Aspiring always to be an environmentally friendly and trustworthy company

TAMAGAWA NEWS

2018.3
Vol.20

A greeting from new President

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Tamagawa

Aspiring always to be an environmentally friendly and trustworthy company
TAMAGAWA NEWS
March 2018 Vol.20

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The cover of this edition

Naked Festival on the day of Hatsu-uma (first horse day) at Tokimata

It originated during the Kamakura period and has been held on the second Sunday of March every year. The event date will be March 11 this year.
This naked festival is an event to announce the start of spring season to Minami Shinshu area (southern part of Nagano pref.) and a Shinto Ritual which many people are looking forward to. It is the origin of the festival that the lord appreciated the victory and dedicated a wooden horse to the local temple named hoseki-ji to comfort the deceased soldier's spirit. Currently, it became a festival which men carry a variety of Mikoshi (portable shrine) while taking a cold water of the Tenryu River to hope for good harvest and home safety.

Tastes from the region Kurimanju, a secret recipe passed on from Kyoto 120 years ago Harukiya-honten

Located near the Hirugami Onsen hot spring in the inn-town of Komaba, near the vestiges of the ancient Eastern Mountain Road. Harukiya-honten is a confectionary store in the center of the town..In 1887, a Kyoto confectionery craftsman, Jinroku, made a journey along the road of the old province of Shinano, where he received help from a tofu store owner, Chotaro, who ran Harukiya at the time, before leaving him with the recipe for kurimanju (chestnut bun) as a gesture of gratitude. Then in 1889, the kurimanju, which tapped the streams of high quality Kyoto confectionary, was sold for the first time in the Inadani valley, at Harukiya-honten, where it acquired a fine reputation, and where it is still cherished to this day. The sweetness that gently melts in the mouth fits perfectly with powdered or other green teas. There is also confectionary giving a flavor of the scenery around the ancient Risshakuji temple in Iida city, such as persimmon mizuame syrup (Ikuyo), and the Eijitsu, which is a popular sweet with a refined flavor, also using persimmon.


Kurimanju


Ikuyo
persimmon mizuame syrup with special rice cracker


Eijitsu
persimmon kingyoku (agar jelly)

● Inquiries and orders **Harukiya-honten Eishoan**
243-1 Komaba, Achi Village, Shimoina district, Nagano Prefecture, 395-0303 TEL: (+81) 265-43-2878 FAX: (+81) 265-43-2879
【Opening Hours】8:30AM — 7PM 【Closed】Thursday Website : http://www.harukiyahonten.com

Greetings from the new President of Tamagawa Trading Co., Ltd.

At the general meeting of shareholders on February 11th, 2018 Shigeo Seiki has assumed the position of President of Tamagawa Trading Co., Ltd.

President Shigeo Seki

It is an honor to be accepted as the President of Tamagawa Trading Co., Ltd. at the 34th Ordinary General Meeting of Shareholders and the Board of Directors. Respectfully, I would like to say a few words. Although my experience and ability are limited, I will not stop providing my soul and effort to take our company to a higher place. Your continued patronage and support are highly appreciated.

It has been four years since I was appointed as the President of Tamagawa Seiki Co., Ltd. Our activities have been based upon our corporate philosophy of "grow technology and sale technology", while making contributions to the community our priority. We celebrated our 80th anniversary in 2017, which encouraged a big jump in performance, the equipment-related FA business showed significant growth both in Japan and overseas. We enjoyed the strongest sales ever in the history of Tamagawa Seiki Group. In the automotive-related CA business, sensors for drive motors of hybrid vehicles which were initiated about 20 years ago, have a significant potential in the Japanese market in the first place and in overseas markets as well, as a result of the recent global trend of change to electric vehicles. The aerospace, space and defense related distribution automation products, which have been our stronghold since the foundation of our company, are predicted to have a bright future with potential growth for commercial aircraft and space-related business. The defense related products have been maintaining steady performance. In the rapidly changing global market, business expansion that is focused on technology development is able to retain competitiveness and is a key factor in maintaining sustainable growth. What is more valuable for us is our flexibility in meeting our customer's requests and is increasingly more and more important. Taking this opportunity in assuming the position of President of Tamagawa Trading Co., Ltd., I would like to say that fulfilling my duties is the priority as the President of Tamagawa Seiki Co., Ltd., as well as implementing the policy of putting our customers first. Building a strong system of being all divisions in one is also my focus by eliminating the boundaries between divisions such as sales, technology and manufacturing. We will strive to maximize our efforts to make contributions to the development of our customers' business such that all our employees always put themselves in our customer's shoes in providing quality products.

Tamagawa Seiki Group aims to become a strong company which can compete in a global market by strengthening and refining its technologies and never stop developing new technology while fulfilling customer's needs. Your continued patronage and support are highly appreciated.

Profile

Shigeo Seki

Born in Iida City of Nagano Prefecture on August 9th, 1951.

Resume

Mar. 1974	Bachelor of Photographic Engineering, Faculty of Engineering at Chiba University
Apr. 1974	Tamagawa Seiki Co., Ltd.
Feb. 2002	Director of Tamagawa Seiki Co., Ltd.
Feb. 2011	Executive Director of Tamagawa Seiki Co., Ltd.
Feb. 2013	Executive Vice-President of Tamagawa Seiki Co., Ltd.
Feb. 2014	President of Tamagawa Seiki Co., Ltd.
Feb. 2018	President of Tamagawa Trading Co., Ltd.

Interests : Drum

Tamagawa Trading Co., Ltd.

- ☐ Establishment: Nov. 21st, 1998
- ☐ Capital: 14,650,000 Yen
- ☐ Number of employees: 110

Notification of executive change of Tamagawa Trading Co., Ltd.

New positions are assumed at the general meeting of shareholders as follows:

Senior Managing Director : **Yasuo Hagimoto** (Sales)　Director : **Masahiro Shiozawa**

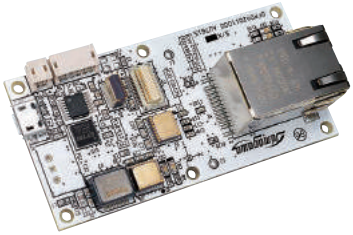
New gyro factory has commenced operation

In October 2017, the MEMS gyro and IMU production facilities were moved from the Second Fukuchi Factory at the Hachinohe Plant to the Second Hachinohe Factory, where they have commenced operation becoming the new gyro factory.The gyro business is one our core businesses, with which the company has been involved since its foundation. From this base factory, we plan to expand further with the forecast future growth in demand.At the Second Hachinohe Factory, we were able to consolidate the processes onto a single floor, which improved working efficiency. The cleanroom is spacious, and we were able to secure area for expansion as we look towards a future increase in production.In the future, the usual design and manufacturing of fiber optic gyroscopes, FOGs, along with the attitude measuring devices in which they are applied, will be carried out at the First Plant located in Nagano Prefecture, and the design and manufacture of the MEMS gyro and their IMU applications will be performed here.

Second Hachinohe Factory

Site area	34,251m²
Factory area	15,089m²

Second Hachinohe Factory chief products



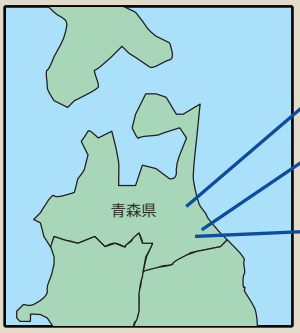
MEMS IMU

MEMS gyro

Rotary encoder
glass disc manufacturing

Introduction of Aomori district factories

The Second Hachinohe Factory is located neighboring the Hachinohe Plant, and with this factory, Aomori Prefecture now has a total of one plant plus four factories. The products manufactured at each factory are presented here.



2 Misawa Factory
1 Hachinohe Plant / First Hachinohe Factory
◉ Second Hachinohe Factory
3 First Fukuchi Factory
4 Second Fukuchi Factory

①First Hachinohe Factory

[Equipment related robot]

Large servo motors

~Second Hachinohe Factory~

Inside the factory

Photo-processing of sensor elements (tuning fork sections) for MEMS gyros. Production is carried out in an area of the cleanroom maintained at the Class 100 standard.Glass discs for rotary encoders are also produced here.

MEMS IMU　Assembly line

MEMS gyro　Production line

Measurement room

Motion control research meeting

This was held on February 16 at the Second Hachinohe Factory.Customers from many fields attended this session and, with the completion of our relocation, the itinerary included a tour of the new factory.The next session is scheduled for 11st,May, so if you are interested in MEMS gyros and IMUs, please feel free to contact us.

Coriolis-kun

A gyro history exhibition is planned to be installed in the entrance area.Look forward to a glimpse into the history of our company, which has long been engaged in designing and manufacturing gyros of various principles, as well as those products in which they are applied.

②Misawa Factory

[Car-mounted equipment related products]

Automotive VR type resolver Singlsyn

Resolver / digital conversion IC Smartcoder

③First Fukuchi Factory

[Equipment related robot] [Medical products]

Servo drivers

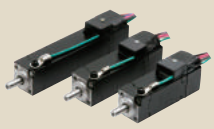
Rotary encoder

Sheet metal

Trackballs

④Second Fukuchi Factory

[Equipment related robot] [Car-mounted equipment related products]



Brushless resolver Smartsyn

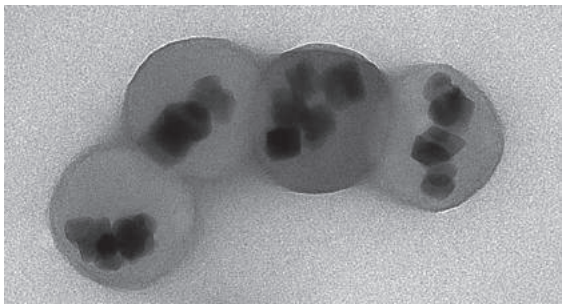
Small servo motors

New products

●FG beads® HM((high magnetic response FG beads®)

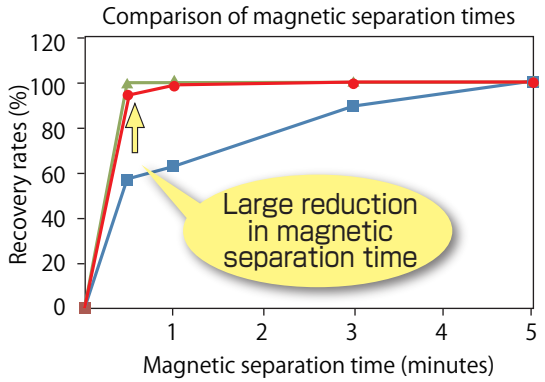
FG beads® HM(high magnetic response FG beads®)

Magnetic separation times can be greatly reduced in comparison with conventional products



Features

- By making the polymer layer thinner in comparison with conventional products, the magnetic responsiveness has increased despite the particle diameter being smaller.
- arget substances can be purified to a high degree with high recovery rates.



FG beads® HM (140nm) NEW

FG beads® (0.2μm)

CompetitorA (2.8μm)

※Using Protein G in each case

[Measurement conditions]

Solution: 50 mM KCl buffer
(20 mM HEPES-NaOH (pH7.9), 50 mM KCl, 1 mM $MgCl_2$, 0.2 mM $CaCl_2$, 0.2 mM EDTA, 10%(v/v) glycerol, 0.1%(w/v) NP-40, 1mM DTT, 0.2 mM PMSF)

Temperature: 25℃

Applications

- Immunoprecipitation (IP):This method immobilizes antibodies on the surfaces of the beads and concentrates and purifies target antigens from crude protein solutions, such as cell extracts, using the specific interactions of antigens / antibodies.
- Antibody purification: Antibodies derived from serum, ascites, cell culture supernatant, etc. can be selectively concentrated and purified using the beads.

Model number

Product name	Type	Internal volume {Capacity (concentration)}
HM-Streptavidin beads	TAB8848N3170	5mg {0.25mL×1 tube (20mg/mL)} 10mg {0.25mL×2 tube (20mg/mL)} 20mg {0.25mL×4 tube (20mg/mL)}
HM-Neutr Avidin™ beads	TAB8848N3171	
HM-Protein A beads	TAB8848N3172	
HM-Protein G beads	TAB8848N3173	

※*Neutr Avidin™ is a trademark of Thermo Fisher Scientific, Inc. and its affiliated companies.

Specifications

Bead diameter	140 ±20 nm
Concentration	20 mg/mL
Storage temperature	4℃
Storage solvent	10mM HEPES-NaOH (pH7.9)
Binding capacity	HM-Streptavidin beads, HM-NeutrAvidin™ beads: >3 ug Biotin label BSA/mg of beads HM-Protein A beads, HM-Protein G beads: >25 ug Human IgG/mg of beads

Excavation!

Introduction of drawings from before the Pacific War <Part 3>

~Illustrations for a vision of a semi-underground factory, Iida factory, First Machinery~

When dismantling one of the old company buildings, 70 to 80 blueprints for parts to be mounted on Former Japanese Army fighter jets etc. were uncovered.

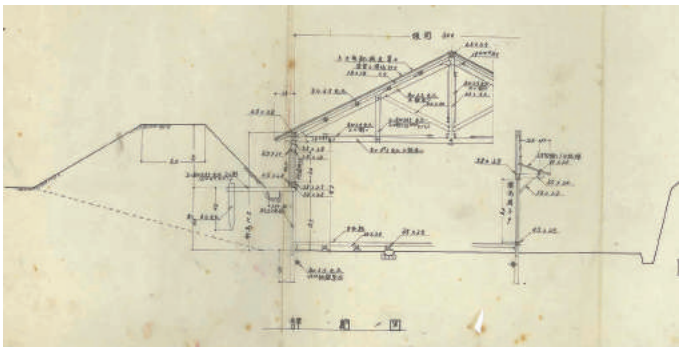
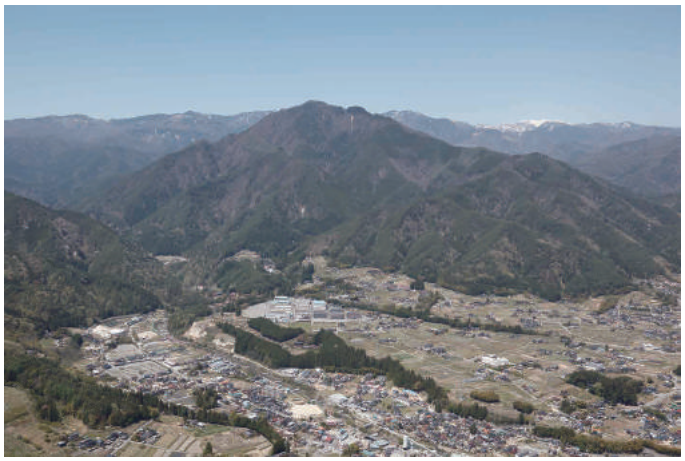


Figure 1

In this article, we introduce construction blueprints for a semi-underground factory structure, still in its conceptual stage as the end of the war approached.
The Iida Factory (currently the Head Office / the First Plant) is located at the foot of a mountain (Kazakoshiyama) in the western part of Iida City. The factory site was selected by its founders during the war, partly because winds crossing the mountains resulted in turbulent air flow, which would make it difficult for enemy aircraft to launch an attack.
However, on April 15, 1945, as defeat seemed imminent, Tokyo's Omori and Ebara districts were bombed, resulting in the Tokyo headquarters, the men's and women's dormitories, and the Tamagawa Academy in Kamata being burned down, and it is thought that this Iida Factory was conceived as a semi-underground factory in preparation for such an attack.
For this factory, the buildings were planned to be surrounded on all sides by embankments built to a height of 12 feet (approx. 3.6 m), while also taking advantage of the natural gradients of the sloping ground (Figure 1). There is a drawing (Figure 2) detailing the internal layout of machine tools such as lathes, polishing boards, milling cutters, etc., together with the matching details of the foundations, and it is quite clear that the plan was making very solid progress.
Looking further to the units of length on the drawings, the measurement system for buildings was ken (traditional Japanese building spacing), for external machine tool dimensions it was mm, whereas the fixing bolt diameters of machines were in inches (as a result of the introduction of American and British machine types). In the mixing of these measurement systems, one senses the labor involved when these drawings were produced.
During the war, 1,200 Type-97 Fuel meter were produced monthly (see Tamagawa News Vol. 18). At the Iida Factory, in addition to the volunteer corps, nearby shopkeepers, youths and agricultural workers were mobilized to an extent of over 2,000 people, achieving full production with "human wave" style tactics.
Eventually, the semi-underground factory plan was abandoned, and 18 100-tsubo (approx. 330 m2) buildings, together with a plating factory, were neatly arranged to form the Iida Factory, which appears largely unchanged externally even to this day, and is used as the headquarters / First Plant.



Current headquarters / First Plant located at the foot of Kazakoshiyama mountain

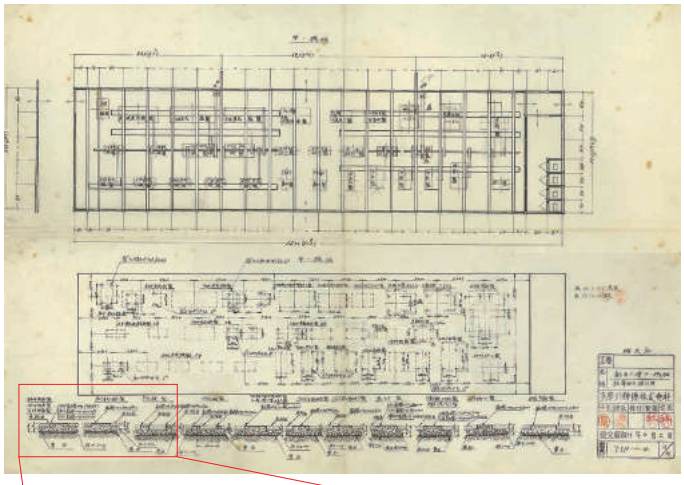
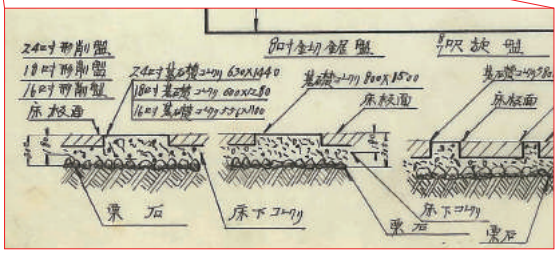


Figure 2



Units of inches, feet, mm and ken are mixed together in the blueprints

Next time The next article will conclude this series. The gyro, which represents one of our core businesses, will be discussed in the context of its appearance in the blueprint of a "Gyro wheel".

Information

Notice of Website Renewal

The company website has been renewed.
To make the website easier to search and view, not just on PC, but also on smartphones and tablets,
the page structure and design have been completely revised.
Please take a look.

http://www.tamagawa-seiki.com

Notification of the opening of the Second History Museum

The "Second History Museum" will present a selected 20 years of representative products and major achievements from the time between our foundation, 61 years ago, up until the present day, and it is scheduled to open on the anniversary of the foundation, March 3.
An attraction at the museum will be the high-precision resolver mounted on the ALMA radio telescope, installed and operated in Chile, South America.
It will be presented with a model of the large radio telescope. At the rear of the building, you can see achievements from the selected 20 years presented on a large screen.
Also, the first history museum, which presents around 60 years of history since our foundation, is in an adjacent location, so please visit both together.

- Address／(Head office - First Plant premises) 1879 Oyasumi, Iida City, Nagano Prefecture
- Opening hours／9 am - 4 pm (reservation required)
- Closed on company vacations ■ Admission free
- Contact／Headquarters General Affairs Division (+81) 265-21-1800

01 RISCON TOKYO 2017 (RISCON TOKYO)

Date: October 11(Wed)- 13(Fri)
Venue:Held at Tokyo Big Sight

We exhibited at this Security & Safety Trade Expo with the chief aims of making the case for the ATLAS surveillance camera series to attendees from a wide range of industries, and also recruiting district sales agencies for local government-oriented ATLAS products, i.e. partner companies.
The main features of the exhibit were the "Urban style model" with redesigned ATLAS-PLDN casing and the "Omnidirectional Surveillance Camera with Spatial Stability Function".
The "Urban style model" which blends into the busy scenery of an urban area, having a cool design that would not be out of place in an amusement park, received a very positive evaluation from the visitors.
Many people commented that in comparison with all-round cameras that use a fish-eye lens, the "Omnidirectional Surveillance Camera" works as a multi-purpose product, providing a complete 360 degrees circumferential view without image distortion.
This time, we not only aimed to distinguish ourselves from other companies in terms of performance / functionality, but also to perform PR for ATLAS products from the new perspective of "design".

ATLAS-PLDN Urban Style Model

Omnidirectional Surveillance Camera

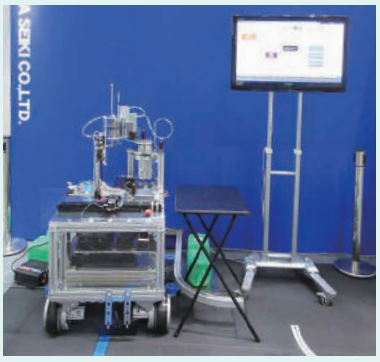
Exhibition booth

02 2017 International Robot

Date: November 29(Wed)- December 2(Sat)
Venue:Held at Tokyo Big Sight

We exhibited at the International Robot Exhibition, which gathered together industrial and service robots along with related equipment at Tokyo Big Sight, where we occupied a space with 4 booths (12 m in width, 3 m in depth).
In addition to a rich product lineup of motors and sensors, such as AC servo motors / drivers, step motors, rotary encoders and MEMS IMUs, as reference exhibits, we presented the robot servo actuator "torque servo module" that we have developed and a demonstration of a transfer robot applying 2-wire system technology.
The "torque servo module" jointly developed with Toyota Motor Corporation is a servo actuator for driving the various joints of humanoid or other robots. As a demonstration of the technology operated and experienced by many participants, we installed it in two steering handles producing synchronized movements in the image of remote control, and also demonstrating how a load (torque) applied to one handle could be experienced via the other.
Many visitors also inquired about a new application example of a 2-wire system in which this technology was applied to a transfer robot incorporating a 10-axis mechatronically integrated motor, and which effectively demonstrated the simplicity of the wire savings.
Through exhibiting at the International Robot Exhibition, we find a meaningful opportunity to make the case for our technological capabilities, while looking to a robot market where there is daily innovation in pursuit of co-existence and collaboration with human beings, both in our living spaces and our various industrial sites.

Torque Servo Module



Demonstration of 2-wire system technology applied to a transfer robot

Exhibition information

We will be exhibiting at the following upcoming exhibitions. Please come along.

- **Sea Japan 2018**
  Session: April 11 (Wed) to 13 (Fri) / Venue: Tokyo Big Sight, East Hall 6, Booth No.: T-01
- **TECHNO-FRONTIER 2018, 36thTECHNO-FRONTIER 2018**
  Session: April 18 (Wed) to 20 (Fri) / Venue: Makuhari Messe, Booth No.: 4B-39

Tamagawa Mobile Equipment Co., Ltd.

Tamagawa Mobile Equipment Co., Ltd.

This company was founded in Misawa City, Aomori Prefecture in March 2008. Manufacturing began as a natural disaster countermeasure, which decentralized production of Tamagawa Seiki's sensors for hybrid vehicles away from the factory located in Iida City, Nagano Prefecture. In 2009, the company accepted transfer of the press processing business from Tamagawa Hightech Corporation and began its processing.
In 2012, integrating with Tamagawa Gyrotronics Co., Ltd., production of MEMS gyros was newly commenced at the Fukuchi Factory, and the IMU products in which they are applied are also currently being manufactured. In October 2017, the MEMS gyro and IMU businesses were relocated from the Fukuchi Factory to Hachinohe Factory, which is the new base.
Our company has maintained its high quality while continuing to increase production volume, and while flexibly responding to our customer's requests, all our employees will continue to work together in striving for even higher quality. We will devote ourselves to manufacturing products which provide "peace of mind" and "inspiration" to our customers and, through such corporate activities, contribute to society.

Main Factory

Hybrid vehicle sensor "Singlsyn"

Hachinohe Factory

MEMS gyro special test area

Information

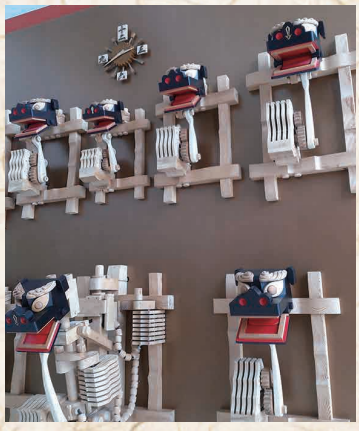
■Location / Main factory: 2-100-1 Otsu, Misawa City, Aomori Prefecture, 033-0134
Hachinohe Factory: 1-147 Kita-Inter-Kogyodanchi, Hachinohe City, Aomori Prefecture, 039-2245
■Established / March 2008
■Capital / 8 million yen
■Employees / 156 persons
■Products / Automobile-use angle sensors, automobile-use motors, pressed parts
MEMS gyros, ultra-compact high precision gyros, related applied products

Hachinohe City, Aomori Prefecture

Extra edition

Hachinohe City, a fishery city boasting some of the country's largest catches, is also one of the leading industrial cities in the Tohoku region. Here we present a selection of attractions relating to fisheries, industry and nature around Hachinohe City.

Hachinohe Portal Museum "Hacchi" Karakuri - Mechanical Lion Dance



Hachinohe Portal Museum "Hacchi", while cherishing our area' s resources, works as a facility to create new attractions through supporting tourism, culture & art, manufacturing, child-rearing, etc.
On the 1st floor, in 'Hacchi' Square, a "Mechanical Lion Dance Clock" made by Minoru Takahashi, a contemporary toy creator from Hachinohe city, has been installed. The lions and the mechanical parts moving them are made of wood, and our servo motors, drivers, and controllers are used to provide the motive power. Adjustments unique to the wood construction are necessary, and maintenance is still being performed twice a year, so you can experience the satisfying sound of their teeth snapping with perfect timing. It' s a wonderful work that fuses the culture and art nurtured in Hachinohe with its manufacturing, so please have a look.

【Inquiries】
◆**Hachinohe Portal Museum 'Hacchi'** 11-1 Mikka Machi, Hachinohe City, Aomori Prefecture, 031-0032
TEL:(+81) 178-22-8228 FAX:(+81) 178-22-8808 Opening Hours／9:00 - 21:00 (Please visit our website for specific exhibit operating hours)
Closed days／Second Tuesday of every month (when this is a holiday, the following day), December 31 and January 1 URL／**http://hacchi.jp/**
◆**Work and Play House, Karakuri Workshop** 3-19-8 Aoba, Hachinohe City, Aomori Prefecture, 031-0804 TEL:0178-44-4831 FAX:0178-44-5006
URL／**http://karakuri.jp** Facebook page：**https://www.facebook.com/mekakizumu**

Our company has various hobby clubs, and people with the same hobbies are getting together to enjoy them, regardless of department, position or age.Here, a side of employees unrelated to their work is introduced.

Tamagawa Badminton Club

Representative / Yukinori Ikegami (Special Equipment Engineering Section, Spacetronics Laboratory)

In this edition, we introduce the badminton club based at our headquarters gymnasium which, sited at an altitude of over 600 m, is the highest location in our company. The day is in February, the coldest time of the year, but despite the outside temperature being below zero, there's no heating in the gym. In this atmosphere (seemingly more suited to altitude training?), I get to visit the members breaking out into a healthy sweat.

Please tell me about your activities

We are here at the headquarters gym every Wednesday from 19:30 to 21:00. Currently, there are 20 members, including both members who are experienced at badminton, and those who started when they joined the club.
The tournaments we play in are held several times a year in Iida City, so we're working hard to be able to play an active part, both as individuals and in teams.
We also participate every year in the Nagano prefectural workers' athletic meet, and our female team came second in the prefectural tournament in 2017.
Since practice day is a weekday evening, there are times when you can't attend because you are busy or it clashes with a business trip, but the members who can make time will gather and play together. And before the tournament, our powers of concentration boost and we become a team that can really prove itself.

What are the good points about your activities?

Because your body tends to harden up doing desk work all day, it is good to have some fun moving your body, and you can also enjoy your free time, talking about things other than work, or going out together for a meal.

Some of the members are from outside the company. Whether you are from inside or outside the company, and regardless of how experienced you are, if you' d like to get your body moving then let' s play badminton together.

Autumn company sightseeing trip

September 29 (Fri) to 30 (Sat)

The employees were able to choose between an overnight stay for Autumn Tajima with a Kinosaki Onsen trip, and the day-return trip to Kyoto and Arashiyama, and many of us were able to enjoy the autumn sightseeing and the delicious food.
At the large banquet held at the overnight trip destination, employees in their first and second year decided on the program, which was centered on 70's - 80's songs and dansing, and the senior employees also really got into the spirit of things. The weather was good, and it was an enjoyable trip which deepened our friendships.

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