional competitors. "Our survival hinges on our ability to tailor our products to suit specific applications of our customers," stresses Hayato Hirano,

President of ENEOS Materials, which is engaged in synthetic rubber, thermoplastic elastomers, latex, and other raw materials. "One of our core strengths lies in our expertise in customization technology, which is bolstered by our extensive experience and knowledge in polymerization. Presently, a significant portion of our revenue is derived from baseline products categorized as elastomers. However, our goal is to increase the share of specialized products, such as binders for lithium-ion batteries (LiB) and Solution Polymerized SBR (SSBR) for high-performance tires used in automobiles, including EVs (electric vehicles)."

As a manufacturer of electrolytes for LiBs, the emerging EV segment is also a focal point for MU Ionic Solutions. "It is true that EV and LIB customers, as well as suppliers, are expanding their production capacity. As a battery material supplier company, we believe that this growth in demand will give us a huge opportunity for business growth," explains president Kenichiro Mawatari. "Our target is to capture 25% of the world's demand and at this time market demand for electrolytes for xEV on the basis of LIB-equipped vehicles is 500,000 tons per year, but it is expected to exceed 2 million tons by 2028."

For adhesive manufacturer Alteco, the transition to EVs indeed poses challenges, but also a great opportunity. "We can provide suitable anaerobic adhesives for the motor shaft, motor core, motor magnet and so on. We believe these products will be of interest to EV manufacturers," says president Reo Tanaka. "Another popular product of ours is our light-curable instant glue, which is an instant adhesive that has light curability. The curing is faster than conventional high-speed adhesives due to UV light irradiation. We believe that this is also ideal for EV applications."

Nippon Pigment is also focusing on the EV sector, as well as semiconductors, with its liquid dispersion technology. "For us, power semiconductors will be of big interest and we are working on developing die bonding materials for power semiconductors," says president Tatsumi Kato. "Through aggressive investments in the metal material area of semiconductor production, we would like to make it a core pillar of our future business. This is why we built our new facility in Saitama in 2018. This facility is producing color filters for LCDs and liquid dispersions for semiconductors."

Moving to the health and hygiene industry, Hattori Paper has pioneered alkaline electrolyzed water, whose applications include the company's wet cleaning wipes. "We are a small manufacturer, but we have a big dream. Our mission for alkaline electrolyzed water is to make kitchens around the world safer and cleaner," says president Masakazu Hattori.

Indeed many Japanese SME manufacturers like Hattori have ambitions to grow internationally and Takumido, whose mission is "to drive and revitalize struggling businesses", is there to support their global ambitions. "Japanese companies conduct business in Asia with a strong client-first mentality, often going above and beyond, even at their own expense, to provide exceptional services and maintain a trustworthy *monozukuri* reputation," says president Mitsunori Suwa. "This commitment is a strength we can harness through our company. While these companies may incur significant costs and investments without immediate returns, our support allows them to realize returns in the future. We believe that our support will differentiate our companies from many other Japanese SMEs."

Tsuchiya Kogyo ready to tackle markets with innovative technologies

From automotive and home appliances to theme parks, innovative printing and molding company Tsuchiya Kogyo is bringing its unique technologies to new markets.



Comiket 2023



Switchable light guide plate

 土屋工業株式会社
TSUCHIYA KOGYO CO.,LTD.

www.tpd.co.jp

"Going forward, we want to emphasize developing original products and providing specialized industrial parts for both the domestic and international markets."

Toshihiro Tsuchiya,
President, Tsuchiya Kogyo

Tsuchiya Kogyo uses a broad spectrum of techniques to convert concepts into tangible products, such as durable decals, molded parts and emblems for a wide variety

of applications, including the automotive industry, home appliances, railways, and theme parks.

The company also uses printing, injection molding, and vacuum-forming technologies to manufacture products requiring precision, such as industrial parts. Most notably, Tsuchiya Kogyo is in the process of creating a lightweight plate that can be applied in the automobile industry, especially for the interior of EVs. This transparent light guide plate has the ability to switch between different display patterns depending on the entry direction of light. The company is also developing a durable and

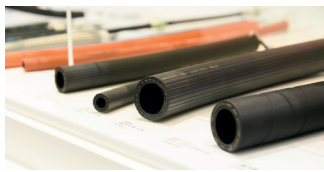
light-weight replacement for chrome plating using insert molding.

Tsuchiya Kogyo's multi-industry know-how has enabled it to expand internationally, and it now has two additional factories in the Philippines, allowing it to export more easily to the U.S. The company is actively seeking overseas partners not only in the U.S., but also in Europe, India, and Vietnam.

"Recently, we have started to diversify into Japanese pop culture projects," says president Toshihiro Tsuchiya. "We, as a manufacturer, strive to develop products that meet constantly changing market needs, including environmental issues."

ENEOS Materials: Committed to global sustainability

ENEOS Materials aims to promote technology skills, innovation, and contributing to the development of society.



Industrial rubber products

Last year, ENEOS Materials – a subsidiary of Japan’s leading oil company, ENEOS Corporation – was established following the break up of JSR Corporation’s elastomer business, and is today engaged in research and development, manufacturing, and sales of synthetic rubber, thermoplastic elastomers, latex, and other raw materials. Since the original business was founded in 1957, it has contributed to the development of various industries, including the automotive sector, by supplying various synthetic rubbers both in Japan and overseas.

“In addition to our top-level R&D capabilities and manufacturing technologies cultivated so far, we aim to make use of the ENEOS Group’s abundant procurement of



“Our strategy is to transform our operation into a ‘glocal’ one, effectively combining global and local elements.”

Hayato Hirano, President, ENEOS Materials

petrochemical raw materials, funds, and global network to stably supply higher quality and even more competitive products,” says the company’s president, Hayato Hirano.

“In addition, in order to respond to changes in the business environ-

ment such as globalization, social infrastructure, mobility, and the achievement of sustainable development goals (SDGs), we will continue to improve our quality and technology skills, promote

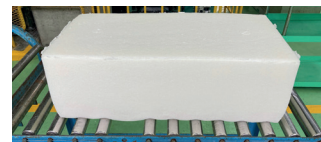
creation and innovation, and contribute to the development of society through materials derived from biomaterials and biofuels.”

ENEOS Materials operates with two main missions in mind. One is a direct contribution to carbon neutrality, which involves the supply of bio-based products mentioned above. Another is an indirect contribution, which is through the provision of specialized products suitable for energy saving and low abrasion tires.



Butadiene Tower

“Over the past decade, our company has made significant strides, largely attributed to our overseas production sites, a global sales network, and robust technical support infrastructure across Germany, Belgium, China, Thailand, India, Korea,



Rubber bale (bulk of raw rubber) and the U.S.,” says Mr. Hirano. “These strides and measures are based on the ‘Glocal’ management philosophy and strategy. The business is about global development, however, the operations should be localized. This is at the center of ENEOS Materials’ management policy. We will never stop improving our quality and technology skills and the uniqueness of our materials continue to contribute to the development of society.”

ENEOS Materials Corporation
www.eneos-materials.com

Magnetic materials for the next generation of vehicles

As the automotive sector undergoes a once-in-a-lifetime change, TODA KOGYO provides unique products, like FEROTOP, to help spark the EV revolution.

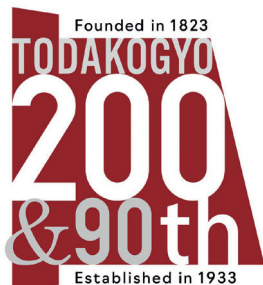


“Our activities right now are geared toward the automotive industry to capitalize on a once-in-a-generation shift.”

Shigeru Takaragi, President & CEO, TODA KOGYO CORP.

With more than 200 years of experience in the chemical material manufacturing industry, TODA KOGYO is looking to expand its unique products into the electric vehicle (EV) market. The company uses the characteristics of inorganic materials to develop and supply a wide

range of iron oxides and material parts globally. With an emphasis on R&D, the Japanese firm has developed high-quality materials for toners used in printers and copiers, cathode materials for lithium-ion automotive batteries, and antenna materials for mobile devices.



Anniversary logo

One of the company’s most innovative products is FEROTOP, a composite molding material made by mixing resin with magnetic powder, developed by Shigeru Takaragi, President of TODA KO-

GYO. Mr. Takaragi explains that FEROTOP is “a material that allows us to control the magnetic powder and provide magnets with the magnetic properties that our customers are looking for.” FEROTOP can be used in components such as fan motors for air conditioners and cooling water pumps for automobiles. The company also provides further solutions for EV production through its use of ferrite material as a replacement for metallic sealing in order to prevent electromagnetic disruption.



FEROTOP®

TODA KOGYO has partnered with fellow Japanese companies to conduct research on new chemical compounds as well as new methods of application. Mr. Ta-

karagi states that TODA KOGYO is ready to accelerate its business expansion overseas if the opportunity presents itself.



CO₂ solid sorbent

Carbon neutrality has become an important focus in many industries, and Mr. Takaragi explains that the company wishes to “to continue to innovate and develop positive materials that contribute to the global goal of a carbon neutral and Earth-friendly environment.”



www.todakogyo.co.jp/english

Koike Sangyo looking to target overseas expansion and emerging markets

Entering untapped Middle Eastern markets is part of an ambitious development strategy that will also see the chemical trader move into traditionally female dominated sectors such as cosmetics.



"Our aim is to strengthen our overseas network."

Yukichika Koike, President & CEO, KOIKE SANGYO, INC.

Despite - or perhaps because of - its lack of natural resources, Japan has become a significant player in the chemical industry over the years, with trading companies making a major contribution to the country's economy since it began 150 years ago.

One such company is Kansai-based Koike Sangyo, a specialist in batteries, electronics, resins and plastics, first established in April 1911.

No firm survives for over a century without facing a variety of challenges, and arguably the most pressing of these is Japan's current demographic situation, where an aging population means a shrinking domestic market and ongoing labor shortages.

Koike Sangyo president, Yukichika Koike, is keen to emphasize that the company's response to these issues belies the stereotype of Japanese industry as inward-looking and resistant to change.

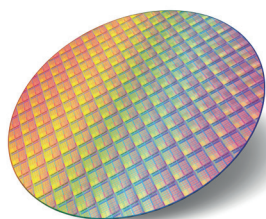
"As Koike Sangyo, we have primarily focused on the domestic market as a trading company," he concedes, "and a significant portion of our sales still comes

from within Japan. But we have recently started expanding our overseas sales and established overseas bases. We have also set up a new department dedicated to the overseas market and increasing the trade ratio."

Key here, according to Mr. Koike, will be the establishment of new free trade agreements (FTAs), which many countries, he believes, do not make use of as extensively as they should. "Harnessing FTAs effectively," he says, "will contribute to the growth of our business."

As for the expectation that traders, historically responsible for logistics and financing, provide value-added services to clients, Mr. Koike is in no doubt about what sets Koike Sangyo apart.

"As a trading company," he says, "our goal is to be a comprehensive producer. This means that we not only help companies sell their products, but also position ourselves upstream by providing logistics, inventory management expertise, and by assisting with store development. We aim to offer a holistic solution to our clients, contributing to the entire process, rather than just being a part of it."



Photoresist & Solvents by Electronic Material Division

When it comes to overseas expansion, relying on exports and establishing local branches does not always guarantee success in the local market. Instead of contacting Japanese companies exclusively, Koike Sangyo's strategy involves establishing a local network by reaching out to local companies.

It is a strategy that is already starting to bear fruit. Mr. Koike again: "Through this approach,

we have discovered that local companies are also interested in exporting their products to Japan, presenting new opportunities. So, our Asia strategy involves reaching out to local companies rather than relying only on Japanese ones. We assist with procurement, sales, and distribution, and we help facilitate their sales to third countries."

Looking to the future, Mr. Koike is keen to establish a presence in countries that other Japanese firms don't typically target. Saudi Arabia, for example, as well as other

countries in the Middle East, which, Mr. Koike says, "have a genuine interest in Japanese products, but often face challenges due to the language barrier."

He continues: "Japanese catalogs, for example, are only available in Japanese, making it difficult for potential customers to understand the contents and make informed purchasing decisions. Our aim is to bridge this gap and facilitate business by providing accessible information."

A desire to penetrate untapped Middle Eastern markets is, of course, part of a wider company strategy to "explore regions or countries that others are hesitant to tackle, to challenge stereotypes and seize opportunities."

Still, there are challenges on the homefront too – and stereotypes to break down.

Even at one of Japan's leading trading companies, only 15% of employees are female; and in managerial positions the figure is even lower. Yet, as Mr. Koike acknowledges, female employees bring diverse perspectives and contribute unique value to the companies they work for.

"In a declining population," he states, "it is vital to create an environment where women can work and balance their careers with motherhood."



Electrode material by Battery Material Division

Perhaps with this statement in mind, Koike Sangyo is gearing up for expansion in the rapidly growing Femtech market, and is soon to release a new cleansing product called *hemmate* with internationally renowned make-up artist Haruka Tazaki.

The product, which was inspired by the hardships endured by women during the Covid-19 pandemic, is part of an accessible range of daily care products designed, in the words of its inventor, "to help women liberate themselves and foster greater self-love."



Ms. Haruka Tazaki

In 2026, Koike Sangyo will celebrate its 115th anniversary, a hugely impressive achievement by any standards. But Mr. Koike will not be resting on his laurels. "Within the next three years," he concludes, "our primary objective is to achieve a 30% contribution from overseas operations. Our work has only just begun."



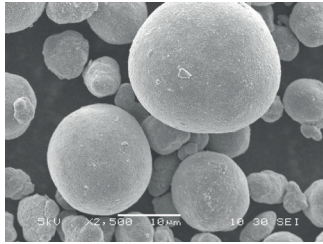
小池産業株式会社
KOIKE SANGYO, INC.

www.koikesangyo.co.jp/en

Specialty Adhesive
by Resin & Performance Material Division

Energizing the future: Inside the innovations of Kansai Catalyst

With a strong foothold in the Japanese chemical industry, Kansai Catalyst is charting a more diverse course towards international success.



Spherical nickel hydroxide

Despite the challenges from regional competitors, Japanese chemical manufacturer Kansai Catalyst is thriving, focusing on highly functional and specialized chemicals.

In addition to the characteristic battery materials, Kansai Catalyst's versatility extends to electronic components, catalysts, and surface treatments, catering



"With over fifty years of battery material expertise and a commitment to quality, we lead in the chemical industry's technological advancements."

Yoshiki Minoura, President, Kansai Catalyst Co., Ltd.

to the distinct requirements of these sectors, and quality remains a fundamental commitment.

"Japanese chemical companies have a high level of experience in quality control," president Yoshiki Minoura says, also pointing to the key role played by collaboration with customers, exchanging ideas and specialized knowledge.

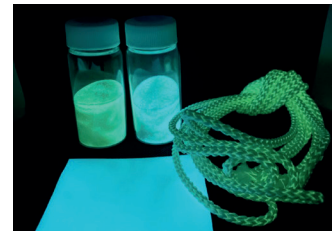
Kansai Catalyst aims to cultivate a global clientele base across Asia, the United States, and Europe. And in the face of



Composite nickel hydroxide

critical lithium-ion battery material shortages, the mission around augmenting recycled material utilization, with Mr. Minoura anticipating "substantial advancements in recycling by 2025".

Kansai Catalyst's spheroidizing technology allows it to produce high-density nickel hydroxide and composite hydroxide, meeting diverse battery design requirements. And its R&D also targets new functional materials, such as luminescent ones with



Phosphorescent

potential applications in power outages and security.

Being actively involved in the Electronic Components Industry, especially functional materials, as well as the field of battery technology, allows Kansai Catalyst to further explore those international opportunities, adapting to the dynamic markets.

And with that in mind, Mr. Minoura's objective for the future is to chart a new core trajectory beyond batteries.

"Aside from the technological evolution in battery materials, I envision a transformative shift and my goal is to establish another pivotal axis for our business, diversifying our strategic landscape."

Kansai Catalyst Co., Ltd.

www.kansyoku.co.jp/english

Nippon Pigment's vision for sustainable growth

Amid supply chain disruptions, demographic shifts, and growing demand for sustainability, Japanese manufacturing stands at a pivotal moment, and Nippon Pigment is one example of those addressing these dynamic changes.



while the rising material prices from China impact performance.



Factory in Kodama, Saitama (constructed in 2018)

"For liquid dispersion, the next focus will be the metal material area of the semiconductor industry, with our mixing technology potentially making this a key market."

Tatsumi Kato, President, Nippon Pigment Co., Ltd.

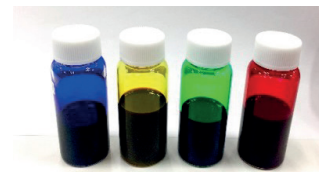
Japanese manufacturing faces various challenges and opportunities, and Nippon Pigment is one company taking advantage of its reputation for reliability. Despite benefits of a depreciated JPY, this is countered with the shift back to the domestic market after COVID,

"We are reviewing our entire business in the aftermath of the pandemic to focus our investments on areas that will help support the sustainability of our operation," says company president Tatsumi Kato.

To address demographic changes, Nippon Pigment is diversifying its workforce, introducing male and female workers, local and foreign, while investing in automation to ease physical burdens. This approach mirrors the production facility of its affiliated company in China, which, thanks to automation, has increased productivity sevenfold.

One major strength is its liquid dispersion technology, and Mr. Kato identifies the automotive and semiconductor industries as key markets for this, especially as the automotive industry transitions to electric vehicles.

"We are developing die bonding materials for power semiconductors, and monitoring continued growth in the sector."



Solvent-based nanoparticle dispersion, NEODISPER®

In line with global Sustainable Development Goals, Nippon Pigment is actively pursuing environmentally sustainable solutions and initiatives to reduce waste and energy consumption. Another important aspect is



Overseas factories

partnerships to sustain overseas operations, Korea and Indonesia being key examples.

Looking further ahead, the president is aiming for some clear outcomes from their ongoing review process.

"I would like to get a good evaluation of our liquid dispersion technology, which will be the first step in transforming our business model," Mr. Kato concludes.

日本ピグメント株式会社

www.pigment.co.jp

Pantech: The international plastic recycling specialists

The Japanese firm Pantech has established itself as a leading provider of plastic recycling services, working with partners in Japan and overseas.

Established in 1996, Pantech is a Japanese company that provides comprehensive waste plastic recycling services. It specializes in collecting plastic scrap generated by the consumer goods industry, before converting it into recycled plastic raw material and distributing it domestically and internationally.

"Plastic has a lot of different types, from general purpose resins such as polyethylene terephthalate (PET) and polypropylene (PP), all the way to engineered plastics such as carbon-fiber-reinforced polymers (CFRP)," says Masaaki Kuroki, Pantech's president. "There are many kinds of plastic waste, so we have developed various solutions for the collection of these different plastics."

Based in Otsu City, Shiga Prefecture, Pantech is a fables company, working with partner recycling factories both in Japan and overseas. In all, the firm currently boasts a network of some 50 partner recycling plants – a total that is always rising. "As we increase the number of partnerships we have, we can also increase the volume of recycling that we can do," Mr. Kuroki notes. "This will grow our business and lead to further contributions to the environment."

At the heart of everything Pantech does is a dedication to *Sanpo Yoshi* – a corporate philosophy that has been the company's credo since day one. "*Sanpo Yoshi* means creating benefits for all three sides," Mr. Kuroki explains. "Pantech seeks the greatest possible benefits for itself, for waste-producing companies and for its partner plants, in order to contribute to society and sustainability."

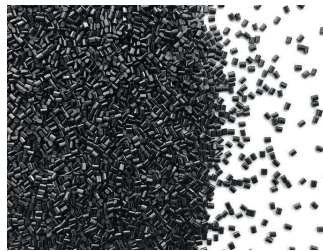
Ultimately, the company's goal is to help achieve a circular economy – in line with the Sustainable Development Goals (SDGs) established by the United Nations – in which materials are recycled and reused, and waste

"Pantech seeks the greatest possible benefits for itself, waste-producing companies and partner plants, in order to contribute to society and sustainability."

Masaaki Kuroki, President, Pantech Co., Ltd.



Pantech Headquarters



is kept to an absolute minimum. "To realize this vision, though, it is essential to adopt a circular design process that considers the product's recyclability before it is manufactured," Mr. Kuroki says. "Of course, product design change is not easy, but Pantech provides companies with extensive circular design support throughout the research and development process." Pantech will open its Circular Design Center (CDC) this year on December 8th in order to comply with the increasing quality demands of the global market.



Sanpo Yoshi "Benefit for All Three Parties"



Kanpla "Plastic Circulation"

In Japan, Mr. Kuroki continues, there is a growing sensitivity to the importance of recycling and the need to improve products' recyclability. "Japanese people have been raised on mass consumption and mass production, which in turn has resulted in mass waste," he says. "And the Japanese emphasis on superior quality means there is a proclivity to produce intricate materials or products that amalgamate diverse materials. This complexity can lead to products that pose challenges in recycling. In 2021, however, the

Japanese government gave people the opportunity to reflect on how they use plastic and I think now, slowly, Japanese manufacturers are becoming more aware of just how vital plastic recycling is."

Crucially, manufacturers are increasingly open to teaming up with organizations like Pantech, Mr. Kuroki says: "We have seen a growth in opportunities to work with the people in the development departments at companies that produce waste. By working with those departments, we have been able to come up with solutions."

Internationally, Pantech has a history of working closely with recycling partners overseas – and as the company seeks to strengthen the already significant impact of its activities, it is targeting new alliances right across Asia. "Up until 2017, more than 80% of recycled plastic generated in Japan was supported by global demand, so because of that we have a lot of partners abroad," Mr. Kuroki reveals. "Actually, you can find a lot of companies overseas, especially in the U.S.A. and EU, with advanced recycling technology, far better than that found in Japan. This is why we have a lot of partnerships for technology all over the world for plastic recycling."

"Moving forward, we would like to promote even more cooperation with Asian countries, particularly in the Association of Southeast Asian Nations (ASEAN) region. If we look at commodity production, a lot of Japanese companies have moved their production sites to other Asian countries, and 50% of European plastic production is now done in Asia. We believe a focus on the production of recycled products is needed throughout Asia more than any other region. There is a lot of potential in this region for recycled products."



www.pantechco.jp

Oak Tree: CNT innovation for semiconductors and beyond

CNT innovator Oak Tree is using its unique carbon nanotube techniques in the technologies of the future.



"Practically every company in the world is looking at ways to decrease their carbon footprint, and our products fit the bill."

Kodai Okuma, President,
OAK TREE INC.

Innovative thinking does not always entail the invention of something new, but often it is the reimagining how a product can be used. Japa-

nese manufacturer Oak Tree is taking this approach with its diverse uses for its forward-thinking technology.

The company's underlying strength lies in its ability to make decisions and embrace new technology quickly, owing to its management structure which allows company president Hiroshi Okuma to quickly decide on the correct strategic moves.

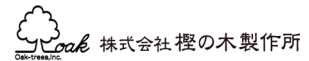
One of the company's hallmark technologies is its single-walled carbon nanotube (CNT) dispersion. Oak Tree separates single CNTs into ultra-pure metallic type CNTs and semiconductor CNTs. As Mr. Okuma explains: "CNT films offer unique properties including high conductivity, flexibility, and sensitivity, making them suitable for various kinds of industries."

However, Oak Tree's vision stretches further with the product, and it is especially interested using its know-how to move into the printing of radio-frequency identification (RFID) tags. The production of RFID tags through printing technology will make it possible to manufacture tags at just a tenth of the current cost. This huge reduction in cost will allow RFID tags to be used in a plethora of products.

As Mr. Okuma adds: "I envision a future where information is stored on a person themselves. Through the chip, we might be able to access information like required medication saving peoples' lives." The company is actively looking for like-minded partners who can aid them in the production of RFID tags to make this vision a reality.

This type of innovation reflects Oak Tree's R&D strategy which sees it working in partnership with experts from Tsukuba University to expand its knowledge of the possibility of single-walled CNT dispersion, a technology key in the production of RFID tags.

As the company continues to increase its range of environmentally-friendly, CNT-based solutions, it is also committed to finding new markets which its unique technologies can improve, including telecommunications. As Mr. Okuma says: "Practically every company in the world is looking at ways to decrease their carbon footprint, and our products fit the bill."



www.oak-tree.co.jp

TB Global Technologies looking towards the future

With more than 65 Years of excellence in the transfer of liquids and gasses, TB Global Technologies has developed first-class "Made in Japan" loading arms, becoming instrumental for Japanese energy security, and contributing to the international supply chain with its technology and quality.



"As a first-class designer and manufacturer, our role is to develop new products and solutions that can contribute to society."

Laurent Poidevin, President
& Representative Director,
TB Global Technologies Ltd.

Playing a core role in the Tokyo Boeki Group, TB Global Technologies strives to enhance people's standard of living by offering creative solutions to the energy industry. As a technical partner for its customers, TBG participates in the



Marine Loading Arms

global energy society through the development, manufacturing, sales and maintenance of energy-related equipment, with loading arms being its flagship product and a vital link in the energy supply chain.

"Our TB-NIIGATA brand is recognized worldwide for its unmatched quality and reliability," says president Laurent Poidevin. "We are very proud to be present in Japan and on the international stage."

TB-NIIGATA

Recently TBG pioneered the development of a liquid hydrogen rigid articulated loading arm in

cooperation with Kawasaki Heavy Industries, Ltd. (KHI). This first-of-its-kind technology was particularly challenging in terms of design to cope with cryogenic temperatures of -253 degrees celsius, and high inflammability due to the presence of oxygen. To minimize heat



ingress, full vacuum insulation was implemented. TBG is delighted to contribute to the energy transition with this new LH2 loading arm, which enables the realization of a cleaner energy society.

Energy transition will happen regionally in different paths, with fossil fuels, principally decarbonized LNG, playing a paramount role in this transition. To that end, many countries still aim to give up coal



Swivel Joints

and ensure their national energy security; and new infrastructure to export and receive LNG will be necessary to support this transition. "TBG wants to be instrumental in offering modern, environmentally friendly solutions according to the latest available technology, for on-shore, nearshore or offshore projects," Mr. Poidevin confirms.

TB Global Technologies Ltd.

www.tbgttech.co.jp

Super Resin: Shaping the future of industry through innovative materials

Its excellence in composite materials and R&D marks Super Resin out as a genuine innovator.



"At Super Resin, we're not just making materials; we're creating the future, one innovation at a time."

Akio Asakura,
President, Super Resin, Inc.

A pioneer in Fiber Reinforced Plastics (FRP) molding, Super Resin has for over 60 years established its expertise in advanced composite materials offering one-stop solutions tailored to the requirements of its customers, including parts manufacturing for aerospace equipment, LCD/OLED and semiconductor manufacturing equipment, industrial machinery, and defense (e.g. Radar Dome).



Radar Dome

"In addition to utilizing high-quality composite product design and manufacturing technologies, we propose optimized one-stop solutions by applying advanced design technologies that cover every stage through electrical, mechanism, and optical design," explains Akio Asakura, President of Super Resin. "We now have over 60 years of experience specializing in FRP, firstly in Glass Fiber Reinforced Plastics (GFRP) and later in Carbon Fiber Reinforced Plastics (CFRP) and throughout our history we have tended to

produce high-mix-low-volume, providing cutting-edge technologies and products to the market."

One of the unique projects associated with Super Resin is the Expo '70 in Osaka, the first ever 'world's fair' held in Japan and Asia. "One of the symbols of the event was called The Tower of the Sun where we produced the Face of the Sun, and although it looks like it is made from concrete, it's in fact made of GFRP," says Mr. Asakura.



The "Face of the Sun" (lower)

Fast forward to today and currently the company is engaged in numerous aerospace projects.

"Our business model is B2B mainly," the company president continues. "Super Resin has two key business pillars: one is to focus on R&D, providing cutting-edge solutions, and the second is manufacturing high-quality items with thorough care." This manufacturing activity accommodates about 70% of Super Resin's business serving clients across industrial machinery, aviation, aerospace and defense. Within this 70%, each of these three market segments represents approximately 33% of that total share, outlines Mr. Asakura.

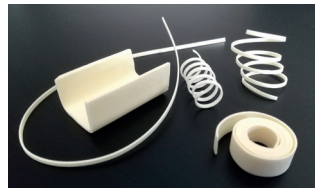
"One other key up-and-coming field we are now focusing on is the energy field. This is tied with wind power generation and future power generation in particular. When I say 'future' I'm specifically referring to nuclear fusion. In the context of vehicles, hydrogen tanks emerge as strong candidates for both transportation and energy storage. These tanks would incorporate CFRP, and this is an area where we believe we can make a significant contribution."

As part of this effort, Super Resin is currently engaged in a collaborative R&D effort with a

well-known Japanese automotive manufacturer, focusing on materials for next-generation vehicles.

"This project is relatively small in scale, aimed at jointly developing, evaluating, and analyzing materials," says Mr. Asakura. "But through partnerships like this, our goal is to establish a stronger presence in the next-generation vehicle industry. Additionally, we see promising opportunities in the large-size drone sector and eVTOL. We are currently conducting market research and exploring potential partnerships with companies in these fields as well."

Since being established in just 2011, the company's R&D department has since then been dedicated to the development of proprietary resins used across a number of innovations applied to diverse uses and industries. At the heart of this innovation is what Super Resin calls 'Epoxy Foam' technology, which enables the creation of exceptionally lightweight CFRP sandwich configuration.



Original foam material
"Epoxy Foam"

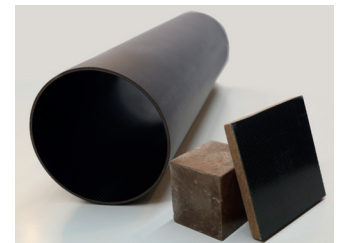


Application example for
complex shape

"What sets this technology apart is its ability to produce thin foams right from the outset, eliminating the need for post-processing such as shaving or grinding to achieve desired thicknesses," explains Mr. Asakura. "This epoxy foam offers the flexibility to shape 3D structures seamlessly during

the initial manufacturing phase. Intriguingly, when we combine it in a sandwich structure with CFRP skin and epoxy foam as the core material, we achieve a remarkable balance of extreme lightweight properties, alongside the high rigidity and strength characteristic of CFRP. This combination results in products that are both robust and flexible, allowing us to shape them into various forms, including cylindrical shapes."

The company also recently introduced its Glycol Lignin-containing Epoxy Resin System, a groundbreaking biodegradable epoxy resin. Glycol lignin, derived from Japan cedar, possesses two noteworthy attributes: it facilitates carbon dioxide absorption during cedar growth and boasts inherent biodegradability.



Original environmentally friendly material
"Glycol Lignin-containing Epoxy Resin System"

"By blending glycol lignin with epoxy resin, we reduce our reliance on oil-derived epoxy resin and facilitate the formation of CFRP while immobilizing carbon dioxide. This innovative system is also adaptable, opening up a plethora of solutions for our clients, as it can be adapted to both CFRP and foam materials, allowing for the creation of diverse shapes and forms. The development of this epoxy system underscores our commitment to transitioning from older products to environmentally friendly, biodegradable alternatives that align with our clients' Sustainable Development Goals (SDGs)."



www.super-resin.co.jp/en

TORQ: The leading screw wholesaler starts to provide digital services as its revenue driver

Known throughout Japan as the market leader of screws, TORQ has transformed into a digital services provider for SMEs in the construction and manufacturing trades.



More than 50,000 items in stock

Having grown its business hand-in-hand with Japan's modern industrial development, TORQ Inc. has provided *monozukuri* centered around screws for nearly 100 years. Today, in a challenging environment for the construction trade amid Japan's increasingly aging population, TORQ Inc. is now focussed on reinventing itself as not just a screw wholesaler, but a digital services provider.

"A lot of SMEs and secondary traders have had serious succession issues in recent years, so in

many cases they are now being absorbed by larger companies or simply closing down their businesses. In order to grow within the existing market, we try to do M&As or engage in partnerships within the industry, but also we are trying to provide new types of services besides the screws themselves," explains TORQ president Toshiyuki Higaki.



Automated warehouse in central Osaka, Japan

"For example, we have developed a B2B e-commerce application which is called Neji Net, which allows clients to easily complete transactions online. By providing

this service we are supporting the enhancement of their production capabilities and to date, we have completed transactions with approximately 1,000 businesses. I think this is a key strength of the company that differentiates us from our competition."

TORQ has also independently developed a locker box for product delivery utilizing IoT technology. This smart locker is equipped with infrared sensors and remote surveillance cameras, allowing real-time monitoring of the storage status of packages. It also in-



IoT Smart Locker Box System



"We are providing new digital types of services besides just screws."

Toshiyuki Higaki,
President of TORQ Inc.

tegrates with the company's mobile device application software, available since May 2023, enabling safe and secure unmanned delivery of products around the clock.

And now, the company has begun offering these digital services to its customers in addition to screws, becoming a digital service provider.



Precision stamped: Mutsumi Industry's tailored solutions

Mutsumi Industry supports customers by manufacturing products with the best quality, lowest cost, and fastest delivery.

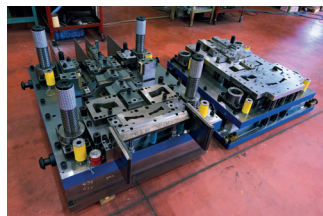


Tetsunori Kondo, President,
Mutsumi Industry Co., Ltd.

Established in 1949, Mutsumi Industry has forged its position in R&D, design and the production of press dies and machines for production lines. As challenges and opportunities have emerged, the company has managed to adapt.

"Japanese companies adhere to quality standards that surpass those of any other nation on the planet," believes the president, Tetsunori Kondo.

By designing and manufacturing stamping-dies and machines for mass production, Mutsumi Industry supports its customers across multiple industries including automotive, home appliance and construction.



Stamping-die

From the starting point of developing prototypes, the process is seen all the way through to production. Even after delivery to customers, Mutsumi engineers also provide support, including on-site startup, parts supply, maintenance, repair and training of workers.

"Our stamping-die manufacturing must be seamlessly complemented by top-tier engineering capabilities," Mr. Kondo says of one of the company's key selling points. "We craft the die systematically, from analysis to 3D design, undertake virtual trials to ensure feasibility, and ensure precision manufacturing using cutting-edge technology. All our stamped parts

undergo thorough inspection via a coordinated measuring machine."

The team's expertise spans a wide spectrum, from crafting small precision components to large parts using a diverse range of materials, including high-tensile steel.

"Every machine is tailor-made with the specific details of each order arranged for every customer," adds the president. "The ability to deliver products to clients within their desired time frame holds



Specialized machine paramount importance." Machines, AI and advancements in robotics play a pivotal role in the company's production capabilities, including plastic forming, caulking, inspec-



1,300kN servo press

tion, transfer, assembly, hydraulic, servo mechanisms, and cutting.

As the business has grown, and it explores various promotion avenues, including distribution channels, technology transfer, and partnerships, it already serves more than 17 countries around the globe. And Mr. Kondo envisions a bright future.

"The trajectory beyond this point rests upon the shoulders of the subsequent generation, with my daughter poised to steer the company's course for many years to come."



mutsumi-industry.co.jp/index-eng

Takumido: Nurturing craftsmanship, uniting SMEs, and transforming industries

Takumido is committed to revitalizing traditions, fostering expertise, and building a brighter future.



From left to the right: Masanori Arai, Nihon Kansoki; Masahiko Yoshino, Nippon Engineering Service; Hirotake Tomobe, Otomo Seisakusho; Rikiya Masuda, Hartwell; Yohei Ito, Pronec & Saito; Nobuyasu Tomobe, Takumi no Haken; Koichi Fujita and Yuichi Tanaka, PLUSEEDS

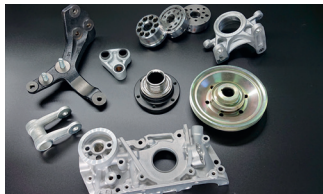
At the heart of Japan's manufacturing sector, Takumido, under the leadership of Mitsunori Suwa, its Representative Director and



Packaging machine, Nippon Engineering Service

President, is making waves with its unique approach to revitalizing small and medium-sized enterprises (SMEs). Specializing in breathing new life into struggling businesses, particularly those in manufacturing, Takumido focuses on preserving the rich tradition of Japanese craftsmanship on a global stage.

"Our mission is to drive and revitalize struggling businesses, leveraging the strengths of Japanese manufacturing values," says the company president. "These are things to be preserved, given their great appeal for exceptional quality, meticulous production processes, and punctual delivery."



Metal components processed by Saito

One of the ways Takumido aims to distinguish itself is by fostering collaboration among its group's companies, often SMEs lacking public listing and financial resources. This desire for alliances extends beyond traditional boundaries, with firms pooling

their strengths to cover functions like marketing, PR, and supply chain management.

"One company can be really good at finance or marketing, but it may be lacking in other areas. Each can contribute its expertise, and any weaknesses can be compensated by others," Mr. Suwa explains, highlighting the example of Pluseeds using Takumido's marketing support along with Hartwell's PR knowledge. The key is maintaining a trustworthy *monozukuri* reputation.

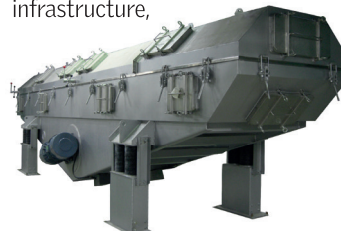
There is a common awareness that Japan's aging population poses a challenge, especially in the transfer of essential skills. Takumido's unique approach to this involves rethinking retirement age and allowing skilled elderly workers to contribute on a more flexible basis, focusing on passing down valuable attributes to the younger generation.



Coil products, Pronec

"This helps address the pressing issue while allowing older workers to find joy in their work and life, fostering a sense of usefulness in society," the president emphasizes.

Recognizing the importance of digital transformation, Takumido is actively developing a unified IT infrastructure,



Industrial Dryer, Nihon Kansoki

focusing initially on areas such as sales and marketing, with a gradual expansion to supply chain management and production control.



Cosmetic containers, Pluseeds

"Whether frequency of client interactions or website traffic metrics, we will access everything from one centralized location," explains Mr. Suwa.



Imabari Towel, Hartwell

In the face of rising competition from countries like China, Takumido banks on the aforementioned collaboration within its group's companies to preserve a competitive edge. Aiding the expansion of smaller Japanese firms is not only within their own nation but also overseas, with enterprise-level management at the forefront.

"Our concept revolves around our uniqueness and cutting-edge niche products," Mr. Suwa notes.

With a view to an overall international expansion strategy, targets are on optimizing resources, leveraging factories in the Philippines and Thailand as central hubs for growth in Asia. The company remains cautious when required, stressing the consolidation and strengthening of core operations at its headquarters, with an objective to establish a stable foundation within the domestic market.

The Japanese firm's business model clearly involves acquiring struggling companies, but Taku-



"We're dedicated to preserving Japan's craftsmanship legacy and empowering SMEs to thrive."

Mitsunori Suwa,
Representative Director &
President, Takumido Co., Ltd.

mido has a different perspective to others by providing comprehensive support, becoming the headquarters for each of those SMEs, and allowing organic exploration of funding or partnerships. This long-term commitment sets it apart from traditional private equity funds.

"Our concept may put us in a unique position to welcome new companies," Mr. Suwa proudly adds.



Plastic injection molding products, Otomo Seisakusho

As Takumido looks toward the future, the president envisions the company following through on the substantial growth potential and an expanding workforce, with the focus remaining on investing in optimized factory spaces, embracing AI technology, and establishing a manufacturing hub.

"If there are those who share our vision globally, we'll gladly want to hear from them and will enjoy working together," he concludes.