

JAPAN

Be safe, feel safe: safety is the key for a sustainable world

Throughout the 75 years of its history, IDEC has constantly strived to provide the optimum HMI (human machine interface) products, so that humans and machines can collaborate safely and efficiently.

Safety should never be traded off for higher productivity. A win-win approach is necessary. To achieve these apparently conflicting goals, we take a comprehensive, interactive approach that focuses on human, technology, management, and international standards.

First, an adequate level of safety knowledge is required for workers. IDEC is the market leader in Japan in terms of industrial risk assessment capabilities accounting for 40 percent of safety lead assessors and over 30 percent of robot safety assessors certified in Japan. To help the

Training people alone is not enough to ensure the safety and productivity of the workplace, and machines must remain safe even if they break down or if a worker makes a mistake. We have various safety devices such as emergency stop switches, door interlock devices, laser scanners, door interlock devices, laser scanners and light curtains to build safe manufacturing environments.

Among IDEC's broad lineup, the robot safety device installed on the industrial robot operation console stops the robot with the operator's reflexive motion in the face of dangerous situations, and



Concept of Safety 2.0



Safety (be safe) and ANSHIN (feel safe) where humans and machines collaborate in a shared area.

working community acquire safety knowledge, we offer seminars and consultations on safety in manufacturing and in explosion-proof work environments. In Japan alone, IDEC has held 1,600 seminars with 37,700 participants cumulatively.

Secondly, IDEC offers the leading safety technology in our products.

occupies 90 percent of the global market share. And as we enter an era where humans and machines/robots work collaboratively, IDEC advocates the next-generation safety concept, *Safety 2.0* (Collaborative Safety). The conventional way to ensure safety has been to implement protective measures on

machines and to isolate machines from humans. In Safety 2.0, people, machines and the environment collaborate to maintain a high level of safety. Based on this concept, IDEC, also as a system integrator, provides services and solutions for the establishment of flexible and highly productive production systems and collaborative robot systems.

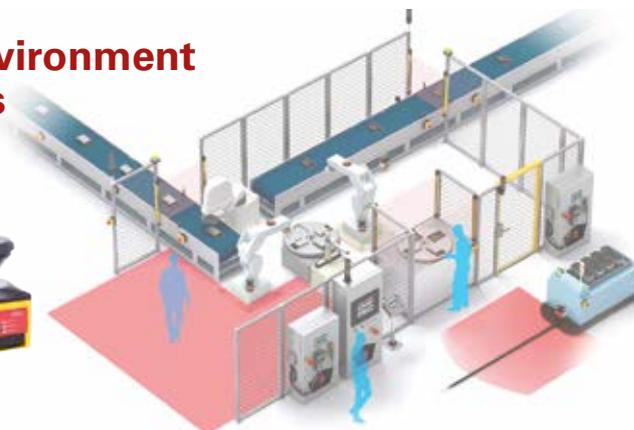
Thirdly, acknowledging the pivotal role that management plays in ensuring safety and productivity, IDEC became the first Japanese company to join the *Vision Zero* campaign. Led by the International Social Security Association (ISSA), *Vision Zero* is a global campaign calling for safety, health and well being in workplaces. The *Vision Zero* philosophy that requires top management to engage in sustainable workplaces matches with our corporate safety policy, and we strive to build a climate of trust and open communication in our workplace.

The fourth element that completes IDEC's safety approach is participation in the international standards activities. As a manufacturer of devices that protect the lives of people at work, IDEC has actively participated in various activities related to international standards, such as ISO and IEC standards, for the healthy and sustainable evolution of technologies.

Since its foundation in 1945, IDEC has created innovative products and features above and beyond regulation requirements to create peace of mind which has contributed in setting higher safety standards across industries. Moving forward, IDEC will continue developing technologies to create a safer and sustainable world.

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Japanese robotics to help companies drive efficiency

As sales of industrial robots have grown sixfold in less than a decade, it is estimated that increased automation in the workplace could cut labor costs, increase productivity, limit defect rates and enhance quality.

Industrial robots have been used on assembly lines for decades now. But recent technological advances have enabled them to take on more complex work with more speed, accuracy and efficiency than human workers, thus prompting booming global demand that shows no signs of slowing down.

Global sales of industrial robots have grown sixfold in less than a decade, rising from 60,000 units in 2009 to 381,000 units in 2017, according to a report by the International Federation of Robotics (IFR), which predicts that figure to reach 630,000 units in 2021.

Five major markets represented 73 percent of the total sales volume in 2017: China, Japan, South Korea, the United States and Germany. As automation continues to rise, Boston Consulting Group forecasts that 45 percent of tasks in China, Japan, and the U.S. will be carried out by robots by 2025, compared to a current global average of 10 percent.

The use of industrial robotics has resulted in significant improvements in quality and efficiency for manufacturers. After a Chinese factory replaced 90 percent of its human workforce with automated machines, it experienced a 250 percent increase in productivity and an 80



percent drop in defects. Meanwhile, Sony's automation activities have staggeringly reduced defect rates from 2000 to 20 parts per million.

As leaders in the use of robots and factory automation, Japanese companies have managed to significantly boost their competitive edge and drive growth. In Deloitte's Global Manufacturing Competitiveness Index 2016, Japan ranked the fourth most competitive country for manufacturing, a big jump from the number 10 spot it held just three years prior.

Quality and competitiveness, therefore, have become key drivers for factory automation in Japan, but so too has the nation's demographics. "Relying on automation processes

and robots will be one of the solutions to our decreasing workforce and aging population," says Mr. Yoshiharu Inaba, Chairman and CEO of FANUC Corporation, the world's leading manufacturer of industrial robots.

"However, this solution is clearly not limited to Japan. It will be applicable to the entire world. Our industry is focused on developing robots that can help human beings. The idea is to have machines, robots and such, do the heavy and monotonous labor, while humans focus on precise and unique work."

Toshi K. Funaki, President of IDEC Corporation, another leading Japanese manufacturer of industrial robots and factory automation equipment, takes a similar view.

"I believe that the Japanese population should embrace these new technologies. Robots could be the answer to our shrinking labor force and they should be able to work together with humans, which in my opinion can be nothing but positive for our country," he says.

"We are coming to a new era of machine and human cooperation, which we are excited to take on. There are many fields that require our technology and we are building strength in human and machine interface systems, for which we currently have a 50-percent domestic market share."

Together, FANUC, IDEC and a string of other Japanese companies – including Yaskawa Electric, Mitsubishi Electric, Omron Corp., Yokogawa Electric, and Nidec Corp. – are responsible for delivering over

half of the global demand for industrial robots. Five of the top 10 producers are Japanese, making Japan the world's number one industrial robot manufacturer.

As a result of the increasing global demand for these companies' products and the advancements in automation and robotic technologies, the value of the Japanese market for factory automation and industrial controls is expected to grow to \$20 billion by 2021, up from \$13.11 billion in 2015.

But it's not just the major players looking to drive the way towards a new era of robotics and factory automation, key elements of the Fourth Industrial Revolution (or Industry 4.0). So too are smaller-scale companies known in Japan as the *Chuken Kigyo* – the strong and technology adept Japanese SMEs.

"There are several fields into which we are looking to expand. With the advance of Industry 4.0, robotics is playing an ever increasing role in production lines. As such, we would like to grow our portfolio in this business," says Shigemasa Yanagawa, president of Cominix Co., Ltd., a trading company specializing in industrial equipment, including cutting tools, precision measuring machines and optical systems.

With decades of experience bringing unique solutions to the market, Cominix today has a presence in China, South East Asia, Mongolia, Mexico and the United States, where it trades under the name Cominix U.S.A., Inc.

Always seeking the best technology to offer its clients, the company sources much of its products from Japan, Germany and U.S. – all leaders, of course, in robotics and factory automation technology, which should help to facilitate the growth of Cominix's product portfolio in such technology.

The trading firm is also exploring other Industry 4.0 technologies in its quest to support the productivity and efficiency of its customer by

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"Relying on automation processes and robots will be one of the solutions to our decreasing workforce and aging population"

Yoshiharu Inaba, Chairman and CEO, FANUC Corp.



"Our position is to contribute to help smaller and medium-sized companies to automate"

Hidetake Sakai, President, Iwashita Engineering Inc.

providing the best state-of-the-art manufacturing solutions.

"At Cominix, our mission is to provide technologically advanced items to our clients in order to increase their efficiency, reliability and productivity," explains Mr. Yanagawa.

"With the rise of 5G technology and the ever-increasing amount of data available, we believe that high-speed transmission optical fiber will be on the rise and we would like to play our part in introducing it. We also have also pinned down LCD manufacturing technologies."

Smart and IoT devices, industrial robots, cell phones, cars, home appliances and data centre equipment: these are just a few of the places where you'll find the high-quality electronic connectors of Hirose Electric, one of the many 'silent partners' in the advancement of Industry 4.0 originating from tech-rich Japan.

"The digital revolution is rapidly accelerating. We are aware that adapting to this change, in both our products we offer and our own manufacturing processes, will be key to our success," says Hirose president, Kazunori Ishii.

"In terms of product development, we have an entire section dedicated to factory automation and robotics. In our testing center, we have installed IoT technologies to enhance our reliability and effectiveness."

With Industry 4.0 technologies such as autonomous vehicles, factory automation and IoT, the demand for data exchange has inevitably increased, thus increasing the demand for the next-generation Ethernet connectors, such as Hirose's 'ix Industrial' series.

"With its small robust outline and its high-speed transmission design, 'ix Industrial' contributes to smart manu-

facturing applications in industrial environments," explains Mr. Ishii.

The 'ix Industrial' is yet another example of Hirose's superior design capacity that has allowed it to expand globally, with an integrated sales network that covers Japan, Asia, America and Europe.

Indeed major corporations with the financial muscle and capital to invest in the latest robotics and factory automation are the ones that have reaped the most benefits from their applications – leaving smaller companies somewhat behind. However, Cominix and Iwashita Engineering are committed to providing SMEs with the latest affordable robotics and automation technologies to increase their efficiency and competitiveness.

"Thanks to our expertise, we are able to provide an extensive amount of information both to international and domestic clients. This knowledge allows us to understand what Japanese companies, from large conglomerates to SMEs, require in order to better serve them. I believe that supporting SMEs with the tools to increase their efficiency is our responsibility," says Cominix's Mr. Yanagawa.

Hidetake Sakai, president of Iwashita Engineering Inc., who shares the Cominix boss' philosophy, explains how his company's affordable, high-performing products – such as its desktop robots, automated dispensing machines, and temperature control and pipetting systems – help to drive the automation capabilities of its SME clients.

"Our position is to contribute to help smaller and medium-sized companies to automate. We seek to provide robots and other devices at a lower cost. Our product is a combination of different modules that can be used at a

smaller scale to replace manual work, therefore we offer smaller robots. In doing so, we hope to contribute to SMEs by helping them automate.

"If I were to explain this in a nutshell, we're not looking to offer our technologies to Toyota. We're looking to offer these technologies to those supporting Toyota on the small and middle-scale level. If they were able to introduce some of our products to help them automate, then they can produce and deliver cheaper products to Toyota as a result. Ultimately, we're really looking at the whole production chain."

Iwashita Engineering manufactures and supplies high-precision and high-speed dispensing robots and automated systems which cover a wide range of applications, from electronics components, semiconductor, LCD screens and communication devices, to food, pharmaceuticals and cosmetics.

"Our main line of work is PCBs (printed circuit boards) and those are utilized in multiple sectors such as electronics and automotive industries. What we do is provide technologies used in the coating and adhesive elements of circuit boards. Meanwhile, our pipetting robots are utilized in the manufacturing of pharmaceuticals," says Mr. Sakai.

"What's key is that our products can be customizable according to whatever segment and need which is how we diversify. In order to respond to our clients' needs, we create specific technologies and devices that meet their specific specifications."

With the experience it has dealing with the demands and high standards of the Japanese market, Iwashita Engineering is now looking to expand to meet the growing demand for industrial robotics and automation in China and Southeast Asia.

"A goal for us moving forward is to what extent we can incorporate the ethos of manufacturing and meticulous attention to detail that Japan is so well known for within our products, when we do export our products overseas," adds Mr. Sakai.

The electronics and automotive industries continue to experience the largest rise in sales of industrial robots (33 percent and 22 percent, respectively, in 2017, according to the IFR). And with a large portion of their clients in these sectors, which together make up over half of the market, Hirose, Iwashita and Cominix are well positioned to see business grow globally over the coming years as they step up their operations in robotics and automation.

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PATLITE: Visualizing the factories of our future

Traditionally a manufacturer for safety and security systems, PATLITE has diversified to offer a true Industry 4.0 solution: wireless factory visualization.

Every successful economy – and by extension every successful business – is customarily based on two fundamental characteristics: security and the ability to innovate. In recent years, we have seen international press criticize Japanese companies for struggling with the latter. However, statistics prove otherwise, as Japanese companies play a dominant role in smaller, niche sectors.

Thanks to their high level of technological prowess, Japanese companies have become the undisputed market leaders in many B2B segments and are

companies was focused simply on increasing their production capacity. Recently, however, we have seen a shift of these capital investments to improving and maintaining the productivity of production,” explains Hisato Takano, CEO and President at PATLITE.

This shift is driven by one of the defining economic and societal issues of our time: a declining workforce due to the aging populations of the world’s developed countries. It is an issue that Japan faces with more urgency than arguably any other nation.

enables factory visualization will become very important,” explains Mr. Takano.

The factory visualization concept – which simulates the combination of man power with plant machinery, robots and handling equipment to manufacture optimum output at the lowest cost – has therefore become an area of primary focus for PATLITE.

With more than 1,000 employees and the wholly-owned sales subsidiaries in the USA, Germany, Singapore, Korea, and China, it is already widely recognized as a top global brand in the safety and security solutions industry. Recently, through its new WD Series, PATLITE has developed the world’s first innovative wireless solution that can simply gather manufacturing equipment operation status by adding a wireless unit onto signal towers.

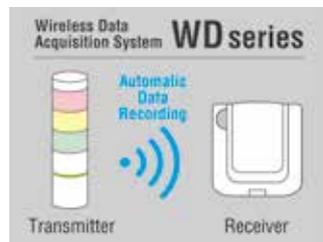
“The WD wireless technology enables a cost-effective investment which provides wireless communication between machines and equipment made by different manufacturers, regardless of its model or year of equipment,” says Mr. Takano. “Our partners agree with the simple concept of our wireless solution, and these factors have made this product a big hit in the Japanese manufacturing industry.”



Hisato Takano,
CEO & President

For these reasons, with further incorporation of new digital and network technologies, Mr. Takano says PATLITE can maximize its scope and create a complete visualization solution.

“My dream has been to see the PATLITE signal tower on all factory equipment. And, in a sense, as we now have the number one market share in the world, we can say with pride that we have achieved this. With the newly released WD series, we have become a supplier to which the end users can provide feedback and make requests. The dream I have for my successor, is for us to become a company that the end user depends on. Specifically, I want manufacturers to expect to achieve productivity improvement when they collaborate with PATLITE.”



responsible for providing the quality required to make complex end-products or systems.

PATLITE, an engineering and manufacturing company that specializes in safety and security solutions such as innovative LED status indicating lights, sound alarms, visual and audible communication networks, is a prime example of this.

“About ten years ago, capital investment for Japanese

“Internet of Things (IoT) and Industry 4.0 provide a means to increase production capacity as well as productivity at manufacturing plants,” says Mr. Takano. “As a B2B manufacturer, it is necessary for PATLITE to develop new products which support the growing demands for improving productivity at manufacturing plants. Moving forward, digital technology such as Industry 4.0 that

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The Machine Pioneering Wire Harness Processing

Thirty years ago, an engineer began working at LION POWER, a specialized Japanese company that today makes printed circuit boards (PCB), automated systems and medical devices. This employee had a rare medical condition and had to undergo dialysis three times a week. During his dialysis sessions, Yamato-san had plenty of time to think. And on the recommendation of LION POWER's then president, he used this time to contemplate the development of a revolutionary product.

"After that, two engineers joined the company and they developed the HI-1001, which is the prototype of the HI-3000. This occurred 18 years after that man joined our company," recalls current president Keishiro Takase. "While it is extremely difficult for SMEs to keep an R&D laboratory, we were able to continue our research because our founding philosophy has penetrated the minds of our employees."

That founding philosophy, 'playful minds + technology = innovation and invention', led to the development of the HI-3000, a fully automatic wire processing machine that saves precious time, money and manpower in

the manufacturing of wire harnesses, which are essential components for the railway, automotive, aerospace and construction machinery industries. While the older HI-2000 model was aimed at smaller-scale manufacturers, the improved and fully customizable HI-3000 is geared towards larger clients.

"The HI-3000 is our most significant product. The design is absolutely unique and we are the only ones in the



Lion Power's New Fully Automated Wire Processing Machine "HI-3000"

world that possess the technology to make it," says Mr. Takase.

The HI-3000 processes the control panel harness (printing and insertion of mark tube, terminal crimping) in just 15 seconds. Instead of making the same kind of electric wires all at once, it is possible to process harnesses in the order of wiring by using the user-friendly control panel. As such,

the efficiency of the customer's next wiring process is greatly improved.

One of the most unique features of the HI-3000 is its U-shaped method of gripping both ends of the wire. The U-shaped unit allows the other process to be performed immediately after the crimping and moving of one end. Furthermore, when passing the wire to the next unit, the transfer is completed by simply gripping both ends simultaneously,

leading to further shortening of the cycle time. Flexibility is another key feature of the HI-3000, where the unit system allows for any number of terminal process units to be added. With less cycle time loss due to expansion, the HI-3000 contributes to improving productivity.

The HI-3000 is the latest in a long list of innovations to originate

from LION POWER, whose PCBs, automated production systems and medical devices are used by major clients in the machine tool, elevator, aerospace and shipbuilding industries. In LION POWER's prestigious client list, we find Japanese multi-nationals and world-leading machinery makers such as Komatsu, Shimadzu, amongst others, for whom LION POWER provides integrated production services for PCBs.

"The manufacturing of circuit boards is not exactly a niche field; it is not a new technology. However, our expertise in this area allows us to assist clients with special needs," says Mr. Takase. "Our company does not focus on mass-production. On the contrary, we focus on answering specific needs through tailor-made solutions for products such as PCBs, mechatronics and more. Consequently, customers are willing to pay an added price for LION POWER's products."



MTC, the ethos of supporting customers



"Learning, becoming better and then excelling at what we do is the MTC way, or what we call: the metal solution"

Kazuhiko Hasegawa, President Metal Technology Co. Ltd.

The shift from the big, bulky cell phones of the 1990s to the sleek, slim touch-screen operated devices we carry around today would not have been possible without crucial advancements in core materials technology and a process called Hot Isostatic Pressing (HIP).

Describing the gravity of this breakthrough within the sphere of materials technology, Mr. Kazuhiko Hasegawa, president of MTC, who introduced HIP to MTC in 1984, says it is akin to having the ability to blend

oil and water to form a homogeneous mixture. "This is what HIP allows us to do with dissimilar solid or powder materials," he says. "And our skill, know-how and experience with HIP technology allow us to create structures and shapes that other processes would struggle to achieve."

HIP has been essential to the miniaturization and enhancement of semiconductor components that is the key behind advancements in cell phones, laptops and other devices. And the technology also has functions in the fields of aerospace, automotive and medical devices. Today, MTC is the second largest HIP company in the world and possesses the world's largest HIP unit, the Giga-HIP, with a diameter of 2.05 meters and a height of 4.2 meters.

Listening to and working with its customers under the *suriawase* philosophy, a Japanese concept that can be translated as 'fine tuning,' explains Mr. Hasegawa, has led to the utilization of new technologies and techniques. As an example of meeting new challenges, MTC's Giga-HIP unit recently supported its customer Shimoda Iron Works to achieve NORSOK certifica-

tion to better serve its customers in the oil & gas industry. NORSOK is an industry standard created in Norway and Shimoda Iron Works became the first company in Japan to receive the certification utilizing the HIP Near Net Shape (HIP-NNS) process in close collaboration with MTC.

"Our Engineering Division is responsible for the design and proto-typing of our clients' products and maintains close communications with our customers in order to create *suriawase*," adds Mr. Hasegawa. "The engineers and salespeople work together to understand exactly what the customer requires." Successful collaboration – on this occasion with renowned research institutions and universities – also led to one of the company's latest developments, an electron accelerator system. This compact and easy-to-install system has a variety of applications such as surface modification and electron beam sterilization, which is used for the sterilization of medical devices, for example. And as always, in line with its commitment to *suriawase*, MTC can design and produce the optimum system that is tailor made to the individual customer's needs.

MTC's engineering division has also played a prominent role in the development of complex parts for Japan's nuclear research particle acceleration programs, working closely with the Japan Atomic Energy Agency on the Mercury Target Containers resulting in improved performance of the Mercury Target Container Unit 8 currently in use on the J-PARC (High Intensity Proton Accelerator) facility since September, 2017. The company has also designed and produced crucial components for the development of nuclear fusion technology for ITER, the world's largest nuclear fusion project in France.

From smartphones and medical devices and onto nuclear, MTC's technology has been turning clients' dreams into reality for over three decades. Moving forward, the company will continue scouting the global market to expand its depth of knowledge. "We are always hungry to learn more, become better and then excel at what we've learned," adds Mr. Hasegawa. "This is the MTC way, or what we like to call, *the metal solution*".

Auto-parts makers: the true strength behind Japan's automotive industry

Having built a solid reputation for supplying high-quality, high-performing components to Japan's auto industry, Japanese auto-parts makers are focusing on expanding their presence overseas, as too are other companies from the fields of aluminum materials technology and hydraulic tools.

While China has become the largest player in the Asian region in recent years, producing almost three times more vehicles than Japan in 2017, Japan's automotive industry is still one of the most prominent, distinguished and technologically advanced industries in the world.

Japan's automotive industry is responsible for employing some 5.5 million people, representing 8.7 percent of the workforce, and represents around 21 percent of the total R&D spending of all of Japan's manufacturing sectors, at around \$18 billion dollars.

Since the 1960s, when the industry began to really take off in the post-war years, Japan has been firmly placed in the top three largest producers in the world. Of the top ten selling car globally, three are Japanese companies: Toyota, Honda and Nissan.

While Toyota, Honda and Nissan are major brands that represent the

strength and reputation of the Japan automobile industry worldwide, the true strength of the industry lies in the hundreds of smaller companies that supply the parts and components to these big car makers, as well as to manufacturers in the U.S. and across the world.

Their badges and logos won't be found on the top of the hood, on the front of the steering wheel or on the head of the gear stick. But take a look inside the door panel, underneath the steering wheel or in the gear box, or at the hundreds of small pieces that make up the engine, and you will find examples of the high-quality and high-performing craftsmanship developed by these Japanese parts manufacturers.

"If you drive a car such as a Toyota, Honda, Nissan, Ford, Volkswagen, Fiat or Chrysler, you probably use our products without realizing," says

Osamu Inoue, President and COO of Sumitomo Electric, a global leader in the manufacture of wire harnesses for automobiles.

"Our production of these wire harnesses is essential for automobile manufacturers to produce their cars and deliver them to their costumers."

With fuel efficiency of great importance nowadays in our environmentally conscious world, the R&D and engineering divisions of Japan's parts manufacturers are going to great lengths to develop lightweight components and materials.

"In the area of wire harnesses for the automotive industry, we developed new aluminum-based products and they have been in widespread use across the globe. Since aluminum weight is half that of conventional materials, it has been used to create lightweight vehicles," explains Mr. Inoue.

Mazda, one of Japan's leading car companies, is at the cutting edge when it comes to emissions-reduction, thanks to innovations such as its trademarked SkyActiv technology. As such, Mazda demands the highest standards from companies that supply it with its components – companies such as Keylex Corporation, which is also constantly striving to develop lightweight and high-performing parts that are integral to the fuel efficiency performance of Mazda's vehicles.

"The automotive market is changing and there is an increasing demand for lighter materials and our mid-term strategy is mainly shaped around coming up with new lighter alternatives for our products that will increase the automobile's fuel efficiency, sustainability and performance. If we are successful in this mission we should be able to continue growing steadily in the future years to come," says company president, Mitsuru Iwao.

"At this time we are focusing on making our pressed parts less heavy. These are the parts that add the most weight to cars and we are developing new ways to lighten their weight, including the introduction of lighter materials, such as aluminum for in-



"Our mid-term strategy is mainly shaped around coming up with new lighter alternatives for our products that will increase the automobile's fuel efficiency, sustainability and performance"

Mitsuru Iwao,
President, Keylex Corp.

creased performance of the vehicle. Here at Keylex, we always strive to improve our line of products to satisfy the needs of our customers."

Aside from efficiency, the drivability and safety of their vehicles are other key priorities for Mazda. And Keylex supplies the carmaker with a range of lightweight and high-rigidity body parts that play a key role in not only efficiency, but also in maneuverability, safety and driving experience.

To make such high-performing products, Keylex incorporates the latest, state-of-the-art production systems, using laser welding, image inspection technology and robotics. Its Cell Production System can carry out simultaneous processing, with small high-speed robots allocated in a space-efficient manner through the use of robot simulation. The system allows the company to manufacture multiple parts within a single cell by switching jigs with handling robots.

"We believe robotics and industrial machinery are extremely important for the development of a better manufacturing system. Encouraging automation will guarantee companies such as Mazda that the efficiency and quality in their factories is up to the standard they need," adds Mr. Iwao. "We are currently present in China, Thailand and Mexico,

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"We have expanded from our initial presence in Indonesia to other countries like Malaysia, Vietnam and Thailand and are intending to keep growing in that area"

Mitsuhiro Goto,
President, Gohsyu Corp.

where we are trying to implement these methods of production, but we are looking at some other potential markets to continue our expansion."

With 95 percent of its output going to Mazda, Keylex has not had to aggressively focus on its own international expansion, and instead has followed Mazda wherever it has gone. But moving forward, the company is developing and pursuing its own international strategy as it looks to bring its ever-evolving technologies to new customers worldwide.

"In 2024 the company will celebrate its 100th anniversary. In the years to come we want to focus on working towards satisfying our customers' needs by developing new products, processes and technologies," says Mr. Iwao.

"At Keylex Manufacturing, we always try to think of the future and make use of our strengths especially in countries that have needs in that. We can definitely see that our accumulated technology may find new customers and clients in Malaysia, India or any other country in Asia. We are just starting this journey, but we are very excited about it."

Another Japanese firm, Gohsyu Corporation – which makes strong, light and high-precision forged parts for engines, chassis and transmis-

sions – is also pursuing international expansion, with a focus on China and booming Southeast Asia.

"China produces 30 million cars per year and we believe it has great potential for the future. The South East Asian market is experiencing growth in nominal GDP and especially GDP per capita, which is very important for the automotive industry. We have expanded from our initial presence in Indonesia to other countries like Malaysia, Vietnam and Thailand and are intending to keep growing in that area," says president, Mitsuhiro Goto.

"Japanese quality is praised in many countries all over the world and people tend to give preference to our products even if they are more expensive than that of the competition. We work alongside Japanese corporations that move overseas and also tend to the demand of local companies. Our standards of production here and abroad attract companies internationally to collaborate."

Since the 1990s, Gohsyu has been approached by the big automotive companies to collaborate when going abroad and bring its manufacturing capabilities overseas. And the dependence of Japan's big carmakers on the nation's technology-adept SMEs is one factor that distinguishes Japan's auto industry to that of the U.S., Mr. Goto argues.

"Other countries like the United States prefer to take a more vertical approach and develop their own manufacturing techniques instead of outsourcing it to smaller companies. Big Japanese companies that have a strong presence overseas are now exploring this method, but most still rely on the expertise of SMEs," he says.

"In our case we did not follow that wave of expansion to the U.S. and focused on improving our precision and technology. Nowadays we supply to American companies that see the value of our products from Japan."

Like Keylex, Gohsyu's ability to make strong, light and high-precision parts stems from the sophistication of its production system and processing technologies, which allow the company to respond to the various needs of customers. Some of its processing methods include: hot forging, used to manufacture parts such as crank shafts, axle shafts and steering knuckles; warm forging for inner rings and bevel gears; and hot-cold forming for the production of speed gears and parking gears.

The company has also recently developed a series of energy-saving

heat treatment processes that improve both product function and machinability, while achieving environment conservation and low costs, which include: Forged Isothermal Refining, Forged Isothermal Annealing (which converts low carbon steel and case-hardening steel into a complete refined ferrite/perlite structure suitable for recent high-speed cutting methods); and Forged Quenching and Tempering, which enables the creation of materials with strong mechanical properties and high toughness to be achieved.

Gohsyu has been successful in maintaining and replicating the high standards and sophisticated production systems used in Japan in its overseas plants; while domestically the company is exploring greater adoption of Industry 4.0 technologies in the face of the nation's shrinking workforce.

"When it comes to our overseas expansion, it is impossible to expect the same level of skill of personnel we have in Japan, but what we have been successful in doing is standardizing our process, breaking it down and training our workers. Now we expect the same quality we produce in Japan."

Masanori Maeda, president of Nissin Manufacturing Co. Ltd., also

highlights how the superior quality achieved by specialized Japanese firms is intrinsically linked to the high standards put in place at the production process.

Nissin Manufacturing, for example, employs a state-of-the-art production line system, its own unique software and well-maintained quality control systems to ensure the high-precision, high-strength and high-durability of its products, which include engine and transmission components such as valve rocker arms and shift forks all-terrain vehicle (ATV) transmission systems.

"Japanese manufacturers are known to invest an extensive amount of time and resources to monitor, analyze and, ultimately, enhance their production processes. From raw material sourcing and processing to assembly and completion, our aim is to ensure that each aspect of the production line is as close to perfection as humanly possible," explains Mr. Maeda.

"By virtue of its characteristics, the Japanese manufacturing industry, including Nissin Manufacturing, has chosen to specialize in the production of high-end products targeted at complex industries. As such, we only utilize the purest raw materials; we structure the most reliable pro-

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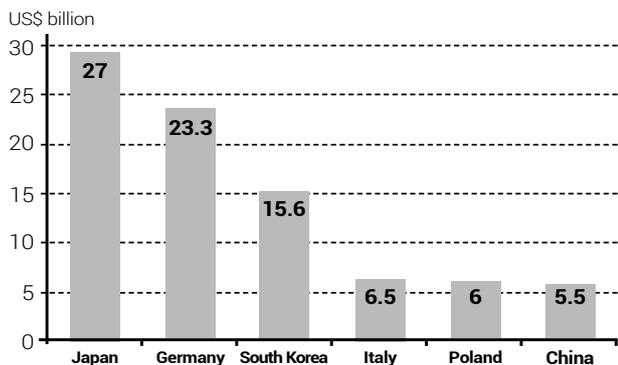
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Net exports of automotive parts (2018)



Net exports are defined as the value of a country's total exports minus the value of its total imports.

Source: WTEEx

duction lines and we release complex high-precision products."

Aside for components for the automotive industry, Nissin Manufacturing provides precision parts and machine tools used in various fields, such as hydraulic/pneumatic systems, consumer appliances, dies, general purpose engines and sewing machines. And over its 50-year history, the company has gained a reputation as one of Japan's leading manufacturers.

Looking towards the future, Mr. Maeda says the company is looking to branch into the medical industry and strengthen its presence overseas, where it currently has production sites in China, Thailand, Indonesia, Mexico and Vietnam.

"Currently, our strategy is to strengthen our already-established locations. Before further expansion, we must reinforce our local workforce, enhance our production capacities and fortify our client support systems. While we are not currently looking forward to physically

moving somewhere else, we expect the continent of Africa to have great potential," says Mr. Maeda.

"Furthermore, we have plans to penetrate a new field: the medical sector. In 10-years' time, I want to see our medical business going well and maintain our steady supply of high-quality products. Our mission is to promote global values through new business projects. To do so, our objective is to develop into a sustainable enterprise which contributes to society at large."

Beyond the automotive industry

As aforementioned, aluminum is an important material for the likes of Keylex and Sumitomo in the production of their light-weight automobile components. And one company that has been at the forefront of aluminum-based materials technology for over 90 years is Toyo Aluminium K.K., whose four main business segments are foil products,

powder and paste products, solar cell related products, and household products.

In 1964 Toyo Aluminium established the first laboratory worldwide to focus on aluminum foil and powder. Since then the company has developed high-level technologies to produce a unique product that no other company can imitate.

"By researching the unique characteristics of aluminum, we have successfully launched a variety of products useful to society, industries and individuals," says president, Hiroshi Yamamoto. "Our products can be found in a variety of markets, from packaging materials for food and pharmaceuticals, to electronic devices and renewable energy production."

The company is also focused on expanding its overseas presence. And in 2015 it restructured its R&D division in a bid to increase its strength in advanced technologies and materials for new fields and markets, such as China, South East Asia and Africa.

"We want to see our company's sales grow 5 percent yearly, by focusing on innovation and coming up with new products and expanding internationally. We are focusing on South East Asia, China and India. Europe and the United States have matured societies with high purchasing power in which we would like to introduce new products. In Africa we believe the main necessity is for health and pharmaceutical products and we would like to collaborate with local authorities and companies to add value in the area," says Mr. Yamamoto.

"This company will be a pioneer and we believe one of our strongest competitive advantages is our constant strive to come up with new ideas and innovate."

International expansion is also a major priority for Izumi, which makes a variety of high-quality hydraulic tools and hydraulic equipment aimed at both the B2C and B2B market.

In the B2C market, one of the company's most popular products is Japanese-made electric shaver incorporating unique blade technology and built to the highest performance and reliability. In the B2B segment, its battery operated hydraulic tools are widely used, for example in electrical cables installation, offering an alternative to traditional tools and allowing customers to apply forces of up to 12 tons



"By researching the unique characteristics of aluminum, we have successfully launched a variety of products useful to society, industries and individuals"

Hiroshi Yamamoto, President, Toyo Aluminium K.K.

with just one hand, which greatly increases their efficiency. In September 2018, it launched its 7th Generation Battery Operated Tool with pressure sensor, GPS functions and Bluetooth connection that enable management of operation history from a linked computer.

Izumi's international strategy entails expanding its distribution network to bring its hydraulic tools technology to a growing customer base in the U.S., Europe and Asia.

"Our company's overseas expansion is mainly focused via OEM in the United States, where we have about 15 percent market share, and Europe, especially in Germany, France and the UK via local distributors," says president, Juichiro Shima. "In Asia we operate in a similar way both in China and Korea. We have local subsidiaries in China, which should help our sales increase in the area."

In October 2018 Izumi merged with Maxell to become Maxell Izumi – a milestone move that will bode well for its overseas ambitions and mission to develop innovative new products.

"This merger will allow us to come up with new products and solutions. Our combined know how and resources will be extremely positive for our clients all around the world," says Mr. Shima.

"I would like to see Maxell Izumi as the top maker of battery operated hydraulic tools globally. We are currently the leaders in the Japanese market with more than 50 percent and it's our objective to become the number one internationally."



Kurihara Kogyo: a century of engineering excellence

If there were ever a good moment for a long-established company to take stock, look back at how far it has come and envision where it is going, it would be on its 100th anniversary. And in 2019, Japanese construction engineering firm, Kurihara Kogyo, which over the past century has played an integral part in Japan's industrialization story, is doing just that.

Established in 1919, Kurihara Kogyo began as an electrical contracting services company in Osaka. By 1942, it had extended its operations to Tokyo, Nagoya and Hiroshima, before taking its first steps overseas in 1979 with the establishment of its branch in Singapore, where it has helped to support the city-state's steadfast development during the past four decades.

Today the company is one of the top ten Japanese companies in its field, offering engineering solutions from planning, designing, material supply, erection, and supervision to testing and commissioning, with a

1,600-strong workforce that shapes the success of the brand. From its humble roots in Osaka, it is now operating in five Asian countries outside Japan, in China, Vietnam, Thailand, Singapore and Myanmar, where it is actively promoting industrialization through the adoption of advanced quality engineering and technologies that meet the local conditions of the respective countries.

"Since its establishment in 1919, Kurihara Kogyo has sincerely and honestly responded to customer requests in the field of construction equipment for buildings, factories and production plants, such as electrical equipment, air conditioning equipment, sanitation equipment, information and communication equipment, plant equipment, construction electrical equipment, factory electrical equipment, and instrumentation equipment," says president, Nobuhide Kurihara.

"Throughout our history, we have cultivated and developed new technologies and have worked to improve our technological and construction

capabilities. Based on the construction system with safety and quality first, we propose the best solutions according to the needs of customers and have been highly evaluated in various construction equipment fields."

Having gained experience in working on everything from small plants and facilities, right through to infrastructure mega-projects, Kurihara Kogyo has developed an array of equipment, installations and technologies of various types and sizes, which allows it to offer tailor-made solutions to customers across several fields. And that bespoke services offering, combined with the engineering expertise it has gained over the past century, is one of its main competitive advantages and keeps its satisfied clients coming back.

"Through this approach we have won the trust of both our local customers in Japan and overseas customers. We listen to them; conduct the hearings and consultations, and then the construction for them. We feel we are very strong in the Japa-



Nobuhide Kurihara,
President,
Kurihara Kogyo Co., Ltd.

nese market because our brand is known for providing perfect solutions for all types of construction projects," adds Mr. Kurihara, who is overseeing the strong growth of the brand's reputation overseas.

To mark its 100th year anniversary, Kurihara Kogyo has adopted 'Honesty and Earnestly' as a brand statement and over the next century aims to play an important role in socio-economic development in fast growing Southeast Asia as it has done so during its long history in Japan – always moving forward based on its founding spirit of integrity and constant innovation.



Contributing to the power plants of tomorrow

As the world races to lower carbon emissions in line with the goals of the Paris Climate Agreement, it is essential for power and manufacturing plant owners to adopt the latest technologies, parts and equipment in a bid to reduce the environmental impact of their operations.

And Seo Koatsu Kogyo (SKK) – a Japanese firm which manufactures steel-forged products, heat exchangers and other heavy industry products – is supporting its customers in the energy and manufacturing industries in this endeavor.

Established in 1926, SKK has been quite literally forging trust and its reputation among its customers for over 90 years. And over the coming years, this highly specialized Japanese SME will play a hidden, yet crucial role in reducing CO2 emissions through the provision of high-quality and state-of-the-art products for the power and manufacturing plants of tomorrow.

"Minimizing the environmental impact of our client's facilities is

of paramount importance," says SKK president, Toshiyuki Osada. "As our market advances rapidly, we maintain a close relationship with our clients and actively monitor legislative changes."

One of these future trends will be



Turbine Cooling Air Cooler for GTCC plant

the move towards next-generation IGCC (Integrated Coal Gasification Combined Cycle) power plants. Compared with traditional coal-fired plants, IGCC plants obtain significant improvements in power generation efficiency and reductions in carbon emissions thanks to the

gasification of coal. And SKK's heat exchanger is an important component in the coal gasification process.

SKK manufactures a 'turbine cooling air cooler' for the GTCC (gas turbine combined cycle) systems in China – a specific product that has been tailored to meet the needs and regulatory requirements of its Chinese clients.

"At Seo Koatsu, we have been successful in complying with changing international regulations," Mr. Osada adds. "For example, while we received the Quality License from China's Labor Department in 1998, we have already upgraded it five times. Every four years, we adapt our products to meet the newest requirements. We have also been exporting this product to the USA and other countries."

And while the industry in which SKK operates has changed drastically due to both regulatory requirements and technology advancements, one thing that hasn't



Toshiyuki Osada,
President, Seo Koatsu Kogyo

changed over the company's 93-year history is the unrivaled quality, performance and after-sales service it provides to its customers.

"When foreign entities purchase our heat-exchangers, we provide an equivalent assistance to what we usually offer in Japan. And we can also manufacture forged products in all process from forgings to machining and testing and inspection from the standpoint of using as well as making," says Mr. Osada.

"Each employee is committed to reliable manufacturing, working faithfully with awareness and responsibility as professional workers. This emphasis on the 'soft' side of the business has been applauded and praised by our customers."

What to do in case of an earthquake?

A company whose mission is to create a safer world, Century Corporation has developed state-of-the-art, life-saving disaster prevention technologies such as its Emergency Earthquake JMA monitor and series of D-HOPE drones.

"In order to effectively develop new products, one must always prioritize the bigger picture," says Kazunari Shozen, President and CEO of Century Corporation, a company that helps its customer to see the bigger picture with its range of high-quality LCD monitors that are used for everything from airport check-ins to disaster prevention.

Century's story is one of innovation and adaptation: the company began as a semiconductor export and trading company and quickly evolved into a PC peripheral equipment manufacturer and trader. As society began to enter the smartphone era, it expanded its business to mobile phone peripheral equipment manufacturing and sales. In 2008, it launched its best-selling product, the 'plus one' LCD sub-monitor. This

+50% market share within 2 years. Thanks to this technological, yet affordable device, we contributed to spreading safety measures to the whole country," Mr. Shozen recalls.

"After this, we began researching disaster prevention equipment, and that led to the second time that Century had an impact on society at large with the production of our 'Emergency Earthquake JMA' monitor."

Based on the technology developed for its 'plus one' series, the JMA monitor has become an industry standard in Japan, which, due to its low price compared to its competitors, has made state-of-the-art disaster prevention technology accessible to all.

"To transform it into an effective disaster prevention device, we

BLACKOUT GUARD' is equipped with a 100V AC output, a USB port, an FM/AM radio and LED light.

But perhaps Century's most exciting recent developments is its series of D-HOPE I, II and III disaster prevention drones for the Japanese market, which the company has developed in collaboration with Chinese original equipment manufacturer Harwar International Aviation Technology.

"We are currently pursuing our efforts to further integrate AI and IoT technologies within the drone in order to transform our creation into a life-saving solution. We recently introduced the first D-HOPE I and reached an agreement with the Japan Aerospace Exploration Agency (JAXA) for a drone lease," says Mr. Shozen.



"Ultimately, I believe that the true success of a company can only be evaluated by the positive social impact and significance it has had"

Kazunari Shozen,
President and CEO,
Century Corporation

comprehensive rescue operation can be performed immediately. It is my aim to construct such a disaster prevention system," explains Mr. Shozen.

With measures such as the Japanese government's 'Fundamental Plan for National Resilience' the disaster prevention market is becoming increasingly profitable,



Emergency Earthquake JMA Monitor



BLACKOUT GUARD



D-HOPE I



D-HOPE III

series of small and portable monitors has a wide range of applications and is used by organizations across a variety of industries, including as a guidance monitor for airport check-in counters and as a control monitor for robots and autonomous vehicles.

As a company that has at its core an innate desire to have an impact on society and contribute to creating a safer world, Century took the step into developing disaster prevention equipment, an industry that is of paramount importance in a natural-disaster prone nation like Japan.

"As a matter of fact, Century has changed society on two occasions. Firstly, it was by producing market-leading fire alarms. We went on to sell over six million such devices nationally, for a

integrated an alarm within the hardware. When an earthquake occurs, the alarm will ring before the shake reaches its location, effectively warning its surroundings from an incoming threat and allowing for precious time to find shelter," explains Mr. Shozen.

Today, Century boasts a 95-percent market share for emergency earthquake bulletins, tsunami warning and eruption warning monitors. But despite this market share, the company has not rested on its laurels and continues to develop new products and innovations, such as 'BLACKOUT GUARD', a compact and lightweight portable energy source designed to be used in disaster and emergency scenarios. Powered by its high-performing lithium iron phosphate battery, the

Century is currently developing a range of products for the Japanese market that can be attached to the drone in disaster or emergency scenarios, such as a loudspeaker, an infra-red temperature detector, a 36x zoom camera, and set of ball-shaped fire extinguishers, which can be accurately dropped from the drone to extinguish fire in dangerous situations or places where it might be too hazardous for human fire-fighters to go.

"In the case of a huge earthquake or tsunami that will come soon, one could grasp information quickly from the emergency earthquake JMA monitor. At the same time, it transfers the disaster status and tsunami situation automatically and communicates with the self-supporting flying drones linked to it. Then a

and is expected to grow by 20 percent to reach \$9.7 billion by 2021. But for Mr. Shozen, profit is not his company's main concern.

"Ultimately, I believe that the true success of a company can only be evaluated by the positive social impact and significance it has had," he says. "If we judge Century through this scheme, I believe us to be superior to other corporations. As such, I do not care about becoming famous or incredibly wealthy. My aim, and the aim of Century, is to contribute to society. All in all, I believe that the greatest testament to my life will have been to have helped others."



www.century.co.jp

On the front line of fire prevention technology

A leading manufacturer of fire extinguishers and state-of-the-art extinguishing systems, Hatsuta Seisakusho's products are developed to meet the industry's strictest and most rigorous standards of quality and safety.



The history of Hatsuta Seisakusho can be traced back to the 1880s and a fateful trip to Germany taken by the president of the Kyoto Chamber of Commerce. There, Bunpei Takagi, who had a background in engineering, attended a trade exhibition and was taken aback by a revolutionary new product that, he knew, could play an extremely important role in the protection of Kyoto's sacred ancient temples against fire.

As a result of that trip, Mr. Takagi was the first person to bring the concept of fire extinguishing technology to Japan. And the bright-minded engineer went on to invent his own dual-bottle fire extinguisher that began to be distributed and sold in Kyoto by Hatsuta at the beginning of the 20th century.

"Hatsuta's history began when we introduced the Dual Bottle Fire Extinguisher in Kyoto to protect its people and cultural assets from the threat of fire. This mindset remains as our focus today and we continue to chase our dream to continue providing safety to the customer with reliable technology and excellent service," says company president, Kazuhiro Hatsuta.

Some 115 years later, Hatsuta is now one of Japan's leading manufacturers of fire extinguishers and extinguish-

ing systems, whose products can be found in homes and factories across the country. Looking towards the future of fire prevention, Hatsuta will continue to channel the spirit of Mr. Takagi to develop pioneering new products, such as its CO2 automatic fire extinguishing system that has been adopted by manufacturers of semi-conductors and flat panel displays (FPDs).

"For plants that have lines producing over 100 units daily, fires can start from a spark. Preventing them is of paramount importance," explains Mr. Hatsuta.

"Our CO2 automatic fire extinguishing system is a proprietary network that automatically and systematically locates the source of fire and eliminates it immediately. This system has sensors to detect the source of fire and directly extinguishes it by using CO2. Right from the start, this product was an instant success."

Semi-conductor and FPD manufacturers count among Hatsuta's most important clients. And the steadfast growth of these industries across the world, has naturally increased the necessity for the company's fire-fighting products, which have been developed to meet the industry's strictest and most rigorous standards of quality and safety.

"One of our products, the Cabinex-EWT, is highly recommended for semi-conductor and FPD factories, whose use of alcohol-based materials in clean rooms increases the risk of fire. Our customers praise this product as it automatically releases CO2, effectively preventing fire immediately, while causing little-to-no damage to the clean room and the equipment," explains Mr. Hatsuta.

One of the peculiarities for a company working in the fire-fighting industry is the underlying hope that your customers never have to use your products. Hatsuta, then, not only provides its customers with fire fighting products, but also offers consultancy services in relation to prevent-

ing fires in the first place. It is a revolutionary service that aims to diagnose fire risk and prevent fires.

As Mr. Hatsuta says: "If none of my products were physically used for a year, I'd be satisfied! Some of our services are free of charge and some follow a payment format. We work closely with public organizations and facility management entities on fire prevention."

Leading the domestic market in Japan (where it expects increased demand of its products as a result of the construction work for the Tokyo 2020



Cabinex - EWT



"Our first priority is to protect, defend and preserve the valued assets of our costumers"

Kazuhiro Hatsuta, President,
Hatsuta Seisakusho Co., LTD

Olympics), Hatsuta's future lies in reaching more customers abroad, from China and Southeast Asia and on to the U.S.; while also exploring the adoption of AI, the Internet of Things (IoT) and smart sensors in fire prevention technology.

"Hopefully, in 15 years from now, an expert will develop technologies employing IoT and/or AI to drastically reduce the rate of fatality from fire. Our company's R&D is trying to follow and implement these ideas into actual products," says Mr. Hatsuta.

Ultimately, the Hatsuta president says, his ambition is always to create products and services "to protect, defend and preserve the valued assets of our customers" – much like Bunpei Takagi before him.