2019 International Food Machinery & Technology Exhibition

**Fooma Japan**

**Jul 9 to 12, 2019**

- New: Food machinery
- Cooling Holding Bin
- Conveyor Belt for Food Inspection

**Ultra-Stable SRT Method**

Industry’s first Metal 3D Printer

Actively promoting paperless system and automation to progress towards factories with top-level product quality and productivity

**Sodick Xiamen Factory**

**Sodick F.T IAC Division**

**LED Lighting Exhibition Report**

**Sodick Kaga Plant**

“Multi Factory” fully operational

- Support: Onsen Rider in Kaga Onsenkyo
- Daishoji Temple Duty Change

**Sodick Business Group**

Participation in the Western Japan Business People’s Sumo Championship

**Inspection group visit**

Sodick, Inc. (Chicago)
Safely and Reliably
Create a Healthy and Delicious Food Culture.

Sodick independently develops advanced line systems based on the noodle-making technology that it has researched and developed for over 30 years. By incorporating the analysis from recent food science research, we quantify the quality of food using physico-chemical methods, pursue the elasticity, structure, compositions and texture of noodles.

Now, Sodick’s noodle technology spreads to various fields and advances to the production of processed foods, cooked rice and sweets.

We will continue to deliver safe and reliable food machines to meet a wide range of needs.

We respond to all sorts of needs with rich experience and cutting edge technology.

We support food production sites.

We make detailed proposals from designing to building production systems, leveraging the noodle manufacturing technology that we have developed over many years, such as fully automated rice lines and CIP (Cleaning In Place) to reduce manpower. What we prioritize is to accurately capture the needs of each customer and provide the most suitable products. We also provide full after-delivery service, allowing you to operate with confidence.

Cooling Holding Bin

- Achieves dramatically high efficiency compared to conventional cooling methods
- Easy adaptation to hydrated textures
- Significantly reduces running costs

“Industry’s first” Cooling Holding Bin for that controls ambient temperature as well as the temperature of the granular material.

Rapidly cools granular materials such as wheat flour and starch, and stabilizes quality.

Adopts a 2-step vacuum system that uniformly cools powder granules at about 30°C in a few minutes.

Test case Medium-power flour
Vacuum pressure: -150 kPa
Vacuum cooling time: 15 minutes
Pre-cooling temperature: 31.0°C
Post-cooling temperature: 21.0°C
Change in moisture value: About 0.5%

Conveyor Belt for Food Inspection (with LED Light)

- Detects foreign objects, hair, etc. with high illumination
- Easy-to-find foreign matter
- Detects foreign matter attached to the reverse side
- One-touch removal during cleaning

An LED light is exposed directly below the inspection conveyor, which makes it easy to distinguish foreign matter which may have been overlooked previously. This contributes to the prevention of contamination, which is the biggest problem in food production.

Introduction example Side dish factory (cut vegetables)... for sorting work after ingredient processing

Tray Feeder

Automatic supply of network trays
A suction conveyor is used, that removes them one at a time without being affected by the slight unevenness at the bottoms of the container trays.

Pressure Sterilization Apparatus

- Sterilization at high temperature and high pressure
- Food materials can be sterilized in a very short time with high-temperature saturated water vapor exceeding 100°C

The concept of cleaning is changing from manual cleaning to washing. Progressing to times where noodle machines will also be rinsed with water.

CIP Mixer

Hygienic with automatic cleaning

For noodles with low to high hydration, we make high-density, high quality dough which is free of unevenness.

Vacuum Z Kneader

Mixing differentiation
Sodick creates a new molding method

**Ultra-stable SRT Method**

Plastic Molding Revolution

Initiatives for carbon steel

**What is SRT (Stress Relief Technology)?**

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

- **Warp suppression technology**
  - Tensile stress is generated from the process of the cooling fusion points, which may cause shape deformation or cracks
  - Newly developed SRT suppresses warping
    - **Mechanism**
      - Expansion is actively utilized by martensitic transformation
    - **Point**
      - Reduces the risk of cracks and can produce objects with minimal warping and deformation

- **Suppresses warping by balancing these**

**SRT results**

- SUS420J2 suitable for plastic molds
- Can produce molded objects with extremely low warping
- Deformations due to stress release are small (easy secondary processing)
- Can thin the base plate
- Hard to break even when molding big workpieces

By overcoming residual stress, which was the weak point of 3D printers, we achieve ultra-stable mold making!

**Collaboration with MS50**

Sodick uses metal 3D printers to manufacture their own products.

- **Examples of linear motor-equipped products**
  - Linear motor drive: High-speed & high-performance die-sinker EDM AG40L
  - Insulator molding carried out with MS50: In-house developed and manufactured linear motor with core
  - Material: Vectra (liquid crystal polymer)

- **Examples of linear motor-equipped products**
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- **SRT applicable items**
  - Insulator mold insert
  - Cavity and core

- **Purpose**
  - Quasi-mass production and prototyping are both possible
  - Prototype
  - Mass production

- **Aim**
  - High-cycle high-quality molding
  - Ultra-short delivery time and low cost
  - High-cycle high-quality molding

- **Mold type**
  - Good precision and highly rigid
  - Simple metallic mold
  - Highly accurate and durable

- **Production method**
  - Selectable
  - Molding composite cutting finish
  - Molding + secondary processing finish for reference plane

- **Molding material**
  - SUS420J2
  - Maraging steel
  - Maraging steel/SUS420J2

**Method selection by purpose of using 3D printer**

- **SRT**
- **P04** Speed lab
- **P06** Standard
- **P07** *Patent pending*
Highly precise and durable standard mold

Shortened cooling time, improved stability during mold release

What is Speed lab?

A method that makes the most of the benefits of additive manufacturing

Producing prototypes in a short time by making the most of the plus points of additive manufacturing
A service of OPM Laboratory.

- Hardness: 37 HRC
- Min R: 0.3 mm
- Mold accuracy: ± 2/100 mm

Integrated structure type

Slide dying is possible

Conformal cooling (3D cooling piping)

Standard implementation

By manufacturing the separate parts of the conventional molds as a single piece, the ideal system of cooling piping can be installed which was not possible with conventional processing machines. This provides optimal flow, reduces cooling time and improves stability at the time of mold release.

Waterproof connector

Moving portion (upper type)

Harness cover

Reduction rate

Mold production time: 476.25 hours 18%
Number of mold components: 9 points 70%
Mold cooling time: 57 seconds 58%
Molding cycle time: 135 seconds 41%

(Compared to the convention)

Fixed side (lower type)

Mold production time: 59 hours 10 minutes 55%
Number of mold components: 9 points 70%
Mold cooling time: 57 seconds 58%
Molding cycle time: 135 seconds 41%

(Compared to the convention)

Mold production time: 54 hours 25 minutes 55%
Number of mold components: 9 points 70%
Mold cooling time: 57 seconds 58%
Molding cycle time: 135 seconds 41%

(Compared to the convention)
Sodick production base report: Supporting the global supply chain

Production Base Sodick Xiamen Factory (China)

Sodick opened its Xiamen Factory in 2007 with the aim of reaching No. 1 in share of electrical discharge machines in the Chinese market. As the company’s newest production base, we aim for a factory that is “Unsurpassed in the areas of product quality and productivity” (General Manager Tatsuki Tsuchiya) through advanced initiatives in paperless systems and the introduction of automation equipment. 11 years after the start, we have established Japanese improvement activities and the company’s unique QM activities, and improvement proposals have come up one after the other from the Chinese staff. The need for high-precision electrical discharge machines increases within China, we are working out policies to further evolve our factories.

We switched to a system where the inspection documents in the acceptance test and the production instructions in the power supply assembly are made paperless, and all this work is done on a PC. In the acceptance test, we check whether parts ordered from a local manufacturer comply with the specifications and whether or not there is any damage. In the past, large piles of drawings and documents piled up on desks, and some parts were overlooked during the test because 100, 200 parts were inspected in a narrow work space. Since June 2018, the company has been paperless, and in about half a year, has successfully reduced these overnights by about 50%. The company has also introduced the latest calipers, which can automatically input measurements into PCs, and has achieved a significant reduction in mistakes and labor costs together with paperless system. Similar results have been obtained in the power supply assembly line, and further improvements are planned by expanding paperless system for the production instructions to other processes in the future.

Constructing a system that can promise consistent production from parts processing to assembly and coating

Both factories in China are mainly targeted towards customers in China, but are divided based on the models produced, such as wire-cut EDM at the Xiamen factory and die-sinker EDM at the Suzhou factory. The main products of the Xiamen factory are standard type wire-cut EDM “ALN400” and “ALN600” They are respectively of the G-type where processing tanks move automatically and the Q type that is the manual movement type. In addition to these four major models, the plant also produces the reasonably priced “VL series.” The production capacity is approximately 1,500 units per year. As of November 13, 2018, 650 people are employed, including 17 Japanese. A major feature of the Xiamen factory is that it produces almost all of the key parts such as the coating parts that form the base of electrical discharge machines, sheet metal parts that cover machine exteriors, linear motors, discharge power supplies and printed circuit boards, and can consistently handle everything from assembly to coating. However, it has not been possible to always provide a steady supply of high-precision wire-cut EDM from the time of launch. Back in the early days when the Chinese staff had no experience in machine manufacturing, “we manufactured relatively simple die-sinker EDMs and gradually improved the technology” (General Manager Tatsuki Tsuchiya). It took about five years to build this system under the leadership of the staff at the ThaiLand and Suzhou factories, who already had the know-how. Currently, the Xiamen factory has built two factories on a site of 56,000 m²; the first factory performs machine processing, sheet metal processing, assembly and coating of parts, while the second factory manufactures linear motors and the magnetic parts which form their materials. A roof is set up between the two factories, and the space beneath the roof is used as a truck yard for finished machinery. The installation of many of our machines in 2017 has been increasing in response to demand from Chinese renovation manufacturers, who have encountered difficulties in investing in automobiles and electric components. This trend has been remarkable in the last 5 years, with about double in 2018 compared to about 700 machines in 2014. General Manager Tatsuki Tsuchiya said in response, “The Chinese market is heading towards high-precision and automation. The installation of many of our machines in 2017 and 2018 is proof of this.” In order to respond to increased production, the Xiamen factory is conducting various activities to increase productivity while ensuring quality. Among these, there is an emphasis on the drastic optimizations such as the introduction of paperless systems and automated equipment.

The first paperless initiative was launched in 2017 with the aim of improving the efficiency of clerical work in the management department. In the past, documents to be approved and various other application documents were submitted to the superiors for approval, but there was no means of understanding their status if they were delayed by some person, resulting in unnecessary waiting time. “In the past, documents awaiting approval piled up every day” (General Manager Tatsuki Tsuchiya), and the daily workload was also large. Therefore, we introduced a new OA system where you can make various applications and approvals through groupware. This system has been set up to allow applications to be made and approved on dedicated tablet devices, providing a record of “who” and “who” approved them. Even if approval is delayed, workers can demand approval “as soon as possible” because they know who is delaying the process. Deputy General Manager Yoshiaki Daichi, who is focusing on paperless systems, says “In addition to ‘visualizing’ business flows, whether the ‘unspoken rules’ in the organization such as ‘this approval must come from the manager of O&D; can be abolished will determine the success or failure of paperless systems.” As the next challenge, the company is making the manufacturing section paperless from 2018. This has already been introduced in three sections of the assembly process via withdrawal of parts, acceptance test of subcontracted parts and electrical discharge power supply.

Sodick Report 2019 Summer
Manpower reduction and labor saving through introduction of multi-axis robots and automatic conveyor machines

Automation is another initiative that is working towards 24-hour automation of the parts cutting process by multi-axis robots and automatic loading of plate materials for laser processing. Optimizing the number of staff to be placed in both can contribute to the improvement of productivity. After over a year of preparation, an automatic transport machine that can stack 12 different thicknesses of plate material was introduced to the sheet metal process in November 2018. Equipped with racks that can stack 12 different thicknesses of plate material, the system is designed to reduce the burden on workers while improving the quality of their work with a goal of doubling production.

The factory strength is great to achieve a nearly double production increase in several years. As General Manager Tsuchiya says, “Awareness of improvements has been continuous since the start of the factory, and now the staff is thinking for themselves in order to achieve the monthly production target.” There are a number of noticeable improvements and in- genuities that make use of staff ideas such as walking all over the site, jigs that stabilize parts that would otherwise roll if not supported by hand, mobile racks where parts can be lined up from the production side and moved over to the next process and work benches dedicated to assembling the wire harnesses without mistakes. At the Xiamen factory, Sodick’s unique “QVP（Quality Victory Plan）” activities are also promoted, where each employee works to improve the quality of their work with a goal.

Therefore, specialty staff is stationed in each department, and the procedures are intensively prepared over three months. The maintenance of procedure documents led to a significant reduction in the violation rate since 2017.

Expanding past efforts horizontally to speed up the pace of growth

The aim of the Xiamen factory is “a factory which is unparalleled in quality and productivity among Sodick’s five factories” (General Manager Tsuchiya). How can quality metrics reduce the number of claims from customers? Therefore, with the QA division as the center, to gather the know-how of Japanese engineers to the Chinese staff, to cultivate highly skilled young staff. Paperless systems and automation approached the level that General Manager Tsuchiya thought “should be an example for the other factories.” We also created on-site capabilities to support challenging initiatives. We are establishing the foundation of an important production base for expanding the share in global market.

Reducing claims during delivery by creating a site to comply with the procedure manual

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As part of this, “quality patrols” started in early 2015. This is an activity where QA headquarters staff walk around the site, checking how well the procedures are followed. General Manager Nobuyoshi Nabekura recalled, “It was unknown how many people were following the procedures, but when I checked, the number of violations I found exceeded my expectations.”

When we looked for causes of these violations, we found not only that the procedures were not followed, but that in some cases there were problems with the procedures themselves. Therefore, specialty staff is stationed in each department, and the procedures are intensively prepared over three months. The maintenance of procedure documents led to a significant reduction in the violation rate since 2017.

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Introduction to LED Illumination

Bright but not dazzling!!
Really!?
The PIKA series has high-power lighting for indoor and arena use, allowing for the illumination to be adjusted using a touch panel monitor. The “Kirameki” straight tube LED lamp SL-series exhibits more effective models suited for various scenarios. Also, the booth central monitor introduced a number of past case studies.

LED lighting for stadiums
PIKA-PRO
middle/narrow/super narrow

Equipped with the industry’s highest level of light output, this is a next-generation high illumination LED floodlight that realizes higher brightness, light spread, light strength and more vivid coloring than HID lamps and mercury lamps with the highest standard of radiation efficiency.

LED lighting for outdoor sports
PIKA8
middle/narrow

PIKA8 is very popular for football and baseball grounds. They can withstand the impact of hard balls at 130 km/h. We propose the best night game environment to meet the ground illumination standards using two types of lenses.

LED lighting for indoor arenas
PIKA-GL
series GL3&GL6

Each LED light source is equipped with a lens and baffle to suppress glare. Appropriate light distribution reduces leakage outside of the game surface. This has the effect of improving visibility of sports balls and shuttles, and is ideal for indoor sports. The design requires no ball guards. There is also a lineup of models with conventional diffusing panels.

Demonstration of impact durability!!
The PIKA series is designed with a 5 mm thick polycarbonate plate on the illuminating surface so that there is no need for a ball proof guard. During the three days of the exhibition, a 2 kg iron cannon ball was repeatedly dropped from a height of 2 m to demonstrate the impact durability.

An exhibition of lighting devices made by lighting manufacturers within and outside Japan for a variety of fields, such as home use, office use, industrial use, sports use and for crime prevention. At the Sodick Booth, we set up an area where the attendees could not only see but experience the concept of “sports lighting,” and the exhibition created a great reaction than expected.

Sodick LED lighting spreads to the sports scenario

A basketball court is recreated in the center of the Sodick booth for a free-throw experience. The light is not dazzling, so you can concentrate on a three-point shot.

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Sodick Report 2019 Summer
Flexible, multiple production without limiting production items

The Kaga “Multi Factory” was fully operational on November 27, 2018

With the completion of “Multi-Factory,” we have a system that enables production on multiple scales, so we can flexibly adapt to changes in the business environment and market trends without limiting production items. Also, by being adjoining to the distribution center, we aim to simplify movement, increase shipping efficiency and reduce delivery time. In addition, we will actively contribute to the improvement of production efficiency and shortening of delivery times to overseas plants to further enhance quality worldwide.

Factories capable of flexible and simultaneous production

A factory that can handle production flexibly and simultaneously, that can respond to changes in the business environment and market trends according to the acceptance trend of various machines without limiting production items. We aim to improve production efficiency and shorten delivery time by introducing automatic assembly in cell production, using IoT for inventory control, production and its management, and planning labor saving and improvements of work efficiency.

Further improvement of performance and quality of our high-precision, ultra-accurate machine tools

In order to meet a growing global need for high-end machines, we have established a test room equipped with a temperature-controlled room and a thermal displacement room. To develop an advantage for our linear motor drive machines, we aim to further improve the abilities and quality of our high-precision, ultra-accurate machine tools.

Building a system that can quickly respond to rapidly changing situations

In addition to the manufacturing department, the Kaga plant has many engineers in each division (construction, industry, food, etc.), and has built a system that can quickly respond to rapidly changing situations such as customer requests (special applications, special specifications, etc.) and quickly introduces newly developed models and features to the market.

Production System

We will implement “multi-factories” to strengthen our quality in the world.

As the main factory for domestic production, we will enhance production of advanced, custom-made machines such as high precision and ultra precision machine tools, specialized injection molding machines for high value-added products and hard-to-mold products, metal 3D printers and aluminum alloy-compatible injection molding machines that are the key machines for next generation manufacturing as well as machines that support automation and PCD tool processing machines.

We will strive to automate the production of machine tools and industrial machines, promote the collection and visualization of manufacturing data using IoT and continuously launch creative, high value-added products for the next generation.

Over 180 years, the residence walk is conducted at Kashu Daishoji Temple over 540 km!! High school students achieve their dreams through crowd funding.

Students of the part time night high school Kaga Seijo in Kaga City, Ishikawa Prefecture realize their dream of reenacting the duty change at Daishoji Temple.

For the love of Kaga City, Sodick will also support the “Kashu Daishoji Temple Residence Walk 2019” as a sponsor company. This reproduces the residence walk that was conducted at Daishoji Temple during the Shosei Period, dividing the area between Tokyo Nihonbashi and Ishikawa Prefecture Kaga City Daishoji Temple (540 km) into 25 sections, connecting each 20 km with a pair of 2 people, completing the highway connecting the metropolitan and six prefectures.

Kaga Plant, Ishikawa Prefecture

Kaga Plant

“Multi Factory” overview

Construction area: About 12,900 m²

Production floor: About 9,600 m² (total)

Machining Center

Metal 3D Printer

Injection Molding Machine, etc.

Total investment amount: Approx. 3.2 billion yen

Number of employees: 150 (max)

TEL: 0761-75-2000

11-1 Miyamachi, Kaga City, Ishikawa Prefecture

(Inside the Kaga Plant site)

The Kaga “Multi Factory” was fully operational on November 27, 2018. We also sponsored and participated in the 8th bicycle event.

On the first day, “Tachisugi Hill Climb” was held at Yamanaka Onsen and the children’s race “Aurore Cup” was held with running bikes.

On the second day, the main events were the “Shibayama 4 hour Enduro,” “Junior time trial,” and the “Wheelie school,” a bicycle class for kids, along with a variety of bicycle festivals.

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2019, a historic match that will be remembered!!
Hayato Miwa of the Sodick Kaga Plant
won the individual division!!

Although the sumo tournament started in 1935 at the Kansai factory, it was
canceled due to World War II, but was held again starting in 1972 with the aim
of creating friendship between departments through sumo and contributing
to the spread and development of the sport of sumo. With a substantial 70
year history, it is one of the most historic amateur sumo tournaments held by
business groups.

May 2, 2019 | Inspection group visit: Sodick, Inc. Chicago Headquarters

At the request of the Consulate General of Japan in Chicago, the Chairman of the
Liberal Democratic Party, Mr. Kato, who was
on a foreign trip to the United States, visited
the Company as part of a visit to Japanese
companies in Chicago.