

Featured

2020

## Interview with Machine Tools Division Manager

Award

### Won the "Monozukuri Award" at the 62nd Best 10 New Product Awards

Linear Motor Drive  
High-speed & High Performance Large-size Die-sinker EDM

## AG200L

Products

Linear Motor Drive Nano Machining Center

### AZ275nano

Linear Motor Drive Ultra High-speed Milling Center

### UH430L

Technology

What's Possible with !!

## AM (Additive Manufacturing) Technology

Sodick User Report

FUJIKOHGYO Co., Ltd.

News

Thailand Plant Received Award for Environmental  
Energy Initiatives  
- Thailand Energy Awards 2019 -

Won the Silver Prize at the Fuji Sankei Business i Business  
Advertising Awards

A great leap forward for the Sodick Sumo Team!  
Demonstrated Top-class Abilities at the Tournament

Machine Tools Division General Manager Takashi Matsui

## Sodick leverages on its "Total Manufacturing Solution" strengths to win a gold medal!



Raising the curtain on 2020. "Interview with the general manager," featuring interviews with the general managers of the Machine Tools, Injection Molding Machinery, and Food Machinery divisions, will be published in three editions; winter, spring, and summer. 2020 is packed with large exhibitions that the various divisions are putting a great deal of effort into. These are messages from the managers, who are focused on the year to come, as well as on the more distant future.

- As new products and concepts such as electric vehicles and 5G come in to use in rapid succession, automation, the IoT, and globalization have become keywords in the manufacturing industries that support them. What will we ourselves focus our efforts on? -

We achieved record results in the machine tool industry in 2017 and 2018, however in 2019 influences such as the friction between China and the United States saw a 30% reduction in the size of the market as a whole, reaffirming the fact that China is the key to machine tool sales. However, the issue is not that demand in the Chinese machine tool market has dropped. The drop in domestic demand in China has been slight, and the used market for excess machinery remains brisk. Beginning in the second half of this year, we anticipate seeing movement in equipment associated with items such as electric vehicles and 5G.

At an exhibition in China recently, I saw a machine that sang the phrase "Made in China." That is an indication that China is beginning to have confidence in their own technology, and I believe that in the future, China will grow to become a threat in this industry as well. One of Japan's strengths lies in its high level of applied technology, and in its precision manufacturing capabilities. Another is a culture in which techniques are passed down within organizations to young people. We want to improve steadily on this at our company too.

We have entered an era in which even a large enterprise cannot perform production wholly on its own. At Sodick, we now cooperate with other companies in a variety of domains to offer proposals to our customers.

- In an era such as this, what are our strengths? -

Up until now, we have worked to create added values unlike any seen before, but now our strengths go beyond this, extending to a "Total Manufacturing Solution" that encompasses the production of electrical discharge machines, machining centers, injection molding machines, metal 3D printers, and food machinery, allowing us to offer proposals to customers using an extensive range of manufacturing. As a result, we possess strengths and added value that, while not readily visible, are lacking in our competitors. There is a story to this, which all of us must convey the appeal of to our customers effectively.

- Two large events, IMTS2020 (the International Manufacturing Technology Show, held in Chicago in September) and JIMTOF2020 (the Japan International Machine Tool Fair, held in Tokyo in December), await us. How will we present the appeals of our company? -

In 2019, we announced the AP30L, which is suited to the needs of the 5G market. This machine boasts precision processing that cannot be matched by cutting machinery. There is a need for large molds in industries such as automobile and aircraft manufacturing. Although there have been EDMs compatible with large molds in the past, the AG200L (see next page) we released offered world-first technology in a compact form, and won the Monozukuri Award at the 62nd Nikkan Kogyo Shimibun Best 10 New Product Awards. We will continue to focus our efforts on new product development.

With China's "Made in China 2025," the USA's "Industrial Internet," and Germany's "Industry 4.0" all in competitive development, what strategy will Japan take? I believe that if we make products suited to the culture of Japan, a "Japan-style IoT," through manufacturing with the applied technology I mentioned earlier, we will be able to compete at a global level. And so, when we look again at the abilities of this company, it becomes evident that our strength lies in our "Total Manufacturing Solution." This year, we will introduce products that take a different form to those of the past, which will give a concrete reality to our strengths at IMTS2020 and JIMTOF2020. These efforts will center on the key themes of machinery suitable for the industries where these shows are being held, on consistent manufacturing linked with the IoT, and on improvements in productivity through automation.

- What are the Sodick's goals for 2020? -

The Olympics—a wonderful event—are to be held in Japan this year. Every athlete seeks to win gold, not silver. The founder of our company acted with the same determination to win gold, or other words, to achieve first place. In 2000 we changed the color of our machinery, and now use a gold color scheme. This reflects our hopes that gold is symbolic of coming first. We will launch new products ahead of the major events such as IMTS2020 and JIMTOF2020. Let's join together as a team this year to win the gold with our machinery on the world stage!

(Interviewer: Miki Shimamura, Caribou, Inc.)



- Achieving superb finishes without polishing -

Linear Motor Drive  
High-speed & High Performance  
Large-size Die-sinker EDM

» AG200L



### The AG200L won the Monozukuri Award in the 62nd Nikkan Kogyo Shimibun Best 10 New Product Awards in 2019.

A linear motor driven large-size die-sinker EDM, the AG200L utilizes a new design and new technology to achieve 2,000 mm of movement on the X-axis, 1.7 times more than previous products compatible with large-size workpieces, while offering a high level of precision more typical of medium-size machinery. In recent years, large molds for vehicles feature many deep small-diameter holes and slits with complex shapes, which are difficult to achieve in cutting processes and require processing that does not need hand polishing, and the AG200L can provide a surface finish roughness of up to Rz 0.6 μm. Movement on the X-axis has been greatly expanded from 1,200 mm to 2,000 mm, and from 650 mm to 1,200 mm on the Y-axis, yet in a compact design with dimensions only 1.5 times larger than the previous products, and it features the "LN2A2 power supply" developed in-house specifically for Y-axis slide methods in the AG200L. The breakthrough performance of these advanced-edge technologies at the forefront of manufacturing has been highly acclaimed, and has won the award.

### » Product Characteristics



#### Supports large-size workpieces + space saving

The X-axis was expanded to 2,000 mm from 1,200 mm, and the Y-axis was expanded to 1,200 mm from 650 mm. Sodick successfully realized the downsizing of the machine by reducing the machine size (area) 1.5 times compared to the conventional maximum size machine, while supporting large-size workpieces with about double the maximum workpiece size (area), and a machining tank space volume of about 3.2 times.

#### Reduced weight shifting & improved axis responsiveness Unique Y-axis slide method

Adoption of a slide structure where the Y-axis is stacked vertically, reduced the weight shifting while expanding the stroke of the machining axis, and improved the responsiveness of the axis.

#### Stable electrical discharge system Arc-less Plus

The performance of die sinking has improved greatly, such as increased speed, maximized suppression of electrode wear, and realized various machining surface qualities from satin to mirror surfaces.

#### Improved operating efficiency Latest man-machine interface

Various assist functions and help functions by the "LN2A2 power supply" only for the AG200L equipped with a simple highly visible operation screen, supports improvement in operating efficiency.

## Ultra fine machining under 0.5 G

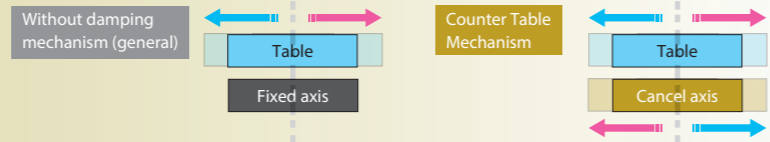
This flagship model demonstrates the highest machining performance in the nano-range  
Linear Motor Drive Nano Machining Center

### AZ275nano



Canceling out reactions and fluctuations in the center of gravity position  
**Active vibration-free system "Counter Table Mechanism" (Energy offset type twin linear motor drive)**

- The XY axes are equipped with a canceling axis driven at the phase opposite to the machining table



- Equipped with Sodick's proprietary linear motors on a total of 7 axes, XYZ axes + canceling axes

20,000 to max. 120,000 min<sup>-1</sup>  
**New ultra-high speed spindle**

- High-speed milling is achieved with high-speed rotation of small diameter tools, shallow cutting and high feed cutting



#### New NC unit "LN4AZ" developed and manufactured by Sodick

- Resolution of scale feedback is enhanced from 3 nm to 0.1 nm
- Precise step feed commands greatly improved comprehensive motion performance

#### Box structure with a low center of gravity

- Overhang-free box structure having high rigidity/low center of gravity supports high-speed, high-acceleration operation

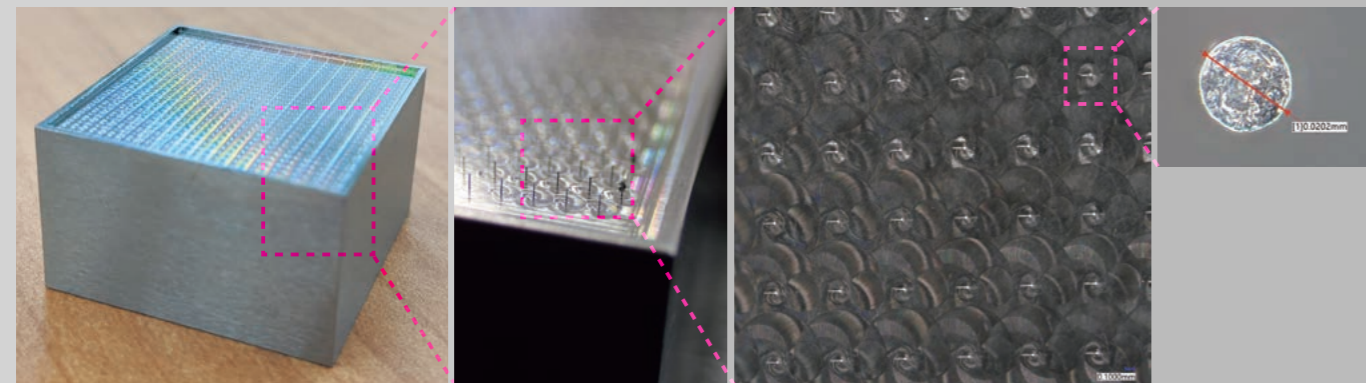
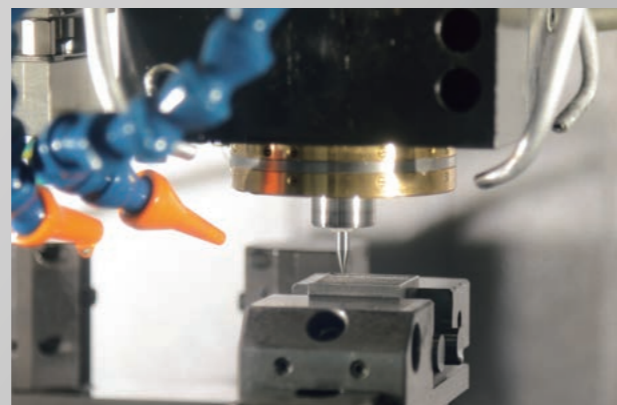
#### High frequency amplifier developed and manufactured by Sodick

- Faster acceleration (1.7 times that of conventional models) in the precision range reduces time for machining

### SAMPLE: $\phi 0.02$ mm pin machining

This is machining of a total of 841 pins of  $\phi 0.02$  mm with L/D 15 times. The active vibration-free system suppresses vibration to the limit, enabling ultra-high precision machining.

Machine	AZ275nano
Material	STAVAX (HRC52) 25 x 25 x 15mm
Notes	$\phi 0.02$ mm 0.3-mm height pin 841 pins (29x29) Pitch 0.8 mm
Cutting time	Rough machining : 12 hr 7 min 43 sec (52 sec/pin) Finishing : 15 hr 10 min 34 sec (65 sec/pin)
Cutting condition	Main spindle rotation speed (S) : 95,493 to 120,000 min <sup>-1</sup> Feed rate (F) : 457 to 460 mm/min
Cutting tool	2 pcs. CBN $\phi 0.5 \times R0.02 \times L0.5$ (SSR200) CBN $\phi 0.2 \times R0.02 \times L0.5$ (SSR200)



## All-linear perfect balance

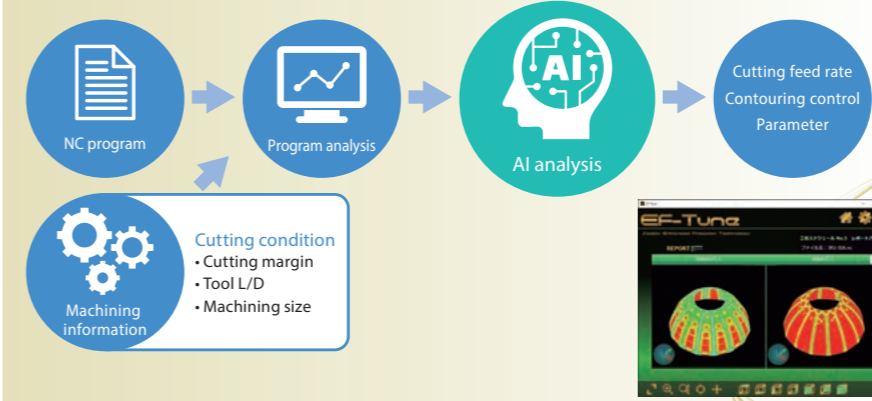
Linear Motor Drive Ultra High-speed Milling Center

### UH430L

## AI-based software assists machining!

### EF-Tune (Optimum cutting speed calculation software)

- Software that calculates the cutting feed rate and SEPT parameters
- Calculates the optimal conditions ideal for machining based on analysis using artificial intelligence (AI) technology.



#### New NC unit "LN4X" developed and manufactured by Sodick

- New screen design with clear visibility and direct operation
- Improved performance of high-speed/high-precision contouring control SEPT

#### Equipped with machining simulation software as standard

- MotionExpert®-AI allows more accurate estimations of machining time and surface quality

#### All-axis (3-axis: XYZ) linear motor drive

- Employs Sodick's proprietary PWM amplifier, which increases speed of linear motor control cycle on each axis (3 times faster than previous model)

#### CFRP used for head structure

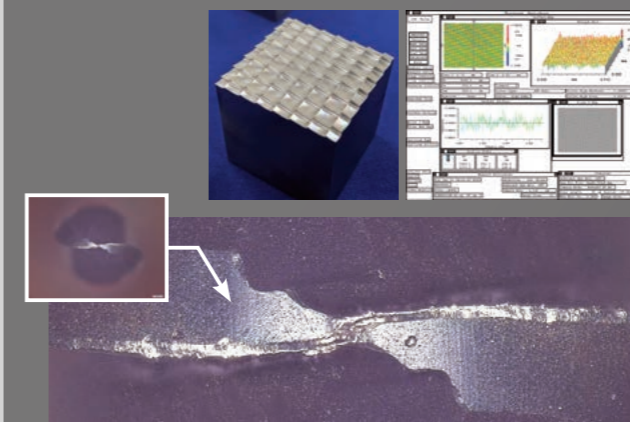
- CFRP, which has excellent vibration damping properties, is used for head structure of HSK-E25
- Reduced weight improved operating performance and dynamic deflection accuracy by 50%
- Displacement in Z-axis direction reduced by 36% (compared to previous model using actual values for HSK-E32IK)

### EF-Tune application example Comparison of tools

This example shows when the feed rate (F value) is calculated using EF-Tune. The bottom of the tools after reflector shape machining (rough) were compared.

### The optimal F value reduces tool wear!

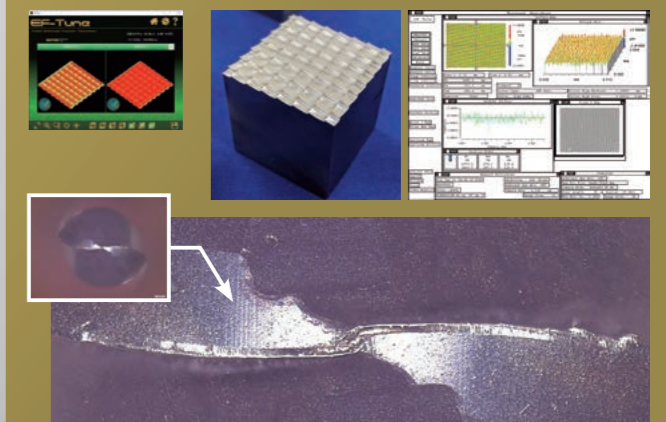
Standard condition : Surface roughness Ra 0.211  $\mu$ m



Worn in short (27 min 55 sec) machining. The rotation speed is too high for the feed rate.

Feed rate(F):	rotation speed(S):	Cutting time:
1,500 mm/min	25,000min <sup>-1</sup>	27min55sec

When EF-Tune is used : Surface roughness Ra 0.210  $\mu$ m

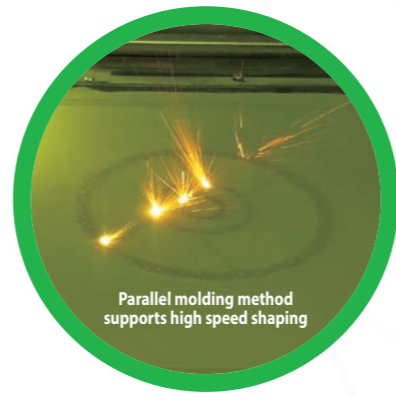


No wear even after more than 30 minutes of machining. Appropriate feed rate reduces tool wear!

Feed rate(F):	rotation speed(S):	Cutting time:
1,003 mm/min	17,000min <sup>-1</sup>	32min18sec

What's Possible with !!

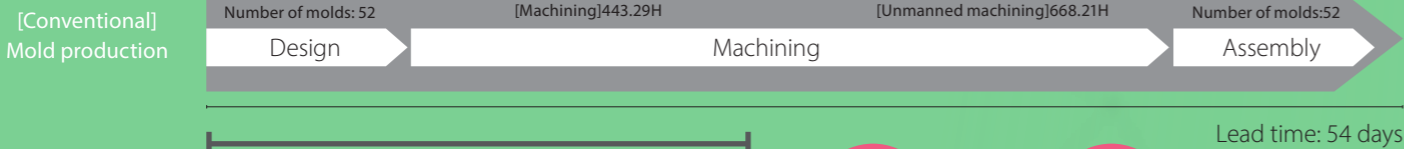
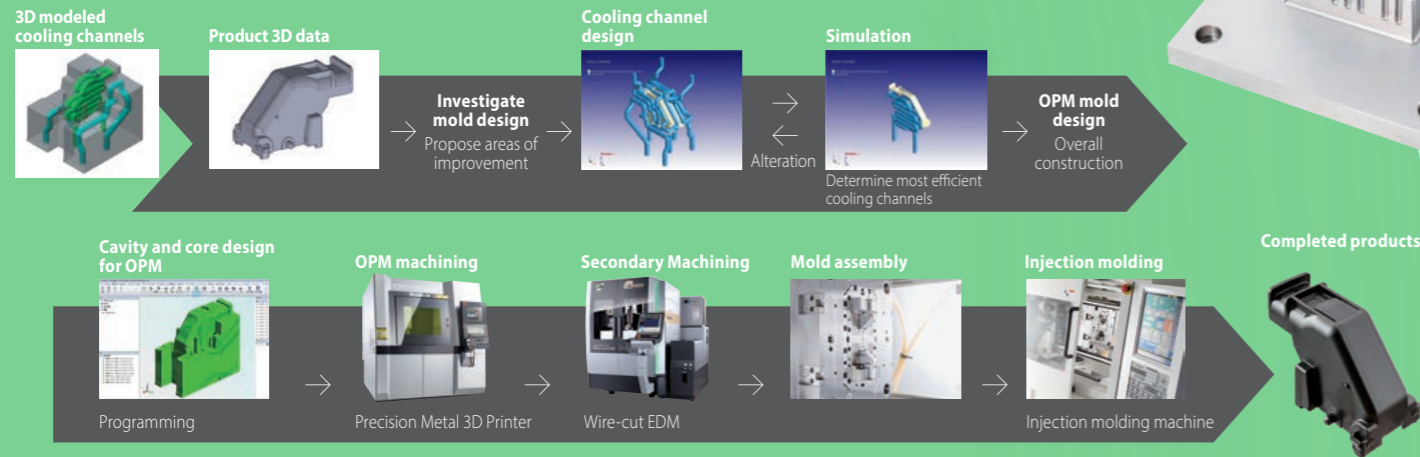
# AM Additive Manufacturing Technology



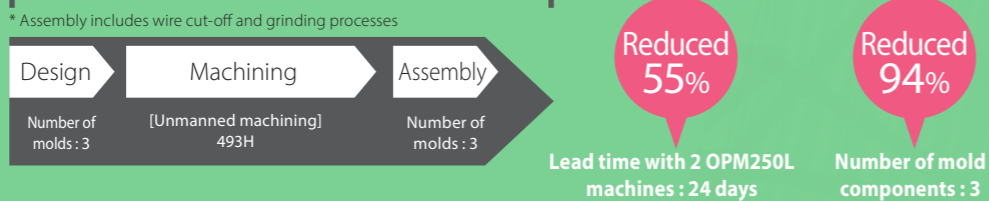
## (1) Make Metal Molds!

Compatible molds: Plastic, Rubber, Die casting

### Procedure



### Mold production using OPM



## (2) Make Components!

Use **generative design** to mold components in design evaluation processes and model creation **topology analysis** for calculating optimal shapes while maintaining high levels of rigidity.

\* What is generative design?

A method of generating design proposals quickly by inputting design goals together with parameters for factors such as performance, space requirements, materials, production methods, and cost limits.



Compatible materials: Al, CoCr, Ti, SUS 420J2, Inconel®, Maraging Steel

\* Inconel® is a registered trademark of Special Metal Corporation.

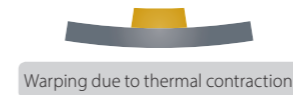
## (3) Precision in Large Items!

### What is SRT ?

Technology that balances stress by intentionally expanding thermal contraction in the device during lamination molding

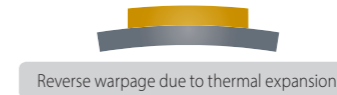
#### Mechanism

Expansion is actively utilized by martensitic transformation



#### Point

Reduces the risk of cracks and can produce objects with minimal warping and deformation



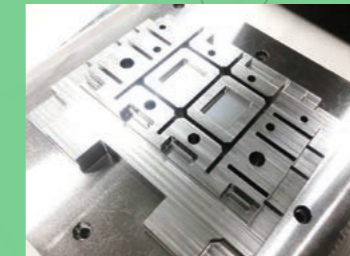
Balanced stress reduces warpage

\*SRT = Stress Relief Technology

### Point of SRT method

Purpose	Quasi-mass production and prototyping are both possible
Aim	High-cycle High-quality molding Process integration
Mold type	Good precision and highly rigid
Production method	Selectable
Molding material	SUS420J2

### Examples using SRT



### SRT results

- SUS420J2 suitable for plastic molds
- Small objects for which warpage is suppressed can be manufactured
- Deformations due to stress release are small (easy secondary processing)
- Can thin the base plate
- Hard to break even when molding big workpieces
- No model modification required for the stress concentration zone
- Can directly target dimensions by cutting machining (no model correction required)
- Hardness of molded object is about HRC53
- Using the same base materials, common heat treatment conditions can be used.

## (4) Metal 3D Printer Lineup



Model	LPM325 MRS*	OPM250L MRS*	OPM350L MRS*
Max. size of object (W x D x H) [mm]	250 x 250 x 250	250 x 250 x 250	350 x 350 x 350
Machining method	shaper	milling	milling
feature	Molds and components High-speed molding and reference surface processing Compatible with a range of metal materials	High-quality molds and components High-speed molding and high-quality finishing	High-quality molds and components High-speed molding and high-quality finishing
SRT method	○	○	○

\* MRS is optional.



Hakusan City, Ishikawa

**FUJIKOHGYO Co., Ltd.**

## Rapid progress with production of vehicle-mounted electronic components

# The insert molding technology that has become their specialty

Orders and production of electronic components for FUJIKOHGYO Co., Ltd. (Hakusan City, Ishikawa) are going well.

Although they make individual press components and general formed plastic items, they specialize in using precision-pressed items made in-house together with thermoplastic resin to create insert-molded items.

Of these, their customers are particularly pleased with the QCD (Quality, Cost, and Delivery) of the vehicle-mounted electronic components, which include high-performance switches, sensors, and connector terminals.

FUJIKOHGYO's insert molding technology has progressed to the point where it can be called their specialty, and the injection molding machines that support it must not be overlooked.

Particularly as they entered the 2000s and moved to install Sodick's injection molding machines featuring the V-LINE® system, their processing techniques developed dramatically, helping to achieve the successful results.

Now, as the need for complicated shapes and materials requiring complex processing grows, they are devoting themselves to the study of these techniques with the intention of continuing to offer their customers safety and peace of mind.



V-LINE® Vertical Rotary Type Molding Machine TR100VRE



President Kiyoshi Koshimura

### Established an integrated production system in-house that includes pressing, resin molding, and assembly

FUJIKOHGYO was established in Shin-mikawashima, Tokyo, in 1939 as a precision metal press machining manufacturer. In 1951, after the end of World War II, the company began making parts for large manufacturers of electronic components. Responding to a need at the time for low-current products such as radios, televisions, audio-visual products, and magnetic tape, FUJIKOHGYO also turned to the task of making camera parts and hinges for cellular phones.

A turning point came in 1990. As their major customers shifted their focus from low-current to vehicle products, the company's president Kiyoshi Koshimura relates that, "Our customers asked us if we would expand a range of machining." Up until then, FUJIKOHGYO had specialized in using presses for drawing processes, but was advised to add resin molding and assembly processing to its press processing-focused capabilities.

Although such work is still component processing, the requirements for low-current and vehicle-mounted products differ significantly. Vehicles do not require tolerances as exacting as those of low-current products, but because human lives depend on these components, faults are unforgivable, and it is not possible to stop production in mid-flow. It almost goes without saying that the company's lack of experience in resin molding left the company uneasy about this move.

After careful consideration, the decision was made to follow along with its customers. The company established an integrated production system in-house that included pressing, resin molding, and assembly. "It's different when you are talking about a company with sales of more than 10 billion yen, but I think it's very unusual to find a company such as us, with sales hovering around 2 billion yen, that has three different processes." (President Koshimura)



Kenji Sakai, manager of the Metal Production Division and head of the factory.

However, it is precisely because the company struggled at the beginning that its insert molding technologies are so strong today. "While manufacturers who specialize in resin molding can purchase terminals from external vendors, they cannot see points of difference. Our company performs both pressing and resin molding in-house, so we can see the differences if anything happens, and it's easy for us to respond," says Kenji Sakai, manager of the Metal Production Division and head of the factory.

### Experiencing the merits of V-LINE® system

FUJIKOHGYO's molding techniques began to improve significantly with the beginning of the 21st century. Specifically, this was brought about when the company received orders for stop lamp switch cases, and in 2002 installed its first Sodick's injection molding machine (a horizontal model). While it is a precondition that all vehicle-mounted components are inspected, and it is absolutely unacceptable to ship a faulty item, trials with their existing injection molding machines did not produce stable component shapes. But, "When we ran tests at Sodick's factory, there was no variation in shape or weight, and we were able to produce stable re-



Forming Production Division manager Shin Hashimoto



In recent years the ratio of Sodick-made vertical injection molding machines for inserts has increased.

sults." (Forming Production Division manager Shin Hashimoto)

The most important factor was the V-LINE® system structure of the Sodick's injection molding machine. Previous injection molding machines used an in-line screw (in-line) system with the screw and injection cylinder (measuring and filling) on the same axis, and consequently the resin would backflow, causing variations in the filling volume. Conversely, measuring and filling are separate processes in the V-LINE® system, thus there is no backflow and the filling volume is stable. Experience showed FUJIKOHGYO the strength of the V-LINE® system, and thereafter, the company went ahead with installation of Sodick's injection molding machines.

Currently there are 34 injection molding machines in the Forming Production Division, 20 of which are vertical injection molding machines for insert molding. Among these, it is the rotary injection molding machines that insert single metal components to perform

injection molding, and the single-action injection molding machines that insert metal components connected in a hoop shape. In recent years the ratio of such vertical injection molding machines for inserts that are made by Sodick has increased dramatically.

**Many improvements have been achieved in molding.**

FUJIKOHGYO's technology and Sodick's injection molding machines are a good match, which is evident in the insert molding. It is used for processing of a variety of components now, but by far the most numerous are those for making vehicle-mounted components, which account for 80 percent of sales. The following are some typical examples.

The first is the processing of connectors for vehicle-to-vehicle distance sensors. These connectors are made from resin, which is both heat- and electricity-resistant. Although trials were made

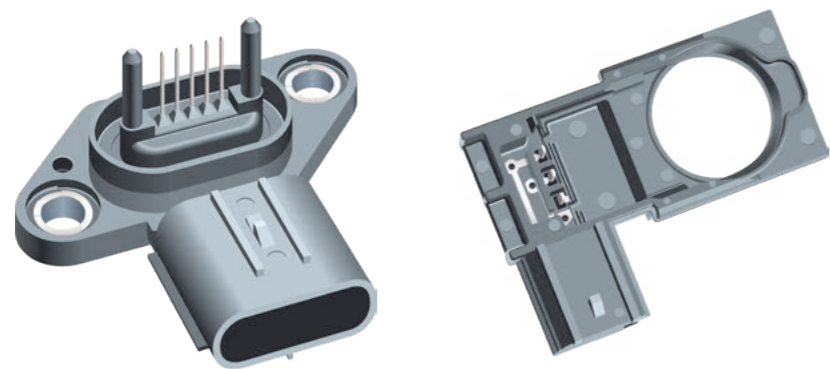
using in-line system injection molding machines, they were unable to resolve the marks on the product exterior caused by the resin gas. "Generally speaking, it is easy for marking to occur at fast filling speeds, but when we lowered the speed we found that the resin would not go all of the way around; we couldn't get it to work, no matter how many times we tried." (Hashimoto)

Hashimoto says that when they tried with the Sodick's rotary model TR100VRE, both measuring and filling were stable, and the marking problem was resolved, leading to improved productivity.

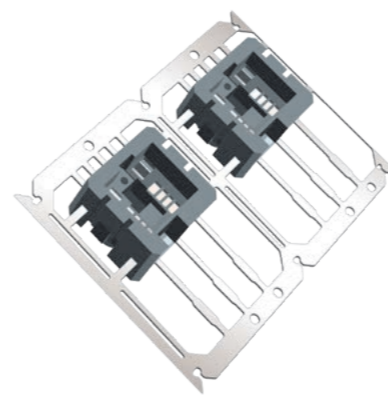
The second example is processing of components for connectors used in vehicle weight sensors, which are made of PBT (polybutylene terephthalate) resin. Although initial trials were undertaken using in-line system injection molding machines, the curve dimensions would not stabilize, even when flow analysis was performed. The issue lay in stabilizing the weight of individual product items. When attempts were made with the Sodick's rotary model TR100VR, both measuring and filling were stable and the curving problems resolved.

**No wear on screws or cylinders**

Insert molding is also used to produce components other than those used in vehicles. One example is processing



Examples of components for vehicle-to-vehicle distance sensors (left) and those for vehicle weight sensors (right)



An example of gas sensor module components made using polyester resin

of gas sensor module components made using polyester resin. Initially we used a number one mold for injection molding using machinery from another manufacturer, but we were unable to solve weld (cracking) quality issues, and the yield rate was also poor. There were also other problems; since 40% of the ingredients were glass, the screws and cylinders wore out quickly.

"We replaced the screws and cylinders frequently, but that alone cost us several million yen. As customer demand increased we were faced with the problem of what to do. We decided that our only option was to replace everything with Sodick products, and took the opportunity afforded us when we updated our molds to install TR75EHV single-action vertical injection molding machines." (Sakai) Weld quality improved after installation of the Sodick's injection molding machines, and faults were eliminated. Moreover,

the frequency with which screws and cylinders had to be replaced dropped dramatically.

"At first we thought that costs for replacing parts might be higher because the Sodick's injection molding machines have two axes, but to our surprise we have been using them now for more than ten years without having to replace them once." (Hashimoto) With in-line systems, the screw and the injection cylinder move on the same axis, thus a great deal of pressure is applied to the entire system. Conversely, with V-LINE®, parts that rotate (plasticize) only rotate, while those that push (fill) only push, so each lasts a long time. These processed items moved from a low yield rate, where in the past it would have been difficult to produce 50,000 units a month, to their present state where they can make more than 150,000 a month with ease.

**Continuing to offer their customers safety and peace of mind**

With insert molding, it is important that resin flow easily and solidify easily, and that each shot is stable, and the company says that Sodick's injection molding machines satisfy these conditions even when used with high-temperature items. With machines from other companies, a high-capacity heater must be attached, but even the

standard model of Sodick's injection molding machines can raise the temperature of up to around 420°C, making them suitable for use with most super engineering plastic.

To improve the level of cleanliness of its products, the company is considering performing molding operations in a clean room. Accordingly, manufacturers are being asked to completely eliminate contaminants and resin gas output from injection molding machines, and to reduce their size to make them easier to use.

With the arrival of electric- and self-driving vehicles, vehicles are becoming more electronic, pushing the demand for the vehicle-mounted sensors that are FUJIKOHGYO's specialty ever higher. However, this also means that the company cannot afford to relax, as there is an ongoing need for products with complex shapes, and new lightweight, strong materials. Looking to the future, the president Koshimura says, "We hope to have a solid understanding of the changing market environment and the issues involved, and will keep working to offer our customers safety and peace of mind."

**Company profile FUJIKOHGYO Co., Ltd.**

Address of Head Office	1-12 Asahigaoka, Hakusan City, Ishikawa Prefecture, 924-8522	Primary products	Metal press products : Vehicle-mounted connectors/Vehicle-mounted components/Moving vehicle components/Gas equipment components
TEL	076-275-0211		Plastic molding products :
FAX	076-275-0933		Two-wheel vehicle components/Vehicle-mounted components/Consumer components/Camera components
Representative	President Kiyoshi Koshimura	URL	http://www.fujikohgyo.co.jp
Established	1939		
Capital	40 million yen		
Number of Employees	110		
Sales	2 billion yen		



Thailand Plant Award

2019.10.18

## Thailand Plant Received Award for Environmental Energy Initiatives - Thailand Energy Awards 2019 -

A Sodick plant in Thailand has received an award in the Energy Management Team for Designated Factory category of "Thailand Energy Awards 2019," a system of awards operated by Thailand's Ministry of Energy that recognizes efforts made with regard to environmental management and energy conservation.

With a core formed by the Maintenance Department, the Energy Saving Committee worked to reduce electricity consumption throughout the entire plant, using monitors to construct a management system, and was commended for its results three years running.

At the award ceremony held in Bangkok on October 18, 2019, Takeshi Asano, vice-president of Sodick Thailand Co., Ltd., came up on stage to receive the trophy from Deputy Prime Minister Somkid of Thailand.



Food Machinery Division Award

2019.11.25

## Won the Silver Prize at the Fuji Sankei Business i Business Advertising Awards

A Sodick advertisement highlighting the food machinery has won the Silver Prize in the Transformative Advertising Category of the 58th Business Advertising Awards given by Fuji Sankei Business i.

With women taking a more prominent role in society, an increase in the number of elderly people living by themselves, and the growing awareness of the need for disaster prevention, the demand for rice packs that are easy to use and have a long shelf life is booming.

To create this advertisement, we obtained data on trends in production volume for the past six years from the National Pakku Gohan Association. We created unique representations, using photographs of sterilized cooked rice (rice packs) to make graphs. Additionally, we place a large image of demand growth as an eye-catching element in the title section on the front page of a newspaper.



Kaga Plant Company Sports

2019.12.1

## A great leap forward for the Sodick Sumo Team! Demonstrated Top-class Abilities at the Tournament

Since its inauguration in April of 2019, the Sodick Sumo Team has continued a string of victories from its base in Kaga City. 2019 saw the team achieve splendid results at some noted tournaments. We will continue our fight in 2020!

The team made its debut at the 61st National Businesspeople Sumo Championship Tournament held at the Sumo arena in the Saitama Kenritsu Budoukan on September 22, 2019, where it achieved a wonderful first victory, winning it promotion from Group 2 to Group 1 for the year to come.

At the 68th Emperor's Cup All-Japan Sumo Championship, the most prestigious tournament in amateur Sumo in Japan, held on December 1, 2019, at the Ryogoku Kokugikan, Mr. Miwa from the Sodick Sumo Team took his place in the arena against giant veterans, achieving victory thanks to his power and technique. He achieved four wins in a row including the preliminary bouts, making it into the best 16 in the tournament.



Sodick

Sodick Co., Ltd. <https://www.sodick.co.jp/en/>

3-12-1, Nakamachidai, Tsuzuki-ku, Yokohama, Kanagawa 224-8522 Japan  
TEL : 045-942-3111

V-LINE® is a registered trademark of Sodick Co., Ltd. ● The export of Sodick's products and its related technologies (including software applications) is regulated under Japan's Foreign Exchange and Foreign Trade Control Law. In addition, because some of these products may be subject to re-export controls under the Export Administration Regulations (EAR) of the United States; please contact Sodick before offering or exporting these products overseas. ● Photos include images created from 3D model. Options may be included. ● The external appearances and specifications are subject to change without prior notice due to ongoing research. \* The surface roughness unit Rz is used based on JIS B0601:2001 and ISO4287:1997/ISO1302:2002. \*The content is current as of January, 2020.