Pioneers of Fastener R&D

by Dean Tseng, Fastener World

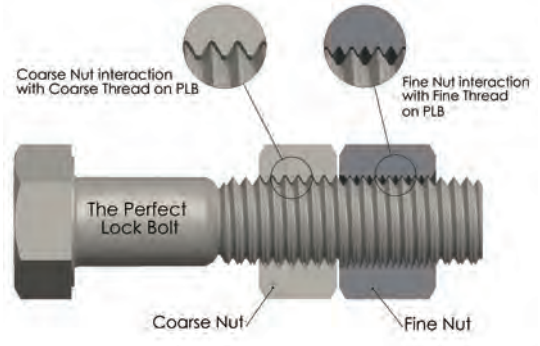
Professional Form Rolling Specialist Develops Innovative Perfect Lock Bolt

Nissei Co., Ltd. from Japan

Established in 1939 in Yamanashi Prefecture, Nissei is a maker of tap and die used for machining. In 1958 the company started producing and selling form rollers. Afterwards, it develops as a maker of form rollers for round dies. Now its form rolling technology is among the top grade of the world. It not only develops machines (e.g., CNC), dies, consumables, but also develops oil for rollers with Idemitsu Kosan company. Nissei president Mr. Shinbutsu Toshinaka says this powerful technical ability is Nissei's strength. It mainly sells form rollers to Japanese automotive part makers.

Form Rolling Technology Making the Impossible Possible

The company features "Galaxy" form rollers. The president explains, "We focus on realizing things that were thought impossible to happen by means of form rolling technology. For example, we developed a form rolling technology able to process automotive gears. Customers pursue 'added values', and namely, they expect 'evolution'." When asked about his views on the machinery market, he states, "Market demand for high performance machines will continue to increase, but the main challenge is that the market needs time to understand and recognize with the performance of those machines."



Achievement in Cross-territory R&D— Perfect Lock Bolt (PLB)

As a specialist of form roller and rolling technology, Nissei does not confine itself in a certain area and even expanded business to the fastener field and developed the original PLB. The president explains, "We have over 70 years of form roller manufacturing experience and have accumulated many technical capabilities. We made this bolt because in the very beginning we were curious about what we could invent out of our form rolling technology, and thus I cooperated with a university professor and developed this product. PLB is characteristic of its unlimited possibility of application. Its processing technology can apply on leg levelers, and turnbuckles. PLB's structure features double grooves, one large and one small, which will not be made possible without the use of our form rolling technology. Simple as the structure seems, it requires extremely advanced form rolling technology. The purpose of PLB business is to eradicate our dependence on any of the specific industries."

Future Plans— New Product, New Base, New Partner

Nissei's R&D does not stop. The president says he will start selling the new product "Z Comet (automotive gear processing machine)" this year. This May, he will set up a joint venture specialized in PLB production and sales in the Middle East with a local company. Currently Nissei's products are sold domestically. He will focus PLB on overseas sales expansion and he is looking for overseas bases and manufacturing partners, "We are looking for makers of 'long-size screw' which adopts PLB technology, and will release it this September. We also want makers of stainless steel or aluminum tubes in which long-size screw (M10, M12, M16) can be inserted." In the future we can expect not only Nissei's rolling technology but also its cross-field innovations that bring surprises.

"Screw" + "Screwdriver"

HIOS Inc. Holds the Trump Card

With 46 years of history, HIOS offers fastening solutions (screws, electric screwdrivers, torque measuring instrument, automatic/labor-saving machines) used for precision assembly and supplied to industries like household appliance, machinery, automotive, electronics, game console, aerospace (screw), railway (screw), and smart phone in Japan, Asia, North America, and EU. It has bases in China and Hong Kong. President Mr. Katsuyuki Totsu explains,

"Domestically we sell to users via traders (agents). The Shenzhen base in China specializes in product technical service, maintenance, torque measuring instrument calibration, and import/export. The Dongguan base in China is a screw manufacturing plant. In the future we will add maintenance bases in ASEAN and increase overseas agents for sales."

The Duo Trump Cards of HIOS— "JYUKU REN ®" Screwdriver & "TOTSUPURA ®PAT." Screw

Screw fastening operation is less complicated with few changes. Therefore, most operators don't possess professional grade fastening know-how, tend to overlook fastening mistakes and are likely to be highly erroneous and unstable. As such, HIOS decided to thoroughly analyze the cause of poor fastening, and then developed and rolled out an all-new screwdriver in 2015 with an intent to make everyone able to become "JYUKU REN" (meaning "skilled craftsman") and achieve expert-grade high fastening quality without the requirement of experience or hunch. The screwdriver can count the motor rotational pulses and precisely detect fastening errors. The body part emits sound to inform whether the fastening is qualified, and it can detect barely visible mix-up of different screws, as well as cam-out, pilot hole damage, and inclination. It can connect to external device for torque data management and manage multiple networks. As it does not require training to operate proficiently, it was awarded as one of the top 10 new products by Nikkan Kogyo news company. Additionally, HIOS developed the semi-automatic screwdriver (BLOP-OST) that can be mounted on existing machines, thus reducing customers' cost.

Everyone must have ever been troubled by cam-out when fastening cross-recessed screws. The culprit is the screw head's recess design. HIOS improved the head design and developed TOTSUPURA screw with 1.5 times more driving area, increased driving efficiency and far less chance of damaged recess. Moreover, the patented "Intertorque

®PAT." screw (refined from "Torques" screw) does not incline during fastening and reduces 40% operating time. It can even couple with screw feeders to achieve automated operation.

Future Plans & Prospects

In the interview the president points out an important industry trend: "Recently the manufacturing industry calls for automation and robotization. The Japanese manufacturing industry is also trending towards 24 hour unmanned production line, and thus the industry requires the use of components qualified for automated operation, but ordinary screws are not qualified. HIOS improves the recess defection and offers the market with highly precise screws. As for screwdrivers, the existing ones (including JYUKU REN) all come with manuals, but global scale market expansion requires simpler and easy-to-use screwdrivers, so we are developing manual-free screwdrivers." HIOS screwdriver coupled with patented screw achieves improved quality, defection prevention, work efficiency and low cost. With HIOS, the era of manual-free screwdriver is not a distant dream.

Inventor of New Snap-in Nut

Shoki Limited from Japan

Last autumn, Fastener World Magazine reported a fairly interesting new nut from Japan, called "One-Shot-One". With this brilliant special nut, it only takes you minimum time and effort to "snap" the nut to a bolt or threaded rod. Imagine how much convenience this invention brings! However, you might be surprised to find that the main business of the inventor is electric engineering of the construction industry rather than fastener manufacturing. The inventor is Shoki Limited. President Mr. Tsuruda Kiyomi says, "Although our business content differs from fastener manufacturing, we use bolts and nuts on a daily basis." As for the reason why this construction specialist would step a foot out of his professional field and invented this special nut, we can tell that from his words: "I'm always thinking what I can create for the industry."

Why is It Named "One-Shot-One"

The biggest characteristic of One-Shot-One Nut is that you can easily and instantaneously snap a nut to a long bolt with just a single hand. The single-hand installation and removal feature enables One-Shot-One Nut with better operating performance compared with other companies' "insertion type nuts". It also comes with other advantages, including: (1) The ability to snap in the nut from anywhere on the bolt; (2) No need to waste your strength on tightening the nut; (3) Cheaper than common insertion type nuts; (4) Reduced construction time; (5) Solving labor shortage; (6) Suitable for expansion construction or the situation where you forget to install bolts and have to install them afterwards. Why does this nut come with such a special name? The president gives an

interesting answer: “A one-time snap (ONE SHOT) + A lock-on in a single operation (ONE)”. It turns out that the name itself tells all of the product’s features. This product cannot only apply to common construction works and factory constructions, but also to multiple applications including EV battery box fastening in the automotive industry. What brought the president to the invention of this nut? He explains, “More than a decade ago, there was a time when we had to use insertion type nuts at a construction site, but eventually we gave up on using those because the cost was high (JPY 500 per unit of insertion type nut) and it required tools to insert the nuts. Therefore, I started to develop cheaper and better performing nuts in my company.”

The Resin Snap-in Nut with Strong Performance

One-Shot-One Nut adopts black reinforced resin (polycarbonate plus 20% glass fiber), resisting temperatures ranging from minus 40 degrees to 160 degrees. It weighs only 6.5 grams with breaking load at 3,357Nm (342 kg). Here’s how to use the nut. Push the mouth of the nut from an inclined angle towards the bolt. When the nut’s mouth opens, insert the nut at a perpendicular angle onto the bolt. When the bolt’s threads engage with the nut’s threads, slightly push the mouth inwards, and you complete the fastening process. In removing the nut, all you need to do is just budge the mouth open from below. Just as simple and quick as that. The president plans to sell 300 thousand units of One-Shot-One Nut in the first year of sales launch, “I expect traders to join and cooperate with us. Certainly we welcome anyone visiting us. The motive of One-Shot-One Nut is to give operators access to cheaper and easier nuts. In the future we will work more on reducing the cost and increasing sales.” Let us look forward to Shoki Limited rolling out innovative and interesting products in the future.

The Environment Protector Speeialized in Advanced Coating Technology

SUDOU Coating Co., Ltd. from Japan

Established in Saitama Prefecture in 2004, SUDOU performs adhesive liquid coating for anti-loosening/sealing/adjustment of male or female screws, and designs/manufactures/sells automatic coating machines. President Mr. Misao Sudou tells me how he entered the coating industry: “It has just been 11 years since I established this company, but if my pre-establishment endeavor and work are included, it is 3 decades. 30 years ago, the method of coating adhesive and sealing materials onto screws for loosening prevention and waterproofing was not prevalent because the coating cost was much higher than the screw manufacturing cost. In 1995, the Product Liability Act was put in force to prevent critical accidents caused by loose fasteners, and the act fostered the development of the coating industry. For many years I have been using my accumulated knowledge and technique to supply safe products to the automotive, aerospace, construction, household appliance, and medical industry, etc.”

Coating and Machinery Production

SUDOU’s current available pre-coat brands include 3M (organic solvent; extremely small particle size, therefore suitable for small screws or torque control), LOCTITE (anaerobic; water-soluble; eco-friendly), and TAIHEI KASEI (organic solvent; suitable for sealing or adjustment). Moreover, SUDOU also offers nylon resin filling type (water-soluble nylon; whole-circumference coating without using adhesives; eco-friendly) as well as nylon patching (nylon powder resin; suitable for torque control; eco-friendly). Besides coating, SUDOU manufactures coating machines.

Domestic/Overseas Sales & Overseas Cooperation

SUDOU mainly supplies processed products to fastener makers and traders, delivering to Japanese automotive production lines located in Japan, North/South America, Asia, the EU, as well as Japanese fastener factories located overseas. The president said, “Japanese coating companies rarely ship processed products directly to overseas customers because the domestic manufacturing cost is high. Despite that, I expect to enhance the sales of SUDOU’s coating technology and machines in the emerging Asia and Southeast Asia. Our new automatic processing machine has started operation since last year at Japanese companies located in Thailand.” In June 2012, the president attended Fastener Show Shanghai, and after a visit to local factories he felt proud of his world-class fastener anti-loosening and sealing technology. However, he also witnessed culture shock there: “I was surprised by makers in Taiwan and China because they had acquired coating materials that were not yet available in Japanese logistics or manufactured in Japan. Afterwards I started to visit these companies and built an OEM relationship with them, purchasing machines, components, and coating materials, and exchanging processing technique with them. Thanks to them, SODOU was able to upgrade and develop environmental protection solutions.”

The Coating Industry & Prospects

Shipping directly from Japan to overseas companies is rare due to high cost, but SUDOU does not intend to be restrained by that. The president noted, “I believe there will be more sales opportunities for processing technology and machines in ever-growing emerging countries. SUDOU will continue to evolve to provide safe and eco-friendly products to the society and companies.” SUDOU and the coating industry bear the mission of quality guarantee and endeavor for environmental protection!

Developer of More Than 100 Types Creative Fasteners

IIFAS Co., Ltd. / Sigtec Fasteners Inc. from Japan

Established in 1966, IIFAS is entering its 50th anniversary. Its main business includes industrial fastener production/project planning/proposal, fastening research, and the acquirement and application of industrial property rights. Surprisingly, it holds over 100 industrial property rights, including unpublished ones. Now its original products (OEM included) represent 80% of revenues! Sigtec Fasteners Inc., a subsidiary of IIFAS, focuses on manufacturing and exporting products. Now you must be curious about the strength of IIFAS. President Tom Ito says, "Our strength lies in our specialized R&D staff and trial manufacture staff. We gather unique creativity and pursue differentiation, developing excellent products at low costs. Moreover, we are a family-owned business which is different from large corporations, so we can utilize our strength and operate more efficientty." IIFAS mainly supplies to the assembly industry, temporary scaffold industry, assorted product makers, construction machine makers, construction industry, and traders of fastener, hardware, tube and electric materials.

Featured Brands: SIGTEC® & SIGLOCK® Series

SIGTEC is a series of the company's original screw and anchor, including blind fastener for single-sided fastening, fastener for insulating work, anti-vibration fastener, other assorted fasteners, and anti-vibration/insulating hardware for light equipment and roof support. SIGLOCK series is well-acclaimed since the sales launch in 2002 and includes nut (anti-theft, insertion type, anti-loosening type, torque control type), anti-theft bolt, and torque control type washer. Among the series is Magic Nut with an openable jaw to clinch a threaded rod, which won the second place in "New Product Showcase Contest" in Cologne Practical World Show in 2004. I wonder what the abundantly innovative president's next step will be. Tom explains, "Our next focus of R&D is anti-loosening nut and blind anchor. The development of excellent anti-loosening nut is our common task, and the market needs this nuts. We are planning to roll out the definitive version of the currently available anti-loosening nut, and we are developing a blind anchor that enables single-sided fastening."

License Plate Anti-theft Bolt

In Japan, creative inventions could happen anywhere in daily life and almost nothing is impossible. IIFAS even cneated anti-theft bolts for license plates. Why did the company invent anti-theft bolts for license plates? Tom explains, "Around the time of Beijing Olympics in 2008, the metal price hiked and there were multiple domestic thefts of stainless steel playground slides and ditch covers. In fact, over 4 years ago we already released the well-acclaimed anti-theft (shear) bolts and nuts. After that we started to think whether our shear fasteners can apply to license plates. (There are 30,000 plate thefts every year!) That is when the anti-theft bolt was born. Users only have to replace the existing screws on the plates and they will witness the anti-theft result immediately. Now, the most requested solution is the anti-theft function for solar panels."

Into Online Purchasing Business

Many companies in Japan, Taiwan and China are SMEs and therefore only a few of these companies with enough capitals can develop online shops. IIFAS is one of the few fastener companies in Japan with online purchasing platforms. Tom said, "Our official website was built in 2000 to promote our products. We started operating our online shop in 2007 for sales to users and small-lot sales. Although currently the shop is only available to domestic users, we are planning to roll out an overseas payment system to start in early 2017. Even small lots generate enough profits for us. Now we mainly deliver to Europe and Australia. As for our targets of overseas purchasing, we are mainly looking for sources of supply in Taiwan and Japan, and also looking for global sources." (Contact: sales@iifas.jp) In fact, Tom visits Taiwan 3 to 4 times a year.

What's the Next Surprise?

Compared with other fastener companies, IIFAS has acquired an amazing number of patents, among which the most welcomed invention is the anchor bolt for temporary scaffold. With full confidence, Tom said, "Our goal is to offer original fasteners with high performance and quality, becoming a contributing company to the industry." What is the next invention from Tom? We will find out and let us look forward to it!