The AMADA Magazine No.3 / 2017

ForYourSuccess

AMADA

www.amada.com

Nov.2017

Contents

Cover photograph : "Kiyomizu-dera Temple" is one of the most celebrated temples in Kyoto. It is among the preeminent Kannon Pilgrimage locations in Japan, and is listed as one of the UNESCO World Heritage Site Historic Monuments of Ancient Kyoto.

ForYourSuccess

No.3 / 2017

Published 1 November, 2017

Published by:
AMADA HOLDINGS CO., LTD.
200, Ishida, Isehara-shi,
Kanagawa 259-1196, Japan
http://www.amada.com/

A street corner at Gion, a representative shopping and entertainment district in Higashiyama-ku, Kyoto.

History of Tankin

Tankin (Smithing) is a type of metalworking for creating seamless objects such as vases, pots, and teaware by beating plates of copper, brass, or aluminum with special hammers and stake anvils . It started around 4000 B.C. in the period of Mesopotamia and ancient Egypt for manufacturing arms and ornaments with naturally produced gold, silver and copper.

The technique came to Japan from continental Asia in the Yayoi period between the 10th century B.C. and the middle of the 3rd century A.D., and was used to produce bronze mirrors, iron swords, armor, etc. Grave goods excavated from ancient tombs include harnesses and ornaments that seem to have been created by Tankin.

Throughout history, Tankin has expanded with changes in the times and lifestyles.

In the 6th century when Buddhism was introduced to Japan, Tankin started being widely used to create Buddhist artworks, including metalwork, Buddhist altar equipment, and swords. In the Nara period (the 8th century), the Great Buddha and many Buddhist statues were created, and from the Heian period (the 9th century), Tankin was widely applied to arms and weapons used in war as well as to decorative ornaments. From the Muromachi period to the Azuchi-Momoyama period (the 14th to 16th century), temple doors and windows, ornaments, tea ceremony tools, tea kettles, and Buddhist tools were created by Tankin. In the Edo period (the 17th century), decorative ornaments smithed for ordinary people increased; and in the Meiji period (the 19th century), smithed pots, kitchen utensils, tableware, and other daily goods in the western style increased.

Kyoto-Tankin

Tankin - Traditional technique going back to 4000 B.C. Refined tool manufacturing passed down in Kyoto, the 1200 year old historical capital of Japan

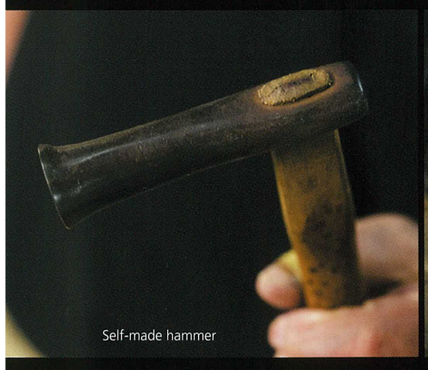
Beautiful hammered pattern

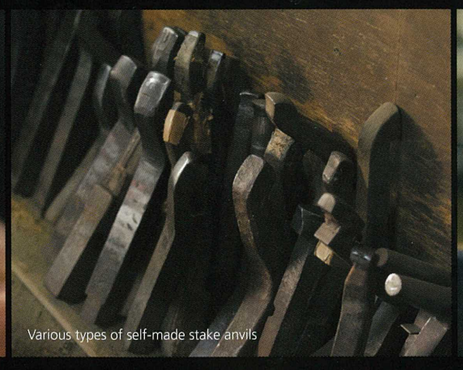
A town of metalsmiths in Higashiyama, Kyoto

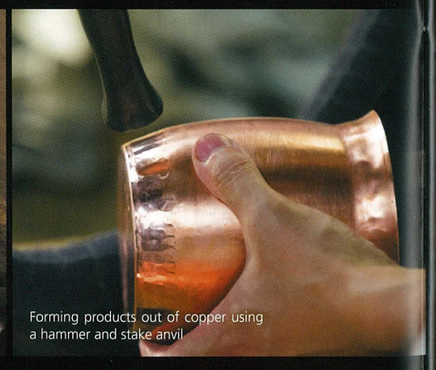
In Kyoto, the historical capital of Japan from the Heian period more than 1200 years ago, metalsmiths created a colony called "Kettle Town" located in the Higashiyama area before World War II, where their Tankin technique was passed down across generations. However, many of the metalsmiths who were forced into the war as soldiers or military employees did not return, and it became difficult to hand on the Tankin technique to the next generation. After the war, although few metalsmiths returned alive and materials were scarce, those who returned cut out steel plates from old unused buses to create pots, kitchen utensils, and tableware using hammers and stake anvils.

A traditional Tankin workshop in Kyoto

One such returned metalsmith was the father of Mr. Shigeru Teraji, who founded Mosaku, Co., Ltd., a manufacturer of hammered products, and is the owner of "Tankin Workshop WESTSIDE33 " to the west of Sanjusangendo Temple.
"My father was a metalsmith and manufactured various military goods when he was dispatched to China as a military employee during the war. After he returned from the war, he managed to find material and created pots and kettles to support his family. I grew up hearing the sound of his hammer beating metal and naturally started helping his work when I was in elementary school. When I was in the first year of middle school, I made my first pot by myself, and it sold. It made me so happy."
Mr. Teraji, who will be 81 this year, has devoted himself to Tankin for more than 70 years.
"I shape metal by beating down on it and stretching it on the stake anvil with a hammer thousands of times a day. At times, I have gotten tendinitis and not been able to use my dominant arm. My non-dominant hand continuously holds the metal in the correct position while I shape it by beating, stretching, shortening, and folding it on the stake anvil. If my timing is even slightly off, I cannot shape it properly. Therefore, my legs and feet are also used to hold the metal and the stake anvil in place. Sitting and working in the workshop all day may seem tiring but it's not so bad once you're used to it . Smithed pots are said to have excellent heat conductivity and heat storage performance. I imagine the final product, considering its best shape and how best to maximize the 'flavor' of the materials while I beat them with a hammer," says Mr. Teraji, whose upper body, his arm muscles in particular, has been hardened through many years of Tankin.

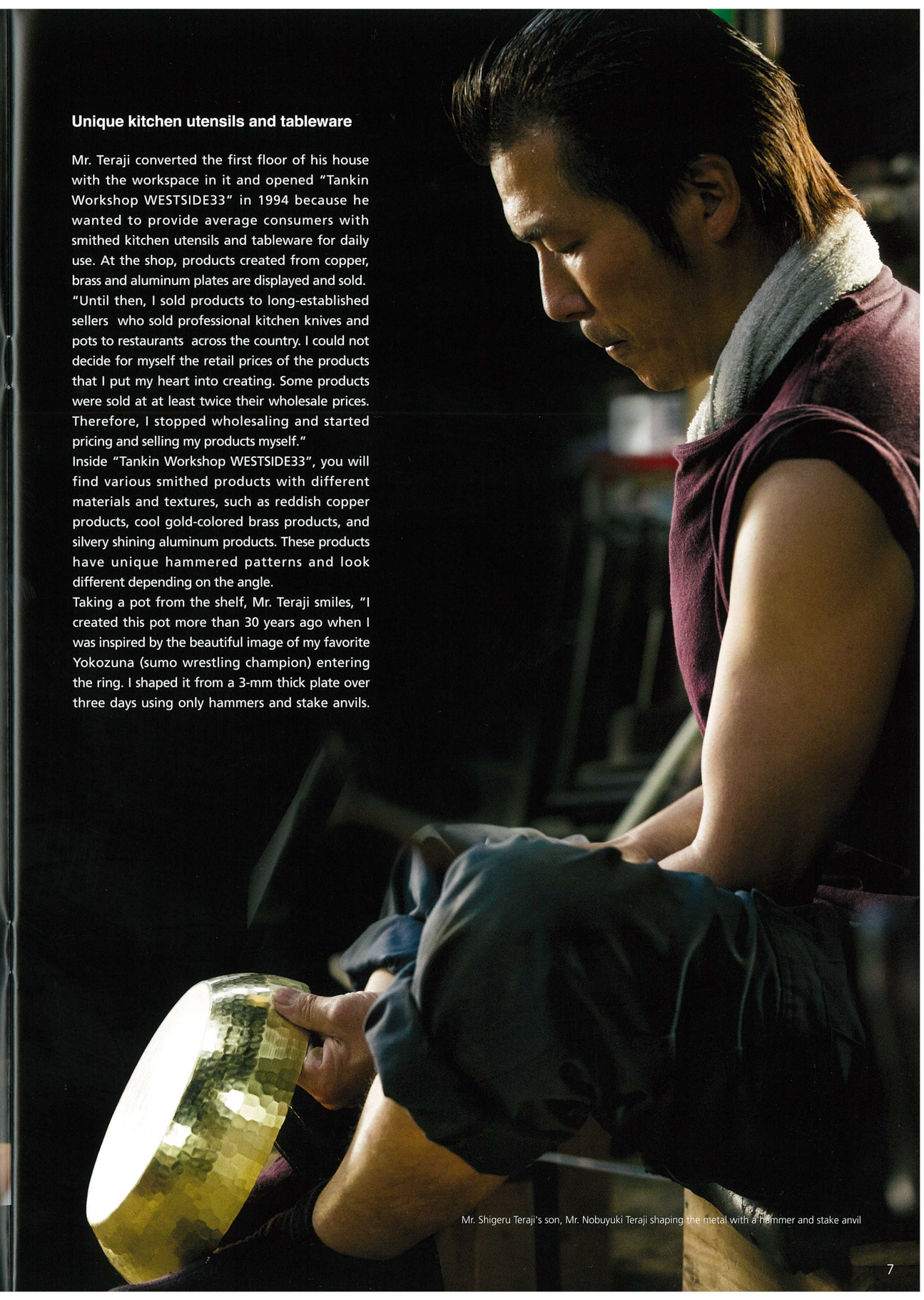

Self-made hammer


Various types of self-made stake anvils


Forming products out of copper using a hammer and stake anvil

Unique kitchen utensils and tableware

Mr. Teraji converted the first floor of his house with the workspace in it and opened "Tankin Workshop WESTSIDE33" in 1994 because he wanted to provide average consumers with smithed kitchen utensils and tableware for daily use. At the shop, products created from copper, brass and aluminum plates are displayed and sold.
"Until then, I sold products to long-established sellers who sold professional kitchen knives and pots to restaurants across the country. I could not decide for myself the retail prices of the products that I put my heart into creating. Some products were sold at at least twice their wholesale prices. Therefore, I stopped wholesaling and started pricing and selling my products myself."
Inside "Tankin Workshop WESTSIDE33", you will find various smithed products with different materials and textures, such as reddish copper products, cool gold-colored brass products, and silvery shining aluminum products. These products have unique hammered patterns and look different depending on the angle.
Taking a pot from the shelf, Mr. Teraji smiles, "I created this pot more than 30 years ago when I was inspired by the beautiful image of my favorite Yokozuna (sumo wrestling champion) entering the ring. I shaped it from a 3-mm thick plate over three days using only hammers and stake anvils.


Mr. Shigeru Teraji's son, Mr. Nobuyuki Teraji shaping the metal with a hammer and stake anvil

Computer scale assembling process

"Monozukuri" FOOD MACHINERY

Main product: High-speed and high-accuracy computer scale

The first combination weighing machine model manufactured in 1973. Approved as a Mechanical Engineering Heritage by The Japan Society of Mechanical Engineers

Observing the world's "food" for 123 years

Seller, buyer and society – "Three Way Harmony" is our corporate philosophy

Ishida Co., Ltd.

Flexibility for surviving the changing times

As of 2017, there are 1,485 long-established companies that were founded more than 100 years ago in Kyoto. Kyoto ranks fourth in Japan in numbers of long-established companies, accounting for 2.4% of the total number of companies in Japan, in which Kyoto ranks third.

Kyoto has been a center of politics and culture since the Heian period more than 1200 years ago. Due to its ability to evolve through the changing times while preserving its traditional culture, Kyoto has many long-life companies . In addition, it was relatively undamaged during World War II and temples and shrines have supported and nurtured the traditional crafts. Companies in Kyoto adjust to the changing times striving for success through soft innovation across their businesses, from product development to management techniques.

Ishida Co., Ltd. is one such 100-year old companies. Since our establishment in 1893, Ishida has been an important presence in society as a developer of advanced industrial technology. As the first privately held domestic manufacturer of weighing equipment, we have made a significant contribution to the Japanese economy, and have been a leading representative of Japanese industry worldwide.

In 1885, the Meiji government signed the "Treaty of the Meter". Then, as a more modern system to unify weights and measures, the Weights and Measures Act came into effect in 1893 and the system of production and sales of measuring instruments was changed from a licensing system to a certificate system. The supervising authority considered that the regulation could not be maintained due to the difficulty of managing one-to-one licenses given to workers who manufacture measuring instruments. Therefore, the government asked Mr. Otokichi Ishida, then a member of the Kyoto Prefecture Assembly , to purchase all products manufactured by the workers and take responsibility for selling them.

In the same year, "Ishida Scales Mfg. Co.,Ltd.", the root of Ishida Co., Ltd., was founded. The business was more focused on social service than gaining profits in its initial years. With such a background, "Three Way Harmony", i.e., "good for sellers", "good for buyers", and "good for society", which is an important guiding precept of the Omi shonin(*), became the company's philosophy.

Ishida, a leader in measuring tools

Known as a leader in weighing equipment, Ishida has an overwhelming strength in the field of industrial weighing instruments. The Company has expanded the business across all industries and is especially strong in the food industry, winning a 70% share in the Japanese market. Recently the Company has a good record in the solution business that provides an integrated system using its own products for weighing, packaging, inspection, marking , box packing, and information. The Company is also focused on entering the medical and drug industries, investing in the

development of a hospital guidance system.
Consolidated sales of the Group for the fiscal year ended March 31, 2017 reached JPY109.12 billion, and non-consolidated sales of Ishida reached JPY79.54 billion. The ratio of consolidated sales is 64.3% in Japan and 35.8% overseas. The operating profit ratio is 40.7% in Japan and 59.3% overseas, with bases installed base in over 100 countries. The number of employees is 3,451 worldwide and 1,438 in the Ishida company itself as of June 21, 2017.

Providing total solutions

The business of selling instruments by themselves is difficult to deal with, and the demand for automation systems are increasing due to a labor shortage in the food industry in Japan.
Mr. Shinsuke Sakamoto, General Manager, R&D Department , says, "We aim to expand our business to increase competitiveness and added value while focusing on the four core techniques of "measuring", "packaging", "inspection" and "marking". We are also putting emphasis on the food manufacturing industry which accounts for a large share in our company. There is an increasing demand for automation due to labor shortage."
These days, awareness of centralized management for all processes and ensuring traceability is increasing in the whole food manufacturing process.
Mr. Masafumi Nakano, Assistant Manager, System Department, mentions system development based on IoT technology, explaining, "Food processing factories need smartification that can centrally manage Ishida's or other companies' food instruments and devices connected by IoT technology. We launched the production and quality management system "i-FORT" for supporting food safety and security in order to help customers solve production and quality management problems."

X-ray Inspection Systems

2

3

1) Units assembling line 2) The digital Yatai manufacturing system based on the internally developed digital procedure adopted for the units assembling line 3) Sheet metal process at the "Processing Technology Center" in the Shiga factory. The center produces core parts, creates development prototypes, and manufactures parts required after delivery

Mr. Makoto Nakatani, Section Manager, R&D Department, says, "Interest in food safety and security is increasing more and more, and there are global opportunities to support customers in the food manufacturing industry. We wish for our products to be used in all food related sites from farm to food factory, logistics and retailer until they are widely reputed as 'food infrastructure'".

Digital manufacturing supported by IoT

Ishida's "food infrastructure" is supported by the Shiga factory, which is the production site in Shiga, the prefecture next to Kyoto. For the process of assembling units and products, the factory has adopted the digital Yatai manufacturing system and cell production system based on the internally developed digital procedure, enabling flexible IoT-based manufacturing that can adjust to the sales trend. The cell production system was adopted 20 years ago and the digital Yatai manufacturing system was adopted 10 years ago. The systems continue to be improved.
In the field of weighing and packaging, Ishida strives to be at the forefront of manufacturing and continue to drive the global market as an industry leader.

* Omi shonin
Merchants from the Omi region (modern Shiga and Kyoto prefectures) who were active in the Edo period (the 17th to 19th century).

From the left: Mr. Masafumi Nakano, Assistant Manager, System Department, Mr. Makoto Nakatani, Section Manager, R&D Department, and Mr. Shinsuke Sakamoto, General Manager, R&D Department

Company name:	Ishida Co., Ltd.
Address:	44 Sanno-cho, Shogoin, Sakyo-ku, Kyoto, 606-8392 Japan
President:	Takahide Ishida
URL:	http://www.ishida.com/

Redefining the manufacturing framework

"Kyoto Shisaku Net" arising from the city of craftsmanship

Kyoto Shisaku Net

Kyoto - One of the largest centers of prototype processing

Kyoto Shisaku Net, a general incorporated association, was established in July, 2001 by a group of ten small and medium companies engaging in machinery and metal in Kyoto, under the principle of creating a center of prototype processing in Kyoto. Now consisting of 50 members, it provides a wide variety of services for assisting prototype processing.

As IT becomes widely used after the Lehman Brothers bankruptcy in 2008, Business Process Reengineering (BPR) in manufacturing has increased. Mr. Shigero Suzuki, President of SAIJOINX Co., Ltd., who became the fourth representative director of Kyoto Shisaku Net in 2016, says, "Today, creating prototypes and manufacturing are required to directly connect to solution of social problems and contribution to society. 'Kyoto Shisaku Net' is redefining the manufacturing framework".

Kyoto Shisaku Net is always at the front line of manufacturing prototypes ("SHISAKU"), and has expanded its business under the philosophy of Peter F. Drucker that the most important business functions are marketing and innovation and the purpose of a business is "to create a customer". The association aims to increase the global recognition of "SHISAKU" (prototype) by making it worthwhile to "KAIZEN" (improvement).

The association actively searches for opportunities across the world by getting involved in prototype manufacturing related to equipment and devices from a concept development phase, not only for a component phase. The association is making the high quality of Japanese prototype processing technology known to the world by participating in international trade fairs related to medical and electronic devices such as the annual "MD&M" held in Anaheim, California, USA and "electronica" held in Munich, Germany.

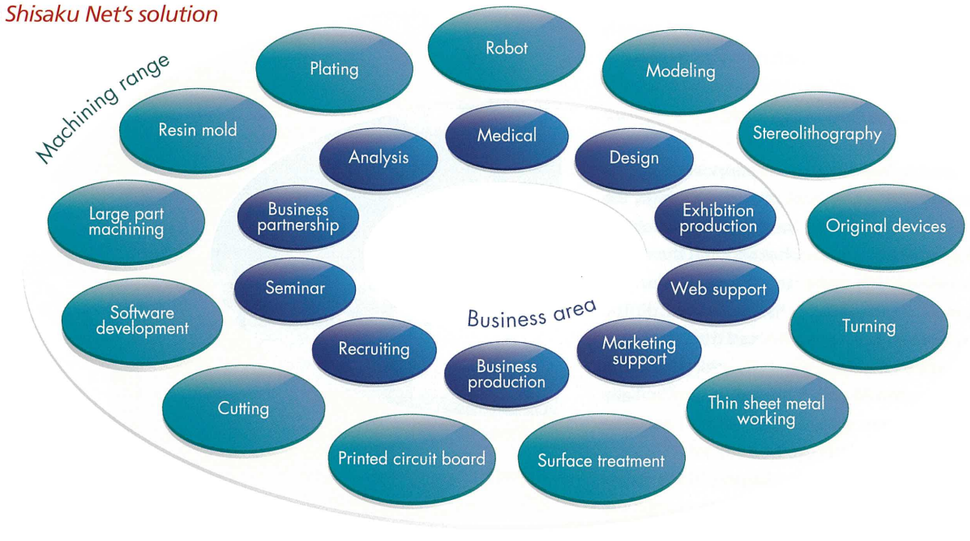
Supporting manufacturing entrepreneurs based in Kyoto

Even if funds can be collected through Crowdfunding campaigns, manufacturing entrepreneurs in the world often encounter such problems that they cannot bring a prototype into mass production or cannot meet the specified delivery date. Looking at such situations, the association started to develop a project to support their startup.

In 2017, in cooperation with partner companies in Japan and throughout the world, the association joined in operation of "Makers Boot Camp", a venture capital company based in Kyoto that helps product development from prototype processing to mass production according to business models. From Kyoto, a city of craftsmanship, the venture capital can provide the right support for individual entrepreneurs. The association is also planning to enter the fields of health care, electronic devices and robotics, which are expected to grow in the future.

"Our goal is to become the 'Google of manufacturing'", Mr. Suzuki explains.

Kyoto Shisaku Net's solution

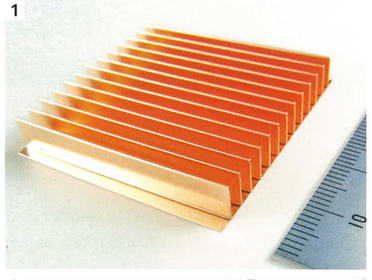


"Monozukuri"

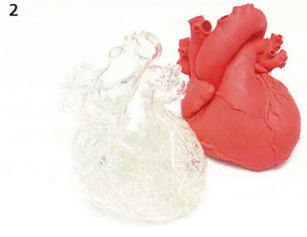
SHISAKU

Group name:	Kyoto Shisaku Net
Address:	Kyoto Research Park Building 2F #2, 134 Chudojiminami-cho, Shimogyo-ku, Kyoto, 600-8813 Japan
Representative Director:	Shigero Suzuki
URL:	http://kyoto-shisaku.com/en/

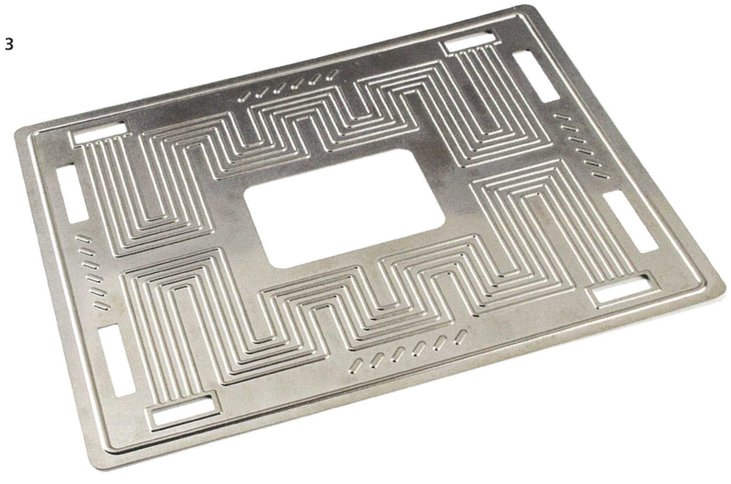
1



2



3

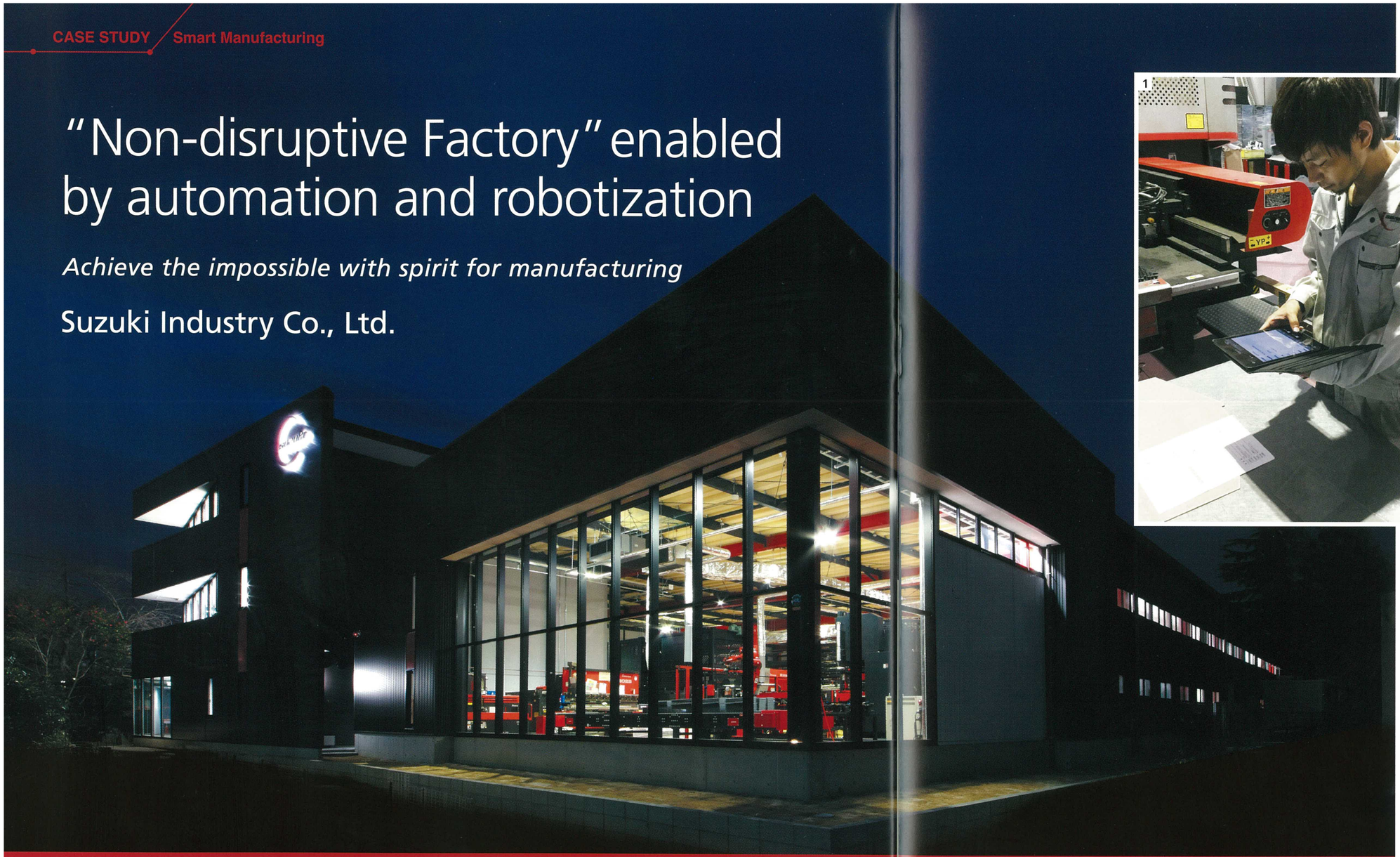


1) Original development method of the thin sheet heat sink. Starting from thermal analysis and design 2) Cardio simulators. Realistic model hearts made based on CT scan data. Can be utilized in pre-surgery simulations and training 3) A thin sheet metal separator for fuel cells. In the past, the separator took at least 6 months for development, but can be produced in parts in as short as 3 weeks

"Non-disruptive Factory" enabled by automation and robotization

Achieve the impossible with spirit for manufacturing

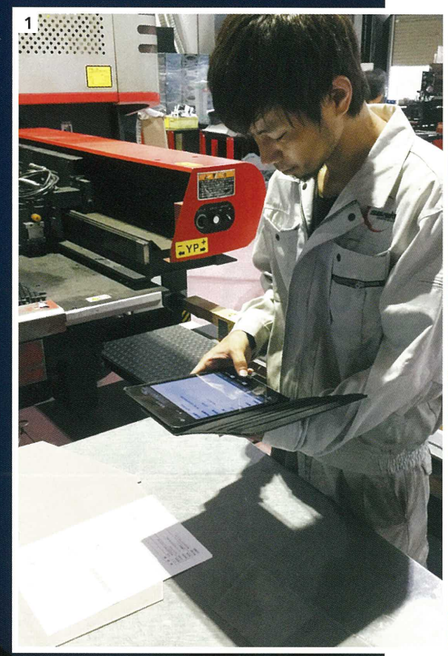
Suzuki Industry Co., Ltd.

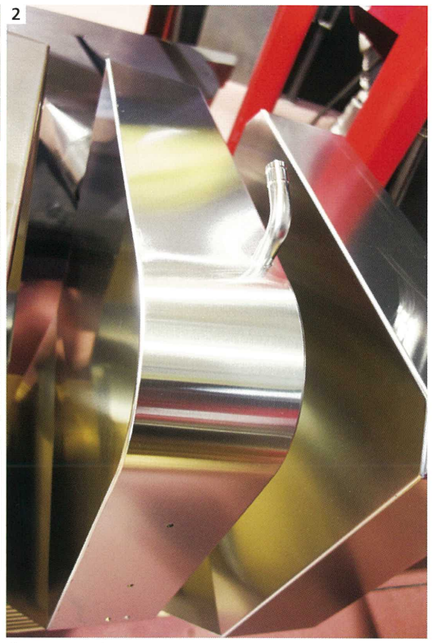


New factory opened in December, 2016. The inside is visible through the glass wall and the processing equipment can operate unattended and is illuminated by LED lights through the night

Non-disruptive Factory

With the catch line of "embodying any ideas and achieving the impossible with spirit for manufacturing", Suzuki Industry Co., Ltd. has encouraged employees and promoted their motivation for work, and thus doubled the sales and the number of employees in five years.
In December, 2016, the company opened a new factory whose inside is visible from the outside through the glass wall facing the street. It has processing equipment that can operate unattended and is illuminated by LED lights through the night, and therefore is called a "Non-disruptive Factory" by people passing through the area.
Long continuous operation and JIT production are enabled by the automated system with a fiber laser combination machine in the blanking process, the bending robot line in the bending process, and the fiber laser welding robot system in the welding process.





1) Progress/result management with tablet device (iPad). 3D modeling of a product can be viewed as 3D PDF 2) Stainless steel products processed with a fiber laser welding system. It has high quality without visible warp or welding burn

Progress/result management with mobile devices

The company's main products are used in the fields of transportation vehicles (such as body frames of trucks and trailers), housing (such as fire extinguisher boxes and meter panels), and communication devices (such as cabinets and racks). Due to the trend of high-variety, and low-volume production, more than tens of thousands of types of items are being manufactured per month, and to ensure QCD, production management and process/result management has grown in importance.
Although a production management system was introduced and bar codes of work instructions were read with handy terminals for progress/result management, the limited number of handy terminal units and the limited battery life prevented sufficient management.
Therefore, the company started operating the "IP progress management system" that reads bar codes using the built-in camera of Apple mobile devices such as iPod touch, iPhone and iPad. In addition, 3D modeling of a product can be viewed as a 3D PDF while on site using iPad, which promotes paperlessness.
"Our goal in the future is to be a smart factory that can visualize the production process, such as by trailing the movement of operators with the GPS function of mobile devices" (Mr. Suzuki, President).

Company name: Suzuki Industry Co., Ltd.
President: Sadaharu Suzuki
Address: 40-23 Aza-Matoba, Hora-cho, Okazaki-shi, Aichi, 444-0008 Japan
URL: https://u-suzuki.co.jp/

Sanmatsu staff using a 3D solid model during an editing meeting

Integration of IoT and craftsmanship

Realizing high-value-added management with the "small lot manufacturing agent service"

Sanmatsu Co., Ltd.

Shifting to "small lot manufacturing agent service"

In the ever-changing environment surrounding industrial structures and companies, Sanmatsu Co., Ltd. has shifted its business model from sheet metal processing to "small lot manufacturing agent service". Today about 100,000 parts and products of 8,000 to 9,000 types are produced every month. The products are used in various applications, including leaf tobacco dryers, semiconductor production equipment, telecommunication equipment, food and kitchen equipment, medical devices, and building material.
Lately, with "SMASH", an internally developed simulation software based on 3D CAD, the company is working on robot software development in cooperation with a major robot manufacturer. It is also expanding the business in multiple directions through cooperation in medical engineering, academic-industry cooperation in material processing, and cooperation with venture capitals. In Vietnam and China, overseas business with Japanese companies and local companies has started.

Integration of IoT and craftsmanship

The most important challenge for the President, Mr. Tetsuro Tanabe, was "figure management". Mr. Tanabe joined the company in 1996, and in 1997, he built and started operating the "Sanmatsu Integrated Network System (SINS)", a unique production management system, meant to enable (1) checking of real-time progress and delivery time, (2) detailed cost management, and (3) strict process management of individual items.
"SINS" continues to be improved—centralizing the management of processing data, CAD data and production information, developing a program that automatically collects production information from 3D models, synchronizing information in reports and drawings, and compiling information on workers' techniques and skills into a database as the company's asset.
In 2016, the "carrier management system" was introduced. Location information of individual carriers has been visualized with beacons attached to them and receivers installed in the factory. In addition, current locations of products and progress of the process can be identified by linking the system with "SINS" and mapping the cart numbers to the production numbers. The system has shortened the time to search products and carts and reduced total annual work hours by about 3%.
Thorough streamlining is promoted, and unique training systems such as "Sanmatsu College", "Sanmatsu Unified Exam" and "Sanmatsu Company-wide Election" have been introduced, aiming for a "workplace where employees can exercise their abilities more than ever".

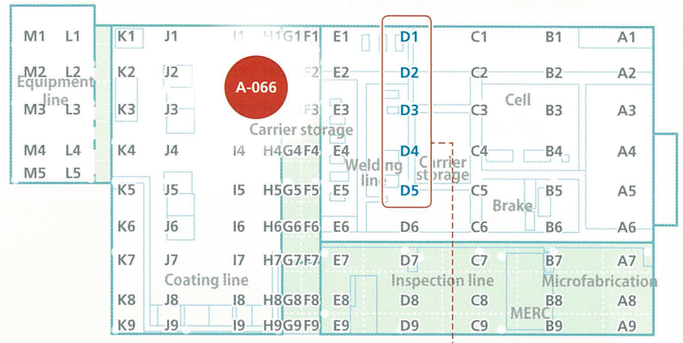
Carrier Management System

In the factory Collect beacon waves

280 beacons are attached to carriers and detected and collected by receivers installed in 60 locations around the factory

Carrier management system Search product and carrier locations

Location information of the carrier (A-006) is displayed on the map, making it possible to assess the location and progress of products in real time.



Numbers indicating the locations of the carriers are on the upper parts of the factory pillars

Bending machine HG-1003ATC with Automatic Tool Changer

Company name: Sanmatsu Co., Ltd.
Address: 3-10-9 Okada, Chikushino-shi, Fukuoka, 818-0013 Japan
President: Tetsuro Tanabe
URL: http://www.sanmatsu.com/

NEW Fiber laser machine

ENSIS 3015 AJ Fiber Laser

FL FIBER LASER 3kW

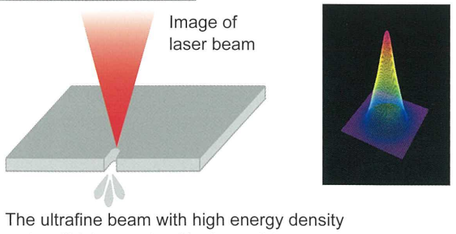
ENSIS-3015AJ

Thin-to-thick material cutting with a single machine

Optimized beam control

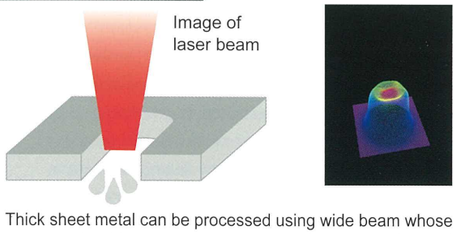
The shape of laser beam is controlled using our unique beam control technology.
ENSIS-3015AJ creates optimized beam in response to thickness of the sheet metal.

Processing thin sheet metal

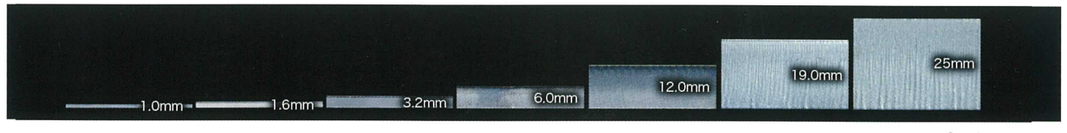


The ultrafine beam with high energy density makes "high speed cutting" possible.

Processing thick sheet metal



Thick sheet metal can be processed using wide beam whose cut range is wide. A clearance is made after processing and assist gas blows the molten material into the clearance.



Cutting sample

AMADA DIGITAL INNOVATION V-factory

High precision bending robot system

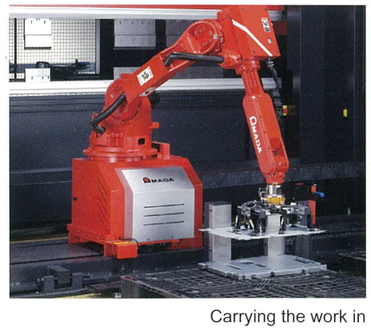
HG 1003 ARs

HG-1003ARs

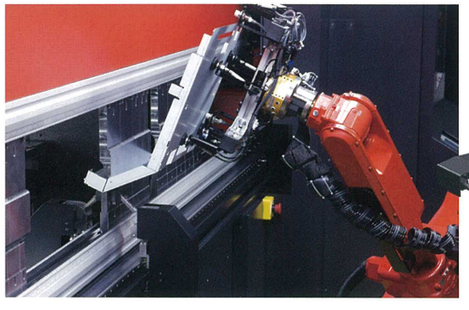
HG-1003ARs corresponds to variable production requirements such as types and quantities

It makes smoother operation possible by automizing annoying setups

Easy operation with single robot (Jointed-arm robot with 7 axes)
Single robot with 7 axes (6 axes + traversing axis) that can carry the work in/out and bend is adopted and the operation range expands.
A robot controller receives order from AMNC 3i (NC device) and operates robots.



Carrying the work in



Bending processing

Company contributing to manufacturing of sheet metal products used in every life scenes

Here
Energy

Here
Train

Here
Construction vehicle

Ticket vending machines

Electronic sign

Elevators

Here
Bus

Buildings

Here
Airplanes

Here
Satellite

Here
Shipping

Here
Traffic signal

Medical devices

Bridges

Automobiles

ATMs

Sheet metal are fabricated into metal products by AMADA's machine

laser cutting

bending

welding

forming

laser marking

Sheet metal

Solid metal are fabricated into metal products by AMADA's machine

cutting

grinding

drilling

Solid metal

AMADA GROUP GLOBAL NETWORKS

AMADA SOLUTION CENTER
Isehara S.C. (Japan)
Haan S.C. (Germany)
Schaumburg S.C. (U.S.A.)

Europe and Africa
AMADA EUROPE S.A. (R.H.Q.)
AMADA S.A.
AMADA OUTILLAGE S.A.
AMADA UNITED KINGDOM LTD.
AMADA GmbH
AMADA MACHINE TOOLS EUROPE GmbH
AMADA ADVANCED TECHNOLOGY GmbH
AMADA MIYACHI EUROPE GmbH
AMADA ITALIA S.r.l.
AMADA ENGINEERING EUROPE S.r.l.
AMADA MAQUINARIA IBERICA
AMADA SWEDEN AB
AMADA AUSTRIA GmbH
AMADA OOO
AMADA MAKINA TEKNOLOJI SANAYI VE TICARET LTD. STI.
AMADA SWISS GmbH
AMADA DENMARK A/S
AMADA MIYACHI EUROPE B.V.
AMADA NORWAY AS
AMADA SP. Z O.O.
AMADA UNITED KINGDOM LTD. JOHANNESBURG BRANCH
AMADA MIYACHI EUROPE KFT.
AB Lki Käldman Oy

North & South America
AMADA NORTH AMERICA, INC. (R.H.Q.)
AMADA AMERICA, INC.
AMADA TOOL AMERICA, INC.
AMADA MACHINE TOOLS AMERICA, INC.
AMADA MIYACHI AMERICA, INC.
AMADA CANADA LTD.
AMADA de MEXICO, S. de R.L. de C.V.
AMADA DO BRASIL LTDA.

China and East Asia
AMADA (CHINA) CO.,LTD. (R.H.Q.)
BEIJING AMADA MACHINE & TOOLING CO., LTD.
AMADA INTERNATIONAL INDUSTRY & TRADING (SHANGHAI) CO., LTD.
AMADA INTERNATIONAL TRADING (SHENZHEN) CO., LTD.
AMADA SHANGHAI MACHINE TECH CO., LTD.
AMADA MIYACHI SHANGHAI CO., LTD.
AMADA MIYACHI WELDING EQUIPMENT (SHANGHAI) CO., LTD.
AMADA LIANYUNGANG MACHINERY CO., LTD.
AMADA LIANYUNGANG MACHINE TOOL CO., LTD.
AMADA LIANYUNGANG MACHINE TECH CO., LTD.
AMADA HONG KONG CO., LTD.
AMADA TAIWAN INC.
AMADA MIYACHI TAIWAN CO., LTD.
AMADA KOREA CO., LTD.
AMADA MIYACHI KOREA CO., LTD.

ASEAN and other regions
AMADA ASIA PACIFIC CO.,LTD. (R.H.Q.)
AMADA (THAILAND) CO., LTD.
AMADA SINGAPORE (1989) PTE LTD.
AMADA (MALAYSIA) SDN.BHD.
AMADA VIETNAM CO., LTD.
AMADA SOFT (INDIA) PVT. LTD.
AMADA (INDIA) PVT. LTD.
AMADA MIYACHI INDIA PVT. LTD.
AMADA OCEANIA PTY LTD.

JAPAN
AMADA HOLDINGS CO., LTD. (G.H.Q.)
AMADA CO., LTD.
AMADA MACHINE TOOLS CO., LTD.
AMADA TECHNICAL SERVICE CO., LTD.
AMADA ENGINEERING CO., LTD.
AMADA MIYACHI CO., LTD.
AMADA TOOL PRECISION CO., LTD.